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ECONOMIC CRISIS AND INDUSTRIAL POLICY

Mots-clés : Politique industrielle, crise financière, stratégie de développement industriel

Key words : Industrial policy, Financial crisis, Industrial development strategy

I. — INTRODUCTION

The discipline of industrial economics got new impetus in the 1970s, when economies around the world experienced a deep crisis, with inflation, social conflicts and for firms, rising costs and new production systems. The *Revue d'Économie Industrielle* was founded in these years. *L'Industria* was created in 1886 but was renewed as a journal of industrial economics and policy in the 1970s when Romano Prodi took its direction (see Bianchi *et al.* in this issue). The crisis therefore had deep structural implications for industry which scholars found necessary to examine.

At the 30th anniversary of the *Revue d'Économie industrielle* a new crisis is having important consequences on industry and is turning attention back to the role the State in the economy. Globalisation primarily meaning increasing competition from new important players that are emerging countries and the boom of the financial sphere of the economy no longer closely related to the productive sphere, all raise important issues for industries.

However, the important structural problems firms are facing have earlier roots than the crisis. In fact, they spurred a debate on the role of industrial policy in industrial development. Discussions around this debate showed that the dominant approach to industrial policy was made of different types of inter-

(1) While this paper results from a joint work of the authors, sections 1, 3 and 7 can be attributed to Patrizio Bianchi and sections 2, 4, 5, 6 to Sandrine Labory.

vention all decided and implemented separately in practice : antitrust, research and innovation policy, regulation, and so on. The limits of such approach were discussed and it was concluded that whereas industrial policy is indeed made of various types of instruments its coherence must be guaranteed at political level by providing a programme, a vision of industrial development.

In the EU, such vision can be claimed to be the Lisbon Strategy. Many economists have argued that this Strategy is a failure, in terms of objectives' ambition and incoherence. However, as a strategy for long-term industrial development it can be considered as a success : it embarks all EU members towards the same aims, in a process that makes increasingly clear, as the implementation of the Strategy carries on, that coordination has to be deepened to more than the simple sharing of informations and experiences.

The paper is organised as follows. We analyse industrial policies before the crisis in section 2, outlining how they gained increasing momentum in the early years of the new century. Section 3 provides an analysis of the crisis, while sections 4, 5, and 6 analyse its major implications on industrial policy : sections 4 and 5 respectively analyse the case of the USA and of the EU, while section 6 addresses a core problem of the crisis, namely the increasing gap between the productive and the financial spheres of the economy. Section 7 concludes.

II. — INDUSTRIAL DEVELOPMENT POLICIES

2.1. The « return » of industrial policies

The role of the State in the economy has always interested economists, but until recently the debate about the role of the State was reduced to an opposition between interventionists and liberals. The liberal doctrine was widely rejected immediately after WW2, partly because of its failures in the period preceding the war, in favour of interventionism. States all around the world therefore massively intervened in the economy, and implemented active and selective industrial policies, the State often becoming producer, in order to reconstruct industrial systems and economies. From the late-1970s and 1980s such interventionism was increasingly criticised because of some inefficiencies created (for instance, State-owned firms tending to be inefficient) and of capture of politicians by some industrial lobbies. A wave of liberal approach therefore started, whereby economic agents, wherever they work, are viewed as self-interested and only appropriate incentives defined in contracts can align their interests with those of the whole society. The 2008 crisis, together with its premises of the 1990s, namely the crises localised in specific regions of the world (Latin America, Asia) in turn reveal the excesses of the liberal approach and may constitute the start of a new approach. A return to interventionism is impossible, because of its excesses and its protectionist tendencies. Rather a sort of « pragmatist » approach seems to be emerging, whereby all actions are

considered beyond ideology, provided they can be efficient and effective. The pragmatist approach appears therefore to locate in between the two extremes of interventionism and liberalism.

However, this evolution of industrial policy has not started with the crisis, but much before it, in the end of the 1990s and early years of the new century (Bianchi and Labory, 2006a). Industrial policy has experienced all the above phases corresponding to the dominant view of the State in the economy: interventionism after WW2 and up to the 1980s, liberalism in the 1980s and 1990s, and what could be called a pragmatic approach since 2000 (see Bianchi *et al.* in this issue).

This is due to the requirements of the new competitive context emerging from the globalisation process. Bianchi and Labory (2006a) show that the new competitive context represented by the diffusion of the knowledge-based economy coupled with the growing importance of competitors such as China and India indeed imply the need to define new industrial policies: competition increases for all products (for example, China had already become the third world exporter, trade between China and the EU doubled between 2000 and 2005) so that developed countries have to extend their relative comparative advantages, in high quality market segments and in high tech sectors. The competition from emerging countries is not limited to lower market segments and lower technology content: China and India train each year more scientists and engineers than European countries and the USA and are developing competitive advantages in high tech sectors. India has relatively strong electronics, IT, pharmaceutical and biotechnology sectors. This trend is so strong that even the world leader in research and innovation, namely the USA, is losing ground relative to emerging countries, especially Asian ones, in terms of scientific publications and patenting activity (NSF, 2009). The research effort has to increase and the market failures in the market for ideas justifies government intervention, through R&D subsidies, protection of intellectual property rights, inducement of cooperation between the various actors of the innovation system.

2.2. Defining the new industrial policies

Defining industrial policy is not easy primarily because defining industry is no longer straightforward. Issues are different if industry is reduced to manufacturing or if industry is defined as all productive sectors. Given the important changes that have occurred in industries in the last thirty years, the growing importance of services and the increasing bundling of services and goods, many phases of the productive process being outsourced and becoming services, we prefer adopting the definition of Adam Smith, according to which industry comprises all productive sector and represents the capacity to organise production. Industrial policy is then a variety of public actions aimed at orientating and controlling an economy's structural transformation process.

The analysis of production processes is the focus of analysis from this perspective.

Production organisation is not given, but often changes due to structural changes in the economy. Such changes are both exogenous and endogenous. Exogenous changes include the emergence of a new technology, the competition from new competitors, the start of an economic integration process between countries. Endogenous changes include technological progress and learning, leading to the development of new competencies hence increase in human capital and knowledge. These factors for change imply that the economy is in constant evolution and imply the need for industrial policies that could accompany transformations. The main reasons why firms may incur in difficulties are the following :

1. change is too frequent and too broad (for instance, Japanese producers with new production processes in the 1980s);
2. change is difficult due to the lack of adequate skills in labour markets;
3. social capital is inadequate: the local community is reluctant to changes or too close;
4. infrastructure is lacking (lengthy and costly administrative procedures that create delay in adaptation);
5. capital markets are inefficient such that firms have difficulties accessing to financial resources.

Industrial policies must aim at resolving the different problems, by developing infrastructure, support training of human capital or access to finance.

The need to adapt is larger when production processes experiences deep changes. This is precisely what happened in the 1990s with the diffusion of information and communication technologies, the emergence of new rivals with the end of the world political bipolarism, both translating into production processes increasingly intensive in intangible assets. These pressures for changes grew and became very important and diffuse in the late-90s and at the beginning of the new century.

As shown previously, industrial policy is a broad concept encompassing many measures and action fields. It is therefore difficult to analyse industrial policy in general, and scholars prefer focusing on one or another of its elements: technology policy, competition policy, and so on. The drawback is that there is a lack of broad view and a lack of consideration of the interactions between the policies; policy evaluation is also lacking as a result. The advantage is that causes and effects can more easily be identified: models are simpler, with clearer conclusions and indicators defined.

Our definition relates to the definition provided by Geroski (1989), who argued that industrial policy is motivated by two major elements : first, the correction of market failures ; second, the orientation of a country's set of specialisations, accompanying restructuring of declining industries and promoting the development of new industries, especially high tech. The second aspect is dynamic in nature and it is what our definition focuses on.

2.3. Industrial policy in the new century

As shown in the *Handbook of industrial policy* (Bianchi and Labory, 2006b), industrial policy has, since 1990, essentially focused on competition policy, regulation and technological and innovation policy. Regarding the different levels of implementation, a large focus has been put on local and regional policies, in so-called bottom-up approaches.

The knowledge-based economy or economy where intangible assets take increasing importance has raised new policy issues in essentially two fields. First, competition policy applied to new sectors incur into the problem of the diffusion of networks. While in the past R&D was mainly conducted within the labs of large firms, now research and innovation occurs through the interactions of firms with universities and other research centres, other firms, and so on. The problem is that innovation is a highly uncertain and risky activity and hence it is very difficult to assess whether a research alliance will lead to anti-competitive practices (Lorentzen and Mollgaard, 2006). This creates legal uncertainty in the implementation of antitrust law. Second, technological and innovation policy has been concerned with both intellectual property right protection and clusters, or networking and establishing systems of innovation. Property rights to protect new knowledge, and networking to increase communication and relations implying higher probability of innovation.

In fact, policies have been aimed at increasing intangible assets in the economy : creation of new knowledge (innovation) to increase the knowledge base and development of adequate skills (human capital). Production processes indeed deeply change and require more intangible assets (De Bandt, 2006). Intangible assets are generated by combining different assets, both tangible and intangible. For instance innovation arises by combining physical assets (labs, instruments, energy to run labs) and intangible assets (human capital, knowledge base and organisational capital, meaning the capacity to organise teams of researchers so that they are motivated and communicate well with each other). The complementarity between assets is thus fundamental in order to create intangible assets, so that networking is key in order to create these complementarities. Hence new production processes are organised as networks, often globally based, with nodes, such as research facilities, in different countries.

Industrial policy cannot act on global value chains. It can act locally, favouring synergies and complementarities that can be inserted in global value

chains. Here again, network is a keyword since the firm organises as a network that coordinates a chain of suppliers, not necessarily located in the same country.

The new industrial policy is characterised therefore by two aspects. First, market forces and private initiative are considered as the driving force of industrial development. Second, governments have a strategic and coordinating role to play in the productive sphere beyond simply ensuring property rights, contract enforcement and macroeconomic stability.

Structural change is the essence of economic and industrial development. According to Rodrik (2008), markets do not provide enough incentives to push for these changes. These are market failures that prevent structural adjustment. However, networking in order to realise synergies is also fundamental in industrial development, hence the objective of industrial policy to favour the creation of systems, that we could call systems of development. There are in this perspective systemic failures that policy also has to address (see von Tunzelman in this issue).

Interestingly, the *Handbook of Industrial Policy* examines different types of industrial policy but never questions the necessity of industrial policy. Reviews of the state-of-the-art concerning different issues concern long time period that comprises the liberal years of mainly the 1990s, showing it is full of policy intervention. Industrial policy therefore has always been and continue to be implemented around the world, despite the official discourse that rejected it until recently (see for instance US industrial policy in section 4). The Handbook shows that the number of questions, fields and instruments of industrial policy is varied and complex, from antitrust, to regulation, intellectual property rights and clusters, regional industrial development and development of broader spaces. The problem is that given that industrial policy could not be mentioned nor studied until recently, no broad view of industrial policy has been developed. A broad view is necessary not only to orientate the various fields and measures towards specific objectives, such as the development of new sectors, but also in order to address the problem of coherence of industrial policy. Without the broad vision that considers the interaction between various instruments, such as antitrust law, policy to promote cluster creation, support to research activities, but also labour market policy influencing market flexibility and macro policy, industrial development policies are likely to be incoherent. Coherence not only regards the various instruments, but also the different levels of implementation, namely regional, national and supra national.

This broad vision was the point of view of classical economists. Industrial development was seen as a determinant of economic development that in turn determined social and cultural development. The social impacts of some industrial characteristics, such as the division of labour, were also very closely examined in order to determine their sustainability and the possible role of policy, hence the State, in correcting possible negative effects.

Before proceeding further in this analysis, what has been the impact of the crisis on the emergence of this new approach to industrial policy? In order to examine this point, we first analyse the reasons for the crisis and then move on to its impact.

III. — CRISIS AND ECONOMIC DEVELOPMENT FROM 1945 TO 2009

After the long global conflict that covers the first half of the 20th century and that is made of different elements, including the end of colonial empires, the economic crisis of the 1930s, the authoritarian regimes in Europe and the Second World War, the world ends up strongly and neatly divided into two and supported by a very delicate equilibrium that opposes two coherent systems and excludes a third one, called the Third World, characterised by under development and chronic poverty.

The Western world comprises the USA, Canada, Western Europe, Japan, South Korea, Australia and New Zealand. The Eastern world is centred around the USSR and its satellites, with difficult relationships with China. The frontier between the two worlds has been sometimes torn or kept with suffering, as shown by the Vietnam War or the construction of the Berlin Wall.

The explosion of the Soviet Union and the transition of many communist countries to market economies has put an end to that political system underlying the economy, opening the way to globalisation. Globalisation can be represented by a game in which all players play against each others, including new important players such as China, India, Brazil and the new Russia, so much so that it has become necessary to establish new rules for the game.

The old rules of the game were established during the Second World War, at Bretton Woods. After the disasters caused by the bad rules established after the first World War, European countries had learned and had new ideas in mind.

Keynes, although very young at that time, had criticised the rules established in the end of the First World War and had realised a deep reflection, in his books *The Economic Consequences of the Peace* (1919), *Tract on Monetary Reform* (1923), and numerous articles some of which published in *Essays in Persuasion* (1931). These thoughts led him to argue that after a very strong discontinuity such as a war economy, it is not useful to try and go back to the situation existing prior to it, but rather it is preferable to concentrate on sustaining the recovery of the economy on the basis of the new conditions. In 1936 Keynes published *The General Theory of Employment, Interest and Money* and in 1940, *How to pay for the War*. In that later small tract, he proposed compulsory savings and rationing in order to prevent inflation during the war. He was at Treasury during the war and after thinking about measures to accompany the war economy, he focused on economic measures for the post-war era. Thus he formulated his proposal for « *bancor* », an international clearing

union, in 1943. He led the British delegation at the international conference of Bretton Woods in 1944 but his proposal was rejected in favour of the US ones, preferring to peg currencies against the dollar and the dollar against gold.

Keynes stressed the importance both of an active role of the State in order to sustain investments but also of an international opening, regulated by international institutions that could manage the transformation of economies.

This illuminated view however was not accepted at Bretton Woods where the American economy imposed itself as central in the new world order, since its currency became the basis of the international monetary system. Keynes had highlighted the risks of such a system and had proposed the *bancor* as a composite currency comprising the different national currencies, that would support an international monetary system based on the stability of various economies rather than just one.

The strength of the American economy was supported by a complex public action which had at its core the military industrial complex. The strong public spending on defence contributed to domestic demand, but the largest contribution stemmed from mass consumption and low imports. For many years this system was consolidated by decreasing costs of both raw material and labour, labour supply being fed by immigration, in a regime of fixed exchange rates and capital costs.

European countries started to grow again in the mid-1950s, thanks to the opening of the internal market within the trade union, the common external tariff protecting European economies from US imports. This situation developed up to the economic boom of the early 1960s.

After the 1960s however the international economic system based on the strong American economy started to show weaknesses, since the American economy showed signs of difficulties, primarily linked to the Korean and Vietnam war. In 1971, President Nixon declared the end of the convertibility of dollar into gold.

A long crisis followed in the 1970s up to the 1990s, although with ups and downs. The end of the fixed exchange rates regime, the deep rise in oil and raw material prices, the endless workers conflicts, the hyperinflation that for years accompanied economic stagnation show again, as pointed out by Keynes, the necessity to identify adequate levels of governance of the world economy in front of changes that affect the political organisation of the world economy.

In the 1980s and 1990s only Europe attempted an institutional innovation, namely an economic and monetary union that has elevated collective action beyond national borders.

On the other side of the Atlantic political unilateralism was relaunched, taking the name of Washington Consensus, whereby the American economy

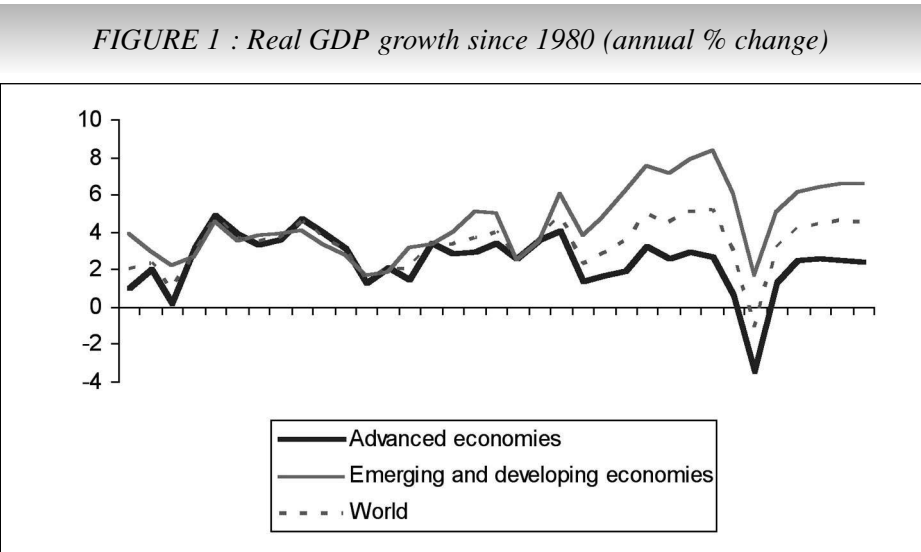
remained the point of reference of the world order and pushed towards trade opening without rules, rapid transformation of some countries, both in transition and emerging, towards the integration of the world economy.

The new economic phase was characterised by the collapse of communist countries, where the centrally-planned economy did not manage to adapt to the increasing complexity of the world economic context.

The lack of adjustment of the world economic system translated into various crises, that Krugman identifies in his 2008 book *The Return of Depression Economics and the Crisis of 2008*. He recalls the warning signals that the crisis of several Latin American countries represents, the Japanese and then the Asian crises, and the speculative waves that have characterised the world economy over the last years of the 1990 decade. All constituting tremors that signalled the arrival of a bigger earthquake, the financial crisis of 2008. The « earthquake » is having devastating effects because the epicentre is no longer at the margin of the world economy, but at his centre, the US economy, although this country was, since the late 1990s, candidate to remain the core of the new world order.

3.1. The dynamics of the crisis

World economic growth has experienced ups and downs since the 1980s, the analysis of which helps to understand the roots of the crisis. Figure 1 shows real GDP growth for the whole world, for advanced economies and emerging and developing countries since 1980.



Source : IMF statistics (www.imf.org)

From the mid-1980s there is a first economic cycle characterised by growth up to 1988, followed by a reduction of real GDP up to the period 1992-1994. A new cycle follows, of growth up to 2000 (apart from the 1997 crisis), followed by a sudden fall in 2001, and then the actual development phase up to the current crisis.

The most striking point showed by the graph is the growing distance between emerging countries that settle at growth levels that are well beyond that of advanced countries. The later countries are most hit by the actual crisis since they almost go back to the growth levels of the early-1980s. Thus world growth is now entirely driven by the growth of emerging countries.

The growing tendency of emerging countries to drive world growth can be dated back to about the early-90s. This corresponds to the fall of the Berlin Wall and the end, from a political point of view, of bipolarism. This process by which growth levels of emerging countries growingly diverge from that of advanced countries, the former gaining higher levels than the later, accentuates with the Twin Towers disaster on 11 September 2001.

Between the Fall of the Berlin Wall and the Twin Towers disaster many changes occurred. The European Union deepened integration with the monetary union and the adoption of a common currency between a core of member countries. Notice that European countries thereby followed Keynes' advice to base their international monetary system on a composite currency. Stability was thus based on the responsibility of all members. Much has been written on the euro, some arguing that it would be too weak, although it revealed too strong after its inception. In any case, during the crisis the single currency revealed an element of stability and strength for European countries, although the European Union is still adjusting to the most important enlargement of its history, in terms of number of new members, after the entry of Central and Eastern European countries.

Such enlargement has consolidated the growth of these transition countries, not only attracting capital from abroad, but also acquiring productive activities from Western Europe, thereby generating export economies that could restructure, allowing the extension of supply networks on the whole European continent.

The rapid growth of Eastern European countries gave impulse to the growth of Western ones, so that benefits were shared among old and new members of the Union.

Regarding other, and most important, emerging countries, growth was very high during the whole period, especially in China.

In the end of the 1970s, modernisers led by Deng Xsiao Ping are governing the country. The policy of Deng is characterised by opening to the world economy, attracting capital first in the area of Shenzen between Canton and Hong

Kong, then in the rest of the country, basing industrial development on low cost production for the external market. This opening also induces democratic opening demands from the Chinese people, that the regime however does not sustain until the Tien An Men slaughter (4 June 1989), which makes clear that the only way to support economic opening without a political one is *via* high growth rates implying growing income for the population.

From then China has kept high growth rates determined by export growth and internal demand growth, together with a competitive exchange rate. In the same years all Asian countries, except for Japan, experience rapid growth, except for the 1997 crisis that hits first and foremost Japan.

The Japanese economy had experienced an extraordinary development since 1945 based on exports and internal demand and, in the 1990s, while internal demand growth slows down, exports are increasingly rivalled by producers of other Asian countries. A stop-and-go policy is therefore implemented in order to reduce inflation but also to support exports. A speculative bubble is created, that shifts savings and investments towards activities with high short-term returns, to the expense of productive investments.

The speculative bubble explodes showing that the stock market and housing markets' values did not have correspondence in the real economy, hence huge losses for families and for the banking sector, followed by a fall in consumption and in industrial investments and a growing public deficit. The government intervenes with strong public spending in order to sustain the economy, bringing government deficit to more than 10 % of GDP and debt to 100 %, in addition to which a massive action is necessary to save the banking system.

The Japanese economy only recovers in 2003, thanks to world demand growth and to the growing exports (of intermediary goods) to the Chinese economy. However, the Japanese economy maintains weaknesses, with an ageing population and mature industrial system.

This « Japanese disease » has been somewhat shared in other Asian countries which rapid economic development induced the World Bank in the mid 1990s to define them « the Far East miracle ». In 1997 the devaluation of the Thai currency opens a phase of financial crisis that extends to the whole Asia. Thailand is a small economy hence very open, so much so that its recession rapidly extends to the other Asian countries.

In the other extreme of the world, Latin America was experiencing big troubles too, again mainly due to the disparity between the financial and productive spheres of the economy. Indeed, the search for short-term profits leads the financial markets, if not regulated, to rapidly expand, attracting all savings, to the expense of the productive sectors which have difficulties in investing and to the government sector, which deficit tends to increase. Such disparity grows up to the point where financial assets are too overvalued and the bubble explodes.

In the same manner, in many Latin American countries, after the so-called *Decada Perdida*, that is, the period of dominance of dictatorship, strong inflationary tendencies put the return to democracies into strains. Argentina and the other countries peg their currency to the dollar, thereby implying a reduction of inflation but also a drastic internal restructuring that induce the rapid exit of the markets by the less competitive firms in a regime of trade opening and overvalued currency. Here again the phenomenon of bubble in the financial and housing markets that shifts resources away from the productive sectors induces a new dramatic crisis in 2001.

In these years the only two countries that do not experience strong crisis are China and India. India experienced a series of reforms during the 1990s that allow the country to consolidate growth based on the development of a competitive industrial sector also supported by investment in human capital.

Various crises take place in the world with a similar scenario, namely the development of weak economies accelerated by the development of financial and housing activities which however crowds out the sectors of the real economy. To this one must add the rigidity of international institutions which only believe in and apply the so-called Washington Consensus, namely a drastic reduction in the role of the State, with reduction in interest rates, so that the capacity of the government to intervene with monetary policy is reduced, together with privatisation and liberalisation of financial markets as a factor for trade opening and rapid integration of capital markets.

These localised events have been considered as only localised without paying attention to their systematic nature across different parts of the world. Until they also hit the American economy.

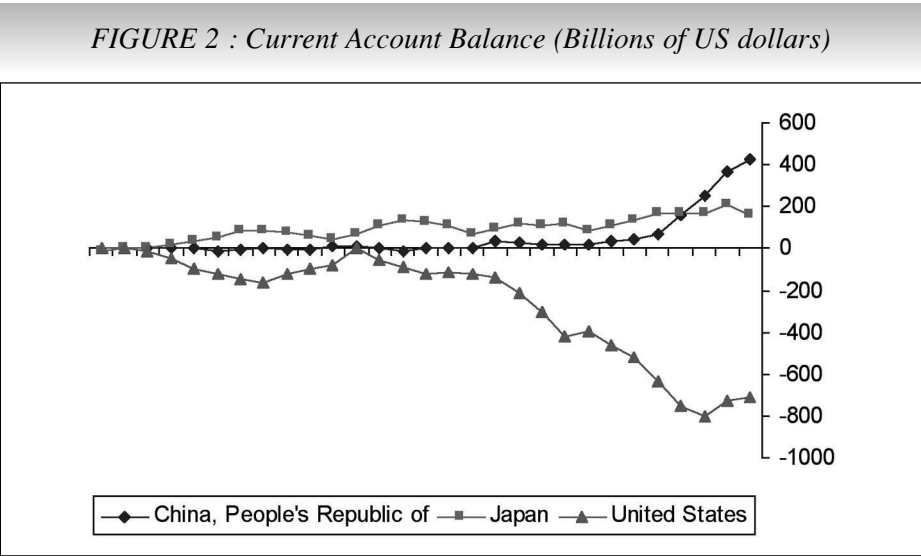
3.2. The problems of the American economy and the crisis

The signals of productive crisis in the United States are not recent at all. Figure 2 shows the balance of payment statistics for the USA, China and Japan. The evolution of the American economy appears to be mirroring the Japanese economy in the 1980s, but from 1991 the American balance of payments worsens continuously and dramatically also relative to the Chinese balance of payments. While the balance of payments was worsening, unemployment reduced from 8 to 4 %, essentially due to the development of tertiary activities that were seen as necessary for the American economy.

While new firms were created in new sectors, a new financial sector was also developing, that was bringing these firms to very high capitalisation levels. The housing market also expanded a lot, with capitalisation effects similar to those of the financial sector. The financial innovations allowed a booming market and high development of the tertiary sector, that however experienced a first internal crisis in 2000. The 11 September tragedy hit the American economy in crisis, with unemployment rate rapidly rising to above 6 %.

The victory of Georges W. Bush in the 2000 elections against Al Gore was also a victory of an industrial system over another one. Al Gore indeed represented the American industry linked to high technologies, that required a new strategy, while Bush represented the « old » system, the military industrial complex that had governed the American economy for years. Bush continued the liberal policy of Reagan and Bush senior, of deregulation and strengthening the links between the military industrial complex and the federal government.

After 2001 the American economy experienced a strong recovery thanks to the boom in public military spending. Although the dollar was undervalued, the balance of payments kept worsening because of the rising imports of consumer goods from Asia. In such a situation characterised by low money cost and boom of new financial instruments, the housing markets boomed even more, incorporating the inflationary expectations of an increasingly indebted economy, in both the public and the private sector.



Source : IMF statistics (www.imf.org)

This toxic mix allowed an expansion of the economy up to 2005 thanks to the contemporary reductions in interest rates and continuous rise in public debt. The federal public deficit reached, in October 2008, \$ 10,538,935,751,874, rising by 3.88 billion on average per day, corresponding to a value of public debt of \$ 34,555 per capita.

The recovery of the American economy was therefore based on the traditional public intervention in the defence sector, which however worsened public debt without a corresponding development in the industrial sector which faced

international competition but saw financial resources dragged away, either to the military sector or to the financial and the housing sectors.

Chinese imports were compensated by the purchase by Chinese authorities of American public debt, thereby allowing a « dangerous liaison » between the two economies.

After the start of the crisis that rapidly diffused worldwide, industrial interest groups, using the State to their own interests, pushed Bush to favour the monopolisation of the economy.

The result was a disaster and the American economy now needs to be restructured, with a redefinition of the role of the State in order to base growth on healthy grounds. Obama wins the election with a programme aimed at both redefining the rules of the game between the State and the market, boosting internal demand through a variety of actions and inducing a restructuring of industry.

We now turn attention to industrial policy in the US (section 4) and in the EU (section 5) in recent years to outline the major consequences of the crisis on industry and industrial policy in section 6.

IV. — US INDUSTRIAL POLICY : A COHERENT FRAMEWORK

In the US, each President defines strategies for long-term competitiveness and economic growth which, given our definition, can be considered as industrial policy. President Bush defined the American Competitiveness Initiative (2). President Obama has also defined and started to implement such a strategy. The strategies (at least since Clinton) put research and development and human capital as the main levers of the competitiveness of American businesses and especially of the development of new sectors, that bring new jobs, opportunities for the restructuring of old business and economic leadership of the country in key sectors.

For instance President Obama has committed \$ 147,6 billion of the federal 2010 budget to R&D (OSTP, 2009, p. 1). Already the Omnibus Appropriations Act (Public Law 111-8) and the American Recovery and Investments Act (Public Law 111-5) increased the budget allocated to research and innovation not only because of their potential contribution to the recovery of the economy but also because of their long-term prospects regarding the development of new sectors. The federal budget appears to have declined in real terms over the period 2004 to 2008 (from about \$ 62 billions in constant 2009 \$ to 57 bil-

- (2) Labory and Prodi (2010) show the coherence of President Bush's industrial policy; President Obama has changed some of the priorities and efforts, but the legislative framework is roughly the same, especially in terms of guaranteeing coherence.

lions), while it has been significantly increased in 2009 (about \$ 72 billions) and 2010 (about \$ 58.5 billions) (OSTP, 2009). The research and innovation effort has four priorities: basic research, clean energy, health and security. Clean energy is clearly a priority of the Obama administration given the adoption of the Waxman-Markey Bill in June 2009, which is the American Clean Energy and Security Act (ACES) primarily aiming at reducing greenhouse gases emissions by developing new energy sources.

The public effort to R&D is high in the US, but the private effort is even higher. The US industry indeed finances around two thirds of US total R&D (3). About 10 % of this spending are subsidised by the federal government (Wolfe, 2006, p. 5). The federal government mainly subsidizes large firms: very small firms have federal subsidies for about 9.6 % of the R&D spending, while very large firms have such subsidies for about 15 %. However, States also support R&D and SMEs in particular. States innovation policy seems to focus on the development of new sectors at the regional level (favouring collaboration among firms, providing high skills, ...). For instance Best (2005) analyses the development of a new biomedical industry in the State of Michigan, where the State had a role through innovation and human capital policies (support to universities so that they could attract high quality students even from other American States) but the most important appears to have been the interactions between firms, local governments, research centres and other important actors.

More importantly, the policy and legislative framework is supportive of the coherence of industrial policy between the State and federal levels. Thus for instance the Federal Technology Transfer Act (FTTA) has been favouring, since 1986 (Public Law 99-502), the transfer of technology developed by federal programmes into States' activities. This act obliges researchers receiving federal funding to actively transfer their innovative technologies to industries, universities, State and local governments. The ways in which this transfer occurs are specified in the law and are mainly technical assistance, licensing of patents, cooperative R&D agreements and educational partnerships. The FTFA also imposes preference for US based business that manufacture their products on the American territory.

It can be argued to be one of the elements of the policy framework that ensures coherence of US industrial policy not only between government levels (State and federal) but also between instruments. Thus the USA have used a number of instruments in order to guarantee the coherence of competition and trade policy with their strong support of domestic industry. The three main instruments can be argued to be specific provisions in trade policy; government procurement and the legal framework for intellectual property rights.

(3) In 2004, US companies in the manufacturing sector performed \$ 147 Bn of R&D, representing 71 % of US total R&D (Wolfe, 2006).

Regarding trade policy, the USA have pushed for free trade after the Second World War, when its hegemony was uncontested. In the period from 1945 to today the USA have always supported trade liberalisation in international negotiations, but they always have taken measures to help industries damaged by free trade.

From the 1970s onward the hegemony started to be contested by Europe and Japan, after their boom of the 1960s. The US therefore voted the Trade Acts of 1974 and 1979. The 1974 Act contains provisions against free trade. First, the Section 201 regulates import relief in order to prevent or to remedy serious injury to domestic producers resulting from increased imports associated with tariff reduction. Individuals injured appeal to International Trade Commission. Second, Section 301 is an unfair trade practices statute. It is designed to ensure fair and equitable access of US products in foreign markets.

During the 1980s, under the Reagan administration policy turned to *laissez-faire*. The US trade deficit increased considerably, so much so that the Congress pushed for measures. As a result, Reagan took some unilateral protectionist measures. In addition, a new Trade Act was adopted by the Congress in 1988, which President Reagan had to sign. This Act contained many indirect restrictions to trade by singling out the countries with trade surpluses with the US and enlarging the definition of « unfairness » of practices.

In more recent years, in the years 2000, it seems that the US have increasingly used government procurement as an instrument for supporting national champions (promoting exports and preventing imports). Thus Weiss and Thurbon (2007, p. 703) argue that « even under the stricter trading regime of the WTO, procurement offers arguably one of the few significant policy tools remaining to governments, both central and regional, to foster domestic industry without falling out of the multilateral rules ». The fact that most American national champions such as Boeing, IBM, Lockheed, Caterpillar and Motorola all have depended and still largely depend on government contracts to ensure market shows that government procurement has been an important tool of industrial policy in the US.

However, the US government sustains national champions not only by providing markets to domestic firms, but also by helping them obtaining procurement contracts abroad. Thus Weiss and Thurbon (2007, p. 705) stress that « no other State has been as globally active in driving open procurement markets; and no other State has been as nationally protectionist in legally mandating “buying national” policies ». On the one hand, the US push for foreign procurement markets to open, both in multilateral negotiations (Government Procurement Agreement, GPA of 1988) and in bilateral negotiations (*e.g.* trade agreement with Australia only under condition that Australia opens its procurement market to US firms). On the other hand, the US protect their procurement market by imposing buy national rules. Thus the « Buy American Act » of 1933 requires federal and State agencies to give preference to domestically produced goods and services. Many governments around the world have local

preferences, but the US goes further by making Buy American a legal requirement for its federal agencies (Weiss and Thurbon, 2007, p. 706).

In contrast, EU procurement directives are designed specifically to prevent buy national policies, so that buy national policies are much more difficult to implement than in the US. The US however grant foreign firms a « waiver » from the Buy American legislation, but in reality EU reports on US trade barriers claim that the implementation of waivers is shrouded by « legal uncertainty ». (European Commission, 2007).

The legal framework governing property rights is also strongly complementary to technology policy and to other elements of industrial policy (Coriat, 2002). Since the Bayh-Dole-Act of 1980 and the subsequent laws encouraging the patenting of inventions subsidised by the State, universities have encouraged their researchers to patent their innovations. The apparent objective is to encourage innovation, since patenting means getting the return from one's inventions. However, in the case of universities, which primary aim has always been fundamental research in order to diffuse it openly to the rest of the economy, thereby guaranteeing maximum spillovers, other aims might prevail.

In fact patent systems have been strengthened in all countries since the early 1980s. During the negotiations of the Uruguay Round, the USA argued that the violation of intellectual property rights could have as negative effects on international trade relationships as non tariff barriers. Hence the USA asked that the commercial dimensions of the treatment of intellectual property be extended within the GATT, while redefining their technological policy.

The US industrial protection rights have progressively become the new international norm. The new American doctrine of intellectual property protection of living objects and software has diffused in the EU (Coriat, 2002). Other countries, such as China, have changed their system following US pressures. The diffusion of American norms worldwide is completed in the TRIPS agreements, negotiated within the framework of the Uruguay Round and progressively implemented since 1995. TRIPS imposes all countries in the WTO to respect minimum standards in terms of intellectual property rights.

In fact, the « Section 301 » of the 1984 Trade Act and the Bayh-Dole Act imply both a widening of what can be patented and an extension of norms regarding patents.

Therefore, coherence appears to be high in the US and is ensured primarily by a strong, central (federal in this case) government that coordinates actions. Measures to promote new industries are strong and different but complementary at the local (State) and federal level. Trade policy is also coherent with the support of domestic industry through a number of provisions and exceptions defined officially for reciprocity reasons. The legal framework is also complementary with industrial policy and all contribute to provide a context conducive to the competitiveness of the American industry.

V. — INDUSTRIAL POLICY IN THE EU

While the USA were concerned about the competitiveness of their industry, the European Union launched, in 2000, a complex strategy for industrial development that could revitalize the European economy in a context of starting monetary union and enlargement to Central and Eastern European countries. The context external to the EU was also important since the Doha agreements were signed in the same year and saw the entry of China in the WTO. The Lisbon strategy proposed a concerted action that involved all the policy lines already experienced and constituted an important innovation in the decision-making method of industrial development policies.

The Lisbon strategy is based on two pillars. The first pillar is market competition which has to be fair, abuses of dominant position and possible biases of state aids being avoided. The second pillar is the support to the competitiveness of European firms, through research and innovation policy and structural policy directed to less developed areas of the Union. Both pillars operate on trans-national aggregative factors, with the promotion of networking between firms and institutions ultimately aiming at creating an environment favourable to industrial growth.

These multiple actions find coherence in the definition of an objective common to all the continent, namely the leadership in the knowledge economy.

The Lisbon strategy is therefore articulated into four main fields of actions :

1. more research, development and innovation ;
2. a more dynamic environment for firms ;
3. investing in people, through training ;
4. greening up the economy, that is, investing in technologies that could allow industrial restructuring to be environmentally sustainable, starting from an adequate energy policy.

The new European industrial policy thus essentially becomes *a vision of the future*, towards which various policies implemented by policy-makers at all levels, namely local, regional, national and European, could be coherently orientated.

The European Commission is assigned the role of coordination of national policies and monitoring of the progress made towards the achievement of the objectives. The European Commission subsequently has defined a new approach to European policy-making, the so-called « Open coordination method » : Member States are invited to exchange information on the measures they have implemented so that best practices can be identified and adopted elsewhere, thereby creating partnership between Member States, under the monitoring of the European Commission.

The Lisbon Strategy coordinates both a wide set of instruments and wide set of implementation levels. The long-term vision of industrial development to which all Member States adhere is defined at European level, not by the Commission on its own but essentially on the basis of a dialogue between Member States in European Councils. The long-term vision is then implemented by all policy decision-making levels in the Union, namely European, national and local. The main level regarding competence is the national one (as defined in the Lisbon Treaty, in article 173), where each country adapts the strategy to its own needs and conditions, and takes the necessary measures. At Union level, the European Commission monitors progress towards the general objectives and coordinate national efforts, inducing an exchange of information and experiences between European countries. The European Commission also coordinates efforts made at local level, inducing the sharing of experiences between regions for instance (Interreg programme). The « open coordination method » adopted by the European Commission is very important in ensuring coherence at European level as well as leaving room for possible future more important role of the EU in defining and implementing industrial policy.

This new approach is therefore the « natural » evolution of the Bangemann approach, taking a more active role in the orientation of industrial specialisation in the EU and in inducing structural change to follow specific paths. While in the 1990s industrial policy was aimed at providing the conditions for industry to embark on the best path, in the years 2000 public authorities at all levels also try to identify the best path in order to orientate industrial development towards it.

The Lisbon Strategy therefore represents a new approach to industrial policy, in line with the spirit of the reform of the 1990s (defined in the Bangemann report) and pursuing its development to accompany the new challenges of the new century, namely the competition from emerging countries and the changes internal to the European Union, with enlargement and the monetary union. The strategy has been much debated, especially in the first years of its implementation, where it appeared as an incoherent set of objectives, the macro objectives pushing towards reduction in budget deficit hence public spending while the micro one tending to require more public spending (in research and infrastructures). The European liberals also criticised the Strategy for its willingness to govern the economy and the market.

This new industrial policy necessarily recalls an articulated vision of the economy or, as Hirschman (1999) would argue, is a way of making the economy more complex. This strategy indeed implies a complex and subsidiary vision of the State, from the European Union to towns. The role of the European level is to define a long term strategy, implement common programmes that create European networks and regulate the competitive environment. The national level defines and implements industrial policies aimed at supporting the participation of individuals and firms in the competitive game, while the local and regional levels operate a territorial programming necessary to development.

The success of this new approach will depend on the capacity of Union members to unify behind the common collective objective and eliminate national tensions that, especially in a context of world crisis, tend to mistakenly see in the national frontiers the natural area where problems can be best resolved.

The crisis should not be considered as tempest in which the best is to wait for it to go through. Such a deep crisis must be considered as an exceptional phase of reorganisation and relocation, relative to which a common vision to revitalize and develop the economy is defined.

In Europe, coordinated action is no longer sufficient; after the monetary union, it is now necessary to create the instruments for a common government of the economy, making steps towards political integration and therefore towards the democratic legitimacy of a European leadership, starting from the role of the European Parliament and the independence of the Commission relative to national governments.

The national state that was in the past the only reference for political action is now always and inevitably, given the openness of the economy, involved in a dialogue with other economies in a dynamic evolution that goes beyond national borders. Some national States also have to face the request for major autonomy from local communities. Hence it is now necessary to reflect on the democratic essence of the State and on its articulation at all levels, from the local to the supranational one. The role of international institutions must also be rethought, given that they were created at the end of World War Two, that is, in a context completely different from today's.

In the changed context of today the lessons of classical economists are more than ever useful. In particular, an economist such as Smith highlighted that the Wealth of Nations is primarily determined by industrial production that is, the capacity to organise specialisations and complementarities in knowledge and competencies. Classical economists taught that industrial production is efficient if it corresponds to a market where competition is the expression of the right of all individuals to autonomously and independently participate to collective action. The long term goals of autonomous and independent participation of all individuals in markets and industrial production, rather than the short term goals of immediate profits are what drive the Wealth of nations.

In this context the new industrial policies imply a new design of the international regulation system, including a redefinition of the role of international institutions, but also the search for new development goals, that take into account the problems that the global economy has to face, from environment, to health, and to food security.

For this reason, thinking about industrial policy does not amount to thinking about a battery of incentives and protectionist measures to save the national economy, but rather to discuss the concept of market and the state in a global context.

VI. — GLOBALISATION AND THE INCREASING GAP BETWEEN THE FINANCIAL AND THE PRODUCTIVE ECONOMIC SPHERES

Perhaps the major direct impact of the crisis on industry is to reveal the problems raised by the increasing gap between the financial and the productive sectors of the economy.

The globalisation phenomenon has particularly concerned financial markets, in the sense that world financial flows have increased dramatically in the last twenty years.

Thus trade on the global foreign exchange market is estimated at \$3.21 trillion per day, according to the Bank of International Settlements (78th annual report, 2008). Between 2001 and 2007, foreign exchange turnover increased by an average of 18 % per annum, to an average daily level of \$ 3.5 trillion, which is a bit less than Germany's annual GDP. The ratio of the volume of transactions on foreign exchange markets to world trade in goods and services was 2 to 1 in 1973, 10 to 1 in 1981, 50 to 1 in 1992 and 100 to 1 in 2006 (El Mouhoud and Plihon, 2009), showing an increasing gap between the productive and the financial spheres of the economy, with a significant dominance of the latter.

According to El Mouhoud and Plihon (2009), world financial flows are concentrated in the hands of a few States. Thus developing countries account for about 80 % of world population, but only 30 % of global financial flows. Among developing countries, emerging countries, including for a large part China and India, account for about a half of all financial flows. The USA receive 60 % of world direct investments in order to finance the huge public deficit outlined in the last section.

Besides States, multinational firms are important players in financial globalisation, through mergers and acquisitions. The volume of mergers and acquisitions in the world has represented \$billion 85 in 1991, 558 in 1998 and 4500 in 2007 (according to Thomson Financial).

Financial investors are essentially institutional investors (pension, insurance and mutual funds), private equity funds, hedge funds, exchange traded funds and sovereign wealth funds. In 2008, such funds represented a total of \$ 90 trillion, down 17 % relative to the previous year essentially due to the financial crisis. The breakdown of the various funds is shown in table (next page).

Investors, especially private equity and hedge funds, tend to push firms to increase profits in the short term. These profits are not invested but distributed to shareholders and to managers in the form of very high compensation (Goldstein, 2009). Crotty (2003) estimates that well over half of the cash flow of non financial corporations went to financial markets (interests, dividends, etc.) in the period 1984 to 2000 (peaking at about 74 % in 1998); this percentage was 30 % from the mid-1960s to the end of the 1970s.

TABLE : Global fund management industry

| Type of fund | Asset under management, \$ trillion | % total |
|-------------------------|-------------------------------------|------------|
| Institutional investors | 61.6 | 68.4 |
| Sovereign wealth funds | 3.9 | 4.3 |
| Private equity | 2,5 | 2.8 |
| Exchange traded funds | 0.9 | 1 |
| Hedge funds | 1.5 | 1.7 |
| Private wealth | 32.8 (1) | 21.8 |
| Total | 90 | 100 |

(1) around a third of private wealth is incorporated into institutional funds

Source : IFSL (2009)

The very high compensation provided to managers in all firms but especially in financial firms has raised an important debate during this financial crisis. Excessive compensation in the financial sector has been blamed for further pushing actors to pursue short-term profits to the expense of long-term investments. The recent G20 Pittsburg Summit expressed that « excessive compensation in the financial sector has both reflected and encouraged excessive risk taking. Reforming compensation policies and practices is an essential part of our effort to increase financial stability ».

Not only do these investors push firms to short-termism, but also they mean that shareholding is no longer dispersed, as in the 1970s. The models of corporate governance showing the advantages of the separation of ownership and control and the superiority of the model of capitalism based on firms listed on stock exchanges rather than linked with banks or governments for corporate control and financial resources rely on the dispersion of shareholding. This dispersion does no longer exist, and owners have strong influence over managers.

Countries where family ownership or State ownership do prevail, such as in Italy, appeared to have suffered less during the crisis, at least in terms of public spending to rescue financial organisations. In addition, in the end of the 1990s and early 2000, excluding the exceptional period of financial crisis, the American Treasury has spent six times more than the French State to rescue saving banks and the Japanese State, twenty times more in order to save the large banks.

Hence the European model of capitalism, based on the predominantly family and State ownership (Italy and France) or bank-firm relationships (Germany) might have been beneficial during the crisis. In any case, the crisis made it clear that the advantages and disadvantages of various forms of capitalism have to be re-examined in the current context.

The growing importance of intangible assets in the economy appears to contribute to the boom in the financial sector. Globalisation and intensification of

world competition implies the need for firms to pursue non price strategies, whereby products are more frequently renewed. In order to renew products more frequently and launch new products the phases of the production process that are prior to manufacturing (R&D) and after (commercialisation, marketing) take primary importance. These phases of the production process are also those more intensive in intangible assets (human capital of researchers and designers, knowledge and innovation, etc.), implying, at the level of the firm and of sectors, the growing importance of intangible assets (Bianchi and Labory, 2004).

Many studies have thus attempted to measure the relative importance of intangible and tangible assets in economies. The OECD shows that intangible assets account now for more than 50 % of total capital. At firm level, new methods have been developed in order to better report on intangible assets. (Zambon and Marzo, 2006)

Firms therefore find it important to report their intangible assets to investors. The problem is that they are only imperfectly valued. Patents and other intellectual property rights held by firms measure their knowledge base and their innovative capacity, but they do not account for all the knowledge held by firms. The capital provided by firms' employees is not directly measured either; levels of education may constitute a proxy, but do not account for instance for lifelong learning and learning on the job. Not all intangible assets are reported by firms. Consequently, the concept of goodwill has been defined and is used in capital markets to assess firms' intangible assets. Goodwill is the difference between the market value of the firm and the accounting value of the firm, and is supposed to reflect a firm's intangible assets. However, capital markets are imperfect, sometimes subject to speculation and the value of the firm derived by the market might be under or over estimated.

El Mouhoud and Plihon (2009) argue that the boom in financial markets is due to the development of the knowledge-based economy. Knowledge is difficult to value for markets and the growing importance of knowledge has led to the proliferation of patents in some sectors on the one hand, and the increasing attention to short term profit by firms aiming at increasing their market valuation and hence goodwill.

The growing importance of intangible assets is related to the knowledge-based economy, since the common denominator of intangibles can be argued to be knowledge (Bianchi and Labory, 2004). However, we do not think that firms look for short-term profits only to increase the valuation of their assets. The logic of the financial sphere is quite independent from firms and their production needs. The financial investors mentioned above push the firms they invest in to realise short term profits in order to allow them to earn greater return on their investments. Besides this, investments in intangible assets are intrinsically long term and it would be a contradiction for firm managers to pursue short-term profits in order to raise their intangible capitalisation.

In any case, the growing importance of intangible assets raises new issues in terms of firm reporting and asset valuation, that are being progressively, perhaps too slowly, improved.

The extraordinary development of the financial sphere of the economy is to a great extent independent of the developments of the productive sphere. Agents in the financial sphere speculate and adopt strategies to maximise their earnings, which can be enormous. As Sylos Labini argued (2006, p. 82, our translation), « law creates the embankment through which the waters of the economy flow; without such embankment the waters become a swamp and can flood ». The liberal years have let the financial sphere develop without or with very few limits leading to the financial crisis.

The difficulty of G20 governments to define new rules for global financial flows also shows that it is very difficult to create embankment after a flood has already occurs. As stressed by Dore (2008), financial institutions have a big political power and resist re-regulation.

VII. — CONCLUSIONS

The crisis therefore reveals important structural problems of the economy, to which firms in the non financial sector have to adapt. First, globalisation has meant increasing worldwide competition in which firms invest in intangible assets in order to increase to knowledge content of products. Second, there is an increasing gap between the financial and the productive spheres, whereby the financial sector takes an extraordinary dominance. As shown in the paper, this has two major consequences on (non financial) industry : (a) short termism of firms which pay more than half of their cash flow to financial markets, instead of investing it in long term investment projects; (b) the superiority of the model of firms listed on stock exchange over other forms of ownership such as family or State ownership depended on shareholding being dispersed in the hands of many small shareholders; this is no longer the case, because shareholding is now generally concentrated in the hands of a few funds, be they equity, hedge or pension funds. In this condition the relative efficiency of the different types of ownership structure must be examined again.

These are important issues that must be addressed, especially in terms of policy implications.

Regarding industrial policy, our paper has shown that the issue raised by the crisis is not whether a return to interventionism is necessary. Rather, the relevant issue regards what form industrial policy must take in order to be effective.

Regarding the latter question, an important debate started before the crisis (to which the *International Handbook of Industrial Policy* we edited in 2006 aimed at contributing) which unfortunately has tended to be put aside by the crisis and the fear of return of protectionism. Of course, the crisis requires exceptional measures, including massive State intervention to rescue banks

and avoid the ruin of many small savers. This does not mean that the State is here to stay with interventionism.

Rather, the evolution of industrial policy up to the crisis showed that it was increasingly considered as a programme, a long-term vision of industrial development which ultimate aim is economic and social development (see also Stiglitz on the wider goals of economic development).

Industrial development paths are indeed specific to countries and cannot be repeated. Industrial development paths depend on the more or less recent history of the territory, on the social structure, on economic organisation and on the effective institutional governance of the country. The combination of these factors determines a historical situation that cannot be repeated, and must be addressed by using instruments that may have been used in other contexts, but have to be adapted to the local context. This is one of the reason why the universal recipe of the Washington Consensus could not function. But similarly experiences such as industrial districts or clusters cannot be implemented directly elsewhere.

Industrial policy in this perspective should propose a systemic approach to development aimed at combining available resources with social objectives. The aim of classics like Adam Smith when examining industrial development was to support cultural and social development. Industrial development was studied but as a mean to reach cultural and social development.

For this purpose a complex vision of development is necessary, where different actions combine in a long term perspective, where various agents can be induced to follow an equilibrated and sustainable growth path. As stressed by Hirschmann (1988), it is necessary to act in order to increase the complexity of the economy, in the sense of allowing a higher number of individuals interacting in it. Economic dynamics are thus rooted in social contexts, that become powerful if they manage to incorporate innovation elements without disaggregating. The mapping of social and institutional characteristics must aim at identifying social structures that could be able to transform without losing identity, but rather by adapting this identity.

Industrial development results from the capacity of entrepreneurs to organise production, to organise the division of labour, which tends no longer to be organised in « filières » but rather in overlapping networks, where key resources are no longer tangible assets but rather intangible assets such as knowledge, human capital, social capital, the capacity to create knowledge. Networks overlap both because products are bundled with other products or services and because they are organised at different levels, namely local, regional, national and international levels.

This is precisely what emerges from the publications in the *Revue d'Économie Industrielle*. The new emerging forms of production organisation raise the question of the necessity to re-examine the concept of productivity (for instance, special issues n° 118 and n° 120, 2007), and consequently, from a dynamic perspective, that of industrial development and industrial policies.

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