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# Institutional complementarity and diversity of social systems of innovation and production — Source link

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# Institutional Complementarity and Diversity of Social Systems of Innovation and Production

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## Abstract

This article proposes an institutional analysis of modern capitalist economies. It argues that the institutional dimension is crucial if one wants to account for the co-existence of different types of modern developed economies, characterised by substantially different institutional structures. It explains why no generalised pattern of convergence towards the same economic model should be expected, in spite of 'globalisation'. An institutional analysis of modern economies, or social systems of innovation and production, can be made using the concepts of complementarity and hierarchy of institutions. Institutional arrangements are complementary to each other and thus define the coherence as well as the potential for evolution of the various economies. The hierarchy of institution expresses which part of the institutional drives the others and is helpful for understanding historical evolutions. The paper proposes a classification of developed economies and draws some conclusions regarding the usefulness of the concepts of complementarity and hierarchy of institutions for economic policy.



## Zusammenfassung

Der vorliegende Beitrag bietet eine Analyse der Institutionen moderner kapitalistischer Volkswirtschaften. Der institutionellen Dimension wird entscheidende Bedeutung beigemessen, wenn es darum geht, die Koexistenz verschiedener kapitalistischer Wirtschaftsmodelle mit sehr unterschiedlichen institutionellen Strukturen zu begründen. Es wird erläutert, warum trotz „Globalisierung„ kein einheitliches Konvergenzmuster zu erwarten ist. Eine institutionelle Analyse moderner Volkswirtschaften, zum Beispiel der sozialen Innovations- und Produktionssysteme, kann mit Hilfe der Konzepte der Komplementarität und Hierarchie von Institutionen erfolgen. Institutionelle Strukturen sind komplementär und definieren somit die Kohärenz sowie das Entwicklungspotential der betreffenden Volkswirtschaften. Die institutionelle Hierarchie beschreibt, welches Glied des Institutionengefüges die anderen steuert, und trägt so zum Verständnis historischer Entwicklungen bei. Der vorliegende Beitrag bietet eine Klassifizierung entwickelter Volkswirtschaften und zieht einige Schlußfolgerungen im Hinblick auf die Nützlichkeit der Begriffe Komplementarität und Hierarchie von Institutionen für die Wirtschaftspolitik.

# Table of Contents

## 1. Introduction

The importance of institutions in economics is more widely acknowledged nowadays than it used to be, say 15 or 20 years ago. The idea that 'institutions matter' in economics in general and particularly for growth and long-run development used to be mainly put forward by 'off-mainstream' economists, but this is no longer true.[1] The roots of the previous situation could be found in the fact that mainstream economics has its origins in the Walrasian project of an '*économie pure*', for which the (active) neglect of historical and institutional elements, i.e. particularities, is a prerequisite for the establishment of economics as a genuine science, since science is only concerned with generic patterns. The only 'institution' that finds its place in that setting is the market, and only in a highly idealised form, with the existence of an auctioneer, the absence of exchange until all excess demands are null, and all the well-known hypotheses of General Equilibrium. By contrast, one may thus easily understand why neo-classical economics has always regarded institutional preoccupations with suspicion. To cut a long story short, one may state that historical elements and institutional analyses were seen as best left to historians, sociologists or political scientists since economists had to find out the workings of economic mechanisms irrespective of time and place, they had to discover economic laws.[2]

Still, the pretensions of pure economics have been downward adjusted and the time has come (back) for the consideration of what Malinvaud [1996] calls 'interpretative inference' or what evolutionary economists[3] call 'appreciative theory', i.e. non-formalised assertions, which may be suggested by the study of economic history. The historical and institutional context is therefore no longer deemed an exotic topic for economists. Indeed, the more prominent role of institutions is blatant when one looks at the current publications in economics journals. Modern microeconomics is more concerned with second-best theory, market failures and contracts than the restatement of the fundamental theorems of welfare. One may argue that it is but a very tenuous link to institutional concerns in economics but it remains that the supposedly institutions-free Walrasian-type equilibrium is no longer the main focus of economic theory. New institutional economics is a typical expression of the current interest for institutions, with an emphasis on micro-foundations and a widening of the scope of traditional microeconomics. New

[1] Douglas North, who has written extensively about the importance of institutions for economic development was awarded the Nobel prize in 1993, jointly with Robert Fogel, '*for having renewed research in economic history by applying economic theory and quantitative methods in order to explain economic and institutional change*'.

[2] For a much broader perspective on this topic, see Hodgson [1996].

[3] Particularly Richard Nelson and Sidney Winter.

economic History is the application of that interest to the field of history. Evolutionary economics is concerned with the emergence of institutions, notably through repeated individual interaction. The same pattern applies to macroeconomics: the influence of labour market institutions on the pattern of employment or the role played by a independent central bank are two topics which exemplify the concern about the importance of institutions.

One could use this example to show once again how mainstream economy incorporates what it used to reject[4] as soon as it is able to express it in its own terms.[5] But this sort of methodological debate is of drastically limited interest for what matters here. This paper argues that, yes indeed, 'institutions matter', but saying this is far from enough.

Once the importance of institutions has been admitted, another type question appears, concerning what the institutional features of a capitalist economy should be, since it appears that advanced capitalist economies are characterised by different institutional features. Free-market proponents would insist that if yes indeed institutions matter, they do so in the way that those institutions that promote the dissemination of the market logic to the widest possible area within society are beneficial, whereas institutions that hinder market mechanisms (in getting the prices right) are detrimental to growth and welfare. The logical consequence this standpoint is that there should exist one best way to organise the institutional structure of an economy just as there exists one unique economic equilibrium. As a corollary, the observation of diversity in the institutional features of advanced capitalist economies is a bad omen, indicating that some countries have failed to adopt the 'proper' institutional structure, probably because some organised interest groups have a vested interest in the current state of things. Going one step further, one may safely recommend that a welfare-minded authority should see to it that the correct reforms be initiated so that institutional convergence should set in.

Another line of thought does not consider institutional diversity that dramatically and takes as a fact that that heterogeneity is a distinctive feature of modern capitalism. This position is characteristic of Comparative Political Economy as well as some institutionalist approaches to economics.[6] A consequence is that one should not expect a pattern of institutional convergence among developed economies, or to put it in a different way, economic convergence in terms of GDP per capita and technological level does not imply a strict convergence among institutions or forms of organisation. But it may imply some loose convergence, or at

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4 There was a time where explanations regarding economic growth that went beyond discussions of the Solow residual used to be considered as 'bad sociology'.

5 Amable, Boyer and Lordon [1995] have discussed how 'methodological neo-classicism' extends the field of investigation of mainstream theory by keeping a few principles (optimisation, rational agents,..) without necessarily clinging to the results of 'fundamentalist neo-classicism' (existence, uniqueness and optimality of the decentralised equilibrium).

6 See Hall [1999] for references. Crouch and Streeck [ 1996].

least that if some institutions are not exactly replicated across advanced economies, there exists functional equivalents. The main question concerns diversity and similarity and one should then explain how markedly different institutional structures can coexist and how they can evolve over time.

It is argued here that understanding the diversity of institutional structures, and hence the diversity of capitalism, social systems of innovation and production or whatever one wants to call them, implies to study how different institutions are complementary to each other, in the sense that one institution functions all the better that some other particular institutions or forms of organisation are present. This way do institutions combine to define a coherent growth pattern. Such a perspective is common to several institutionalist approaches,[7] particularly those concerned with long-run capitalist development as well as those which emphasise the existence of several possible institutional architectures for modern capitalism.

The importance of institutions for growth will be emphasised in the following section. This leads to the traditional conclusions that 'institutions matter', or at least they may do so. Section 3 goes further by stressing that the consideration of single institutions may be misleading and may altogether miss the genuine importance of institutions in the economy, which is of a combinative nature. This section will emphasise the importance of the complementarity among institutions as foundations for institutional architectures which are characteristic of specific national models of capitalism or epochs of capitalist development. Section 4 will present a few institutionalist approaches and compare them from the point of view of the hierarchy that they establish among institutions as well as the range of institutions that they consider. Section 5 will present one particular approach, that of the Social system of Innovation and production (SSIP). Section 6 offers a brief conclusion.

## 2. Do institutions 'matter'?

One may start the investigation of the importance of institution in growth theory or more generally economics with North [1990], where the approach is based on the consideration of the microeconomic behaviour in the presence of institutions, and on the consequences of micro decisions taken in a certain institutional context on macro aggregates. Institutions are defined by North as '*humanly devised constraints imposed on human interaction'*. They may thus be described as the rules of the game(s) where individual agents are the players. Together with technology and preferences -the two basic ingredients of microeconomics- they define the constraints imposed on and the possibilities open to each agent. In such a setting, a

[7] Hall [1998], [1999] reviews some institutionalist approaches not mentioned here.

link is provided between the role of history-dependent institutions[8] and individual behaviour since institutional arrangements define the incentive framework in which agents take decisions. North further insists on the fact that institutions are generally not optimal and provides an explanation why non-optimal institutions can still persist. Growth-inhibiting institutions may not be replaced by more efficient arrangements in backward or lagging countries because of the 'fixed cost' aspect of an institutional architecture as well as its 'increasing returns to adoption' aspect. Institutions are subject to the same phenomena as techniques: increasing returns to adoption and hence the possibility of lock-in to inferior solutions.[9] Inefficient institutions can continue to exist because a sufficiently powerful coalition has an interest in their existence, or because individual agents cannot co-ordinate their actions to change them, etc. Applying this framework to long-run economic development, an institutional basis for an explanation of non-converging growth trajectories would then imply the elements described in Figure 1. As a consequence, a large variety of institutions and organisations can influence the growth trajectories followed by nations.

All this can be integrated in the new theories of endogenous growth. Table 1 lists the various sources of growth on which endogenous growth models can be built. The nature of the growth factors considered in the different models implies the presence of, mostly positive, external effects, at least in the vast majority of cases. Institutions may play a role by inserting themselves between the decentralised, institutions-free equilibrium, which is socially inefficient in the presence of externalities, and the ideal reference, the social optimum, which correspond to the internalisation of all external effects. The former equilibrium is assimilated to an absence of institutions because agents react to market prices only, without any other form of coordination being present. One may note that the characterisation of this stylised, Walrasian, 'market' environment as the absence of institutions should not be confused with the highly questionable assertion that markets as we know them are not institutionally grounded. It is clear that exchange in markets as we know them could not exist without a set of social institutions that organise it,[10] but stylised Walrasian markets only need an auctioneer to function adequately.

[figure 1 here]

Any type of 'non-market' arrangement influencing the accumulation of growth-inducing factors is bound to have an effect on the macroeconomic equilibrium. In this sense, institutions matter because they partly, and one may add imperfectly, solve problems of coordination of agents' plans, help promote cooperative behaviour and

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8 Institutions are 'carriers of history' in the words of Paul David [1994].

9 Arthur [1994].

10 The embeddedness of economic relationships in social ones is an important theme of sociology (Granovetter [1985]). Evolutionary economics has insisted on the self-organisation mechanisms that are at the foundations of 'markets' (Lesourne and Orléan [1998]).

overcome opportunistic behaviour, make agents internalise externalities, whether intertemporal or interpersonal, reduce uncertainty, etc. Thus, they contribute to determining the macro outcome of individual agents' actions. Some modes of organisation and some institutional arrangements may be more or less effective in having agents internalise external effects, in promoting co-operative behaviour or facilitating co-ordination than others. Therefore, the characteristics of national institutions, along with more strictly technological characteristics, will determine the accumulation of physical capital, investment in R&D, the type of education of the labour force,...and hence the growth path.

[table 1 here]

It is therefore possible to consider an institutionalist interpretation of the results of endogenous growth models. Some papers have already made some steps towards an institutional theory of growth and have shown the impact of:

- The type of financial intermediation system on growth: in Amable and Chatelain [1995] a bank-based financial system favours long-term innovation projects whereas a market-based financial system favour short-term projects; the impact on the rate of growth depends on the relative productivity of the different projects. If there exists many potentially productive long-term projects, a decentralised financial intermediation system will lead to a slower growth rate than a more concentrated financial system. In Amable, Chatelain and De Bandt [1998], a concentrated banking system favours financial stability at the cost of higher intermediation margins. On the opposite, a more competitive banking system has lower intermediation margins, but is more prone to financial fragility. Since rational investors and savers take into account the possibility of bankruptcy of the banking system, the level of investment and savings may be higher with a concentrated banking sector than with a more competitive sector in spite of higher intermediation margins. The outcome may then be a faster growth rate.
- Labour markets characteristics on innovation or capital accumulation and growth: in Palokangas [1996], wage bargaining conducted by trade-unions is favourable to researchers' wages, which incites skilled people to innovate and is in the end favourable to growth; in Saint-Paul [1996], the level of firing costs influences the pattern of international specialisation, from which one can derive that not too flexible 'European-type' labour markets tend to induce producers to specialise in mid-tech goods whereas an 'Anglo-Saxon'-type of deregulated labour market favours high tech production.
- The type of education system on growth and welfare. In Benabou [1996], inter-personal and intertemporal externalities influence the individual accumulation of human capital, along with education sector's capital. The pattern of school funding (locally or nationally) is going to have consequences on the pattern of human capital accumulation in poor or reach areas and hence on the whole economy's growth rate.

These are just a few examples of the incorporation of institutional preoccupations in growth models. Table 1 suggests that several other possibilities exist.[11] It is also possible to make the growth-influencing institutional features themselves endogenous, for instance by means of a political economy equilibrium. An institutional architecture may be stable if validated by a political equilibrium determined as a consequence of utility-maximising individual agents' decisions (Figure 2), or by a more sophisticated political theory.

[figure 2 here]

## 3. The interaction of institutions: institutional structures

Acknowledging the importance of institutions for economic decisions and outcomes is not enough to build an institutional economic theory. A first and frequent shortcoming is the failure to distinguish between different types of non-market[12] means of coordination: conventions, organisations, institutions,… and to treat them as belonging to the same class of 'institutions'.[13] Such a simplification is understandable in modelling exercises such as the search for game-theoretical bases of 'institutions',[14] but game theory seems more apt to find bases for conventions than institutions proper (See Table 2 for a tentative taxonomy), as witnessed by the examples of 'institutions' given in Young [1998]: whether men or women should propose first, whether men or women should give way to the other when approaching a door, etc.[15] One may argue that attempts to build institutions on interacting individuals miss all the social constructs that mediate between the individual and society and guide the former's perception of the latter.[16] Likewise, contract theory may be helpful in the theoretical investigation of the organisation, but one understands that the type of links between an individual and the constitution of the country he/she lives in is very different from those resulting from, say, a labour contract. In any case, conventions, organisations, institutions,…are different in their principles, in the way they operate, in the factors that influence their decay, etc. Hence, a basic distinction of the different elements of an institutional economy is useful in order to understand the dynamics of institutions. For instance,

[11] A large literature exists on the effects of taxation on growth.

[12] Once again, 'non-market' must be understood with reference to the Walrasian market of economic theory.

[13] According to most dictionaries, an institution may be an organisation as well as a custom or a practice or a formal rule. It is however necessary to distinguish between different meanings. The minimal distinction is probably that between an organisation and an institution.

[14] Schotter [1981]. For a recent contribution in this field, see Young [1998].

[15] Young [1998] goes beyond the consideration of such social conventions and customs and discusses the case of the adoption of a common medium of exchange, i.e. money; however, this example looks somewhat contrived.

[16] For more on this topic, see Lordon [1999].

organisations and institutions have different 'selection principles', to put it in evolutionary terms, and lead to a variety of evolutionary processes;[17] one may further state that the conditions in which there exists a competition between organisations[18] are hardly transferable to what could be interpreted as a competition between institutions. The hierarchy that can be read in table 2 partly corresponds to other distinctions found in the literature. North [1994] separates institutions (the rules and the enforcement characteristics of these rules) from organisations (group of individuals bound by a common purpose): organisations, like individuals are the players of the game and institutions are the rules. Reynaud [1994] distinguishes organisations from institutions and stresses that the former can only exist with the support of the latter. Coriat and Weinstein [1999] have proposed to distinguish between 'type 1' and 'type 2' institutions;[19] the former integrate an explicit enforcement dimension and express property rights, the latter concern private arrangements between agents and are submitted to the rules defined by type 1 institutions. It is then understandable that it is possible to alter type 2 institutions without changing institutions belonging to the first type. Hence, there exists a difference in the dynamics of organisation and the dynamics of institutions, and some differences within the class of institutions.

Another factor limits the scope of many approaches: the restriction of the analysis to specific aspects of the economy. This is largely due to the difficulties of a formal modelling involving a role for institutions. For analytical purposes, it is often preferable to point out the influence of one particular institution in the economy than to have to disentangle the joint effects of several of them. The contributions mentioned in the previous sections concentrate on the impact of one institution on the growth process for instance. There is however a risk attached to such an approach. The necessary simplifications one has to make for theoretical investigation on the importance of institutions may turn out to be major drawbacks when the time comes for an empirical investigation. The (necessarily) simple links analysed by theory will give clear-cut hypotheses which will then be directly tested and will probably give disappointing results. The consequence of that may then to emphasise the non-importance of institutions rather than how much they matter.[20]

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[17] See also Nelson [1994] and [1995].

[18] Particularly profit-making organisations such as firms.

[19] This echoes a distinction proposed by Nelson [1994] for application to organisations.

[20] See for instance Sussman and Yafeh [1998]:

'*If institutions matter for country risk, interest rates should decline in response to the establishment of institutions that protect property rights or establish the rule of law… […we found that…] the establishment of modern, Western institutions (e.g. a central bank, a constitution), had no impact on Japanese debt yields. The only events that significantly reduced the perceived risk associated with Japanese bonds was the adoption of the Gold Standard in 1897. In addition, the war with Russia (1904-5) affected yields in the short run, and improved Japan's debt capacity in the longer run. We conclude that well understood monetary rules as well as military achievements matter more for the perception of a country by foreign investors than modern state institution.* '

However, one should not jump to the conclusion that 'institutions do not matter', since the Gold Standard is an institution.

After all, have not most European countries and Japan characterised by sensibly different institutional architectures enjoyed roughly the same pattern of growth after the second world war? If institutions mattered so much, one should have seen divergent growth paths for these countries. In order to overcome this problem, it is without doubt useful to allow for the possibility that different structures of institutions may 'perform' roughly the same -in terms of an economy's growth rate for instance- in spite of having components which look very different compared to one another.

[table 2 here]

It seems therefore a 'natural' extension of the analysis to allow for the possibility of interactions among several institutions and their joint influence on economic outcomes. Just as one particular institution defines a set of constraints, possibilities and incentives for individual agents, several institutions will define a set of interrelated incentives which are going to jointly influence the individual agent's behaviour. This is akin to what North [1994] calls an 'institution matrix', a framework of interconnected institutions that together make up the rules of the economy. It is therefore logical to take into account the structure formed by several institutional arrangements rather than isolated institutions, with the hypothesis that the institutional structure defines the coherence of a 'national model', a historical phase of development, a system of production, etc. To put it in a different way, the various institutions, patterns of organisation, rules, norms, conventions,… of an economy are not a more or less random collection of non-market arrangements. The presence of a particular institution, in a particular form, may or may not be compatible with the presence of another. The conditions for its existence and the relative efficiency of an institution -according to economic criteria- must then be determined by taking into account a large set of institutional arrangement, not just one institution alone.

The basic hypothesis is therefore that, several institutions -in the broad sense- taken together reinforce each other in a sense that will be made more explicit below, so that they form a coherent and stable but not everlasting structure.[21] Sticking to a macro point of view, this structure shapes the growth trajectory or the general features of an economy.[22] The aggregate coherence given by a set of institutions is defined by the complementary character of institutions.

The concept of complementary institutions is based on multilateral reinforcement mechanisms between institutional arrangements: each one, by its existence, permits

[21] The theory of *régulation* in particular has been the target of attacks according to which it would favour too much stability and reproduction and not enough instability and crisis. Such criticisms would appear very odd to anybody with even a superficial knowledge of said theory considering the number of times the word 'crisis' appears in *régulationnistes* book titles, but the argument still crops up every now and then. In any case, a thorough answer is given in Lipietz [1988] and [1990], and the topic is also treated in Amable and Lordon [1992]. Lordon [1997] even proposes a formal treatment related to this question.

[22] See also Zysman [1994].

or facilitates the existence of the others. Sticking to the static equilibrium defined by a particular structure of institutions, the constraints and possibilities defined by a given institution favour other institutions' operation. Complementary institutions make one another more or less efficient according to their respective characteristics. This approach of complementary institutions is roughly that adopted by recent papers that have studied how two institutions or forms of organisation interact to give a coherent outcome: a non-accommodating central bank and centralised wage-setting in Soskice and Iversen [1999], a main-bank-based financial system and a team-based production organisation within the Japanese firm in Aoki [1994], etc. Each institution or mode of organisation defines a set of constraints, incentives and possibilities that determine agents' strategies. The point is that the influence of one institution is reinforced when the other complementary institution is present. The set of incentives to the firm defined by the main bank makes team work all the more efficient, etc. In other words, one institution, or one system if there is an isomorphism between systems (finance, education, etc.) and institutions,[23] functions all the more efficiently when the other institution is present.

This complementary character is fundamental for defining the coherence as well as the pattern of evolution of an economic system. The 'coherence' of a given system -a 'national' model for instance, defined as the set of interrelated national institutions- is then the expression of the complementarity between specific institutional arrangements and the outcome in terms of economic performance (growth, employment,…). What characterises the 'German model' for instance is not only a handful of institutional characteristics inherited from history (a concentrated banking system with a large influence on industry, a particular labour force training system which gives highly qualified workers, strong labour unions and a centralised wage setting, an independent Central Bank,…) but more importantly that these characteristics are complementary to each other and have for consequence some specific economic performance: a certain pattern of industrial specialisation, a certain type of innovation, certain specific characteristics of the labour force in terms of skills or adaptability, a structure of wage differentials, etc.

Another notion is a dynamic version of the former: a given set of institutions reinforce each other over time, which explains the emergence of a particular structure of institutions, or tend to weaken the coherence of the structure over time, which explains why institutional structures, national models, systems of production, modes of *régulation*… are not eternal. The static notion of complementary institutions emphasises coherence and stability, the dynamic notion allows for the emergence and disappearance of this coherence and leaves open the possibility of structural breakdowns. The structure of institutions does not stay put over time and each institution has its own, partly autonomous, dynamics too. More will be said about this in the next section.

[23] This is mainly a methodological problem which corresponds to the level of analysis chosen.

One may just mention in passing a difference between destabilisation of a structure and change taking place within a given structure, a difference understood by reference to the macro-trajectory. If one takes the example of ‘national models’, for instance France and Germany. One may oppose what would be a destabilisation of the French model to changes within the German model. Destabilisation is a breakdown in the pattern of institutional complementarity of a country. Change is a modification of the forms taken by a basic complementarity which keeps on operating with the same principles. The example could then be based on the opposition between changes in the pattern of collective bargaining in Germany which do not threaten the complementarity which founds the German model on the one hand, and the destabilisation of the French model through the weakened role of the State in the economy on the other hand. If one takes for granted that the implication of the State in the economy is (was) the key to understanding what the ‘French model’ is, any evolution which makes Public intervention in the economy increasingly difficult -e.g. the (in)famous globalisation and its constraints on Public policies- is bound to destabilise the whole institutional structure on which the French model is based, calling for further adjustments in other institutional arrangements and a reinvention of the French model altogether.

At another level, considering complementary institutions instead of isolated institutions has consequences for both empirical work and economic policy. Regarding the former, the task devolved to empirical institutional analysis is made more arduous. It will not suffice to test for the positive impact of one particular institution or form of organisation on some economic performance indicator, growth or employment. Since institutions work in complementarity to each other, it will be necessary to check the positive impact of several interrelated institutional arrangements, the consequence being that the same institution or form of organisation present at the same time in different countries may well produce very different outcome depending on the national institutional contexts, i.e. the presence or absence of other, complementary, institutions. Even identifying the set of institutions that complement each other and on what terms they do so may not be a simple task.

The consequence in terms of economic policy is to preclude any sort of ‘institutional tinkering’ that politicians may have in mind when they mention the absolute necessity of reforming a specific area of the economic system. Changing one element of the system may have consequences well beyond the element concerned and threaten a certain pattern of complementarity. The effects of financial liberalisation may not just be a drop in the intermediation margin and a cheaper cost of capital as -one assumes- is intended. It may have effects on the monitoring of projects by financial intermediaries, on the time horizon of investors, etc. Long-term employment contracts are not just an impediment to labour market flexibility, they also play a role in defining incentives for the accumulation of skills at the individual level, without mentioning the positive effects of security on a societal level; consequently, the introduction of more ‘labour flexibility’ (i.e. job insecurity) may endanger the mode of skills formation which supports the production regime of a particular country. Once again, it is necessary to have the whole institutional picture in mind before attempting some reform with an improvement of economic performance in mind.[24]

## 4. Hierarchy of institutions and a tentative taxonomy of institutional analyses

In order to complete the picture of the institutional structure which governs the economy, one may wish to associate another notion to complementary institutions: that of a hierarchy among institutions.[25] The notion of complementarity links together different institutions and modes of organisation in a certain architecture and focuses on the positive interactions between the different elements, interactions which condition the coherence -the intensity of the positive interactions and the overall performance of the system- of the whole. The notion of a hierarchy among institutions insists on the relative importance of one or a few institutions for the coherence and dynamics of the institutional architecture as such. Just as there are static and dynamic notions of complementarity, one may conceive a twin-definition of the hierarchy of institutions. In its static version, hierarchy would be that the inner design of one institution takes into account the constraints and incentives associated to another one. It is thus an extension of the notion of complementarity, except that one institution somehow imposes the conditions according to which complementary institutions are going to supplement it in a certain institutional structure. The circumstances in which such a hierarchy may appear depend on history. The dynamic aspect of institutional hierarchy would be that the transformation of one institution affects the evolution of another one. Both static and dynamic aspects are linked insofar as one institution can destabilise the coherence of a whole architecture by threatening the positive complementarities between institutions.

The hierarchy of institutions is closely linked to the institutional theory concerned (see Table 3). One may distinguish three different types of institutional approaches. The first type is what Amable and Petit [1999] have characterised as 'general purpose institutional approaches'. They link the whole institutional architecture of an economy to its main economic characteristics in order to account for the long-run evolution of various modes of production. The institutions considered cover a large area, beyond strictly economic activity. The second type of institutional approach is more sectoral, centred on a specific area of the economy

[24] See also Boyer [1995] for a similar argument.

[25] Screpanti [1999] deals with 'dominating' institutions, defined as those which govern the highest number of transactions in an economic system. Several types of capitalism may exist according to the way property rights are defined and the type of accumulation governance structures. The hierarchy of institutions thus defined considers the employment relationship as '*the most important relational contract in a capitalist mode of production*'.

and expanding its consideration of the institutional structure from its central focus, the breadth of the expansion varying according to the authors. An example of such an approach is that of national systems of innovation (NSI). One may further distinguish between narrow and broad definitions of NSI as put forward by Lundvall. The former limits itself to the areas of science, research, technology and in some cases education. The latter extends to all economic structures and institutional set-up affecting the production system and innovation. The third approach, to which the 'varieties of capitalism' and the 'social systems of innovation and production' belong, is somehow intermediate between the former two, more restrictive in the set of institutions considered than the general purpose approach but sharing the same ambition to analyse whole production systems, less focused to the analysis of a specific area than sectoral approaches such as the NSI.

## 4.1. General-purpose approaches

The vintage 'régulation' and SSA approaches are two examples of general-purpose institutional approaches. The former is based on the consideration of five 'institutional forms': the wage-labour nexus, the forms of competition, international relations, money, public authorities. The relations between these five forms characterise the overall mode of régulation of the economy. The latter is more country-specific, befitting the case of the US economy, and it may be argued that it is more period-specific as well, tied in its structure to the institutional context of the pre-1970s with a special attention given to the pressure put on workers in the labour market.

The idea of hierarchy among institutions is most present in general purpose approaches, but can also be found in the other works discussed below. Regarding general-purpose approaches, one can take the case of the vintage école de la régulation; its aim was to explain the post-war 'Fordist' golden age as the conjunction of five particular institutional forms. The post-war growth regime was centred around one of the five institutional form: the wage-labour nexus, which then had a predominant position in the hierarchy of institutional forms.

The necessities of a parallel evolution of mass consumption and mass production for the coherence of Fordism put the institutional arrangements of the wage-labour nexus at the centre of the whole institutional architecture. It permeated the whole economic system via a new style for State intervention, a certain form of oligopolistic competition, a particular credit regime and a stable international regime. The capital/labour compromise allowed the implementation of Taylorist methods in the factories in exchange for a certain sharing of the productivity gains thus obtained, a certain degree of employment stability, and the social protection offered by the welfare state. This led to a coordinated expansion of supply and demand and a moderate competition between national producers, best characterised as an oligopolistic behaviour. Inflationary pressures which may result are dealt with an international regime that permitted discrete currency adjustments, and an accommodating monetary policy. Short term demand management policies help in stabilising economic dynamics.

[Table 3 here]

Expressed this way, vintage *régulation* of the late 1970s left little room for possible diversity among developed economies, being more concerned with finding a generic pattern that would fit all advanced capitalist countries for a given historical period. The Fordist mode of *régulation* was meant to apply to all or most developed countries, which adopted the same institutions and forms of organisation, more or less following the American pattern. The consideration of national models, the possibility for differentiated models of Fordism, will come later, with Boyer and Mistral [1986], when further theoretical research as well as empirical evidence will have shown that not only did advanced capitalist countries react to the crisis of the 1970s in different ways, but also they had adopted their own brands of Fordism during the golden age, quite different from the original American pattern in most cases. But in spite of its inclusion of diversity of capitalism, the theory of *régulation* still kept searching for a new unified mode of *régulation* in some seemingly successful national models afterwards, as an equivalent of the United States for the Golden Age. Hence the quest for the awkwardly-named 'post-Fordism' unsuccessfully led *régulationnistes* researchers to Japan[26] until it seemed once again that the United States may have the keys to the new mode of *régulation*. Whereas the Fordist mode of régulation was organised around the wage-labour nexus, a new hierarchy characterises 'tomorrow's capitalism'; Aglietta [1998] coined the term *régulation patrimoniale* for this new mode of *régulation*. In this case again, it looks as if the United States gives the general pattern, as it did before with Fordism, and the possibilities for diversity of capitalism in a regime of *régulation patrimoniale* are not investigated yet.

The structural transformations of the past 20 years are interpreted as a reversal of the hierarchy among institutional forms. One proposition (Amable and Petit [1995], [1996], [1998], Petit [1998]) was that the forms of competition, i.e. the complex of institutions and organisations that concern competition on the product market(s) and, one may add, between financial intermediaries, are now the driving institutional form. It means that the new constraints imposed by the relatively autonomous evolution of the institutions and organisations pertaining to the 'forms of competition' realm are not compatible with the ancient arrangements in other areas (wage-labour nexus,…) and (a) threaten the coherence of the whole system (the Fordist mode of *régulation*) and (b) impose a particular type of coherence for the new mode of *régulation*.

Giving all the aspects concerning these transformations is well beyond the limits of this paper, but one can give a few indications:

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[26] See for instance Boyer and Durand [1997].

- The deregulation of the financial systems favours market-based systems (Anglo-Saxon countries) and threatens the stability of bank-based systems (Germany and Japan). This has implications for the pattern of financing of firms, and hence investment projects' monitoring, as well as providing opportunities for private savings. A new type of complementarity between the new features of financial systems and other systems (industry, innovation, labour relations,…) will have to be found.
- New opportunities for internationalisation of production give firms (large ones at least) the possibility of escaping from the constraints given by a particular national institutional system. This has destabilising effects for the wage-labour nexus.
- New forms of employment emerge from the demise of the Fordist wage-labour nexus and the diversity of the new employment relationships takes over the homogeneity characteristic of the Fordist period.
- Individual income is more dependent on non-wage sources and consumption is more sensitive to wealth effects.

Such an analysis allows for the consideration of a dynamics of institutions but is subject to a certain number of drawbacks. The main one concerns the use of the five institutional forms referred to above. These categories are too large to rule out a certain vagueness in the institutions taken into account. The institutions liable to enter into each category are many and the partition of institutions made according to the institutional forms is somewhat fuzzy. For instance, does the institutions that constitute the financial system pertain to the institutional forms 'Money', Forms of competition' or 'International regime'? The difficulty of coming with an answer is illustrated with how the reversal of hierarchy characteristic of the current period is interpreted. The basic ingredients are the emergence of new types of competition on the product markets and an increasing importance of differentiation and innovation, financial liberalisation, increased capital mobility and a new pattern of corporate governance, the growing influence of financial markets' opinion on the definition of economic policy, etc. These elements can be integrated in a scheme which may alternatively locate at the top of the hierarchy the forms of competition (Amable and Petit [1995]), Money (Aglietta [1998]) or the international regime (Boyer [1999]). There is a difficulty in identifying the hierarchy of institutions and in the lack of precision of the partition of institutions made with the five institutional forms of the vintage *régulation*. For the sake of analytical precision, it may be useful to go beyond this partition and investigate the institutions of forms of organisation within different areas of economic activity.

## 4.2 Intermediate institutional approaches

This is what the Social system of production approach does for instance (Table 3). The range of activities taken into account by this approach is potentially very high and may come close to that of general purpose approaches. However, there seems to lack a certain theory behind the choice of areas, once one wants to go beyond the obvious (industrial relations, training, financial markets…) and reach areas more distant from the usual focus of economics (fairness,…). In fact, it looks as if one had no analytical approach on how to partition institutions outside the traditional economic activities, which explain why the last categories taken into account by the social system of production approach is more a ‘residual’ than anything else: customs, traditions, norms, moral principles, rules, laws… This category mixes very formal rules (the laws) with a mix of informal characteristics which may or may not be the concern of economics. One feels that a national model for instance could be interpreted within this approach by using first the factors of differentiation which are more or less traditional in an institutional economics perspective and then resort to making use of the less traditional elements to explain the ‘residual’, i.e. what is left unexplained by the former factors. One may then build *ex-post* a complementarity of institutions (and even a hierarchy) by adjusting some neo-Weberian elements to an institutional economics analysis. The fear is great to see the appearance of the notion of ‘culture’ -i.e. what is left once economists (or sociologists, or political scientists,…) have run out of explanations-, drafted in to make the necessary adjustments of the facts to the inevitably imperfect economic theory (or sociology, etc.). The National System of Innovation approach is not immune to this, in spite of an initially more focused topic.

The ‘variety of capitalism’ and ‘comparative institutional analysis’ approaches avoid this problem by being more analytical in their understanding of the complementarity between institutions and more restrained *ex-ante* in the coverage of activities. Complementary institutions are derived from economic analysis (sometimes using formal models) and there is a tight relationship between the analysis of complementarity and the areas of the economy which are investigated. The same approach and the same type of relationship between the areas and the theory characterises also the Social system of innovation and production approach. But this latter approach is distinguished from the former two by several aspects. First the CIA approach seems a characterisation of capitalism inferred from the Japanese case, in comparison with American capitalism. This is reflected both in the analytical tools and the main institutions and forms of organisation analysed. By contrast, the SSIP approach aims at analysing a large variety of developed capitalist economies. Second, the ‘varieties of capitalism’ approach seems centred on the firm and its relations with its environment and other firms. The SSIP approach is more macroeconomic in its analysis. Much is attributed to organised business in the ‘variety of capitalism’ approach, which somehow derives from the ‘German’ origins of the theory and the opposition between business-Coordinated Market Economies (CMEs), i.e. Germany, Japan, etc., on the one side, and liberal market economies (LMEs), i.e. the US, UK, etc., on the other side. This may account for the difficulty of this approach to treat the cases of France or Italy, which do not clearly belong to either type. Third, the SSIP approach is more systematically empirical than either the CIA or ‘varieties of capitalism’ schools.

## 5. A variety of Social Systems of Innovation and Production

The research on Social Systems of Innovation or on Social Systems of Innovation and Production[27] is an application of the approach in terms of complementary institutions and tries to overcome several perceived weaknesses of the National Systems of Innovation[28] (NSI) approach:

- Most of the studies of NSI are made on one country at a time. When one concentrates on national case studies, it is tempting to have as many configurations as countries. What one can gain in precision is lost in the generality of the principles.
- Even when attempts at international comparison are made, they concern partial sub-systems and never the whole national system.
- At a time when the internationalisation of research is becoming more widespread, when diffusion of new techniques and modes of organisation is becoming more rapid, it may be an exaggeration to maintain the strictly national nature of learning mechanisms. It seems preferable to consider the notion of Social Systems of Innovation (SSI), which leaves open the question of the territory over which the cumulativeness of the interrelations and the coherence of the system operate.

The results of this approach can be summarised as in Table 5. The analysis distinguishes four idealised models of social systems of innovation and production, each one having its distinctive pattern of institutional complementarity and hierarchy. For instance, Figure 3 gives a possible representation of the market-based SSIP. Based on an empirical analysis, one may distribute a set of 12 developed capitalist countries according to this classification. Although they are systems of innovation and production, the role of technical change should not be overemphasised. There is no simple technological determinism, no straight and direct link between science and economic performance. Macro-level institutions that organise the innovation and production process are determinant, there is no 'natural' configuration according to which the relationships between science, technology and the economy should be organised.

The logic behind the four models could be briefly summarised as follows (see figure 3).

[figure 3 here]

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27 Amable Barré and Boyer [1997a] and [1997b].

28 Lundvall [1992], Nelson [1993],…

## 5.1. The market-based SSIP

One finds on one end of the spectrum a market-based *logic*, held to govern almost all social and economic activities, which is not contradictory with a sometimes heavy involvement of the State in some particular areas, such as defence-related activities. Advances in fundamental science are the result of competition between laboratories, and the patent race decides of the R&D strategies of private firms. A strict definition of property rights and their enforcement by a very developed legal system form two of the pillars of such a SSIP. Sophisticated financial markets allow to mobilise venture capital and give new sectors an opportunity to emerge. Very flexible labour markets do not in general allow skill accumulation within the firm, in a context where vocational training does not develop for lack of market-driven incentives. On the other hand, labour movements between firms favour the dynamism of new firms. This configuration comes close to the representation of LMEs in D. Soskice's classification.[29]

## 5.2. The social-democratic SSIP

At the other end of the spectrum, one may find a model based on compromise and negotiation between the involved parties. Most of the forms of organisation have their origins in the confrontation of the respective objectives of firms, salaried workers and the State. These parties seek to come to an agreement on principles liable to guarantee simultaneously firms' competitiveness and the reduction of inequality. In this sense, this model may be called 'social-democrat'. The egalitarian objectives in terms of income and education prevent the polarisation of skills and induces pressures in favour of high value added sectors. This permanent adaptation process presumes the existence of Public institutions whose purpose is to retrain the labour force rejected by non-competitive sectors. Relatively underdeveloped financial markets do not prevent the pursuit of long term objectives in the field of innovation. In this model, one can see most clearly the construction of an SSI that has little to do with a market-based logic. This model corresponds to the Centralised-Egalitarian (CE) model of Soskice [1999].

## 5.3. The meso-corporatist SSIP

A third configuration can be called meso-corporatist, producing to some extent the same results as the social-democrat model, but according to a different logic and with the help of a different set of institutions. Large firms, linked through financial,

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[29] Soskice [1999].

personal or technological networks, are at the centre of the process of innovation. Public schooling institutions limit themselves to the general education of a large number of students while universities do a certain amount of basic research. However, most of the innovations derive from the acquisition of competence within the firm, according to a learning process that enables a growing sophistication of products, processes and forms of organisation. The control that the main bank has on an industrial firm permits long term horizons. In this model, innovation is mostly governed by the search for products liable to satisfy the private demand, all the more so that the small size of military expenditures and public programmes based on incentives rather than rulings make competitiveness a major imperative of this SSI.

### 5.4. The public SSIP

A public-institutions-based model defines the last configuration in which public institutions play a determining role in the impulse, codification and direction of innovation and are at the centre of the processes of economic adjustment. In opposition to the social-democratic configuration, tripartite bargaining is more difficult and a large part of the specialisation derives from demand originating in public expenditures: transport and communication infrastructures, health, etc. as well as large public programmes, either civilian or military. Basic research is mainly public, as is the education system, so that the transferability to the private sector of research advances and the closeness of fit between training and the needs of private firms may be a problem. Traditionally, public regulations have a role in the allocation of credit by banks. This bank-based credit system tends to favour large firms over small businesses and new firms. In this model, public authorities are an important actor in the dynamic matching of supply and demand in the fields of innovation, production and credit.

The above considerations are necessarily schematic and sum up very abruptly a very complex set of interrelations between economic structures and institutional forms, but what it suggests is that the four models are not variants of one unique pattern, each has an internal logic and synergetic effects that are entirely specific.

As always with stylised models, the adequacy between the model and actual countries is at best partial. One may have reservations when it comes to assigning a particular country to one particular model. There is no doubt that the US and the UK belong to the market-based model, and the size of public (defence) spending on R&D in the U.S. is not relevant here as it has been shown before that the particular U.S. market-based model actually involves a peculiar involvement of public authorities.[30] France is the figurehead of the public SSIP and Japan is the meso-corporatist SSIP. However, one may be more cautious with Germany: the

[30] See Bellon [1986] for instance.

*Sozialmarktwirtschaft* is, in a certain way, close to the social-democratic model, with the importance of bargaining, and close to the public model according to other characteristics. A more refined classification would probably identify some elements of the CME model within the Public SSIP. More generally, the public SSIP is that of Continental Europe, of the founding countries of the EEC turned European Union.

Broadly speaking, each institutional setting expresses a set of objectives which are implicitly or explicitly favoured :

- The market led model puts a strong emphasis upon the need for quick adjustments to an uncertain environment, at the possible cost of dynamic efficiency. Similarly the enforcement of property rights is perceived as much more important that social justice and the implementation of a complete welfare system.
- By contrast, the social democrat-model puts forward the objectives of social justice and universal welfare and tries to organise collectively all the adjustments required by innovation and technical change.
- The meso-corporatist model is another alternative to the market led system : the common interest of permanent workers of the large company is perceived as more important than the enforcement of property rights by shareholders. Therefore, dynamic efficiency is privileged against static efficiency, whereas most of the welfare is linked to each large company.
- The public model is also different, since State interventions are highly developed within any sector of economic activity : the implicit objective is to alleviate a recurring social conflicts between groups and simultaneously the legitimacy of public authorities is closely related to the monitoring of a successful growth regime.

Thus it is not a surprise to observe that each model exhibits different patterns of evolution in terms of scientific specialisation, innovation, factors of competitiveness and therefore growth and employment patterns. Even though they belong to the same economic zone, the countries which follow different models have different trajectories, at least until the early 1990s.[31] But since then, some structural transformations have taken places, each SSIP having its own autonomous dynamics (See Table 6 for a brief summary of the dynamic forces within each SSIP). For instance, the Scandinavian countries belong clearly to the social-democratic trajectory, but their recent evolution has made their macroeconomic performances become more similar to the rest of Europe, notably in terms of unemployment. Similarly, the size of the country and the precise policy followed for a decade may explain differences in performances among countries which belongs to the same broad SSIP. In this respect, the pattern of restrictive macroeconomic policy followed by European countries across most of the 1990s has certainly played a major role. The trajectory followed by the Netherlands is quite original since the reforms in labour market institutions as well as new trends for innovation policy have promoted

[31] For a full analysis of the 1990s see Amable, Barré and Boyer [1997a : 265-312].

a clear decline in unemployment, contrary to what is observed elsewhere in continental Europe. Conversely, France and Germany which belong to the same broad model but experienced significant institutional differences, tend to converge in terms of the reforms implied by the adhesion to the EURO. Japan seems to be plagued by both structural and short-term macroeconomic problems. The former are linked to the difficulty of the transition from a catch-up economy to a world technological leader.[32]

[tables 4 and 5 here]

## 6. Conclusion

This paper has presented an institutionalist approach to the analysis of modern capitalist economies based on the notion of institutional complementarity. This notion is at the core of most analyses that try to identify coherent national models, systems of innovation and/or production, varieties of capitalism or modes of *régulation* to name but a few. These approaches treat their respective objects (countries, systems, models, regimes,…) as not just a more or less random collection of institutions, organisational forms, conventions, etc., but stress that the pattern of interrelationship between the different elements of the institutional structure defines the coherence of this structure. Some authors emphasise historical transformations and isolate phases that are common to the advanced capitalist countries, while others stress the differences between capitalist countries within a given phase. Some works are more focused on a particular area within the economy while others consider more extensive sets of institutions.

Putting the emphasis on institutional complementarity has consequences for theoretical research, empirical work and policy recommendations. To put it shortly, it is more important to study the effects of interacting institutions or organisations than just admit that 'institutions matter'. Empirically, one would expect that the pattern of activity specialisation of a country (industry and services, industrial sectors, etc.)[33] matches with a certain type of institutional or organisational configuration. Last, any policy recommendation in the realm of 'structural reform' should take into account the coherence and logic of the whole institutional structure.

Regarding the issue of an hypothetical convergence of countries towards the same institutional model -and most analyses consider convergence towards the market-based model, or LME in the variety of capitalism approach-, several elements may be mentioned. The theoretical elements as well as empirical evidence point

[32] Se also Made in Japan.

[33] See Casper [1998], [1999] for the case of bio-technology.

towards both directions of convergence and divergence.[34] If there is a tight connection between the institutional structure and international specialisation, as most institutionalist analyses would conclude, a simple argument in terms of gains of international trade should militate in favour of the preservation of institutional diversity across countries. If some types of productions find a more favourable environment in a certain type of institutional structure, economic efficiency would not recommend that all countries converge to the same institutional pattern.

Another aspects concerns technology. Here again, both theory and empirical data do not point towards the uniformity of developed economies. The once popular view concerning 'global technology' has long been identified as a myth. Technological competence is for a large part developed locally, tacitly and cumulatively, and the research on NSI has shown that national particularities in science and technology systems are congruent to technological and industrial specialisation. Besides, the analysis of the golden age would show that the same Fordist technologies had been adapted nationally rather than merely adopted.

On the other hand, some trends are observable that push all advanced countries in the same direction, that of financial liberalisation and increased capital mobility. Regarding the latter, it is not that obvious that the internationalisation of investment conducted by multi-national corporations (MNCs) should necessarily endanger some institutional complementarities and direct all countries towards the market-based system. On the one hand, capital mobility may initiate a race to the bottom in terms of social protection, labour rights, wage levels, taxation rates and thus public investment… and hence threaten the stability of countries that do not follow the market-based pattern. Such a possibility already exists within the European Union and the UK plays a special role in the competition between varieties of capitalism. On the other hand, the argument in terms of the congruence between an institutional structure and competence for certain types of production may prevail. In this case the strategies of MNCs would be to exploit the opportunities provided by different institutional structures and would thus have an interest in their preservation rather than precipitating their disappearance.[35] The strength of this last point rests ultimately on the strengths of the linkages between institutions and competence in production. Technology may modify this link, and extend the possibilities for relocating for instance German-type differentiated quality production in lower-wages countries, thus threatening the existence of the German model.

Financial liberalisation is not limited to FDIs. The dominant trend is the extension of market finance at the expense of bank-based finance. Considering the role played by banks in providing long-term 'patient' capital in some countries and the inherent trend towards short-termism of market-based finance, this means radical change for countries with a strong bank-based financial system (Germany,

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[34] See also Whitley [1998] on the topic of internationalisation and business systems.

[35] See Ruigrok and van Tulder [1994].

Japan,…), unless institutional innovation provides a functional equivalent to what banks usually do in these countries. In any case, the rise of corporate governance will imply a reshaping of the institutional complementarities.

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## Figures and Tables

**Figure 1 : Why do institutions shape the growth regime.**

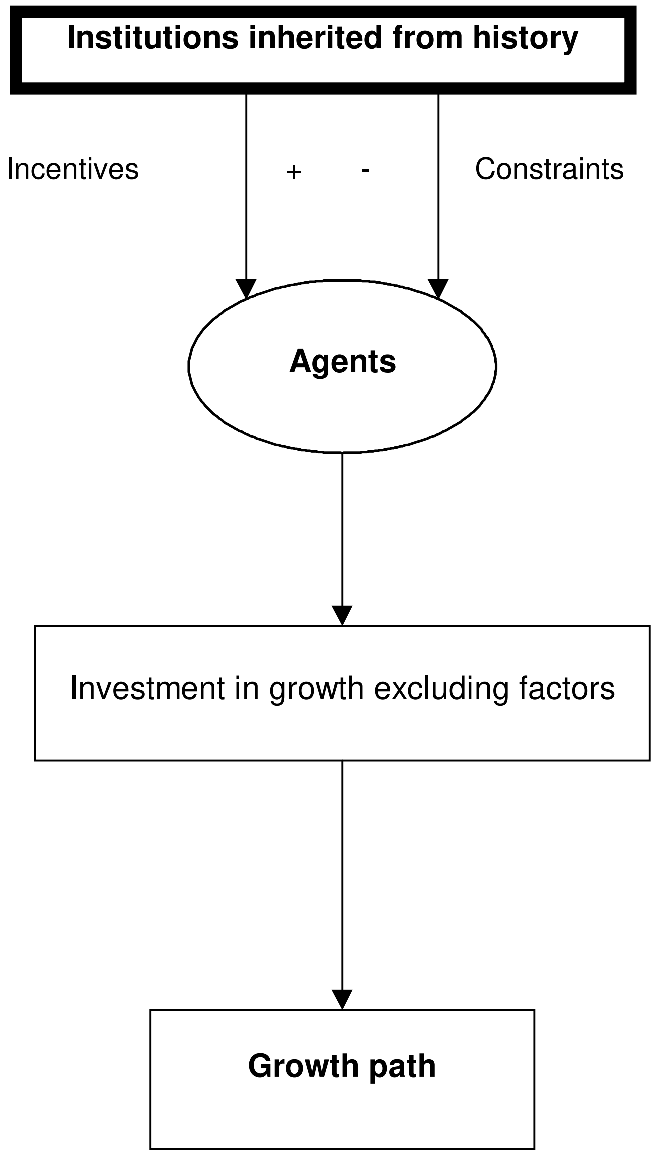

**Figure 2: A political economy view of institutions**

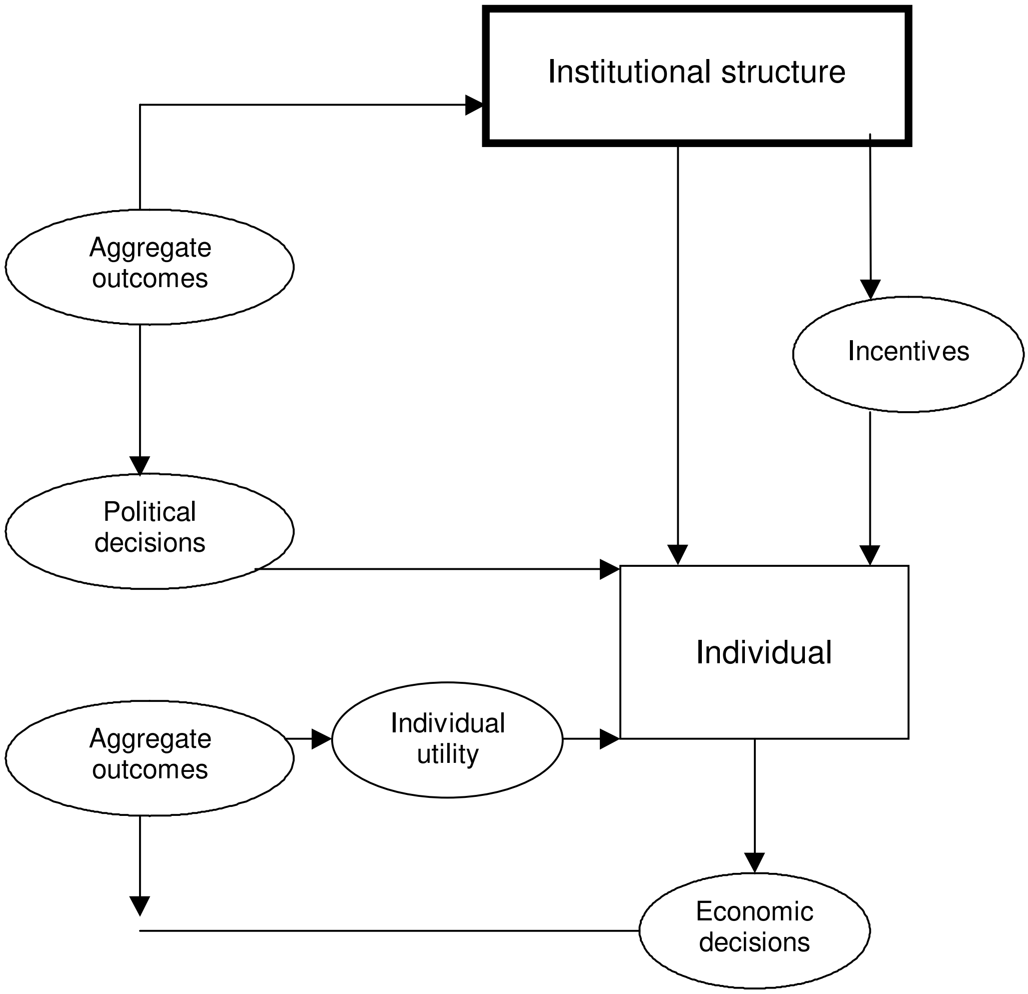

**Figure 3: A stylised representation of institutional complementarity**

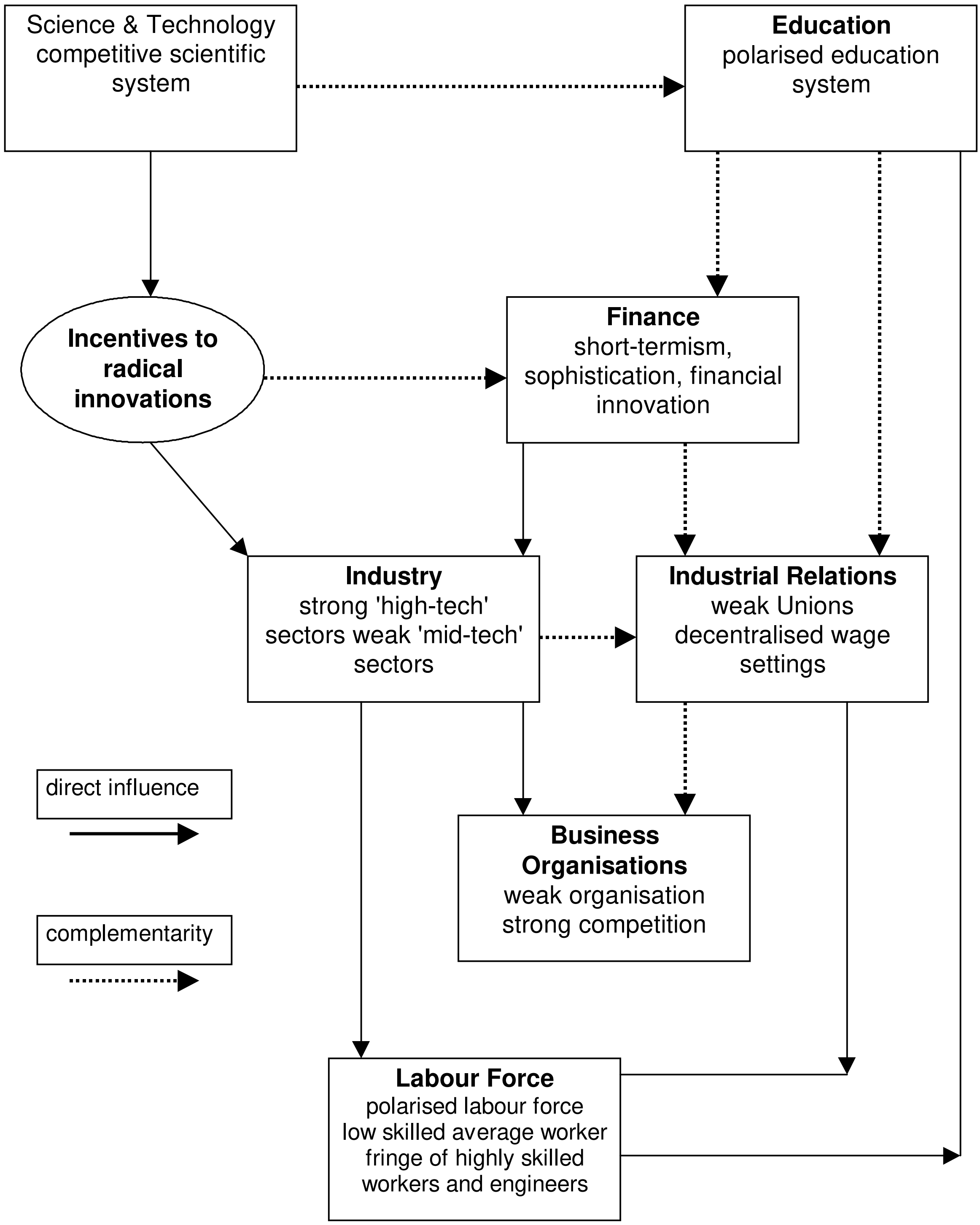

**Table 1. Institutions and organisations influence endogenous growth.**

| **Source of growth** | **Externalities or coordination problems involved** | **Influential institutions and organisation forms** | **economic policy instruments** |
|---|---|---|---|
| **Physical capital** | Positive externalities linked to capital accumulation, through learning by doing or because new knowledge is embodied in new equipment (except in the simplest 'A.K' model where there are no external effects) | ■ financial intermediation system<br>■ firms (mode of organisation, strategies, time horizon,...)<br>■ State | ■ taxes and subsidies to promote investment<br>■ adequate policy mix and macroeconomic stability |
| **Human capital** | Positive externalities through inter-personal (having educated people around makes one more productive) or inter-temporal effects (learning now makes further learning easier) | ■ general education & training system (public or private)<br>■ technical education system<br>■ firms' internal training systems<br>■ more generally the wage-labour nexus | ■ education and training systems reform<br>■ subsidies to education and training<br>■ regulation on diplomas |
| **innovation** | Positive externalities linked to the accumulation of knowledge. New products facilitates further inventions by raising the technical level of the economy.<br>Negative 'business stealing' effects are possible but are distinct from technological externalities. | ■ scientific system<br>■ higher education system<br>■ firms and research laboratories<br>■ the State<br>■ financial intermediation system | ■ laws on patents and intellectual property<br>■ improving the relationships between science, technology, higher education and the firms<br>■ promote the availability of 'patient' capital<br>■ promote the availability of capital for risky investments<br>■ research and technology policy |
| **knowledge and ideas** | Supposedly very strong. Linked to the accumulation of knowledge and the 'public good' aspect of new ideas. Inter-personal as well as inter-temporal effects are possible | ■ networks (firms, scientific community)<br>■ education and science systems<br>■ international regime | ■ human mobility<br>■ capital mobility<br>■ education subsidies<br>■ openness policies<br>■ location policies |
| **public infrastructures** | Positive external effects on private productivity in general. Congestion effects are possible too. | ■ the State<br>■ local public authorities<br>■ firms | ■ public investment programmes<br>■ co-ordination between central and local authorities<br>■ taxes and subsidies |
| **learning effects** | Strong inter-temporal externality, connected to division of labour. The effects are declining with time if applied to the same technique | ■ firms' mode of internal organisation<br>■ education and training system<br>■ wage-labour nexus | ■ labour force stability<br>■ technical education of the labour force<br>■ promote co-operation on the shop floor<br>■ trade policy (specialisation in goods with different learning potentials) |

Source: extended and modified from Boyer and Didier [1998]

**Table 2. Components of an institutional economic analysis**

| | Definition | Principle | Factors of change |
|---|---|---|---|
| **Constitutional order** | A set of rules governing relationships between individuals, organisations and institutions | Legitimacy by deliberation (in democratic societies) | Political process |
| **Institution** | An intangible way of structuring interactions between organisations and individuals | Reduces uncertainty associated to opportunistic behaviour. Favours cooperation | Structural crises |
| **Organisation** | A power structure and a set of rules that organises the actions of agents | Incentives and penalties defined in reference to external institutions and conventions | Weak performance in the competition with other organisations |
| **Convention** | A self-enforcing mechanism of social coordination | The loss of the origins makes it appear a 'natural' behaviour | Changes in the pattern of interactions which render the old conventions 'obsolete' |
| **Habitus** | Pattern of individual behaviour adopted during the socialisation process | Adaptation to a certain 'field' | Switch to another field; New learning |

Adapted from Boyer [1996].

**Table 3. Institutional complementarity in various institutionalist approaches.**

| Approach | Main institutions & organisations concerned |
|---|---|
| **Vintage *Régulation***<br>(M. Aglietta, R. Boyer, A. Lipietz, B. Coriat, J. Mistral, P. Petit,…) | 5 institutional forms:<br>- wage-labour nexus<br>- forms of competition<br>- State<br>- International regime<br>- Monetary regime |
| **Social Structures of Accumulation**<br>(S. Bowles, D. Gordon, T. Weisskopf,…) | - the capital-labour accord,<br>- the capital-citizen accord,<br>- the relationship of domestic capital to the rest of the world<br>- the relationship between capitals (i.e., the nature of inter-capitalist rivalry) |
| **National systems of innovation**<br>(B.A. Lundvall, R. Nelson, C. Freeman,…) | - almost all institutions that have an effect on the accumulation of knowledge and skills and innovation in the broad definitions<br>- science and technology institutions in the narrow definition<br>- firms |
| **Social Systems of production**<br>(W. Streeck, R. Hollingsworth, C. Sabel,…) | Market is but one mode of coordination among economic agents. There are markets, hierarchy, communities, state, networks and associations. Several elements are considered:<br>- the industrial relations system<br>- the training system<br>- the internal structure of corporate firms<br>- the structured relationships among firms in the same industry or between suppliers and customers<br>- the financial markets of a society<br>- the conceptions of fairness and justice held by capital and labour<br>- the structure of the state and its policies<br>- a society's idiosyncratic customs and traditions as well as norms, moral principles, rules, laws and recipes for action. |
| **Varieties of capitalism**<br>(D. Soskice, P. Hall,…) | 4 systems:<br>- financial system<br>- industrial relations system<br>- education and training system<br>- intercompany system<br><br>and several actors:<br>- firms<br>- business associations<br>- trade unions<br>- Central Bank |
| **Comparative Institutional Analysis**<br>(M. Aoki) | - Firms<br>- financial system<br>- labour market |
| **Social Systems of Innovation and Production**<br>(B. Amable, R. Barré & R. Boyer) | 6 sub-systems:<br><br>- science<br>- technology<br>- industry<br>- labour force<br>- education and training<br>- finance |

Table 3 continued

| **Complementarity** | **hierarchy** |
|---|---|
| Expressed in the dynamics of the growth regime and the mode of *régulation*, the latter defined as a set of procedures and behaviours (individual and collective) that serve to reproduce fundamental social relations through the combination of historically determined forms, support and steer the growth regime and ensure the compatibility of a set of decentralised decisions | The wage-labour nexus is the driving institutional form of the fordist regime, but this hierarchy changes. |
| Expressed in the stability over time of the SSA due to the coherence between its elements Another element is its ability to diffuse to other countries than the US | Dominance of the capital-labour accord to settle class conflict |
| Takes place through interactions between boundedly rational agents. The presence of one institution may make learning easier and hence the accumulation of knowledge. | Innovation is the source of growth and hence dominates every other area of economic life one way or another. Technology is the most important (the only?) determinant of economic evolution |
| All the different institutions and forms of organisation cohere together, but the different elements vary in the degree in which they are tightly coupled with each other onto a full-fledged system. Hence a diversity of possible systems.<br>Institutions do not act through incentives alone, they shape modes of representation of the world for agents. | Varies with history and the configuration of institutions. |
| Central problems of the economy are coordination problems. Institutions enhance information flows among actors, provide monitoring and facilitate credible commitments, communication and the establishment of compromises over distributional issues.<br>Interactions between the financial system (corporate governance) and the labour market (industrial relation) or between the Central Bank and the mode of wage bargaining. | Observable with the structure of power and the process of political decision-making. In Germany for instance, domination of the bargaining institutions (labour unions / firms). More generally, the degree of organisation of business conditions the variety of capitalism eventually adopted, either coordinated or uncoordinated. |
| The features of the financial system and the labour market define a set of incentives. Complementarity is based on the joint effects of these combined incentives. For instance, the main-bank relationship characteristic of Japanese industry defines a particular type of management monitoring which reinforces the work-incentives of the team-based work organisation within Japanese firms | The financial system organisation and the pattern of work organisation within firms implicitly drive other components of the economy. |
| The different sub-systems are characterised by a certain mix of institutions and organisations that are inherited from history and partly transformed by political action and purposeful agents.<br>Each sub-system is characterised a set of possibilities and incentives for agents.<br>The compatibility of each sub-system with the other defines ex-post the growth trajectories of nations. | No a-priori hierarchy, which depends on the historical period. The wage-labour nexus (labour-force subsystem) in the fordist era; forms of competition (industry and finance) in the current period |

## Table 4. Four types of Social Systems of Innovation and Production

| | **Market-based** | **Meso-Corporatist** | **European integration / Public** | **Social-democratic** |
|---|---|---|---|---|
| General principle | Market-based is the dominant organising principle and is applied to most institutions. | Principles of solidarity and mobility within a large size economic unit (corporation) with diversified production | Conciliation of the objectives of Public Authorities with private sector development, either through negotiation (Germany) or under the control of the State (France). A regulated capitalism | Bargaining between social partners for rules that apply to the economy and society |
| **Implications for** | | | | |
| Science | Research system based on competitions between researchers and between research institutions | Important in-house research largely disconnected from the academic world | Public basic research disconnected from new products development | Importance of social needs in the definition of research objectives |
| Technology | Importance of intellectual property rights protection, patents and copyrights as incentives to and protection of innovation | Importance of tacit knowledge and in-house innovation | Importance of public impetus for private research | Gradual evolution towards advanced technologies and new sectors: from natural resources exploitation to information technology |
| Competence and skills | Highly segmented labour force, innovation and skills on one side, low skills and production on the other. | Homogenised general education; specific skills developed within the corporation, but labour market dualism | External rather than internal mobility of the labour force | Egalitarian ideals in education and wage setting. Limits to the adverse consequences of technical progress through public action |
| Labour markets | Decentralisation of wage bargaining, individualised wage and labour market segmentation | Wage compromise within the large corporation but synchronising of wage rises | Strong institutionalisation of employment rules, working hours and social protection | Centralisation of wage bargaining under the external competitiveness constraint |
| Competition | Limits to concentration by legal action; constant evolution of oligopolistic competition | Strong competition on internal product markets between large firms | Once moderate competition because of public intervention or business associations has intensified within the single market; concentration of capital | Small number of large internationalised firms and networks of small local suppliers |
| Finance | Market-based finance and sophistication of financial services. Financial innovation, strong influence of shareholders | Stable long-term relationships between the Main Bank and a keiretsu. Strong involvement of public authorities (MOF and Central bank) in private banking | Importance of banks. Relatively low sophistication of financial services | Bank-based financial system, no sophistication of financial services |
| Products | Important product innovation | Adaptation of products and processes in the catching up phase, fast product innovation after | Slow adaptation to market changes | Importance of quality, services and differentiation |

| | Market-based | Meso-Corporatist | European integration / Public | Social-democratic |
|---|---|---|---|---|
| **Other characteristics** | | | | |
| Public Intervention | Fragmented in a series of agencies and monitoring institutions. Strong limits to public intervention, political competition | Furnishes collective services and acts as a co-ordinator. Small size but significant role | Important public intervention (central state or local authorities): firms, regulation, public spending, social security,… | Many forms of public intervention with financial transfers and extensive regulation |
| | Importance of large public research programmes (defence,…) which supplements private research | No large public programs of the 'mission' type | Large variability among the different countries concerned | Largely open economies |
| International regime | Adherence to free trade principles. Status and autonomy of nations depends on size (US vs. UK,…) | Economic development conditions all choices in terms of international trade | Regionalism (EU) favoured over multilateralism. Political will for european integration conditions economic integration | Small countries, strong external constraint |
| **Consequences for** | | | | |
| Innovation | Schumpeterian waves of (radical) innovations. Importance of patents and individual rewards to innovation | Ability to imitate, transfer and transform technology starting with incremental innovation | Both 'mission'-type projects of large size and incremental, quality innovation | Innovation linked to solutions to social or economic problems |
| Industrial specialisation | Sectors linked to 'radical' innovations: information technology, aerospace, pharmaceuticals, finance… | Sectors where coordination is necessary and where competence is localised and cumulative : automobile, electronics, robotics | Sectors linked to public infrastructures (France,…) and/or where competence rests on a skilled labour force: aerospace, mechanics, automobile | Sectors linked to social demand (health, security, environment) or exploiting natural resources |

**Table 5. The dynamics of SSIP**

| | Market-based | Meso-corporatist | European integration / public | Social-democratic |
|---|---|---|---|---|
| Conditions for possibility of existence | - a sufficient level of economic development<br>- large decentralisation of research and economic activities | - an efficient generalist education system<br>- existence of large multi-product firms | - the intent to catch up both economically and technologically<br>- acceptation and legitimacy of a variety of public interventions | - acceptation of the principles of openness and competitiveness<br>- values of solidarity and social justice |
| Strengths | - specialisation in codifiable knowledge-based activities<br>- rapid response to structural change<br>- radical innovation capabilities | - specialisation in activities dominated by localised knowledge<br>- cumulativeness of learning effects<br>- advantage in incremental innovation | - specialisation in activities linked to collective needs (transport, health, communication,…)<br>- favours catching up<br>- possibility to switch to a science-based technological paradigm following Public impulse | - specialisation in local resource-based activities<br>- low inequality<br>- pressure to adoption of new techniques in high tech sectors |
| Weaknesses | - underinvestment in collective goods<br>- income inequality<br>- short termism and instability from financial markets | - underinvestment in basic research<br>- slow reactions to the the business cycle<br>- Banking system fragility | - underinvestment in new industries and slow product innovation<br>- slow adaptation to structural change | - high tax rates, potentially a dissuasion to investment and R&D<br>- inadequacy of the financial system to modern capitalism |
| Possible destabilising factors | - decrease in public expenditures for education and research<br>- lack of co-ordination in some industries<br>- financial crisis | - difficulties in adapting to a basic science based technological paradigm<br>- Banking sector crisis | - getting nearer the technological frontier calls for new modes of organisation<br>- constraints on economic policy hinder public action | - diverging trends compared to the world economy<br>- destabilisation through financial liberalisation and globalisation |

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