Contrato BNDES/FINEP/FUJB

Arranjos e Sistemas Produtivos Locais e as Novas Políticas de Desenvolvimento Industrial e Tecnológico

Estudos Temáticos

Nota Técnica 3

Structure and Development of a Knowledge Based Economy: The Policy Implications.

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Rio de Janeiro, Dezembro de 2000

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The notion of Knowledge Economy refers to a new growth regime of developed economies in a post industrial era. It should not be confused with the more restrictive view taken by the media of the New Economy which refers to all the dot.com activities that have risen in most economies around the world in the last three or four years. When one speaks of a growth regime it means that the very dynamics of supply and demand for all economic activities are concerned by long term structural changes.

These changes go beyond the diffusion of internet and the e-business that it generates. It concerns not only the diffusion of a whole system of information and communication technologies but also the rise in education of the populations and the growing internationalisation of the economies.

Taken in broad terms the change of context has some general characteristics at least in developed economies which are worth being listed and their policy consequences analysed. Still this broad context is also differentiated among countries, meaning that all countries are not in similar positions to take advantage of the changes. Knowledge economies are likely to follow diverse trajectories and not one best way. Conversely , although this knowledge economy is in the first place a growth phase more relevant for developed post industrial economies it concerns as well developing countries at least by three channels : a diffusion of the new technological system which has a global reach, an internationalisation which connects each economy to some multinational networks and a rise in education also to unprecedented levels which changes the internal division of labour and its relation with external worlds.

But of course the magnitudes and directions of impacts are bound to be different and going in various directions, all of which will have diverse policy implications.

In order to analyse these various effects and their policy consequences we shall proceed as follows.

In a first section we shall detail the three long term structural changes. A second section will investigate both the linkages between these changes and the configurations that countries of different development levels and past are facing.

A third section will be devoted to the micro-foundations of the core growth model of such knowledge economy, e.g. how in broad terms the supply and demand sides evolve with the change in the dynamics of productivity gains and of economic rents. We then look in section 4 at the main institutional and organisational changes occurring in the contemporary transformation of growth regimes.

A fifth section will draw on the characteristics of this growth model and on the different situations that countries are facing to assess some policy implications of our analysis.

Section 6 will draw some conclusions on the magnitude and feasibility of the comprehensive

structural policies required for the various economies ;

I. Three main long term structural changes.

A) A decisive environment

One could not single out the increase of information and knowledge available to economic agents as a characteristics of knowledge based economies if a specific environment did not support the diffusion, accumulation and elaboration of these intangibles.

By environment we mean some set of structural changes, openly related and country specific which seem to develop over time being only moderately curbed up or down by the growth trends of economies. The set we retain distinguishes three structural changes. In the first place let us mention the diffusion of a technological system centred around the technologies of information and communication (ICTs hereafter). Second is the steady investment in education pursued in most countries since the post war period. And third is the growing international involvement of nations brought not only by trade and foreign investment but also by the expanding cross border flows of intangibles, whether information, knowledge or personal contacts and general accords that thread the present phase of internationalisation of our economies.

We shall stress hereafter the qualitative nature of these changes showing how they affect a) the nature of physical capital (PK hereafter) with the diffusion of ICTs, b) the quality of the human capital (HK hereafter) and c) the international implication of countries outlining to what extent strategies of economic agents are global or international in some respect.

B) The diffusion of a new technological system.

The diffusion of a new technological system centred around the technologies of information and communication is certainly a central feature in the structural change underlying the new growth regime. A major characteristics, as largely stressed by C. Freeman, is its pervasiveness, i.e. the capacity it has to concern all kinds of operations and parts of machinery, thanks in particular to the ongoing miniaturisation of micro-processors but also to the capacity to inter- connect and therefore monitor a lot of different operations. The steady process of miniaturisation[1], leading to price reductions, has set a rapid pace of innovation and diffusion. This pressure is likely to be maintained for at least another ten years (see IPTS (2000)). Another important dimension is given by the development of the telecommunications. It started with a large increase in the diffusion and use of the telephone, where innovations were basically reducing the costs and ended with a radical innovation such as internet. The global reach that internet and the telecommunication equipment in general provide considerably changed the economic geography, both for producers but also for consumers.

Therefore one of the crucial dimension of all this new fix capital lies in its ability to connect various parts and monitor or control there running at distance.

Knowing the different uses made of these equipment facilities, altogether by firms and consumers, is a central element to appreciate the real effect of this structural change.

[1] Doublin g every 18 months the capacity to treat information according to the regularity observed by Moore, a founding member of Intel corporation, in the early 80s. Nitan and Liskanen (1998) even suggest that this speed could accelerate in the following decade. See also IPTS(2000) for such an assessment.

The factors that can influence the capability of producers and consumers to put to use these new technologies will depend as usual on their know how and on the price of the equipment. The peculiarity of the present technological system lies with the strong externalities that stems from the connectivity of the equipment. It generates sets of network externalities, the proximity of which has to be taken into account when assessing the forces driving the diffusion of the new technological system in a country. This know how of agents and chiefly their knowledge on the capacities of these ITCs equipment can also be boosted by a rise in levels of education as well as by an enlarged global reach of the economic agents of one country.

C) The rise in educational levels.

The level and quality of education is another big component of the contemporary structural transformation. Not only did most countries developed their system of education to meet the needs of the period of sustained growth (see ILO 1999 for the figures), but education has become an important societal fact. More precisely education has become an important goal of self realisation for men and even more for women. This attachment shows in the fact that the rise in scholarisation rates has not been affected by the depression of most labour markets over the last decades.

The impact of this structural change on growth and welfare is still strongly dependent upon the synergy it has with the technological system seen above. It is not strictly linked with the share of technical and professional training. The qualities required to take advantage of the technologies are more diverse. They imply some personal qualities as reactivity, openness, capacity to innovate as well as to collaborate. These are individual virtues to be used in various occasions where individuals are confronted with unknown situations, risk and uncertainty as well as when they are forced to update on the job their training as these technologies are evolving rapidly as we underlined. But properties of the system of education itself may also count such as a good interaction between universities and firms and more specifically between public and private research.

D) The growing internationalisation

Finally the third structural change characterising the new growth regime has to do with the many ways in which countries developed their international relations. This goes beyond the liberalisation and increase of trade and investment flows. Not only did the number of countries involved at international level increased, but the range and complexity of trade and investment flows augmented as well. The rise of intra trade flows illustrates this differentiation. Furthermore international exchanges of information and knowledge greatly helped to broaden the scope of economic agents. It implies that an unprecedented number of transactions are taking place either at international levels or in taking full consideration of the international context. Let us notice right away that the international development of intermediation services (banking, transport, communications, distribution) has been a precondition for such evolution.

This phase of larger internationalisation does not mean though that we have reached a phase of hyper globalisation (where the world would be one big market and one unique sphere of production, dissolving all national borders). This period of greater internationalisation is still much dependent on nations on most international issues where national governments have kept their legitimacy to intervene.

International bodies have not built up such legitimacy so far that would enable them to monitor the growth trajectories of countries if only by influencing the diffusion of technology, the development of education or the international integration of countries. relations,

But the state of internationalisation also severely constrain the old power of governments in economic policy making. The new capabilities of agents to act at international levels, bypassing sometimes national rules, exert a pressure on national regulation. The wave of deregulation of a lot of intermediation activities (such as banking, transport, communication and distribution) in the 80s is just one side of this big transformation in international economic relations. More precisely these deregulations tend to shift regulations from one kind, segmenting markets, to another kind edicting codes of conducts (in search of transparency and accountability). This shift is a long term process though, which is discussed and challenged by judicial procedures, and ends up building complex codes of behaviours.

Most of these pressures resetting the frontiers between national and international constituencies stem from multinational businesses or from international institutions.

In effect this phase of internationalisation gave way to some reshaping and creation of international institutions. The development of regional blocks played a particular rôle in that respect in structuring the process. Internationalisation is though far from being a mere process of regional integration. The globalisation of financial markets if only would make the point. In that respect it is important to notice that "globalised" markets are in no way perfect: information is not evenly distributed and rationality is not similarly bounded for all agents.

Finally the above three structural changes display configurations of material and relational networks, largely interrelated. As the qualities of these configurations are bound to be determinant regarding the development of new growth regimes we shall hereafter investigate them.

II. A fabric of inter-related changes

The three broad structural changes outlined above are in fact occurring in a lot of different and complex ways, according to countries. This matters to assess their outcome. Comprehensive structural policies can find in this diversity new means for interventions, providing that the consequences of such policy interventions are better known. As a matter of fact there tends to be a broad consensus to favour the diffusion of the above changes (namely the diffusion of ICTs, education and internationalisation) which certainly account for their widespread and ongoing nature. But it is also true that they don't constitute universal recipes for economic growth and welfare. There is an hint that they may, when taken in broad terms, turn out to be consequences as much as causes of economic development. There is a qualitative issue there suggesting that somehow the real nature of these changes may condition strongly their efficiency. The lasting productivity paradox which stresses that the diffusion of ICTs does not show into a rise in productivity gains clearly supports such questioning. So does the growing concern over the quality of education and its rate of obsolescence in the present context shown in surveys on literacy (see OECD 1997). And obviously internationalisation of economies may have various results on economic performance.

Exploring the characteristics of these changes and their relative impacts is therefore relevant if one wants to assess the potential of the new environment. A key issue in that respect is to consider, not so much each change separately, but their linkages.

There is a wide recognition that these structural changes are inter-related and that the diffusion of any of the three enhances the diffusion of the others, one way or the other. But the precise nature of

these linkages and how they impact on the growth patterns of various economies is much less obvious.

A) The link between education and ICTs diffusion.

The most obvious and universal link ties the diffusion of ICTs with the education of the labour force. One could see them as changes both correlated with an economic growth of various origins. But it is a specific feature of the contemporary changes for technical change to be linked with an higher demand for skilled labour. This skill bias thesis is largely debated (Berman, Bound and Machin 1995, Wolff, 1995, Bresnahan, Brynjolfssonand Hitt (1999) as it depends on the definition of skills and on the nature of the bias (whether it concerns labour demand or wages). It concerns all developed countries and sectors even if it is more marked in manufacturing activities (OECD 1996). Such complementarity between physical capital and human capital is not that straightforward. In the previous "fordist" phase of economic growth there was a widespread fear on the contrary that technological change would tend to substitute for skilled labour and thus finally deprive work of interest. In the present phase there is a fear that technical change would increase the demand for high skills and that unskilled workers could not get proper jobs. The downgrading of unskilled jobs would in this context be largely the result of the competition of workers of low wages countries.

Conversely it should be mentioned that the rise in demand for skilled workers can attract foreign workers. Some professionals are effectively experiencing a globalisation of their markets. High skilled workers from low wage countries are attracted in greater numbers by the labour markets of more developed economies. The pressure of this brain drain movement has increased, although rather differently according to the country under view (IPTS,1999). This move is not strictly tied with the diffusion of ICTs, but the spread of codified knowledge facilitates such higher brain drain. It outlines part of a broad link between education and internationalisation. The fact is that in the present time labour is a fix factor (and migrations are overall severely restricted) while financial capital has acquired a new mobility, with the deregulation of financial places and the globalisation of their activities. Only high skilled professionals seem to experience an extended mobility.

B) The links between the diffusion of ICTs and internationalisation

We stressed that one of the main characteristics of the present technological system was its pervasiveness, here exemplified by its unprecedented capacity to diffuse world wide without the precondition of the building of large specific infrastructures. Of course telecommunications and banking for instance have to meet certain standards for any business to develop in a modern way. But in comparisons with the sizeable investments required at the time of electricity or railways networking there seems to be relatively few preconditions for the diffusion of the new system. Developments in telecommunications, connecting equipment internationally furthermore helped the multinational firms to strengthen and expand their global reach.

Also the production of ICTs technologies has been internationalised and the world wide competition among producers of micro processors explain for instance why the trend towards more miniaturisation has been steadily maintained.

Of course according to the levels of development of countries, the diffusion of ICTs directly linked with internationalisation will be more or less patchy, e.g. localised in the places with strong international linkages. There is likely to be a strong correlation between the density of ICTs diffusion and the level of development (see OECD(1999), ILO(1999)).

C) Education and internationalisation.

We already mentioned that the rise in education, especially the rise in the number of highly educated people (with a university degree), helped a certain globalisation of the markets for professionals. The spread of multinational firms, first in manufacturing then in services contributed to this circulation of highly educated people. To these populations one should add the population of academics and research workers who have benefited from international accords of co-operation and of a certain extension at a world wide level of the scientific debates and co-operation. Reich (1992) rightly stressed the importance of these "symbolic workers" as active part of the contemporary phase of globalisation.

ICTs helped in this evolution as international co-operation is boosted when codified knowledge is large enough …and makes clear that tacit knowledge (shared by means of travels and expatriations) has to be developed all along. It did help to globalize the labour market of these highly educated people.

Conversely education itself is an activity which in the present phase of internationalisation has tended to develop its international markets. It tends to attract students from abroad with specific marketing and programs but it may also develop local subsidiaries and joint ventures. Here again ICTs are helping these activities to get that global reach in facilitating marketing, foreign provision of educational services[2] as well as after sale on going flows of services. The potential of international development of these activities (in international English especially), whether or not within joint ventures with local providers seems noticeably important.

D) Configurations of structural changes.

The nature of the configuration of structural changes experienced in each country finally depends on the properties of each branch of this triangle of change (this triangle is recalled on graph 1). But it is obviously an ongoing process of cumulative changes, fed and influenced in many ways by the actions of economic agents and it is not an exogenous flows of broad transformations.

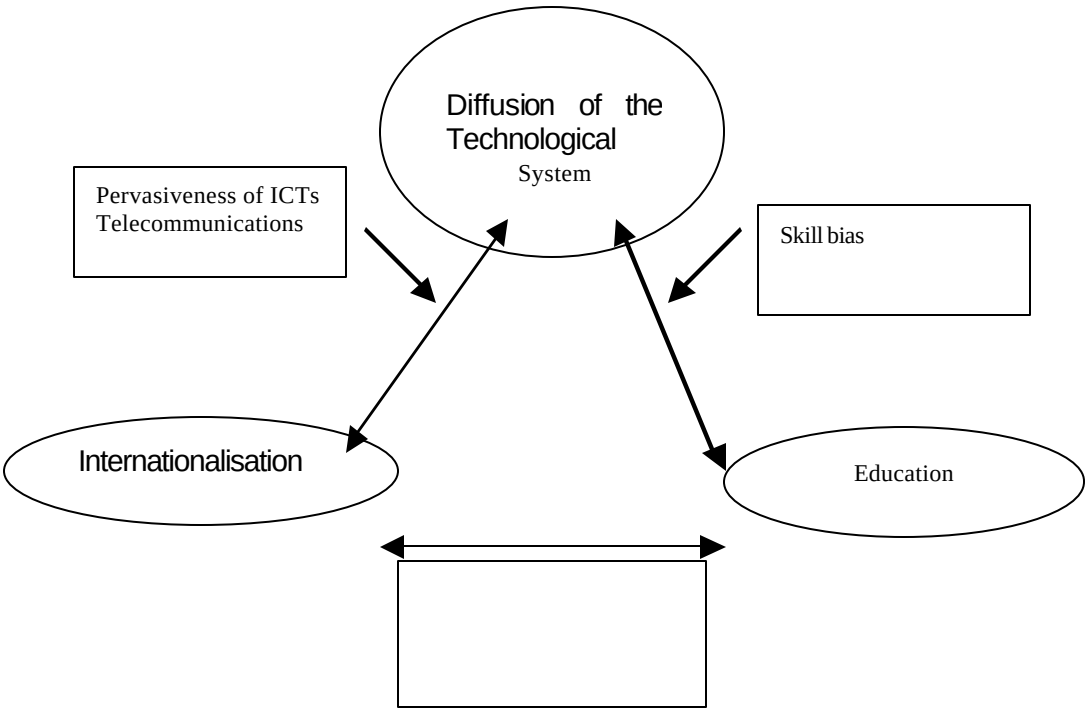
Another way to feature this process is to acknowledge that part of these structural changes combine around similar issues what results from past actions with the opportunities given in today's context. Such perspective refers to the broad past dependency, (which one has in mind when speaking of trends of long term structural changes) with the hazards that precise actions and institutionalization may imply at some point in time for the future (the path dependency argument à la Arthur, David and … North) that accounts for the diversity of trajectories followed by structural changes and therefore by nations.

Policies are precisely taking place at this crossroad, trying to adjust these long term tendencies to their very contemporary context. In that sense structural policies are very general in nature ..and standard macro-economic policies are only a brand of them at a time when structures were giving them sizeable room for manoeuvre (quasi close economies, centrally organised, with steady oligopolies and consistently evolving labour markets). It is therefore at this junction that we shall look for the perspectives opened to the structural policies of today.

[2] E-education as a field of activity largely internationalised is rapidly developing as shown in the first World Education Maket (WEM) held in Vancouver in May 2000. The market is estimated to reach some 40 billions $ by year 2005 (according to Credit Suisse First Boston quoted in Les Echos ,june 13th 2000).

Two dimensions are central to assess these structural policies : the sectoral dimension which tells how activities are concerned (with which intensity and in which direction) and the spatial dimension which tells which are the geographical and political levels of actions.

GRAPH 1
A Triangle of Inte0r related structural changes



We shall of course come back on these issues in the following sections. But it helps to catch the line of argument of this paper to stress from the start that the perspectives for contemporary structural policies will insist on the key rôle of of intermediation that most services play and on the key new balance between geographical levels in favour of the local and of the international levels to the detriment of the central level of nation state (even if this new balance should not be exagerated in most cases where central state governance is still largely predominant).

A sectoral perspective.

One can distinguish two phases in the development of services that accompanied the structural changes under view.

In the first phase the development of large intermediation services such as banking, telecommunication, transport and distribution really took place during the phase of intensive growth of the 50s and 60s. Large network services expanded in terms of employment and value created, providing some basic universal services to wide sets of customers.

In the second phase the above intermediation services took advantage of the new technologies and became able to differentiate their services, while keeping roughly constant their employment levels. Meanwhile new services to firms, providing help at all stages of their production processes, expanded remarkably in the last two decades.

They develop on both ends, as substitutes to menial periferic tasks or as complements to help the firms to deal with complex issues such as acquiring technological know how or expanding their reach towards international markets..

A geographic perspective.

Conversely the structural changes mentioned above have been accompanied by a reshaping of economic geography. Diffusion of ICTs and internationalisation are obviously major factors in setting a new balance between local, national and international levels. But this does not imply that economic activities and transactions can take place anywhere. Many things still rely on personal interactions and tacit knowledge as emphasized by the existence of agglomeration effects which boosted the development of new activities in some large urban areas. But at the same time some local territories managed to take advantage of an increased supply of educated people (or of the existence of a "modernist" group) to organise locally and support the development of new activities or to help with the modernization of others. These new opportunities at local levels are clearly different though from the local systems that the "italian" districts constituted if only because training and knowledge transfers are relying more on external sources (see Courault, 2000).

The new economic geography thus combines agglomeration effects in some large urban areas with some cases of successful local developments. This development points at two enhanced potentials in the new context: :a) the potential of agglomeration which effects have become more rapid, diverse and far reaching and b) the potential of local communities which can learn to draw more advantages from their local specificities.

Still some agglomerations and some territories are doing better than others for reasons that have to be explained, at least for all the reasons which are not directly stemming from history , be it past or path dependency.

The following attempt to assess the changes in microeconomics that economic agents are experiencing in the new context may help to clarify these conditions of successes and failures.

III. An endogenous growth pattern based on New Forms of Competition.

New Forms of Competition

We suggest to consider the microeconomics of the present phase as one where economic agents have at their disposal by various means an unprecedented mass of information and knowledge which they can treat, store and communicate.

This quantum leap in the access to knowledge and information means that the average limit on rationality and information of agents has been significantly lifted up. Still we cannot conclude that this transformation has led the economies closer to a fully rational and perfectly informed situation and that economies will simply gain from such improvement. The fact that this development

concerns in very different ways the economic agents would by itself prevent such conclusion.

How can a larger access to information and knowledge acts, everything else equals, to stimulate market expansion ?. To conceive precisely this dynamics for one market one should not see market simply through the existence of a supply and demand functions depending only on a price variable but more comprehensively and effectively as functions depending on information and knowledge detained by buyers and sellers. It is also a dynamic process by which buyers learn on both the qualities of the product on offer and on the characteristics of their own need, while sellers learn similarly on the qualities required of a competitive product and on the evolution of the needs of the consumers. Price in such perspective is one quality of the product but it cannot concentrate all the information on the product. Second, no auctioneer can transmit to all would-be customers all information, and even the transmission of price alone could not be logically assumed by this theoretical auctioneer (see Kirman (1998)).

Does it mean that the non price dimension of competitiveness has uniformly augmented on all product markets ? There is a general trend increasing this non price dimension of competitiveness[3] but it is far from universal. Paradoxically for instance the markets of new ICTs products, where prices are rapidly decreasing with the diffusion of the innovation and its continuous improvement, display an exacerbated price competition. Highly standardised (and stabilised) products are also submitted to fierce price competition (in particular from low wage countries). But even in these markets and a fortiori in all the other markets, niches for quality differentiated products are exploited[4].

In fact the change in context has chiefly increased the range of strategic behaviour of agents. This concerns not only strategic pricing but also strategic product differentiation.
Accessing more information and knowledge buyers are more aware of product characteristics and of their own needs and producers are themselves more aware of the market niches as well as of the relative levels of competition, as given by the various productive competencies. This presses towards a greater differentiation of markets, which clearly shows in the large increase in the number of products available. It thus presses towards competition on more precisely specified markets.

The changes lead therefore to new forms of competition more than to more competition strictly speaking They also transform the structures of industries, of labour markets and of consumption.

New competition and growth.

The challenge is of course to assess the effect on economic growth of these transformations. The question is likely to be open depending on countries and policies.

Still we can try to point at some of the major determining issues.

A first implication concerns of course the innovation process. More information and knowledge, in the sense given above, is likely to stimulate innovation, and more incremental innovation, that stems directly from more general information and knowledge than radical innovation which requires more purposed and complex organisation. The new technological system may thus in a first phase lead more to product differentiation and incremental innovations than to radical innovations.

But the widespread nature of such changes can lead in a second phase to more radical changes

[3] Flows of information and knowledge have effectively changed the structure of competitiveness (see Ioannidis and Schreyer, 1997, Fagerberg, Guerrieri and Verspagen, 2000).
[4] It may concern the intrinsic quality of the product but also the way it is provisionned or serviced.

according to the cumulative nature of the interactions between all these changes.
Interactions among producers are numerous and may lead to major changes when networked for instances but of particular attention in that respect may be the interactions between producers and consumers. More information and knowledge on the consumers needs do lead the producers to extend their productions… and re-organize their production line accordingly, while consumers are themselves learning on innovations potentials. This can be part of a strictly Smithian perspective if this dynamics of widespread product differentiation lead to productivity gains which in turns would favour by means of wages and prices changes a new expansion of demand, thus feeding a cumulative causation dynamics of economic growth as stressed by Kaldor (1972).

But this virtuous circle may not take place. A first reason is that we are in open economies where foreign producers may well benefit from similar flows of information and knowledge and take larger advantage of it. A second reason is that the re-organisation of production lines is looking more for economies of scope than for economies of scale, an objective which in a more competitive context leads to diverse reorganisation of production especially between firms (externalisation, joint ventures, accords, ..) which transforms widely the conditions for the sharing of productivity gains… Moreover the changes in information and knowledge also transform the consumer needs then the value of products and therefore the measure of the productivity gains themselves. A third reason hampering the cumulative causation dynamics could thus stem from a mismatch between learning processes on the consumer side and learning processes on the production side.

In fact because economic agents benefit directly from more information and knowledge they can adjust their actions (innovate, restructure their production line or more simply adjust their behaviour for consumers) without strictly needing the stimulation of market expansion as assumed in a Smithian framework.[5] In that respect the dynamics has also a clear Schumpeterian dimension with an enlargement of the risks which entrepreneurs are ready to take in innovating to consolidate or expand their markets. This risk frontier issue brings a new element in the growth circuit which clearly depends on the institutional context. It is all the more so when the intangible nature of activities requires any innovation to be certified and "protected" to generate rents for the innovators.

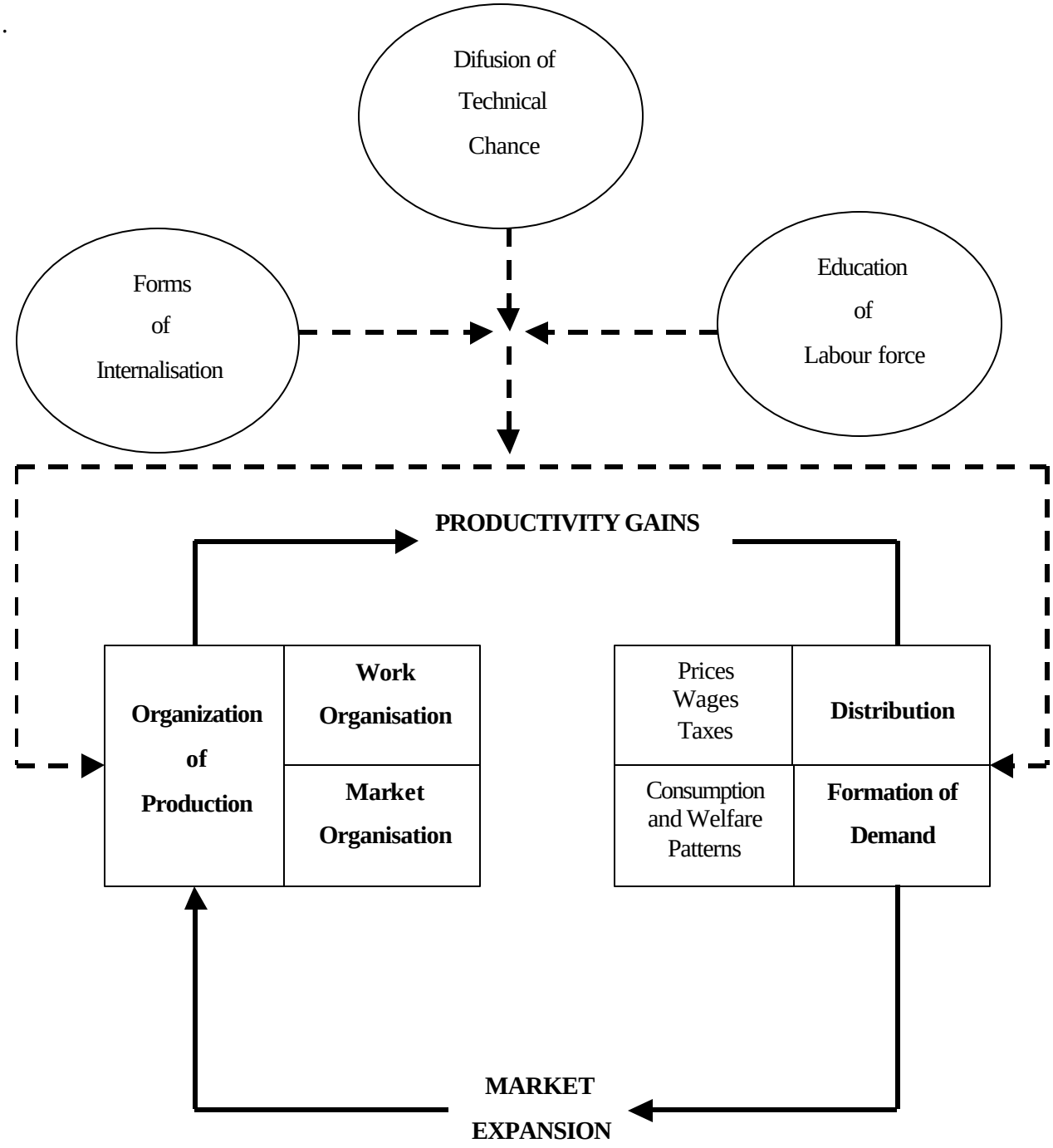
Adapting the intellectual property rights become a central issue in this schumpeterian dynamics. Still while the Smithian dynamics depended much on the transfer of productivity gains into wage increases, the Schumpeterian dynamics is more profit led.

Finally whether or not the Smithian and Schumpeterian dynamics re-enforce each other is likely to be a crucial issue for the new growth regime. We already mentioned that the Smithian dynamics in an open economy with differentiated productions (implying an increased importance of non price competition and lessening the role of exchange rates to counter the price competition from partner countries) may not lead to a cumulative growth process. Conversely the neo Schumpeterian dynamics implies process innovations as much as product innovations, with both opening possibilities of destruction either of old outdated products and more often still of outdated production processes.

Still both dynamics can combine in a cumulative way if, at national level, both learning processes, on the producer side and on the consumer side are re-enforcing each other or develop specific synergies. Graph 2 recalls the line of questions presented above in combining a smithian and a schumpeterian dynamics.

[5] Another way to stress the development of the strategic capability of economic agents is to speak of a more reflexive economy (as developed in Beck(1992) or Giddens (1990) works, see Lash and Urry, 1994).

Graph 2


Difusion of
Technical
Chance
Forms
of
Internalisation
Education
of
Labour force
PRODUCTIVITY GAINS
Organization
of
Production
Work
Organisation
Market
Organisation
Prices
Wages
Taxes
Distribution
Consumption
and Welfare
Patterns
Formation of
Demand
MARKET
EXPANSION

IV. Institutional and organisational changes.

Institutional changes

In the interplay between structural changes and changes in the strategies of agents that we just described institutional and organisational changes are playing a major role. In effect they correspond to some changes in rules, codes and norms of conducts that are essential parts of the new growth regime. We already mentioned the key role of intellectual property rights in the Schumpeterian dynamics. In essence all changes in the institutions which shape the forms of competition are offering new opportunities for rent creation and are closing old ones. Institutional changes are thus crucial to understand the nature of new growth regimes. In that respect the present emerging growth regime in most developed economies has been accompanied, if not fostered, by a set of institutional changes, of transformations of regulations and ideologies in the 80s. The main thrust of these changes was to set "free" the dynamics of market mechanisms and alleviate the pressure of past commitments. Deregulation has been the main motto of this universal trend. It occurred more or less simultaneously in most industrialised countries, with the populist governments of Thatcher and Reagan forging ahead. Countries have been adjusting more or less slowly, to these trends, pressed by internal political forces as well as by external forces, especially at the level of the regions. These processes affected much the reorganisation of the large network service sectors of intermediation (from banking to transport), even if these processes are lengthy and still far to be completed.(even in the US, see Catinat, 1999). The concomitant liberalization of trade has been more rapid and universal, impulsed by regional and global measures. The liberalization of investment followed more restrictively and controversially (see the opposition to the OECD MAI Multilateral Investment Agreement proposal in 1998 and the opposition to the WTO Seattle meeting in 1999)

Besides these major institutional changes, affecting directly the forms of competition, changes in the wage labour nexus (the institutions organising the wage labour status) pressing for a greater flexibilisation of labour markets appear more scattered. The changes towards more liberalization affected very unevenly countries, already very different from the start in that respect. By the end of the 90s the catching up in terms of labour market deregulation thus remained rather limited (see graphs in OECD, 1999).

A more diversified and "certified " division of labour among firms

A whole chain of organisational changes follows from the above assumptions on the more strategic attitude of a lot of economic agents in the new institutional environment.

We shall mainly insist on some main traits of change in the organisation of production and will hint at some of the transformations that can affect in similar directions the labour market and the behaviours of consumers.

For the firms a clearer view of the norms of competition leads them to concentrate more on their core competencies. Knowing what they can do best and what the others can do change in the first place the borders of the firm. In a Coasian perspective the change in information and knowledge amounts to a decrease in the costs of transactions and a change in their structure which determined the borders of the firm. As a consequence producers will tend to extend their relations with other firms. They will make more use of subcontracting, of external business services and will as well develop accordingly alliances and accords to access technologies, markets or develop innovations.

This redefinition of the division of labour among firms goes altogether with another trend towards certification and normalisation of the extended range of products. Differentiation of products would have otherwise been limited by the capacity of agents to reckon these varieties with their own as well as to be sure that the properties announced were effective (a problem of asymetric information between buyers and sellers, often met with services). This trend which led to the development of specific business services and procedures of expertise, normalisation and certification. This search for reliable information and assessment is not restricted to the formal procedures we just mentioned. It also includes more informal relations of interpersonal trust or widespread reputation, traditional assets which value may have increased in the process. A famous brand name has even become a marketable asset used as a label of quality for unrelated products. All these formal or informal procedures of certification can thus allow an extension of markets and limit the risks taken by the buyers.

Development of networks

Still the above transformation in the division of labour and in the practices of certification and normalisation cannot be universal and cannot act in similar ways for all kinds of transactions. Means of normalisation and certification as well as externalisation of tasks are likely to depend on the concern of agents according to their market power, technological capacity, fields of activities or localisation This expected stratification of interests leads to the development of specific solutions to apprehend the external world within which firms are bound to extend their relations. It is on this basis that one can ground the development of the equivalent of clubs or networks regarding most transactions. Such trend is all the more apparent that ICTs help to materialise these networks. The recent development of internet in the business world has helped to popularise this idea of a network economy which is effectively the form under which agents get information and circulate information. But, as important as this notion of network, is the idea of their multitude and diversity with various capacities and interests to access these networks. The large diffusion of internet could in that respect convey a misleading impression of universal services. The restricted clubs of alliances on technology as well as the reduced circle of certified suppliers in large manufacturing industries or the set of clients of a consultancy firm are as important features of this network economy than largely open e-commerce organisation.

This process is evolutive, meaning that the solutions found, the new organisations set up will themselves learn in the process and develop capabilities which would attract new users, re-enforce their interests or lead them to better solutions (giving access to networks requiring some specific previous experience or training).

The use of business services may be telling of such processes. Beyond the peripheral tasks that are likely to be externalised for good by the firms, especially if business services develop clear competencies, new tasks requiring new expertise, as it is the case with the use and development of the new technologies but also with internationalisation processes, complex service businesses will be called upon but often to cooperate or on a temporary basis to facilitate some transfer of know how.

Clearly the driving principle of new forms of competition induced by the availability of more information and knowledge presses towards a new division of labour between firms with new learning processes and by means of a complex fabric of "network" relationships.

But as we said this fabric is highly segmented in particular according to sectors and sizes of firms. In this context of enhanced strategic capabilities of agents the difference between large and small firms remains a priori important. Even if more SMEs can go international, they have less access to

international joint ventures, less possibilities to overcome some barriers to entries, less opportunities to impose their own standards[6]. But beyond this general handicap one can also find on the developing frontier of the new technologies some highly innovative small firms which can very well take advantage of rents of innovation and strategic pricing to undercut the competition and threaten the dominant firms of the sector. The expansion of internet businesses gives a good illustration of this point. It leads to consider differently a sub set of hi-tec SMEs, highly reactive to market conditions and to technical change, which could represent a species particularly fit for the new environment[7]. This explain the success of start up companies … but also points at a key issue in this matter: the role of a re structured financial sector

On the new role of the financial sector.

The transformation of the financial sector has taken full advantage of the new context. Institutional changes have largely launched a process of deregulation of an industry highly segmented in all countries after the crisis of the 30s and the second world war, regulations that the development of ICTs and of internationalisation rendered more and more obsolete. The sector has rapidly become one of the heaviest user of ICTs and one of the most globalised in its own way, e.g. by means of affiliates and joint ventures and in accessing large internationalised financial places. The structure of the industry itself has given full example of the implications of the new principle in setting up international networks and engaging in vast operations of mergers and acquisitions. Chiefly the financial industry has been at the core of the search for expertise and certification. It is a central part of this activity of intermediation to appreciate the competencies of firms, the soundness of their assets and the relevance of their strategies. The present context has helped this industry to develop this scoring capability to such an extent that it has become an important factor at the origin (altogether with deregulation and internationalisation) of the new predominance of financial capital over industrial capital. Business services and ICTs have largely contributed to extend this capacity of assessment which finally strongly influenced the prevailing mode of governance of the firms. This "financial" governance of firms ended by giving full priority to the interest of shareholders over the interest of the other stake holders of the firms, and chiefly over the workers interests. It led firms to follow more short term criteria as well as to develop accords and ventures with other firms. This capacity indirectly fuels the speculation on stock markets. A few investors of large funds are thus setting the trends of the various stocks on the basis of their own valuation criteria. The high norms of profit set by the financial sector (which may well be a two digit figure when inflation is less than 3%) leads the industrial sector to search for short term profits or to take shelter from this pressure by buying back stocks for instance (a common practice in the US for instance) or in engaging in mergers and acquisitions[8]. It follows that the huge appreciation of stock markets (which is pushed also by the growth of pension funds) does not correspond to a similar increase in productive investment. The discrepancy between the value of physical assets (measured at their replacement cost) and the value of shares (as expressed in the Tobin q indicator) underlines the size of the financial speculative bubble[9]. If it does not increase the total amount of investment, it does contribute to reallocate finance between firms and sectors according to the expectations of the

[6] All of which does not prevent SMEs to follow rapidly in using such new means of communications as internet : in 1999 72% of SMEs in Europe were connected (53% in 1998), and around 30% of them had a web site (according to UFB-locabail, Les Echos, january 26, 2000.

[7] Another way to look at this phenomenon is to notice that new fast growing firms (over 20% growth per year), the "gazelles", were responsible for 70 % of the net new jobs added to the US economy between 1993 and 1996.

[8] According to Thomson Financial Securities Data the world market of mergers and acquisitions reached its highest in 1999 with 2324 billions of dollars, of which 764 billions for European operations. It represents a sizeable revenus for the banks of which Wall Street establisments Morgan Sachs, Morgan Stanley, Merill Lynch and JP Morgan are the main beneficiaries.

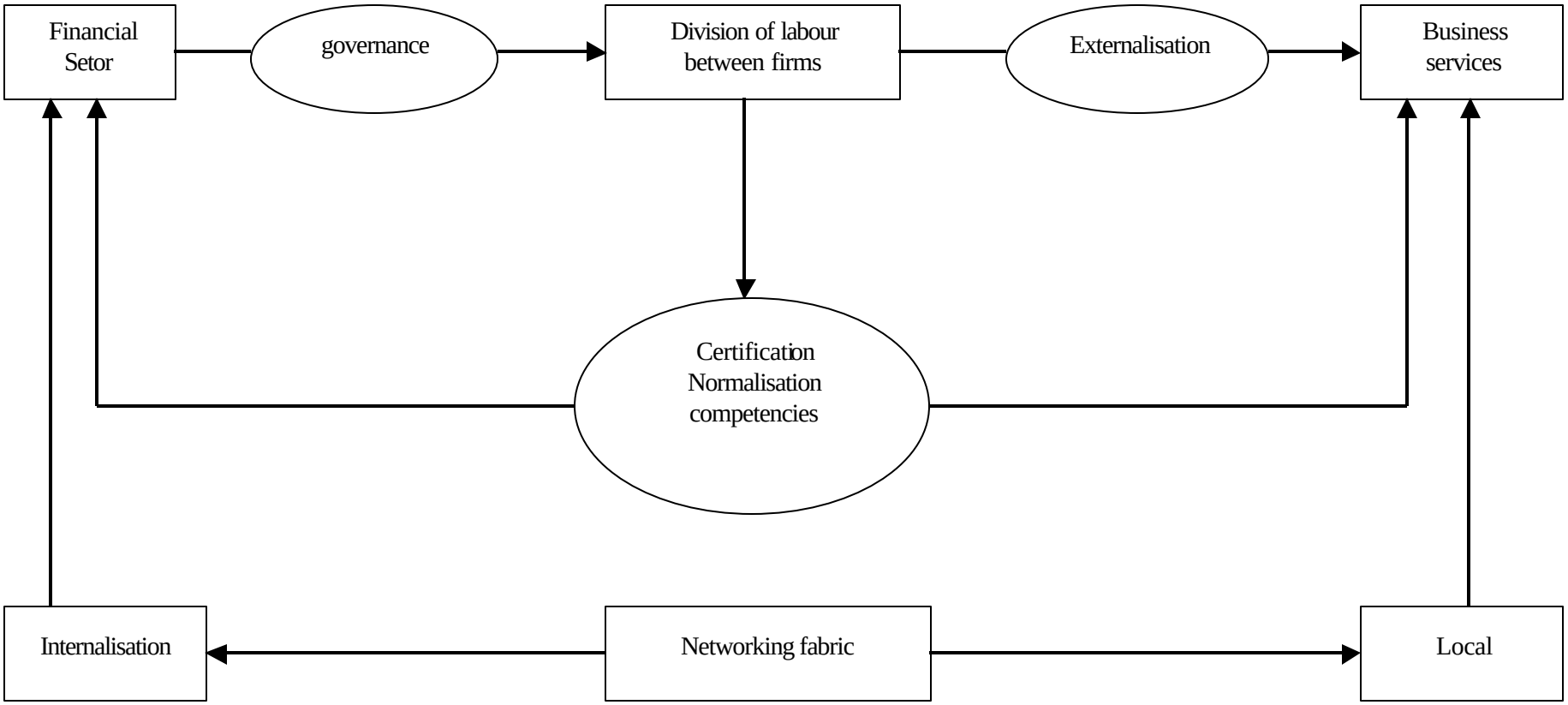
[9] Observers like Smithers and Wright (2000) note that Wall Street may well have to fall by some 60% to recover a more realistic balance between physical assets and stocks values

financial world. Again it is an important mechanism which here favours the high tec companies (see the start up phenomenon) and in particular the dot.com firms at the turn of the century. This reallocation does follow a bumpy road and certainly fuels speculative runs but we observed over the past decade that the financial system has become more resistant to shocks. It is somehow adjusting to higher levels of risks. One has to take into account this greater capacity to absorb shocks when assessing the possible impacts of speculative bubbles (which have on another side reached unprecedented levels).

Graph 3 recalls the various links between institutional changes and organisational changes that we stressed above.

Graph 3

Inter related Organisational changes



Changes on labour markets

The new context has modified the functioning of labour markets along ways directly influenced by the changes in the forms of competition surveyed above. In accordance with the changes in the boundaries of the firm external labour markets seemed to have gained a greater influence over labour markets internal to the firms. This shows at least in two respect. On one side workers have been asked to be more responsive to market changes, to show competencies which could help to react to challenges from product markets. On the other side workers have been asked to be able to cooperate with the external world whether within accords and joint ventures, or in relations with suppliers or external providers of complex services[10].

The demand for such higher and specific competencies may also stem from a relative uncertainty of firms regarding the on going transformation of production processes, as in a kind of precaution principle.

It does not follow that formal initial education gives everything equals a full priority in jobs. Given more information and knowledge the labour market is also more choicy, balancing the criteria of formal education with other elements of the CV (experiences, contacts, other knowledge) with some assessments on personality. In some countries it will lead to increase the length of the transition period to access a standard job, in other countries it will increase the turn over in entry jobs. This only would increase the number of precarious jobs. The labour market has thus become more risky, not only because of the strengthening of its selection processes but also because a tighter competition on product markets and a more finance oriented governance have increased the risks of being sent back on the external job market in a more or less fragile position, depending on the competencies of workers[11].

It is in this context that one should see the debate over the skill bias nature of technical change. It effectively refers to a mix of issues and may occurred in different ways according to the different ways in which labour market work in various countries and sectors.

This evolution goes altogether with a transformation in the wage distribution. With a more competitive job market the wage distribution has become more dispersed with a relative decrease of the wage of jobs at the lower bottom and a sharp rise in the remuneration of high ranking jobs which have effectively to make risky decisions. These monetary incentives can take the forms of bonuses or stock options.

The frontiers between employment and unemployment, between in and out of the labour force are also likely to change in the new context. The main factors pushing for a change are either linked with the rôle of education (depending on how far training all along the life cycle can be developed) and selectivity of the labour market (with a tendency formally marked in certain countries to develop unfit for work categories).

All this restructuring of participation rates much depends on the kind of welfare systems of each country. The change in demography, with most developed economies having become ageing societies, is also simultaneously putting pressure on the welfare systems, and chiefly on both health care and pension schemes when educational needs have not decreased but are on the contrary more demanding in terms of quality. All these changes impinge of course on the

[10] A shift in work organisation underlined also by Zarifian (1995) and Laurent, Raimond, Valenduc and Vendramin (1998, chapter 4).

[11] This may explain why in the last decade in all countries and all categories of workers a feeling of precariousness has increased (see OECD, 1997)

patterns of consumption.

Changes in consumer behaviours

The differentiation of products were meant to fill more closely the needs of consumers. But at the same time more information and knowledge concur both to develop and elaborate this needs as well as to interact with the strategies of producers trying to condition these needs. In fact the user-producer relationships have been more or less directly intensified in the recent period. The development of the trade sector helped in that respect but also all the marketing services and all the media dealing with consumer goods and services. While information and knowledge were embedded in the various customs and habits of well defined social classes, the contemporary process which enlarges and transforms the information and knowledge required on each (new) product markets leads to new patterns of consumption, corresponding to new "tribes" of consumers. A major issue is then to know whether these tribes correspond to steady groups with well defined patterns of consumption or whether groups and/or patterns are volatile and still changing. Marketing professionals tend to think that the whole pattern has become less predictable.

In effect consumers are facing new trade off when in possession of more information and knowledge. It is all the more important that with increased urbanisation and its corollary congestion, time budgets are more constrained .especially for the use of services, all of which require specific (new) skills from the consumers. The transformation of large network services thanks to ICTs re-enforces this difficulty

Producers in those services tend not only to differentiate services but also to practice some strategic pricing (such as yield management of fixed costs services). Some consumers are more smart than others in taking advantage of these practices. Such capabilities may become crucial when using large networked social systems of health or education. The welfare of people cannot thus be appreciated too directly through their income, one has to account also for their respective capabilities to draw qualitative advantages of the new context[12]. This may be a new source of inequalities at a time when wage inequalities are also bound to increase.

These dividing trends may be transitory leaving to some learning processes the task to catch up. But the present dynamics is more complex. Beyond the fact that norms of consumption do not seem to have stabilised, the mechanism of catching up has now to encompass an income gap and a "knowledge" gap. While one could expect everyone to access some standard norms of consumption when incomes grew, this dynamics of convergence (even if lags tended to perpetuate themselves, they shared more or less the same road) is more difficult to develop if information and knowledge levels are in question. Presently consumer have not only to be ranked by means of income levels but also by types of knowledge and information as well as by culture and personal tastes (resulting from diversified individual trajectories).

The challenge for redistributive policies has noticeably increased, when statistics show that all along the rise of the new context the number of people under the poverty line has been steadily increasing in most developed countries.

Such dualism is obviously an high risk in the new growth regime but it is by no way a necessity, if appropriate policy actions are taken.

[12] Moreover have also different capabilities to take advantage of the new context to manage their assets and wealth. As stressed with firms, large individual fortunes can easily do well (they can afford intermediaries to help them), but medium and small asset holders part between those who are doing well and those who are not.

V. Structural Policies.

Policy issues have been mentioned at several stages of the previous development.

Let us recall in the first place that the new context where agents are enabled to develop more strategic behaviours precisely concur to limit the efficiency of past means of policy making. In that perspective Lucas's argument against standard macro-economic keynesian policies has some relevance. The game has become more complex ; still it would be contrary to our whole line of argument to assume perfect information and entire rationality. Therefore standard policies should not be discarded but their effects should be questioned more thoroughly and their assessment cannot be simply drawn from the experiences of the previous phase of economic growth.

We already asserted on this basis that policies should be more structural and comprehensive to support economic growth and welfare.

A major issue for these policies is to balance their actions between two objectives. One is to sustain the initiative and development of economic agents forging ahead in their own country. The other is to help those lagging behind to maintain social cohesion and to transfer some impetus to the economy as a whole.

How countries see these two objectives may largely depend on their level of development, on their international competitiveness and on the importance given to social cohesion in their development. Politics in each country consider differently both issues. Some will attach great importance to industrial policies of modernisation largely based on developing pioneers and champions. The infant industry argument in industrial policy goes in that direction. Others strongly emphasise the need to extend the diffusion of modernisation, stressing that agents lagging behind hamper the development of the entire economy. Such policies press towards differentiated actions, whether it is on the diffusion of ICTs in SMEs for instance or the development of education in disherited areas.

Beyond the balance between these two perspectives around which most structural policies are articulated, questions on the design and levels of interventions of structural policies are central.

We can from our approach distinguish different levels of approach which are more or less easy to set up and more or less efficient in boosting economic growth once implemented. This presentation will help to select core policies, rejecting at least those which are not easy to define and to implement and poorly efficient.

A first level of intervention is directly concerned with what we called the triangle of structural changes. Policies at these levels are easy to design and implement, even if it can be very costly but their efficiency is questionable.

A second level of intervention bears more directly on the very incentives governing the behaviours of agents but in these cases they are hard to design and to implement.

In both case a risk of the policy is akin to a dead weight loss effect. Basically interventions help to change the behaviours of some agents but they also lead agents to have opportunist behaviours and to get an unnecessary support from the policy.

We are going hereafter to precise these various trade offs in the new context where economic agents are more aware of the pros and the cons of various measures.

Direct actions on the triangle of structural changes.

It is a common assumption that direct interventions to increase any of the three structural changes will contribute to promote economic growth and welfare.

Such recipes where measures are taken independently and without differentiating specific objectives are bound to be expansive and sometimes counterproductive.

Subsidising diffusion of ICTs may seem straightforward. Though one of the lesson of the recent past is that diffusion of ICTs may take various paths but shifts and catching up are rapid. Cost variables do not play a great role, more important are the various learning process helping this diffusion. In the first place this issue concern mainly the SMEs and the consumers. This diffusion still is important in the process of networking that will help to generate externalities. Some practices may have sometimes delayed the diffusion like Minitel in France, or the supply side may have been slow to develop as in Japan or in China but we discovered in recent years how rapidly these countries can catch up on internet. Some countries may on the contrary have developed an early diffusion of these technologies for the opportunities of connection they offered like the Scandinavian countries. The early diffusion of mobile phone may also condition the type of access to internet and the development of competencies in mobile internet.

Still it is difficult to link at country level the average diffusion of ICTs with macro economic performances.

Similar conclusions could be drawn from unilateral actions to accelerate the supply of educated people. The quality of education may be more telling than the rough stock of schooling years. Practices of on the job training or of life long formal education schemes may also be important in that respect. This quality issue tends to emerge once the actual literacy of people with a certain level of formal education has been tested (see OECD, 1997). One has indeed to take account of the quality of initial training as well as of its obsolescence to value a work force by formal levels of education. Characteristics are all the more important that labour markets have become more selective (a trend which is clearly supported by the new context) which explains the fact that the number of specific labour shortages may in some European countries have increased at a time when global unemployment remains historically high. This higher selectivity of the labour market is not restricted to education and training criteria alone but it may also take into account personal experiences demonstrating specific responsiveness to challenges or personal computer skills for instance. This finer scoring on labour markets is also taking more and more advantage of diverse intermediations from public and private services.

It finally shows that direct policies to increase education in broad terms may be costly and not very effective if it does not meet certain quality conditions recalled above.

Similarly internationalisation is not a universal recipe to support economic growth. Even if opening an economy to external competition may help effectively to strengthen the efficiency of some activities , it has become clear that comparative advantage can be built up (see Krugman, 1987) when a country is sheltered from external competition. Therefore in a dynamic perspective, increasing internationalisation can be discussed. It may effectively pay off to protect for a while markets from external competition or investment in order to develop some intangible assets and know how… or to reap the benefits of some network externalities at national levels. Still the advantages of taking part in international networks offering global reach and specific

services to transfer technology or access should not be neglected either but specific conditions have clearly to be taken into account.

It is not so surprising that direct actions in any of the three broad fields of structural change that we retained have rather loose effects if they are not designed specifically. In a way the general change in context has risen the conditions for efficiency. One is thus forced to take advantage of the interrelations existing between these structural changes to gain some leverage effects and thus help to reduce the costs of direct interventions. These objections are all the more valid with developing countries where the high costs of direct interventions may be hampering greatly the projects.

Once these interdependencies are reckoned, policy actions remain difficult to design centrally as they are diverse and specific. It is therefore reasonable to orient policies towards the development of intermediaries , such as intermediary or business services that would take care of this specificity. The development of local governance, whether by means of public agencies or active communities is another way to reach the same target of developing a fabric of institutions and organisations that will help to transform general policies into specifically adjusted interventions. .

Developing logistics of services and local governance

Developing intermediary services, which were often publicly provided , has long been a major way to "modernise" countries. Transport and communication logistics have always been thought of as essential infrastructures for economic growth. Nation states monitored their development and have often been directly involved in their provision. The trend in the contemporary period is more supervise their developments by means of prudential regulations and not by means of public provision or regulated segmentations of markets. This monitoring is exactly supposed to facilitate the modernisation and differentiation of these services which ICTs , internationalisation and deregulations have made possible. A similar view applies to financial services to an even greater extent (while it applies only partially to distribution which was less directly monitored by public authorities). Somehow the new field of intervention in the contemporary period has to do with the logistics of business services. Basically these are market activities which concern both peripheral tasks of the firms and highly strategic activities , in research, advising, marketing, accounting, etc .. all tasks largely conditioned by the legal and institutional context in which they take place. This context is essential in the definition of the rents of innovation and therefore on the incentives to innovate, to take risks and differentiate production. It includes the definition for instance of intellectual property rights , as well as the conditions of risk sharing among producers or the protection of consumers. It requires certification and expertise procedures to be set up. Setting up and enforcing these regulatory networks will be costly but will constitute effective support for comprehensive structural policies.

This enlargement of the logistics of intermediation should not be seen as restricted to business and large network of intermediary services but should also concern social and personal services. Education and health services are obviously concerned for their role in the development of a skilled and healthy labour force. Policies in these two fields are highly specific in the sense that the quality of the development depends on the comprehensiveness of the interaction between supply and demand. In other words , as in many complex business services, the quality of the provision of services, its adequacy with needs , is largely determined by the dynamics of the interfaces. A rich interface will help to differentiate and classify the needs and to provide the relevant services. In less general terms such a process requires a complex architecture of (social) networks and gateways that relevant policies should help to develop .

Conditions which are rather obvious regarding such large and crucial social services as education and health , also apply to services less fundamental such as leisure services but finally important by the experiences and the training they provide.

All services in the new context contribute to shape the broad learning processes at work on the production side and on the demand side. We stressed that technology, education and internationalisation all help to organise largely differentiated and interconnected intermediations. How to proceed to develop such potential, beyond some general recipes , is not always straightforward which explains the time length of some transitions. It also leads to diagnose organisational mismatches (a frequent reference when accounting for the long productivity paradox experienced in most countries during the last two decades). An institutional deficit is also often blamed when taking a broad view on economic stagnation in the new context. In effect the "golden years of capitalism" of the 50s and 60s had been preceded by large institutional changes which backed the development of welfare in the fordist period. The question raised by the contemporary evolutions of developed and developing economies is whether a new phase of rapid growth can develop on a large basis without some institutional changes as large as those experienced in the post war period.

We shall come back on this issue of institutional change but beforehand one would like to recall that the new context has led to some revival of initiative at local level which should be regarded as a non negligible organisational and institutional change.

The limits set on standard macroeconomic policies certainly helped to increase the decentralisation of public governance and to develop at local levels industrial and labour market policies. But beyond this trend of decentralisation, the new context increased naturally the reach of local communities and their abilities to develop new strategies , taking advantage of both a clearer perception of local common interests and synergies and a broader view of the opportunities offered by the external world , be it national , regional or global. The fact that the set of structural changes occurred in similar ways at local levels has been a driving force in this revival. It meant that locally three types of conditions were met: a better educated labour force was available, new technologies had diffused (and in particular new telecommunications means) and transportation means and external contacts ensured a global reach. In this trilogy a great attention has often been given to the relations with an educated labour force under the specific forms of close ties with universities and subsidised developments of science parks ...most of the time with good international linkages (whether following FDI or by means of academic international cooperation).

To these preconditions one should add the abilities of local administrations and /or of local elites to be the entrepreneurs of these local ventures. If this local dynamism is a rather common feature it is also obvious that there are successes and failures along time in these endeavours. In other words the key of economic success of countries does not follow directly from the density of local developments. It seems to result from a combination of factors[13].

Forging ahead and lagging behind of countries

One of the difficulty is to assess which are the key factors that would help local successful developments in one country to be the driving force of economic growth at levels.

[13] One indirect way to stress this conclusion follows from the fact that new economy indexes, combining some of the structural changes we retained for the american states are not correlated with their rate of growth or of employment. (see the web site :).

As a matter of fact so far (e.g. up to the end of the 90s) rapid economic growth and full employment had only really resumed in a handset of countries, even if the perspectives were good for a large set of others. Countries forging ahead were mainly small countries in specific situations like Ireland (with its international position between US and Europe, Euroland and the UK, ..) , Norway (with its natural resources) or Finland (with its telecommunication success story). The take off of the US economy (a rather late phenomenon in the 90s) tells another story. Its seems to have restored an hegemonic position in key modern technologies and be in position to capture rents of innovation on intellectual properties, which may be challenged by new competitors and new rules in the future. A threat which is all the more serious that this hegemonic position has also backed the dollar and allowed for a series on huge trade deficits.

In such situation the recipes for success are unclear. There has been some cases of traditional catching up in Portugal of Korea for instance in the 90s. For the rest of countries one would be more tempted to assess specific reasons for relative failures.

The financial crisis of 1997 draw attention on the weaknesses of the financial systems in east Asia and in the first place in Japan which strongly contrasted with the good position of this country, regarding the average level of education of the work force and the diffusion of ICTs.

For European countries as a whole their weak position regarding their capacity to capture rents of innovation from their innovative capacity is often noticed. This gap can be filled but may globally explain some lagging behind of European countries , such as France and Germany. The recent years seem also to demonstrate that closing the gap may not be that difficult once you have good access to finance (both venture capital and international money markets) and technology.

In last resort it may well be the case that the relative difficulties of countries to take full advantage of the new context and to resume high economic growth stem from the new difficulty of these countries to cope with the dualism that the transformation can develop. A common feature has been the rise in inequalities (see Gottschalk and Smeeding, 1997) in developed economies following unemployment (which is not equally distributed among the various income categories) and a new dispersion of wage earnings and other benefits. This rising inequality has been re-enforced by inequality in knowledge and education . The challenges of societies experiencing a large structural transformation is to find ways to redistribute the advantages created by innovating agents without hampering their dynamism.
We may experience situations where the redistributive mechanisms are not strong enough to close the gap and thus diffuse a growth dynamics to the whole economy. It is certainly a threat for the US where inequalities are important and have for long been growing. It is everywhere a threat as inequalities are not only in terms of monetary wealth but also involved a knowledge dimension (a human capital asset) much more difficult to redistribute[14]. Even to close the gap in the distribution of wealth has been made more complex by the international volatility of the financial assets which oblige the new economies to reconstruct their fiscal bases.

It may thus well be the case that persisting dualisms are locking the developments of countries on slow growth paths in the long run. And all the more so that the potential of the new growth regimes would be fully exploited only through a large participation of agents in the fabric of networks that supports the dynamics of modern growth.

This would feature social cohesion as the main challenge to achieve buoyant economic growth. The question is then whether sets of incremental reforms will progressively lead countries out of these doldrums or whether large institutional changes have to be implemented in most

[14] Some authors speak of digital divide for this new base of inequalities (see Cohen Zysman , 2000)

countries to ensure that widening accesses will boost the global benefits and resume strong growth paces. If at national levels it may be the case that relatively marginal measures help in some cases to reach the objectives[15], the question at international level is less dubious and a major institutional change is required for a new international order to balance fairly between rents of innovation and free access to generic technologies.

[15] The US gave such example in the mid 90s, with a negative income tax , little publicised which finally countered at least the main share of the increase in working poor.

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