COHERENCE, DIVERSITY AND EVOLUTION OF CAPITALISMS:
The Institutional Complementarity Hypothesis

Abstract

What are the forces that make relatively and transitoriily coherent the institutional configurations of capitalism? In response to the literature on the variety of capitalisms, the article investigates the relative explanatory power of various hypotheses: institutional complementarity, institutional hierarchy, coevolution, simple compatibility or isomorphism. Compatibility is too often confused with complementarity and complementarity is frequently an ex post recognition, rarely an ex ante design. Both hybridization and endometabolism are the driving forces in the transformation of institutional configurations. Uncertainty and the existence of some slack in the coupling of various institutions are key features that call for the mixing of various methodologies in order to detect complementarities. This framework is then used in order to analyse the degree of transformation of German industrial relations under the pressure of shareholder value. A second case study shows that three distinct institutional complementarities are at the origin of the more successful national economies since the 90s. Thus institutional diversity is being recreated and the existence of complementarities play a role in this process.
1. **INSTITUTIONAL ECONOMICS AND VARIETY OF CAPITALISMS: AN EMERGING ISSUE**

The concern for institutional analysis has been renewed during the 90s in response to both theoretical anomalies and puzzles on one side, new empirical issues on the other. Actually, modern neoclassical microeconomic theory has recognised that market mechanisms cannot cope with public goods, externalities, innovations and social justice concerns (Ingrao, Israel, 1990) and these market failures call for alternative coordinating mechanisms (Boyer, 1997). Simultaneously, economists have rediscovered with Ronald Coase (1937) that firms do play a major role in the allocation of resources and might be more efficient that markets when transaction costs are introduced on top of production costs. The collapse of Soviet Union has triggered a series of researches about previously neglected issues: how to build a market economy? Is there a single brand of capitalism or can a significant variety of capitalisms coexist even in the long run?

These two agenda tend to converge towards two quite central but difficult questions. First, what are the forces and mechanisms that coalesce a series of economic institutions into a viable system? Second, how do capitalisms change and evolve in the long run? The answers drastically differ from one research programme to another.

- **Standard neoclassical theory** considers that economic calculus in terms of costs and benefits can be applied to the choice among alternative institutional forms. Basically, they emerge out of the interaction of individual agents and this process is assumed to deliver a smooth evolution and a continuous adjustment to external shocks that are translated into relative price movements. If some inertia or irrationality prevails, public authorities should use benchmarking in order to convince individuals to adopt superior economic institutions.

- **Transaction costs theory** assumes that organisational forms should be selected in order to minimize these costs. This framework has mainly been applied to industrial organisation in order to distinguish between subcontracting, vertical integration, franchising and so on…. Some authors such as Williamson (1985) have proposed to extend transaction costs to the analysis of capitalism systems. Given the sunk costs associated to any investment into a given organisation and institution, these systems should display inertia, path dependency and in some cases sub-optimality, but in the long run institutions should evolve according to the factors that govern transaction costs.

- **Evolutionary theory** is built upon the hypothesis that heterogeneous organisations and institutions are selected by the equivalent of a fitness criteria and/or they can also evolve via a process of trials and errors and learning. A general feature of these models is to exhibit non ergodicity, path dependency, possible irreversibility and ex post sub-optimality. Therefore, the results that have been obtained for technologies exhibiting increasing returns to scales (Arthur, 1989), can be extended to institutions, scientific paradigms, conventions. Consequently, the very process of evolution is able to deliver contrasted industrial, technological and economic structures, even when national economies are open to trade (Dosi, Fabiani, Freeman, Aversi, 1993). Capitalist economies are seen as systems of coevolving technologies, organisations, institutions and conventions.

- A branch of the **new institutional economics** stresses that the constitutional and legal processes are crucial in the definition of economic rights, among them property rights, and consequently various national economies differ due to their constitutional order (North, 1990). Paradoxically, this vision is not faraway from the older conception that considers that economic transactions are embedded into a dense web of social relations (Polanyi, 1944; Granovetter, 1985; 1992). Therefore, the institutions of capitalism are not necessarily selected according to their economic efficiency since their role is to define the rules of the game, to deal collectively with uncertainty and to help solving the conflicts, disequilibria and crises that are typical of any market economy.
2. WHY AND HOW INVESTIGATE INSTITUTIONAL COMPLEMENTARITY?

Each of these hypotheses captures a part of the stylised facts concerning the evolution of contemporary capitalisms. The present article proposes another and more recent approach in terms of institutional complementarity. This hypothesis originates from scholars that try to comprehend the persisting institutional diversity between the US and Japan and still more between economies in transition (Aoki, 1994; 2000; 2001), or between the US and Germany and other continental European countries (Amable, 2001; Hall and Soskice, 2001; Boyer, 2001). A variant of this hypothesis considers that some complementarities derive from the impact of one institution over another and that this feature i.e. institutional hierarchy may have been a major ingredient for the coherence economic systems (Boyer, 2000; Abizuka, Uemura, Isogai, 1997).

Broadly speaking, the institutional complementarity hypothesis (ICH) is able to explain many stylized facts about the evolution and diversity of institutional architectures. First, comparative analyses do show a limited number of variety of capitalisms (Amable, Barré, Boyer, 1997), far inferior to that would result from a pure combinatory process (Amable, 2003). Second, ICH enlightens why most benchmarking experiments do not deliver the expected results when applied to capitalism, and this is not necessarily surprising since the same factors do not shape capitalist institutions and business internal organisations. There is a good example of the methodological weakness of benchmarking: the rather mixed (Zeitlin, Trubeck, 2003) or poor results (Kok, 2004) of open method of cooperation put forward by the European Commission under the name of Lisboa strategy that was supposed to bring continental Europe at the technological frontier, simply by mimicking the best practices observed in the world. Third, this is also an explanation of the difficulties experienced by the former socialist East European countries when they tried to adopt and adapt to market mechanism: the web of past interdependency between labour institutions, credit management and State interventions hindered the adoption of the new market oriented institutions (Delorme, 1996; Chavance & ali, 1999). More generally, the existing institutional complementarities, inherited from the Golden Age, explain the painful process of institutional reform in many continental European countries (Boyer, 2004c).

Nevertheless ICH is not such a simple notion and thus this article intends to discuss various methodological issues and then apply the major findings to the analysis two difficult but central issues. First, have not the 90s been a watershed in terms of variety of capitalisms? Second, are not coordinated capitalisms, such as the German capitalism de facto converging towards a market oriented configuration similar to the Anglo-American one? A tentative answer to the first question will built upon a research about the institutional prerequisites for the successful implementation of a knowledge based growth regime, as observed since the early 90s (Boyer, 2004). The answer to the second question will build upon the contribution of a German scholar who has investigated the transformation of industrial relations under the pressure of the adoption of typical Anglo-Saxon corporate governance (Höpner, 2003). The paper is organised as follows.

First of all, one should distinguish carefully between proximate but actually different concepts that try to capture the interaction between two or more institutions or organizational devices (§ 3). Second, it is important to recognize the large variety of mechanisms that may generate the equivalent of institutional complementarity: clearly, a purely technological complementarity is only a highly specific conception of the mechanisms that explain the clustering of institutions or alternatively of organizations (§ 4). A third methodological issue relates to the level at which the complementarity hypothesis is relevant: the arguments in order to explain the diversity of internal organizations of firms are not the same as those that are invoked for the diversity of capitalisms in spite of the efforts of the variety of capitalisms (VOC) literature to relate one with another (§ 5). Institutions are generally conceived as constraints that are detrimental to economic performance. By contrast a branch of the literature proposes that institutional constraints might be beneficial and complementarity plays an important role in promoting better outcomes (§ 6) Another important question deals with the issue of complementarity by ex ante design or by ex post discovery. Put differently it is important to make a clear distinction between the retrospective analysis of the social scientists and the vision and interpretation by the actors themselves acting on the spot (§ 7).
The detection of institutional complementarities is not an easy task and this may explain why so different methods are been used by researchers, even when they share the same objective and field of investigation. It is therefore necessary to assess the relative merits and limits of each of the strategies that have been implemented in order to relate institutional complementarity and the demonstration of a variety of forms of capitalism (§ 8). The use of the concept of complementarity is rather static since it is argued that it introduces a large institutional inertia…but this vision can be challenged and quite on the contrary the shift from one type of complementarity (or hierarchy) to another may explain the transformation of an institutional architecture and the related “regulation modes” according to Regulation theory (RT) (§ 9).

Two last sections apply the previous notions and methods to the two issues mentioned by the introduction. Do we still observe a significant diversity of institutional configurations in the era of financialisation, globalisation and productive paradigm shift (§ 10)? How to interpret the contemporary German trajectory: is the transformation of corporate governance compatible with the persistence of the industrial relations typical of a “social market economy” (§ 11)? A short conclusion wraps ups the main findings of the article (§12).

3. COMPLEMENTARITY, COMPATIBILITY, COHERENCE, ISOMORPHISM, CLUSTERING…OR COEVOLUTION?

Actually, there is a risk of confusion of complementarity with seemingly similar but distinct concepts. The emergence of this term has been associated with some implicit hypotheses that have to be clarified.

Complementarity

Two elements E and E’ are said to be complementary if the performance R of the conjunction of E and E’ is superior to any other mix of elements i.e.

\[ R(E, E') > R(E, A) \forall A \neq E' \]  
\[ R(E, E') > R(B, E') \forall B \neq E \]

This precise definition put strong limits to the use of the notion of complementarity. First the analyst has to explicit a criteria of performance that is not so evident (profit maximization for the firm, but what for capitalist economies as a whole: average profit rate, rate of growth, total factor productivity, level of employment and activity, equalitarian distribution of incomes, wealth,…). Second, the concept is clearly associated with the idea of optimum and maximization, a core trend of economic analysis but it is not necessarily so for sociology, law, history and so on. Basically, only sophisticated models (see for instance Amable & al. 2001) are able to prove such a complementarity. But how to diagnose complementarity by direct observation without the construction of a formal model engendering a series of fictitious worlds?

Some examples of possible complementarity might be useful to grasp the nature of this concept. According to many authors, a financial regime governed by direct finance is complementary with weak unions and the domination of short-term strategies and conversely, a patient financial regime built upon banks credit is complementary to a strong union, both involved into long-term strategies. Another example associates as complementary an accommodating monetary policy and flexible labour markets, a typical American configuration, whereas the monetary regime associated to a conservative central banker is seen as complementary to rigid labour markets, that are supposed to explain European unemployment.

Compatibility

This second notion is frequently confused with the first one…but it should not! Actually E and E’ are compatible if they can be jointly observed in existing economies and societies i.e.

There exists an economy such that: \[ E \cap E' \neq \emptyset \]

An interesting example is provided by Martin Höpner (2003) when he investigates the links between the dual management board system and employees’ codetermination. The tenants of a strong variant of VOC
would call these institutions as *complementary* – having observed the good “performance” of the German economy until the early 90s – whereas the observation only says that they are *compatible*. The proof of complementarity would call for a theoretical model adding up and/or subtracting a complete series of institutions and assessing the related impact upon an agreed measure of performance.

**Hierarchy**

This third notion implies a form of causality between two entities E and E’. Basically, the idea is that in order to be sustainable or viable the entity E absolutely needs the presence of another entity E’ out of a complete series E”, E””, E”””. Formally, this means:

If $\exists E$, then among a complete set (E’,E””,…,E”””), there is only one E’ such that $E \cap E' \neq \emptyset$ and $E \cap E'' = \emptyset$,..., $E \cap E'''' = \emptyset$.

In a sense, this criteria is more demanding than both pure compatibility and complementarity. The very existence of one entity cannot be observed without the presence of a single another one. Just to give an example for some monetarists and free marketers, an efficient monetary policy absolutely requires totally flexible employment and wage adjustments. This is a strengthening of the concept of complementarity and it is introducing an *asymmetry* between institutions: E requires E’, but E’ could be compatible with many other entities.

**Coherence**

This is still another notion. Two institutions are declared coherent if they can *easily coexist* i.e. if $E \cap E' \neq \emptyset$ is likely for structural, theoretical reasons for example. This is more than compatibility since it means that the fitness of each institution is improved by the existence of the other but it is less than complementarity since this does not imply that the mix between E and E’ gives the best result among any possible association of alternative institutions. Here the following ranking of the three concepts according to an increasing fitness of the two institutions:

Compatibility $<$ coherence $<$ complementarity $<$ hierarchy

The empirical observation of the coexistence of two entities may hint that they are coherent, whereas in order to declare that they are complementary, one must select a performance criteria and show by a theoretical and abstract reasoning – a model – that the precise mix of two entities give the best results among a whole spectrum of entities.

**Isomorphism**

In a sense, this is a *specification* of the case of coherence. Given the fact that organizations and institutions have interfaces, the constraint upon communication and mutual understanding implies some common principles that may come from one of the composing organizations and institutions (DiMaggio, Powell, 1991). Formally, two entities are said to be isomorph if they are equivalent according to a general common principle $P$ that defines a relation of equivalence $\mathcal{R}$ i.e

$E \mathcal{R}_P E'$

This ex post symmetry might well be the unintended outcome of the imposition by element E of its logic to element E’. Thus, it is a form of coherence and it may appear as the consequence of hierarchy. Sociological research on institutions gives many examples of institutional architectures generated by isomorphism. For instance, the rise of a Weberian public bureaucracy may impact upon the internal organization of large corporations. Conversely, the triumph of a free market ideology may induce a redesign of the same large corporations in order to mimic quasi market competition among profit centers. The concept of industrial and military complex is a third example of the consequence of isomorphism,
even if the explanation of its emergence is up to a political economy analysis. Therefore, in a sense, isomorphism is a specification of a mechanism able to produce some form of coherence.

Just to summarize:   Isomorphism ∈ Coherence

Hierarchy ⇒ Isomorphism

[Note that this implication is not general, since hierarchy may be associated with contrasted logics, i.e. flexibility for $E'$ but rigidity for $E$.]

**Clustering**

This concept simply describes the fact that two or several institutions are frequently observed simultaneously when some systematic comparisons are carried over. The concept is therefore purely descriptive and does not imply at all any idea that such a grouping of institutions necessarily implies better performance. Formally, this can be described by the existence of a significant correlation across various case studies ($i = 1, 2, \ldots, N$)

For sufficiently large $N$, correlation $(E_i, E'_i) > A$  

This is a strong distinction with respect to the usual definition for complementarity. Implicitly at least, competition is not perceived to be a strong selective mechanism that would destroy any inefficient clustering. Furthermore, there is no natural efficiency criteria for a given institution that may fulfill simultaneously various objectives in different fields. Last but not least, evolutionary theories suggest that the fitness is relative to a given context, let it be ecological, economical, social or political. The relations of clustering with related concepts are the following:

- Clustering = complementarity without efficiency criteria
- Clustering = high frequency of compatibility
- Clustering = coherence for a set of economies and periods
- Isomorphism = a possible source of coherence and clustering

Again, an example might be useful. When German multinationals go abroad, they rarely or neither export the codetermination nor do they export the dual training system. This would mean that these two institutions are clustering within the context of the German economy, but that they are not necessarily complementary at the level of the firm. The coherence of two institutions could well be context related. This means that institutions may exhibit triadic and not only dyadic relations, a quite important feature indeed (see fig. 10, infra § 11).

**Coevolution**

Most if not all the previous concepts were totally static. By contrast, the notion of co-evolution imply that the observation of the joint occurrence of two institutions or organizations might be the unintended outcome of a selection or learning mechanisms, operating via the succession of stochastic shocks and possibly major events such as crises. This concept is central to evolutionary contemporary research that was first designed in order to understand technological innovation but it can be extended to social norms, managerial tools or even economic institutions. A formal definition could be the following:

When $t \rightarrow T$  

Again, the German trajectory is an interesting example. In a sense, the contemporary vision of a built-in complementarity between industrial relations and corporate governance might well be the unintended outcome of a highly unpredictable historical process made of class struggle, institutional innovations, trial
and error processes at various levels. The observation of the resilience of a mix of institutions imply only that they fit one with another without any idea superiority in terms of efficiency. The example of technologies with increasing return to scale clearly shows that the result of the evolutionary process does not necessarily deliver the most efficient technological system (Arthur, 1989). Hence the following relations with the previous concepts:

Complementarity = ex post and sometimes false presumption of efficiency for the outcome of an evolutionary process that is the origin of the coevolution of institutions

Clustering = evidence that the outcome of a series of coevolution processes might be less idiosyncratic than expected, i.e. more than compatibility.

4. THE ORIGINS OF COMPLEMENTARITY MATTER AND THEY ARE QUITE DIVERSE

The contemporary research displays a clear temptation to derive some major institutional complementarity for purely technical constraints. Just two examples: Milgrom and Roberts (1995) use the concept of supermodularity in order to explicit a strong complementarity between just in time, total quality control and team work. This hypothesis reminds the hypothesis of a strict complementarity between capital and labor in growth theory. “à la Harrod-Domar” Actually, it is far from evident to see managerial tools as basic inputs than can be dealt with the equivalent of a production function with a clear complementary between factors. In the literature on the variety of capitalisms, the resilience of coordinated market economies is attributed to the organizational complementarity that exists at the firm level between skilled and high paid workers. (Hall, Soskice, 2002). This complementarity is extended to economic institutions by the equivalent of an isomorphism between private organizations and national institutions. One may challenge this supremacy of technical complementarity and propose a complete spectrum for the origins of institutional complementarity:

- Natural complementarity derives from scientific laws about nature. For instance, the chemical industry is a good example of production functions with strong complementarity due to the property of atoms and molecules. This constraint deriving from science may of course exert some influence on the organization of the industry. But please note that technical complementarity is strict indeed (only the right mix of inputs gives the desired molecules) and nevertheless one could observe a significant variability in the organizations and institutions governing the same industry across countries.

- Technical complementarity is a proximate concept of natural complementarity but the difference is about the origin of the efficiency associated with the conjunction of two inputs. Most of these complementarities are man made and not deriving from natural laws. For instance, in the computer industry the hardware and the software are complement and not only coherent, since they derive from a coordinated design. Similarly, the combustion engine creates a complementarity between car production and use on one side, oil consumption and production on the other. De facto, social systems of innovation exhibit a series of complementarity or at least compatibility between various techniques and products Amable, Barré, Boyer, 1997).

- Complementarity by design could be a better description of these complementarities. A good example is the invention of assembly line that creates intentionally a complementarity between the mechanical speed of the assembly line and the intensity of work, as well as between the equipment and the volume and skill composition of manpower. A complementarity that seems to be embedded into materials and techniques is actually the result of a choice and a strategy of social control and economic efficiency. According to contemporary conception of economic policy, the independent central bank needs as a corollary sufficiently flexible labour markets and a strong control over deficit spending. Such a complementarity is rarely observed de facto since it is indeed a strategy in order to transform the industrial relations inherited from the Golden Age. This form of complementarity is not at all a constraint but a transformational project.
Ex post discovered complementarity is a fourth configuration: it is not an intrinsic property of organizations or institutions but it results from the observation of the properties of an emerging regime that can be better understood after a long period of trials, errors and learning. Paradoxically, such a discovery of complementarity comes at the very moment when an aging system is entering into a decline or a demise (see also figure 4, infra). A well known example is the recognition of Fordism, as the synergy between mass production and mass consumption, at the very moment when this macro regime entered into a structural crisis. Let us add two contemporary examples. Information and communication technologies do not deliver automatically more productivity, unless they are associated to a significant reorganization of the firms (Askénazy, 2002). Such a statement that was not at all evident in the early 90s. Similarly, ICT and profit optimization are seen as complementary but in the case of the air travel industry it took more than one decade to perceive that the sophisticated information flow that was created by the computerization of air travel reservation could be used in order to develop a real time yield management via continuous price adjustments (Bresnahan, 2002). For this author the emerging complementarity between a new technology and a managerial model is the outcome of a coevolution process made of trials and errors that are erroneously interpreted in retrospect as a typical and well known static model built upon clear complementarities.

Functional complementarity is still another origin for the clustering of institutions. This is especially important for social scientists. The sociologist considers that social roles complement each other when the duty of an individual is the right of another one. For economists, the credit given to a firm is the strict counterpart of the obligation to reimburse to the bank, as well as supply and demand do have to fit one with another. Since functionalism has been severely criticized, functional complementarity has been somehow neglected in understanding the viability of socioeconomic systems. For instance, are not property rights, the existence of a strong and independent justice and the enforcement of law the joint requisites for any capitalist system? When the Soviet type economies collapsed, this basic finding was neglected by many mainstream economists who thought that markets would endogenously emerge out of the self interest of individuals.

It would be thus interesting to survey the available research on institutional complementarity and specially the case studies, in order to clarify the nature of the mechanisms they usually invoke. In the absence of such a survey, one may fear that the concept of complementarity degenerate into a buzz word and a misleading fad.

5. AT WHAT LEVEL DO COMPLEMENTARITIES TAKE PLACE?

The recent trend of research has been to work out the micro foundations for macro regularities and therefore to try to derive institutional complementarities from complementarities observed at the level of the firm. The variety of capitalism approach (VOC) is a good example of such a strategy (Hall, Soskice, 2001).

Hence it is theoretically possible to generate a variety of capitalisms based on a combination of two hypotheses: first a technological or organisational type of complementarity between work, equipment and product; second an isomorphism between companies’ organisation and society wide economic institutions. The reasoning can be captured by the following equation:

\[
\text{(Hall – Soskice [2001])} = \text{(Milgrom – Roberts [1990]) + (Di Maggio – Powell [1991])}
\]

or in more theoretical terms:

\[
\text{VOC} = \text{theory of supermodularity + isomorphism between organisation/institution}
\]

A careful examination of the reasoning and design of figures 3 and 4 (Hall, Soskice [2001: 28, 32]) demonstrates that the complementarities also relate to society wide institutions which in turn shape, constrain or provoke appropriate management mechanisms and routines within firms. The causality is therefore two fold: on one side, it goes from the macro to the micro level, and on the other side, the
macroeconomic dynamic is of course never more than the result of a conjunction of the different firms’ strategies. And yet, these macroeconomic properties have absolutely no reason to be the direct expression of the constraints that the representative firms face.

Thus the distance between VOC’s reality and results and an alternative macro orientation – such as régulation theory RT – is made explicit. The aim of RT is to develop macro institutional foundations for a series of micro behaviours. Figuratively, we could postulate a second equation that is representative of the latest RT developments, but, in a sense, of VOC as well:

**RT Microeconomics = institutional complementarity + institution/organisation isomorphism**

This paves the way for a vast but difficult field of research, where we would examine the extent to which these two conceptions constitute alternatives (figure 1) or inversely can be combined in practice, if only because technology, companies’ organisation and economic institutions all co-evolve over the long run.

*Figure 1. Links between organisational complementarity, organisational/institutional isomorphism and institutional complementarity*
6. INSTITUTIONAL COMPLEMENTARITY AS SYNERGY BETWEEN TWO BENEFICIAL CONSTRAINTS

A second issue is about the conception of institutions as pure constraints that are detrimental to economic efficiency because they block the free adjustments of preferences and production constraints via price formation. For Douglass North (1990) they are also enablers for the strategy of individuals, in dealing with uncertainty, coordination and interpretation of information. Thus, contrary to Chicago school’s conceptions, some mix of institutions may deliver better economic and/or social outcomes that a pure market economy. After all this is no more than the conception that considers the beneficial role of some constraints that restrict economic opportunism, short-termism or allow the supply of some public goods quite essential to the competitiveness of firms (Streeck, 1997). Let us give an intuition of this result.

In the Walrasian tradition, the equilibrium prices make compatible preferences and technological constraints. This feature can be captured by the following equation that expresses that excess demand for each market is equal to zero.

\[ Z = f(p, \mu, T) = 0 \rightarrow \begin{bmatrix} p^w & C^w & N^w \end{bmatrix} \]

\[ Z = g(p, I_1, I_2) = 0 \rightarrow \begin{bmatrix} p^l & C^l & N^l \end{bmatrix} \]

Unfortunately, the Walrasian auctioneer i.e. the global market maker, does not exist and has to be replaced by a series of institutions: a monetary regime (I_1), a competition law, labour market institutions (I_2). Therefore, individuals now react not only in response to the price signals but also according to the existing institutions. This institution rich economy displays a different equilibrium

For most economists, the name of the game is to compare the outcome of a totally abstract economy, the Walrasian one for which any market equilibrium is pareto optimum, with a more realistic economy with various institutions but still an auctioneer. It is easy to understand then that any institution can only deteriorate the fit between preferences and technological possibilities. But if really existing decentralized imperfect markets are introduced, the various institutions might help in reaching a satisfactory equilibrium. Ideally, the various institutional settings could be compared according to their economic and social outcomes. But this requires the equivalent of a social welfare function in order to derive a single index out of the distribution of outcomes for individuals.

Concerning the issue of complementarity, this very simple formalization might help in understanding the difference between compatibility and complementarity.

- **Compatibility** is observed when there exists a set of equilibrium prices, consumption and employment. Such a property is not necessarily fulfilled and thus this is a discriminating criteria in the assessment of the viability of alternative institutional architectures.

  \[ I_1 \text{ and } I_2 \text{ are compatible if there exists an equilibrium } E(I_1, I_2) \neq \emptyset \]

- **Complementarity** is a much more demanding criteria. First, the analyst has to compute an equilibrium with only the first institution I_1 i.e. E(I_1) and repeat the same operation for institution I_2. Second, one adds the second institution and has to compute the new equilibrium E(I_1, I_2). Third and it is still more difficult, the economist has to adopt a welfare function in order to compare the two equilibria. Finally, the institutions I_1 and I_2 will be said complementary if their joint presence deliver a better outcome than each of the separate institutions. It can be captured by the two following conditions:

  \[ I_1 \text{ and } I_2 \text{ are complementary if } \quad E(I_1, I_2) > E(I_1) \quad \text{ and } \quad E(I_1, I_2) > E(I_2) \]
Some examples might be useful.

- If one stick to *general equilibrium theory*, one could introduce two discrepancies with respect to the conditions that deliver an equilibrium. First increasing returns to scale (H₁), second imperfect competition or more precisely oligopolistic pricing (H₂). Whereas a pure competition (H₀) equilibrium does not exist with (H₁), the existence of imperfect competition entitles the existence of an equilibrium i.e.
  \[ E(H₁, H₂) > E(H₁, H₀) \]

- Recent research about *institutional complementarity* (Amable, Ernst, Palombarini, 2002) shows by formal modeling that strong unions (SU) and patient capital (PC) provided by bank credit can be better than competitive labour (CL) markets and short-termism (ST) capital markets, i.e.
  \[ E(SU, PC) > E(CL, PC) \quad \text{and} \quad E(SU, PC) > E(SU, ST) \]

- The viability of a *banking system* is threatened by periodic bank runs especially when free banking (FB) and fierce competition (FC) prevail. This has triggered the efforts of economists in order to find out regulations that could prevent such dramatic episodes. They finally find out the complementarity of two corrective devices. On one side a deposit insurance (DI) reduces the probability of bank runs but it simultaneously might induce banks to take more risk for their credit activities. On the other side, prudential ratios (PR) have been imposed in proportion to the risk taken for each category of credit (Borio, 2003). We find again the same hierarchy among equilibria:
  \[ E(DI, PR) > E(DI, FB) \quad \text{and} \quad E(DI, PR) > E(FC, PR) \]

This leads to two general proposals expressing the same idea. First, *two imperfections might be better than a single one*, since they correct each other potential unbalances. Second, *two constraints might be beneficial to the quality of economic equilibrium and social outcomes*, provided they adequately interact each with another.

7. **EX ANTE VERSUS EX POST: THE ISSUE OF UNCERTAINTY AND TIME HORIZON**

This theme is largely and well developed by Wolfgang Streeck (2003). Actually some theoreticians think to be forward looking and clever enough to detect ex ante complementarity whereas they are simply struggling in order to capture in their models the logic of the clustering of institutions that has been developed by a highly complex and unintended process. Even ex-post “the fact that one institution complements another is fundamentally uncertain”. Furthermore, the institutions that are supposed to be complementary by institutional design, rarely end up so. Let us give an example of such a retrospective illusion and develop the previous case about the regulations and institutions that prevent banks runs.

A first remark about the status of theory of bank runs. Actually, many such episodes took place in history before theoreticians in sociology (Robert Merton) or economists (Diamond, Dybvig, 1983) proposed their explanations. For Robert Merton, the key interpretation was in terms of self fulfilling prophecies, whereas Diamond and Dybvig were interested by the issue of the preservation of liquidity in response to a lower than expected rate of return of the credit. Furthermore the contemporary mix of insurance deposit and prudential ratios was not clearly perceived as THE solution to bank runs. Various experts proposed the creation of a money clearing market among private banks, while others thought that the central bank should be the lender of last resort and thus stop bank runs. Not to speak about the tenants of a pure currency principle according which bank should only manage the payment system, without managing any credit. This is to say that the complementarity between (DI) and (PR) was not at all evident even two decades ago, not to speak one century ago!
Actually, this was the result of a largely unintended process that is ex-post summarized by the hypothesis of complementarity. A priori, many solutions were available from the more backward looking (interdiction of monetary creation by private banks) to the most innovative and unconventional ones such as the supply of an unlimited amount of liquidity to banks suffering from liquidity and even solvability problems. Private insurance companies could have provided the help required and various forms of bank deposits (with or without insurance) could have been proposed to customers. But the trials and errors process has converged towards the idea that a compulsory public insurance should cover individuals’ bank accounts. But then, bankers may become less risk adverse since they are sure to are bailed out in case of liquidity shortage. Therefore the type of banking crisis has changed and calls for new countervailing mechanisms. It took several decades to invent the prudential ratios elaborated by the Bank of International Settlements (BIS) and this device propagated all over the world. Observing that at least for financially developed economies, banking crises had become less frequent, many economists were induced to conclude that exists an intrinsic complementarity between (DI) and (PR) (figure 2).

![Figure 2: How deposit insurance and prudential ratios became to be perceived as complementary](image)

But this was not at all the end of the history of banking management and this nice complementarity has in turn encountered some limits. For instance when prudential ratio were introduced into the ailing Japanese banking system after the bursting out of the 1980’s bubble, the direct impact has been to exacerbate a credit crunch and a contraction of investment. Thus, depressing the level of economic activity, the introduction of PR has created a new wave of bad loans. Given a rather complete deposit insurance, no bank run took place in Japan but the conjunction of ID and PR has not be sufficient to restore confidence into the banking system and dynamism into the Japanese economy. In a sense, the complementarity between two institutions has a variable impact according to the general context in which such a complementarity is embedded.

But there is another reason to put in historical perspective such a complementarity by looking at the American trajectory. Since the early 80s, financial innovations have been promoting direct finance at the detriment of banking intermediation. Consequently, the competitive situation of banks has been deteriorating and pushed them to take more risks. But to compensate the different risks linked to default of payment and interest rate variations, the banks have benefited from the new trend toward securitization: grouping some of their credits and converting them into securities, the bank could spread out the risk that traditionally was concentrating into the credit system. Thus appears a new complementarity of ID and PR with the strategy of securitizations (figure 3). Thus ID, PR and S now exhibit a triadic complementarity.
Figure 3. The rise of direct finance puts pressure upon previous complementarities

The theoreticians drastically simplify the issue of institutional complementarity in removing most of the uncertainty that is at the origin of the emergence of most, if not all, the observed clustering of institutions.

- **Serendipity** is more frequent than rational economic calculation as far as the emergence of institutional complementarity is concerned.

- The very recognition by the actors of a complementarity may trigger destabilizing strategies and innovations that erode the beneficial role of this complementarity, that then may enter into a crisis.

- The **degree of coupling** of institutions might first be rather weak but increase through time by the recognition process according which actors try to exploit this perceived complementarity.

- The success of the complementarity between two institutions is **context dependent**, i.e. it has to be the compatible with the social and economic global ordering.

Thus, the perception by most of the actors of a complementarity could well be the early warning that the system may enter a crisis, due to the exploitation by a larger and larger fraction of the population of the benefits of this complementarity (figure 4).

8. DETECTING COMPLEMENTARITIES: NOT AN EASY TASK

A priori various methods are available in order to test ICH. Of course, the first step is to define a **performance criteria** and this is not evident at all since each brand of capitalism has its own criteria: rate of growth, total factor productivity and profit rate for market led capitalism but improvement and homogeneity of standards of living for social democratic capitalism…and so on. Once this choice has been made, the economists may first build a theoretical model and formalize how economic agents react to various institutional environments and what are finally the global performance indexes. Contemporary **micro theory and game theory** have thus been used in order to assess the possible complementarity of various institutions that result from the interaction of agents within the given institutional context. For instance, some models show that employment stability and the main bank were complementary for the Japanese economy in the 1980s (Aoki, 1988). Or alternatively highly mobile and competent work force are
Figure 4. The process of emergence of institutional complementarity: a synoptic view

- Reversal of previous favourable trends
- Emerging inertia
- Entering into crisis and decay of an institutional configuration
- Change in the context
- Actors perceive a complementarity
- Uncertain coherence
- Incentive for the search of new configurations
- New configuration
- Maturation
- Aging
- Decay and destruction

Degree of coupling of institutions

High

Low
complementary with venture capitalists in the Silicon Valley in the 1990s (Aoki, 2001). Similarly, strong unions and financing by bank intermediation have been proved to be complementary under some conditions (Amable, Ernst, Palombarini, 2002) and this helps to understand the European configurations.

Generally speaking, these models are highly abstract and theoretical. They basically discuss the conditions under which the mix of two institutions delivers a superior performance and the related thresholds are confronted with some stylized facts drawn from historical analyses or international comparisons. Therefore, a direct test of the relevance of a given complementarity has to be carried through different approaches, i.e. rather sophisticated econometric studies, generally combining cross section along with time series. Two institutions will be declared as complementary with respect to growth, if the term built by multiplying a representative index of each institutions has a positive and significant impact on growth (Ernst, 2001). Such a strategy has been popularized by the empirical research on corporate governance. For the time being, few results seem to be robust enough and to fit with the teaching of the theoretical models.

Other methods can capture the rather different concept of clustering. Among them, the qualitative comparative analysis (QCA) (Ragin, 1987; 1994) is interesting since it removes the issue of optimization of performance just to try to reveal the various mixes of institutions that deliver a given qualitative outcome. Such a method has been used in order to detect what institutional architectures can cope with the use of ICT and one of its merit is to leave open the nature and the number of institutions that turn to be associated with a good performance (Boyer, 2004a). Similarly, it can be enlightening in the interpretation of the success of business models to directly test the de facto complementarity between managerial devices, often obscured by the rhetoric and the marketing of these models (Kogut & al., 2002).

But such methods miss a crucial point: the evolutionary aspect of complementarity, clustering and still more co-evolution. In order to address this issue, a first method, available and frequently used by institutional research, consists in digging national or regional economic history in order to check if the circumstances of the creation of an institution are really the same as the reasons that may explain its persistence and viability. Under this respect, most of the institutions that are today perceived as complementary, were in fact created for distinct purposes and only the succession of crises, experiments and sequential innovations finally delivered the complementarity that is recognized at the end of a rather long historical process. But of course it is difficult to drive general results out of a series of singular case studies. QCA was precisely invented in order to extract some general hypotheses from the juxtaposition of case studies. But economists do not use this method since they dream to generate a counterfactual history and thus they prefer to build models in order to simulate various dynamical processes under different institutional and stochastic hypotheses. This is precisely the aim of evolutionary models, the last generation of which has stressed the importance of coevolution: what static neoclassical theory explain as complementarity is actually the outcome of distinct selection and learning process, that are nevertheless related in terms of outcomes (Dosi & al., 1993).

Thus one observes a rough correspondence between alternative links among institutions and the tools in order to check the existence of these links (Table 1). Alas none is self-sufficient, therefore ideally for a given research topic, each method could give a piece of the puzzle.
9. COMPLEMENTARITY AND/OR HIERARCHY: RÉGULATION THEORY

The concept of complementarity was not present in the earlier RT research, since this research programme relied upon the notions of accumulation regime, régulation mode, architecture of institutional forms, exogenously driven and endogenously generated crises (Boyer, Saillard, 2002). Nevertheless, the inner development of this research agenda has shown the usefulness of two concepts: those of institutional complementarity and hierarchy. But the major emphasis of RT is about structural transformation and endogenous coevolution of institutional forms. It might be useful to examine how these three notions enter into the analyses.

Basically, a coherent régulation mode is only the post factum outcome of a series of innovations and adjustments. Quite all institutional forms result from social compromises that are then embedded into law, jurisprudence, social norms and conventions. Each of these institutional form induces some specific behaviour, for firms, wage earners, banks and so on. At the economy wide level, there is no automatic mechanisms that would warrant the compatibility of behaviours associated to the different institutional forms that have different origins, purposes and outcomes. Thus, institutional forms are continuously adjusting one to another and coevolving. The coevolution is the process of trial and error through which a series of institutional forms that are initially disconnected and formally independent (since they result from institutionalized compromises among diverse agents in different fields) adjust to one another until a viable institutional configuration emerges. The economic adjustments then become part of a mode of régulation and retrospectively this mode appears as coherent. Thus TR extends to institutional analysis a concept developed by neo-Schumpeterian theories in relation to the joint evolution of technologies and organizations. However, the mechanisms at work may differ: for technologies, market selection is crucial, while for institutional forms political processes play a determining role.

In retrospect, the analysts of a past régulation mode may find useful to invoke the concept of institutional complementarity. More precisely, the complementarity of institutional forms describes a configuration in which the viability of an institutional form is strongly or entirely conditioned by the existence of several other institutional forms, in such a manner their conjunction offers greater resilience.
and possibly better performance compared to alternative configurations. It has already be mentioned how the Fordist wage-labour nexus and a credit based monetary regime appeared to be complementary, as were the competitive wage-labour nexus and the gold standard regime. The same idea is stressed by the “Comparative Institutional Analysis” in regard to the complementarity of keiretsu, employment stability and the main bank in Japan (Aoki, 2001). The notion of institutional complementarity seemingly transposes at the macroeconomic level the theory of super-modularity (Milgrom, Roberts, 1990), but the underlying mechanisms are rather different: the institutional
complementarity is only observed ex post and does not derive from any organizational or technological complementarity.

The observation of the transformations of industrialized countries during the last two decades has shown the interest of a third notion, that of hierarchy of institutional forms. This describes a configuration in which, for any given era and society, particular institutional forms impose their logic on the institutional architecture as a whole, lending its dominant style to the mode of régulation. Whereas the notion of institutional complementarity implies at least implicitly symmetry between two or more institutions, the hypothesis of institutional hierarchy stresses the asymmetry among these institutions. Thus, TR adopts two definitions, one static, the other dynamic.

- **Institutional hierarchy by design** means that during the conception of some institutional form, the constraints of another central, and hence superior, institutional form, are explicitly or implicitly taken into account. For instance, if nominal wage becomes the equivalent of a labour standard, the objective and the tools of monetary policy have to be redesigned (Hicks, 1955) and this means that collective bargaining on wage has a primacy over the (Keynesian) monetary regime thus that there is a hierarchy from labour market institutions to the monetary regime. Similarly, the monetary regime put forward by a conservative Central banker implies flexible labour market adjustments and the absence of any structural deficit spending by governments. This is *an inversion* with respect to the previous institutional hierarchy.

- According to a second interpretation, the transformation of an institutional form guides the development of one or several other institutional forms. Under Fordism, the wage-labour nexus played this role, because of the founding compromise from which it originates and its transformations finally permeated nearly all other institutional forms (figure 5). With the opening of domestic economies and the financialisation of corporate governance, the form of competition and the financial regime have progressively shaped quite important transformations into the inner organization of the wage labour nexus (figure 6). Ex post, the two definitions converge but when analysing the process of institutional change, the second definition is more operative that the first one. This remark brings an important issue about the *time horizon* of institutional complementarity and hierarchy. Both the concepts may give the impression of a completely static and deterministic system, without any uncertainty or slack nor time dimension. Actually, these two issues are central for RT, since the cross-national comparison of régulation modes has shown that the fit of various institutions was far from perfect and that it varies in the long run in response to two major mechanisms.

- **Hybridization** describes the process through which tentatively imported institutions are transformed via their interaction with domestic institutional forms. This means that there are some degrees of freedom within each general institutional form. This mechanism of hybridization is a major factor in order to explain the evolution of institutions and the diversity in institutional architectures. For instance, the respective institutional architectures of the American and Japanese capitalisms can be fruitfully interpreted as the results of their interactions over nearly a century (figure 7).

- **Endometabolism**, i.e. the inner development of tensions within a given architecture is a second source of evolution of these institutional architecture. In a sense, the mechanism described by figure 4 is one example of such a dynamic analysis of the emergence, maturation, and crisis of a regime. The recognition that the fit among institutions is always partial and transitory brings at the forefront the mechanisms diagnosed by comparative historical analysis (CHA): *layering* and *conversion* are powerful mechanisms of evolution (Thelen, 2003) as well as *recombination* of institutions (Stark, 1997). Again this implies a “softening” or at least a careful use of the concepts of complementarity and hierarchy.
Figure 6. Internationalization and financialisation: the new hierarchy since the 1990s

- Internationalisation / financialisation
  - Seeking new institutions OMC
  - No successor to Bretton Woods
  - Competition extended beyond the national framework
  - Deregulation and deterritorialization of finance

- Stiffer competition
  - Heterogeneity of labor

- A monetary regime under the control of finance
  - Aim zero inflation
  - Exchange rates determined by finance
  - Finance control economic policy

- Lean State: No deficit, reduced social protection, low tax rates

- Restructuring the wage-labour nexus
  - The market penetrates the way production is organized
  - Wages/jobs become adjustment variables
  - Ration-alization of social protection

- Just in time Total quality Flexibility Workfare
Figure 7. Hybridization and endometabolism, two factors of institutional change: the joint evolution of American and Japanese trajectories

- **Henry Ford’s vision**
  - Obstacles to its implementation
  - Actual American Fordism
  - Rise and maturation

- **Structural crisis of American Fordism**
  - Financialisation
  - Crisis of a finance-led growth regime

- **Endometabolism**
  - Exacerbates American crisis

- **Hybridization**
  - Adaptation process
  - Obstacles to the adoption

- **Japan**
  - Invention of Toyotism
  - Rise and success

- **Structural crisis of Toyotism**
  - Slow and uncertain growth
  - Obstacles to its implementation

- **Hybridization**
  - Exacerbates Japanese crisis

- **1900’s**
  - World War I
  - World War II
  - Oil shocks
  - Financial globalization

- **2000’s**
It is time to test these notions, tools and hypotheses against some contemporary evolution. Ideally the background is no more than the large literature about the diversity of capitalisms and evolutions (Fligstein, 2001; Jessop ed., 2001; Coates ed., 2002; Whitley, 2002; Amable, 2003). More modestly, the next section investigates the institutional configurations that have been successful during the 90s and argues that they display three different complementarities (§ 10). The following section analyses the trajectory of the German capitalism, quite interesting indeed: since it was supposed to be a viable alternative to the Anglo-Saxon model, it allows to test alternative notions (complementarity, compatibility, …) and to propose alternative scenarios (§ 11).

10. CONTEMPORARY DIVERSITY OF CAPITALISMS: HOW USEFUL IS THE INSTITUTIONAL COMPLEMENTARITY HYPOTHESIS?

The 90s have propagated the practices of benchmarking and the ideas that both corporate governance and capitalist institutions should converge towards the most efficient configuration. This vision can be tested (Boyer, 2004). First a performance criteria has to be selected: let us define a successful economy experiencing simultaneously an increase in total factor productivity, fast growth and job creation. Second, quantitative as qualitative indexes of institutional forms have to be elaborated in order to characterise each institutional configuration. Third, in order to let open the number of successful configurations it is convenient to use the qualitative comparative analysis (QCA) method.

The results are interesting since they confirm the plurality of successful institutional architectures, but they do not cope with conventional interpretation (Figure 8).

- The knowledge economy relies on the complementarity between the high general educational levels that permit intensive job training and institutionalised cooperation between, on the one hand, the academic system and the research centres, and on the other, business. On average, a large proportion of total output is devoted to education, to software and to other vehicles for the transmission of knowledge. Information and communication technologies are used intensively, but they are simply a channel that favours widespread socialisation of knowledge by means of collective investments. Basically this model is different from the so-called “New Economy”, and its leading firms such as Intel and Microsoft, since Linux may well become the emblem of this type of knowledge economy. Here the market is not the dominant form of coordination – instead cooperation is, in this instance, institutionalised and organised on a national basis. Thus this configuration does not bring major inequalities since the rather even distribution of education endows individuals with good skills. Sweden, Finland and Denmark (Lundvall, 2004) belong to this configuration. This feature is good both on the production side with the dynamism of innovation, and on the demand side, for diffusion of new products with a large informational content.

- The deregulated economy on the other hand allows for a private appropriation of advances in knowledge inasmuch as patents and the defence of intellectual property rights become the tools that enable those who have the highest diplomas and/or the most talent to keep most of the innovation rents for themselves. A very active external labour market is given the task of evaluating at all times how much everyone is to be remunerated, depending on his/her competency and on the demands of the market. This capture of the rents associated with innovation is mitigated by the fact that competition on the product markets tends to cause a considerable drop in the price of information goods, allowing consumers to benefit ultimately from innovation-driven advances. In this configuration the unequal distribution of competences is a key ingredient of the very dynamism of growth. The US but also most English speaking countries explore this trajectory.
Figure 8 – The successful contemporary capitalisms: three distinctive complementarities

8A – THE SOCIAL DEMOCRATIC CONFIGURATION

- Life long learning
- Good and homogeneous general education
- Ability to master ICT and innovation
- Investment in knowledge

8B – THE DEREGULATED, SCIENCE PUSHED CONFIGURATION

- Pressure to innovation
- Competition on product markets
- Market for competences
- Leading role and science based innovation

8C – LEAPFROGGING FOR LAGGING COUNTRIES

- Opening to the world economy
- Rupture of the Fordist paradigm
- Catching up
- New opportunity with ICT

Mismatch between institutions and technological paradigm
The accelerated catch-up model is made possible by a shift in the technological paradigm. This is another configuration that is capable of triggering a virtuous circle. Despite, or maybe because of, the initial lag that the countries in question (Ireland, Portugal) were experiencing during the old Fordist mass production model. A heavily protected labour force does not impede membership in this regime – unlike the second configuration, which is typical of countries that are characterised by their confidence in market mechanisms. The complementarity between institutional arrangements is not so clear but the structural changes in the international economy and innovation systems play a role since they remove the barriers to development that previously existed.

This method finally exhibits the complementarities or at least compatibilities between various institutional arrangements (Amable, Ernst, Palombarini, 2002). Nevertheless, they do not derive from a canonical supermodularity originating in technology (Milgrom, Roberts, 1990); just-in-time, total quality control, are not considered here. Furthermore, these configurations differ from the ones previously investigated. Comparative institutional analysis (Aoki, 2001) contrasts the hierarchical and vertically integrated mass-production firm with the flexibility associated with modular production and the mobility of competences typical of Silicon Valley. The ‘Varieties of capitalism’ theory stresses a dichotomy between non-coordinated and coordinated market economies, with the US on one side, and Germany on that of a social market economy (Hall, Soskice, 2001). In fact, different configurations emerge when the analysis focuses upon complementarity/compatibility issues.

11. EVOLUTION AND COMPLEMENTARITY: THE GERMAN CASE AS A SOCIAL LABORATORY

A second interesting case study relates to the transformations of the German capitalism since reunification. Actually, the institutions and economic policies of this country have been significantly altered. An intensive investigation has taken place in order to detect the importance of the transformations of the corporate governance upon the viability of the institutional legacy of the so-called social market economy (Höpner, Jackson, 2001; Höpner, 2001; Hassel, Rehder, 2001, Höpner, 2003a; 2003b). These studies point out a paradox: whereas the shareholder orientation of large German companies increased markedly in the second half of the 90s (dissolution of the German company networks, frequency of hostile takeovers, diffusion of stock options for top managers), the institutions governing industrial

Figure 9. Financial regime and industrial relations: the complex German evolution since 1989
relations and codetermination seem to have coped quite easily with these major changes, even if productive and organizational restructuring has been intense and has triggered a redistribution of income from wage earners to profits (figure 9). Basically, within this qualitative unchanged institutional and legal context, co-determination seems to have evolved from a class oriented background to a consensus that is now oriented towards the efficiency and the viability of each large corporation. Such an evolution reminds the shift that occurred after WWII in the Japanese industrial relations, towards enterprise unions and a mesocorporatist capitalism (Boyer, Yamada, 2000).

A key question is thus the following. How do the previous notions help in understanding the contemporary transformation of German institutions? More precisely, will the shareholder orientation of the large corporation erode the specific German industrial relations, especially codetermination? Basically, if strict complementarity prevails between German labour market institutions and the conventional governance mode of this country, the answer should be positive. A more careful analysis suggests that the observations gathered by Martin Höpner and its colleagues (Höpner 2001, 2003a; Hassel, Rehder, 2001) are compatible with a whole spectrum of interpretations and they support a significant variety of scenarios.

- A first interpretation could gravitate around the hypothesis of an hybridization of German labour institutions by the diffusion and redefinition of shareholder values. But this is a rather general analysis that has to be broken-down into a series of sub-hypotheses.

- After all, the Hall and Soskice interpretation of a strong complementarity between nearly all the German institutions might be not so right. Actually, the current diffusion among large companies of shareholder value would mean that the leading role of the main bank and patient capital on one side, and codetermination and work councils on the other side were in the past compatible but not necessarily complementary.

- A third interpretation stresses the fact that the inner functioning of codetermination is redefined under the pressure of the adoption of shareholder value by major German corporations. This would imply that labour market institutions and governance structures are experiencing a conversion that would imply in the long run a significant transformation in the institutional architecture. The central argument would be that there is a lot of slack in any institutional order, even within the tightly organized “social market” economy.

- Still another vision may stress the differences between the firm level analysis and the macroeconomic outcome of a given institutional transformation. At the micro level, shareholder value can be inserted into codetermination and work councils, but this may mean growing inequalities as well as a slimming-down of employment. These evolutions in the long run will necessarily destabilize the previous mode of regulation. In a sense the poor macroeconomic performance of the German economy since the mid 1990s could be an evidence of such a divergence between a micro corporate regime and an emerging crisis at the macro level.

- This brings the issue of firm heterogeneity within the same institutional context. May be large German corporations may cope with shareholder value and codetermination but it is not necessarily so for small and medium size firms. Since they do not have access to financial markets and do not usually benefit from generous public subsidies and support (for instance via early retirement), the demography of German firms may be adversely affected and consequently, the viability of the whole institutional architecture could be threatened.

- May be the observation of a surprising compatibility between shareholder value and codetermination may derive from the fact that the previous compatibility is challenged and eroded but it takes time for institutional change to manifest itself into a different regulation modes that can be easily recognized as such by experts and economic actors themselves. This reminds that institutional change manifests itself only in the long run. The conclusion about the compatibility between shareholder value and codetermination would only derive from the built-in inertia of institutional systems.
A variant of a previous interpretation emphasizes the role of *early retirement*, and other public policies in making compatible the pressures of shareholder values, with the agreement of workers for organisational restructuring and employment reduction. Therefore, the contemporary compatibility between corporate governance and industrial relation evolutions would be obtained via the permissive role played by a rather specific economic policy. But ultimately if all the disequilibria pile up in a large public deficit, the ongoing evolutions will prove to be not sustainable. This means that complementarity would exist but between three institutions (figure 10). Thus the incompatibility between two institutions can be removed by the adjunction of a third one. By extension, the whole institutional architecture might pay a role, but this makes the analysis quite difficult, since it calls for the extension of ICH from dyadic to triadic relations, and even a larger number of institutions.

**Figure 10. Institutional complementarity: from dyadic to triadic?**

A – AN APPARENT INCOMPATIBILITY OF TWO INSTITUTIONS

B – THE CATALITIC ROLE OF A THIRD INSTITUTION

![Diagram of institutional complementarity](image)

Still a different interpretation can be given of the same process. Whereas, in the Golden Age of the “German model”, under the aegis of codetermination and working councils, the wage earners had a leading role, the same legal organization is compatible with a *shift in the bargaining power* of corporation that are able to impose a shareholder value strategy. Therefore, in terms of outcomes, the system is no more the same in spite of a large continuity in governance institutions. Hence, the hypothesis of a *shift in the hierarchy between corporate governance and industrial relations* (figure 11).

**Figure 11. A shift in institutional hierarchy?**

A. THE SOCIAL MARKET ECONOMY

B. THE SHAREHOLDER SOCIETY

![Diagram of institutional hierarchy](image)

This crucial role of some public interventions suggests still another interpretation. Until the 80s, the economic rationale of corporations was *compatible* with the structure and financing of welfare. The competitiveness of these companies deteriorated after the reunification, but since the early 2000, the search for competitiveness of large corporations has succeeded (Collignon, 2004; Amable, 2004; The Economist, 2005), but they have divorced from the German territory and invested abroad, therefore they have created an unbalance in job creation, public budgets and welfare financing. Thus even if the legal context of industrial relations is basically unchanged, the share of wage in national income has drastically declined. Consequently, there is an emerging incompatibility between forms of competition and the relations between the State and the citizens (figure 12).
One could infer that *institutions per se are unimportant* since the driving forces of institutional change would be two powerful structural economic transformations: the stiffening of competition on the single European market and globalization on one side, the entry of international investment funds into the German stock market on the other side. After all, this is precisely the argument developed by some theoreticians of finance (Rajan, Zingales, 2003). They believe that in the long run institutions are selected according their efficiency and this efficiency is enhanced by the development of international markets and finance.

But in turn this vision can be challenged. The survey of the Max Plank Institute on work councils (see Höpner, 2001) allows to conclude that a *functional convergence* of outcomes may exist, while adapting at the margin the *existing domestic institutions*. By the way, this would contradict the hypothesis of a definite institutional complementarity at the national level and also the supermodularity hypothesis at the firms level: a series of marginal innovations along the same German principles might deliver the economic performance required by world competition and financial globalisation. *Institutional diversity but convergence of economic performance*, that could be a last interpretation.

It is not an easy task to calibrate the relevance of these numerous interpretations. Clearly, the analysis of institutional change is still an infant industry: many new theoretical developments and empirical studies are required in order to dare to provide any clear prognosis. By chance, it is a very active field of research (Đelic and Quack, 2003; Thelen, 2004)

12. CONCLUSION

The previous developments can be summarised by seven provisional findings.

1. The institutional complementarity hypothesis (ICH) opens a rather *promising research programme* that could help understanding the nature and evolution of capitalisms. First, complementarity is one of the forces that stick institutional forms one with another. Second, there is not a single form of complementarity but a significant variety. Third, this explains why benchmarking is not necessarily successful and why institutional reforms are so difficult: as soon as two different institutions are complementary they should to be changed simultaneously, whereas reformers tend to divide and segment the issues as stake.

2. *From a methodological standpoint*, ICH runs into many difficulties. First, complementarity should not be confused with more or less close notions such as *compatibility, coevolution* or *clustering*. Second, various methods have to be combined in order to test ICH. Among them QCA and non-linear econometric methods seem rather promising for a general social science approach, whereas formal modelling is an avenue more easy to explore for economists than for other disciplines. Third, if complementarity is not only dyadic but triadic, empirical research becomes more difficult but probably more relevant.

3. *From a theoretical point of view*, three major findings emerge concerning respectively the origin of complementarity, the time horizon that governs complementarity and finally the level at which it operates.
First, economists often refer to technical complementarities in order to derive the related complementarities between institutions. Of course they might exist but they describe only a part of the large set of complementarities. Some of them derive from pure institutional factors: for instance the liquidity of the commercial bank calls for a deposit insurance, then prudential ratio and finally a lender of last resources. Second, historical studies exhibit a form of paradox: when a majority of actors discover and opportunistically use the benefits of a given institutional complementarity they have finally discovered, this complementarity tends to be eroded, to vanish and to enter into a crisis. Third, the ICH is not sufficient to bridge the gap between micro and macro analyses of institutional complementarities. Nevertheless, the notions of isomorphism, and to a certain extend of hierarchy, do provide some cohesive factors between firms organisational configuration and the overall institutional architecture.

4. When applied to the issue of capitalism diversity and evolution, ICH suggests quite interesting hints. First, complementarity is one of the factors that provide the glue that sticks a global institutional architecture. Second, even in the era of globalization, financialisation, and knowledge based competitiveness, national economies still exhibit contrasted institutional configurations...but the number of these configurations is quite limited compared with what should result from a pure combinatorial approach. Third, capitalism diversity is not a pure matter of historical legacy, inertia or irrationality since, at least two mechanisms – endometabolism and hybridization – permanently drive institutional change both in terms of destruction of obsolete configurations and creation of new institutions.

5. The present article points out a challenging research agenda. What are the patterns of institutional evolution and what are the forces and factors that shape these patterns? The ICH explain some typical patterns: emergence, diffusion, maturation, sophistication, lack of reactivity and finally erosion and crisis. Nevertheless, case studies and comparative analyses suggest that other and quite complex patterns have been observed. A priori, a creative use of the various notions of compatibility, coevolution, clustering, and of course complementarity and hierarchy may probably explain the diversity of these patterns in institutional change. This could help in the design of institutional reforms that have proved to be so difficult during the 90s.

6. In order to make some progress in this direction, a comparative institutional analysis of change seems a good starting point. It seems premature to try to capture within a formal economic model the various mechanisms that have been defined by the present article, because the system could become so complex, that it would be difficult derive any clear analytical conclusion. By contrast, it would be quite interesting to survey the various studies of institutional change – focussing on the dynamic of capitalisms – and elaborate a list of the explaining factors put forward by the authors. Then each empirical study could be incorporated into a large sample of national and historical cases and the use of QCA could be quite useful in diagnosing the mix of factors that govern institutional change. In a second phase, economists could try to build some models in order to check if logical reasons are at the core of the observed configurations.

7. This article suffers from a clear weakness. Whereas it deals with social compromises, the shift of bargaining power between actors and the related shift in institutional hierarchy, no explicit mention to a political economic approach has been mentioned. Clearly, the contrast between the Fordist golden age and the contemporary period cannot be explained without a serious analysis of the transformation of the social structures within national economies in relation with the process of internationalisation on one side, and the formation of political coalitions on the other side. May be, this is the force that create institutions and the glue that makes them legitimate and compatible. This would be the origin of viable growth regimes.

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