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INDUSTRIAL ECONOMICS AND POLICY: RECENT HISTORY AND THEORETICAL FOUNDATIONS

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1. INTRODUCTION

The main purpose of this contribution is to better understand the nature of the evolution of the notion of industrial policy since the 1980s. Our point of view is twofold. We will first investigate what is the origin of that which was called industrial policy by policy-makers and economists in the 1980s and how the term evolved from the 1980s to the present day. We will also take into account the main existing theories which have tried to explain this real evolution and to understand its conceptual meaning.

Three periods will be made distinct from this perspective. The first corresponds to a period in which industrial policy as such mainly tended to be discarded and replaced by competition policy. In the second period, the major concern was the promotion of innovation-based economies; this changed both the real contents of industrial policy and the analytical reflection devoted

to it. The last period is characterized by a profound revival of industrial policy and a substantial modification of its contents related to the impact of economic structural change. This temporal distinction does not correspond however to three entirely different periods including for each one single specific approach. For instance, the difference or even the opposition between industrial and competition policy will be one of the common threads of our contribution. The idea that industrial policy can be reduced to competition policy or is mainly based on it is more or less present in each of these periods even if it is more and more debated. Then, there is no one-to-one correspondence between the periods considered and original analytical approaches. Most of the time, different interpretations of industrial policy have tried to focus on the same period even if they referred to distinct visions of the economy. Moreover, some concepts, debates or analytical developments are present during all the three periods considered. For instance, the discussion about the respective merits of markets and state intervention was always present and divergent views on industrial policy co-exist, defending various approaches. These remarks point out that industrial policy is a complex reality and a polysemous concept which this text will try to clarify.

2. “THE BEST INDUSTRIAL POLICY IS NO INDUSTRIAL POLICY”: LIBERAL AND NEO-LIBERAL INDUSTRIAL POLICY

“The best industrial policy is no industrial policy” (Aiginger, 2007, pp. 297-323): this is the main idea which prevailed during the period of the 1980s when economic public intervention was discredited and industrial policy was substituted by competition policy. In this context characterized by firms faced with to a substantial rise of new competitors, subsidies devoted to support traditional “declining industries” were first considered to be unhelpful to the necessary structural adjustments required by the transformations of the global world economy. Secondly, industrial policies supporting “national champions” endowed with sector-based subsidies were clearly criticized. Quite the reverse, the main idea was to try to reduce public spending in three ways: the reduction of subsidies; the privatization of public firms out of core state activities and the encouragement of competition at both the national and international levels. The term “industrial policy” was less

and less used by policy-makers and was often interpreted as a typical example of an inefficient form of state intervention. There are two ways of interpreting this discredit of industrial policy. The first is as the consequence of a liberal conception of the working of a market economy which tried to convince of the benefits of the perfect markets and of the harmful effects of the welfare state. The second – related to a neo-liberal conception – introduced a different point of view since it accepted the legitimacy of a form of state intervention associated with the substitution of industrial by competition policy. The period of the 1980s is highly representative of an overall change in nature and scale of policy intervention. At the beginning of this decade, Margaret Thatcher and Ronald Reagan were elected and favoured deregulation policies while the ex-communist countries began to replace planning progressively by markets. Moreover, the substitution of industrial by competition policies also became a general tendency related to globalization. Thus, for instance, assistance to development coming from the World Bank or the International Monetary Fund became conditioned by liberalization in many emerging countries according to what was called the “Washington Consensus” (privatization of public firms, policy of opening markets, etc.). But it is certainly in the European Union, which was under construction, that this principle was applied the most strongly. As Elie Cohen noted, since the introduction of the Rome Treaty, “competition policies have a quasi-constitutional status. The Commission defends the interests of the consumer while adapting the global movements towards economic liberalization to the community space” (Cohen, 2007, p. 221). Mario Monti also stressed the fact that the EU is the only economic zone which provides such a form of control of state subsidies (Monti, 2009, p. 237). From an international perspective, the predominance of competition over industrial policy is also convergent with the principles and rules of the World Trade Organization concerning trade policies, public subsidies to exports and anti-dumping legislation.

Can all this set of new wave of policies, which emphasis competition above all, be qualified as liberal or neo-liberal?

2.1. Is a liberal industrial policy conceivable?

In many respects, there is no real liberal policy. Most of the time, the liberal approach to industrial policy only consists in a criticism of state intervention and the reaction of liberal economists to the industrial policies of

the 1970s provides a good instance of this attitude. The origin of this reaction derives from the idea that in a market economy there is no efficient form of economic regulation apart from market allocation. The theoretical origins of this form of economic liberalism are various. One of them is the Austrian economic tradition of the spontaneous order which argues that the firm seen as a form of organization, the state or any other type of economic institution are unable to equal the market as regards their performances in the allocation of scarce resources. According to this economic tradition, market competitive mechanisms are information processes which permanently participate in a “discovery procedure” and favour the tendency towards an economic equilibrium supporting the prevailing social order. Therefore, most of the forms of rigidity generated by forms of organization, institutions, state planning or regulation should be eradicated. However, the Austrian tradition also considers that competition has to be considered in relation to innovation. Now it is perfectly possible that during the discovery procedure entrepreneurs will find possible unexploited opportunities for welfare enhancement that they have ignored until then. These opportunities might be associated with transitory monopoly profits related to the first phase of entrepreneurial innovation as in Schumpeter’s competition theory. If during this phase public authorities restrict the monopoly profits that arise before a monopoly is contested or before innovation makes the monopoly irrelevant then they will reduce invention and innovation. This is why according to the Austrian tradition a liberal competition policy might be less restrictive in some circumstances.

Another analytical foundation is the predominant interpretation of the Walrasian-Paretian tradition which emerged in the 20th century, after Léon Walras and Vilfredo Pareto and relates market to social optimum. The existence of a market General Economic Equilibrium is indeed considered as the necessary condition for the realization of social welfare. For this school of economic thought, production, intertemporal exchange and capital accumulation are indeed nothing more than extended forms of competitive exchange. Therefore, they are entirely dominated by a pure market-oriented economic logic and we can now understand why according to the post-Walrasians the notion of market competition is the core of industrial activity and sums up how this activity is actually working. In contrast with the Austrian tradition, the Walrasian-Paretian approach does not take into account the possible emergence of innovations.

Therefore in the approaches related to both Austrian and Walrasian-Paretian traditions, the only possible attitude as regards industrial policy of the 1980s is to fight against the state intervention which was emblematic during the golden age years and the predominance of the Welfare State even if the ways and means of this fight are not identical in both traditions.

What is important to notice here is that, within the empirical liberal point of view, very often even the notion of competition policy itself may be contested. This policy is supposed to give too much room to standard-setting action by the state through measures of quality or norm control of products for instance especially through anti-trust policy. According to this view, it is better to leave to market private institutions the task of market control since they are more efficient than public institutions. This task can be given to self-organized professions the purpose of which is to make markets more transparent, more efficient and more consistent with free competition mechanisms. These professions include accountants, firm consultants, fiscal consultants, firm auditors, financial analysts, legal advisers, etc.

Therefore, competition policy itself often seems useless for the partisans of this first type of approach. It assumes that market economies are essentially self-regulated by free market and free competition principles. Any type of institutional or control intervention which does not respect these principles can only be analysed as a perturbation of the logic of exchange and therefore as a violation of some form of natural or optimal order.

2.2. The neo-liberal conception of industrial policy: the primacy of competition policy¹

Contrary to the precedent approach, another conception stresses the centrality of competition policy as a state policy. The general point of view

1 This part draws heavily on an OECD report entitled "Competition policy, Industrial Policy and National champions" and especially on the analytic note written by David Spector which does not concern directly the period we consider here but perfectly uses and expresses the economic arguments developed by the "neo-liberal" approach (OECD, 2009).

defended by this neo-liberal conception consists in considering competition policy as the core of industrial policy replacing then the latter by the former. It also leads to drawing attention to the danger of building and implementing a pure policy supporting “national champions”. Competition policy is no longer considered to be useless by neo-liberal economists as it was the case for a large part of their liberal colleagues. For neo-liberal economists, the sole purpose is the “maximization of consumer welfare” (OECD, 2009, p. 11). However, the meaning of this purpose is not identical to its Walrasian-Paretian equivalent. The approach here is not the introduction of a once-for-all and general rule concerning operation of the market and supported indifferently by law, state regulation, competition authorities or even private operators. It is the introduction of a consistent public combination of various long-term and permanent political actions of the state favouring this purpose. The main arguments used only partially overlap the traditional liberal approach: left to itself, the state is not able to obtain the adequate information in order to be able to choose which industry or sector to support (because of the imperfections of public and centralised information or because of market failures for instance); rents generated by uncontrolled public support provoke activities of capture and corruption (electoral and political motivations replacing the search for economic efficiency); selection of and public support to national champions only chosen by political authorities favour distortions related to the size of firms and generates market allocative inefficiencies. However, the neo-liberal conclusion clearly differs from the liberal one: industrial policy is a necessity but should be limited to competition policy since the latter is considered to be much more efficient than the former, in order to fight against excessive prices while being clearly less expensive.² Therefore the main foundation of competition policy is here a kind of cost-advantage calculation rather

2 In a more recent context and concerning industrial policies developed by emergent countries, the following quotation of the OECD secretary report perfectly characterizes this conception: “In any case, empirical evidence shows that, in a globalised world, emerging firms grow better by first competing at home without state support, and thus prepare themselves better to compete on international markets. Indeed, intense rivalry between firms and the permanent threat to incumbents posed by innovative entrants are a far better engine of growth than industrial policies run by bureaucrats who are not subject to market discipline, but are capable of being captured by vested interests. There is also ample evidence of the failure of many national champions, which can often be ascribed to a lack of accountability, and to economically irrational decisions resulting from politicised governance” (OECD, 2009, p. 16).

than the idea of the immediate and absolute establishing of an optimal economic equilibrium, ideal or natural. Using the former foundation neo-liberal arguments consist of showing that competition policy and its related political and/or legal actions (market regulation and control of mergers) can in fact help to better realize the objectives of industrial policy: rationalizing production; fighting against “excessive prices”; developing new sectors, new firms, new goods produced by incoming firms; stimulating productive and allocative efficiency related to rivalry on contestable markets, etc. (Spector, 2009, p. 41). When competition policy is compared to a policy of national champions, three types of positive effects are noticed as regards economic performances: “the realization of economies to scale” which essentially results from the pressure of market mechanisms and from the concentration and the rationalization it generates (*ibid.*); “the limitation or excessive prices by foreign monopolists” thanks to the creation of positive transnational externalities (*ibid.*, pp. 42-43) and “measures facilitating entry in new sectors and firm efficiency” (*ibid.*, pp. 43-45). However, in practice, competition law regulates competition policy and if theoretical debates in economics have made more complex the very definition of competition and sometimes influenced the legislator, what finally remains is that “maximizing consumer welfare is the only economically legitimate goal of antitrust policy” (Brock and Obbst, 2009, p. 67) while however this maximal welfare remains a long term purpose which should be built little by little and permanently. Those principles underpin competition policy.

2.3. The neo-liberal conception of industrial policy: universality and context-independence

If industrial policy includes other measures than those of competition policy, it must be compatible with the latter. If this condition is satisfied, it also consists of specific purposes such as the improvement of the competitiveness of national industry, the increase of knowledge and the intensification of the innovation necessary for achieving it. But these purposes must necessarily be compatible with competition policy and “respectful of sound competition principles” (OECD, 2009, p. 12). The central role attributed to competition policy must always be maintained whichever is the macroeconomic context which prevails and the sector considered, as the following quotation confirms:

“The importance both of the free market and of the protective role of the competition authorities as regards the free market should prevail, even in times of severe economic crisis. In fact, in turbulent times, competition itself can play a considerable role in helping to steady economic nerves; competition law and policy, as instruments that protect competition, are therefore of significant value. It is axiomatic that political concerns are capable of influencing proposed solutions to a given economic crisis. Consequently, such solutions may be formulated in a manner that does not respect the pro-competitive principles of the free market. At all times though, policy makers should recognise the fact that robust competition policy is essential in order to prevent long-run harm to the global economy in the period following the stabilisation of economic conditions. In dealing with the current crisis one must ensure that competition law and policy continue to apply to, and to be respected in, all sectors of the economy, including the financial sector” (OECD, 2009, p. 12).

This quotation is especially significant. It points out the central importance and permanence of the principles which support competition policy within the neo-liberal approach.

On one hand, competition reinforcement is perfectly independent of the macroeconomic context in which the national or the global economy is developing. Obviously, this point of view can only be conceived if one assumes that the microeconomic working of market economies is not influenced at all by its macroeconomic context. It therefore implies that the macroeconomic state of the economy is only the aggregate result of micro-decisions and that it only depends on these decisions. Some form of logical consistency is thus respected even if the price to pay is high: the only relation between the micro- and the macro-economic levels is aggregation; therefore, the macro-decisions of the state or of international institutions or organizations cannot influence the microeconomic working of national and global economies, except as a form of distortion or imperfection as regards social welfare. In this context, competition precisely appears to be a positive means to avoid this form of distortion or imperfection. To a large extent, this conception is not contradictory with the Walrasian/Paretian view of the economic system. Game theory is more difficult to combine with it since international relations can work with strategic public interactions differently from those of internal firms (Arena and Dutraive, 2016, pp. 18-19).

On the other hand, it is assumed that competition policy must be applied in the same way to all economic industries. No exception is conceivable. This point of view excludes any form of sectoral specificity and implies that the institutional (type of market auction, form of organization of buyers and sellers, nature of intermediaries between supply and demand, degree of price flexibility, role of social norms on the market...) and productive (type of product, materiality of product, form of trading, form of returns, prevailing techniques...) characteristics of the market are themselves not influenced by competition policy since its effects are assumed to be uniform in all the markets of the economy. Again this view is not incompatible with a Walrasian/Paretian conception while it is less compatible with the Austrian one (because of the differentiated role of innovation in this analytical framework) and is entirely incompatible with the foundations of game theory which always stress the importance of sectoral differences (Arena and Dutraive, 2016, pp. 12-14).

From this perspective, the very notion of “industry” or of “sector” loses any meaning and it becomes impossible to conceive a sectoral or a macroeconomic dynamics where economic structural change prevails. This view is also contradictory to evolutionary approaches to industrial policy. This neo-liberal approach implies therefore a vision of industrial dynamics heavily rooted in a conception of the economy where steady states provide the benchmark of economic systems and economic disequilibria are seen as linear and provisional perturbations. The notions of vertical integrated sectors, production chains or networks are also difficult to define and use in this context which underestimates interdependence effects at the national or the global level. Specific, sectoral or industrial market failures are also excluded and therefore the possibility of sectoral state subsidies is not rejected, these subsidies are necessarily limited, transitional and supposed to disappear in the long run.

Solutions provided by competition policy are therefore universal, namely, independent from time and geography. They pave the only possible way to follow. In this context, the meaning of globalization only refers to the context of a competition policy extended to the world economy. In a nutshell, the originality of the neo-liberal approach compared to the liberal one consists of the defence of an active and permanent competition policy (or an industrial policy based on competition policy) attributing to

the state the unique role of restoring competition. Therefore, neo-liberal approaches are not purely critical concerning public regulation as are liberal approaches regarding the notion of industrial policy. We will see however that the growing space empirically attributed at the end of the 1980s and in the 1990s to technological change and to financial globalization, and to the decrease of the importance attributed to the specificities of economic has obliged the neo-liberal approach to change and shift to new concepts in order to continue to exert an essential intellectual influence until the present days.

3. THE NEW “HOLY GRAIL” OF INDUSTRIAL POLICY IN THE 1990S AND THE BEGINNING OF 2000S: INNOVATION, CLUSTERS, AND COMPETITIVENESS

The purpose of the second part of this paper is to provide an analytical interpretation of the changes which affected the contents of North American and European industrial policies during the 1990s and the beginning of 2000s. During this period, the revival of industrial policy led to the restoration of active state intervention, sectoral policies and national champions support which a majority of policy-makers and economists preferred not to make use of in the previous period. However, competition policy did not disappear even if it had to adapt to a new context and a new agenda for economic policy. One of the major specificities of the period – reflected in Europe by the Lisbon Agenda for instance – indeed consisted of promoting the building of a new “knowledge-based economy” rather than a “manufacturing renaissance”. The 1990s were the decade of major technical and technological changes which had crucial repercussions on the world economic structure. The USA and Japan, the main competitors in technological leadership, both illustrate an effective policy of support for high technology industries since the 1950s and 1960s³ differing from the usual conception of competition policy. The United States massively financed the research and development of companies thanks to various agencies related to the military and civil sectors. The Japanese

3 See Mazzucato (2013) for the major influence of state “entrepreneurship” in USA economy and the mythology of a pure market economy.

government attributed very important grants to the university research. It played an essential role of coordinator and prospector, especially through its focus on the innovative activities of companies. Moreover, the American strategy especially became a model for high-income countries and the link between knowledge-oriented activities and economic growth became a predominant and recurrent theme. This is why it can be said that in this period, “industrial policy is merging more and more with innovation policy” (Soete, 2007, p. 273).

In connection with this new context, the nature of industrial policy and its economic justifications significantly evolved in comparison with previous periods.

3.1. Innovation policy: nature of interventions and theoretical justifications

The public support of innovation therefore became the new credo of economic policy. In this context, the new spirit of public intervention is to avoid the fallacies of “sectoral and vertical industrial policies” of the 1960s and 1970s and first promote “horizontal” policies, namely to act on the microeconomic and legal environment of companies in order to reinforce its compatibility with competition policy. Therefore, strictly liberal policies were definitively abandoned. To a large extent, neo-liberal competition policies continued to prevail even if their contents substantially changed, becoming more and more different from the Walrasian/Paretian intellectual framework. They were more and more influenced by game theory (Arena and Dutraive, 2016, pp. 14-16) and evolutionary theory for two main reasons. It became first impossible to continue to defend the point of view of a unique and universal context developed in the preceding section. They could not persist in ignoring the necessity to take into account the new institutional and geopolitical specificities of a form of globalization where international competitiveness and an intense race towards innovation were now prevailing. Moreover horizontal policies implied enlarging the set of the political actions of the state in favour of specific companies which had to be stimulated in order to generate more and more innovations.

The prevalent idea became the necessity of helping to build a new “knowledge-based economy” and to organize public action around three main

domains: education, upstream and downstream factors of innovation – the financial conditions of research and intellectual property rights laws – and high-technology sectors. In the first of these domains, the objective was to improve labor productivity, adaptability and mobility of the workforce in order to fit with the new economic context of international competition. Thus world indicators devoted to the comparison of national educative systems (such as the Program for International Student Assessment – PISA, Academic Ranking of World Universities – Shanghai Ranking) were introduced to favor the normalization and geographic mobility of the labour force. Concerning the second domain, various political tools were mobilized to sustain research and development by direct subsidies, stimulative fiscal policy and financial market regulation on the one hand, and by a development of the sphere of intellectual property rights (to boost the possibility of appropriation of research results) and reforms in public research systems (to move it closer to the market by patenting and public-private cooperation) on the other hand. The idea was to allocate public funds to small and medium rather than to large firms “reflecting the view that industrial policy should rather focus on the development of small innovative companies. This view can be traced back to Schumpeter’s idea that growth is a process of creative destruction in which new firms displace older incumbents, so that a sound industrial policy should foster the development of small, innovative firms rather than help incumbents” (OECD, 2009, p. 32). Major attention was paid to the generic high-technologies and especially to information and communication technologies and biotechnologies because of their supposed structural effects on economy taken as a whole (especially on new sectors, new products and markets but also on the productivity in all other economic sectors) in agreement with the prevalence of horizontal policies.

Two major analytical foundations were used to explain the introduction of this new type of industrial policy, leading to a much more eclectic approach: market failures and welfare economics literature strongly supported by the advances of game theory (Arena and Dutraive, 2016, pp. 14-18) on the one hand and evolutionary economics on the other hand. Market failures and welfare economics literature developed what was initially called “the new industrial economics” (see for instance Jacquemin, 1987; Tirole, 1988). In the 1990’s, this literature provided precisely some arguments for public intervention in order to foster innovation

(Dobrinski, 2009, p. 284). According to this literature, private companies cannot indeed appropriate some of their expected returns. Industrial activity is associated to externalities which make, at least in the short term, activities implemented by private companies and indirectly financed by private equity and financial markets risky. Externalities are not intrinsically related to activities based on research and development and knowledge. However, these activities are among those which tend to increase the most the level of risk since they permanently generate externalities which are especially hard to avoid. Legal means such as patents or licenses provide in this context a means to put these externalities in contradiction with the old strict Walrasian-Paretian framework; moreover, competition including these means allows a form of externalities distribution among firms through imperfect competition mechanisms which can be retraced through standard as well as dynamic game theory (Arena and Dutraive, 2016). Sometimes, if some forms of knowledge generate too large increasing returns or externalities in spite of legal devices, the state must intervene as is the case for instance in the field of fundamental research (Encaoua and Guesnerie, 2006). Therefore, the game theory literature on market failures and welfare economics contributed the questioning of traditional competition policies in showing that new technologies and especially information and communication technologies create externalities which in fact increase the variety of market failures and of the cases in which social welfare is not reached. It therefore paved the way to a new industrial policy attributing a larger role to legal means of reducing externalities and to state intervention when markets become inefficient, in connection with what was observed in the real economic world of the 1990s.

Evolutionary economics also provided a set of tools which could help to take seriously into account the role of innovation and knowledge as factors of growth in a dynamic perspective. Based on the various influences of Neo-Schumpeterian ideas (Arena, 2016), the initial purpose of evolutionary economics was to offer an alternative theory of the firm and of competition by overtaking difficulties associated with “substantive rationality”, production functions and traditional microeconomics. This approach focused on the notion of selection in competitive processes, introducing variety, adaptation, and learning behavior in a dynamic economic framework. Within this framework, economic

growth is conceptualized as a co evolution process of social and technological technologies. In so called Neo-Schumpeterian's models (Metcalfe, 1998), "the traditional view of linear innovation models (from research to technology to commercial product) has given way to the now dominating view that innovation results from simultaneous interactions of many agents interconnected in a complex system" (Dobrinski, 2009, p. 281). Because the economic mechanisms and dynamics bound to these factors are complex and multiple (see for instance Saviotti, 1995 part II) and consequently imperfectly manageable, the lessons for a public industrial policy are not so easy to be drawn. However, a strong message of evolutionary models is the conclusion that market processes are not always efficient, as the defenders of competition policy tend to argue. Therefore the defense of an horizontal competition policy is difficult to support using a Neo-Schumpeterian approach which is influential today at least in Europe and where sectoral specificities play an essential role. Thus, even if market failure and welfare economics literature as well as evolutionary economics tried to provide new tools to understand the industrial policies of the 1990s and the beginning of the 2000s, it is obvious that these two approaches strongly differ from an analytical point of view. This remark shows that far from inspiring industrial policy, economic theories rather provide tools which can be used by policy-makers to justify or explain their own conceptions. This is why policy-makers do not exclude making use of different approaches, even if they are based on distinct analytical foundations.

3.2. A new form of organization of economic activities: regional cluster agglomerations

As the preceding section stressed, innovation-based activities are much too complex to be only and always managed by market processes and some new institutional and organizational forms therefore emerged which are connected to the localization of activities. The forms of this localization are various and generated a vast literature which distinguished a typology of geographical areas in relation to the kind of innovation they promoted, the kind of industrial organization they created, their degree of insertion in the international economic system or the role of the state in the constitution of the cluster. Because of the emergence of these agglomerations, national economies are less and less considered as the core of the

geographical organization of activities. This is why delimited territories or areas more and more became the targets of new policies.

The economic arguments used to support a decentralized approach of industrial policy focusing on “clusters” can be found in the developments of new research areas such as evolutionary economics and new geographical economics. These two fields and the approaches they generated share the idea that price dynamics is not only affected by variable costs, as in traditional microeconomics, but also by fixed costs of varied nature, which entailed Marshallian increasing returns. Proximity and geographical agglomeration favor territorial external economies of scale – based on the sharing of inputs and the constitution of labor pools – compatible with a combination of competition and of inter-firm cooperation at different stages of the process. Proximity also favors learning and spillover effects bound to industrial and market linkages which provide the intangible assets of innovation.

All the economic properties, first grounded in Marshall and Beccatini’s analyses of industrial districts or Porter’s “clusters”, and updated in evolutionary or new geographic models have in common their connection with “dynamic market failures” (increasing returns, locking effects and polarization phenomena) in opposition to “static market failures” (size of the market, size of the firm) as in the previous models of competition policy. Therefore, industrial policy has to favor these positive dynamic effects. This is the reason why “industrial policy then not only internalizes externalities, but also produces externalities” (Aiginer, 2007, p. 314). Secondly models also tend to show that the “success” is uncertain, based on finally unpredictable and unverifiable micro-phenomena (sometimes explained by historical events). These difficulties generated some debates concerning the capacity to influence economic agglomeration and the issue of the respective room to leave to market and state. These debates did not lead to definitive conclusions and it is not clear to-day to what extent competition policy is able to contribute to the industrial efficiency of these agglomerations. This temporary conclusion introduced more uncertainty regarding the credibility of competition policies confronted by the rise of these new phenomena. Even more, a purely horizontal competition policy cannot easily be conceivable to favour the development of specified clusters.

3.3. Competitiveness and the international dispersion of productive processes

At the same time, besides this trend towards regional agglomeration an opposite trend of production fragmentation emerged and could also be observed in the 1990s. The globalization of the productive process by transnational companies rose in parallel to the rise of the share of exports in the World Growth National Product. In other words, the tendencies towards supranational and regional level of activities overlapped. The rise of globalization of production and offshoring was clearly the outcome of a combination of political factors, which widened the opportunities for foreign direct investments (China's opening, fall of the Berlin Wall), of technological factors (which reduced information cost and favored fragmentation of the value chains) and of specific economic factors (market deregulation policies in trade and finance). Within this new context the notion of competition was more and more replaced by the notion of competitiveness. According to Bailey-Driffield (Bailey-Driffield, 2007, p. 193), in the last decades this term "has become the holy grail of industrial policy". Popularized in the political sphere by Porter, the concept of competitiveness moved from the analysis of firm business and management to the study of regions and countries and transposed explicitly the assessment of countries performances' from the macroeconomic to the microeconomic framework (Aiginger, 2006, p. 63). This interpretation contributed to the macroeconomic context to an aggregative result and therefore reinforced the usual neo-liberal conception of competition. Increasing market shares in world exports by reducing costs, increasing productivity and fostering innovation became the major objective of economic policies. On the other hand, the search for competitiveness also consisted in attracting foreign direct investments (FDI) by fiscal means. In this process of attracting FDI, territories, national economic regulation and institutions were put into competition. This is why globalization is also a force of policies homogenization. As the World Bank Doing Business Ranking explicitly declared: "By gathering and analyzing comprehensive quantitative data to compare business regulation environments across economies and over time, Doing Business encourages countries to compete towards more efficient regulation; offers measurable benchmarks for reform; and serves as a resource for academics, journalists, private sector researchers and others interested in the business climate of each country" (World Bank Doing Business, 2015).

The conceptions developed by evolutionary economics and new geographical economics can be extended to and used in the field of international economics. For instance, evolutionary economics can help to explain phenomena such as the polarization of FDI in research and development, the success or failure of some offshoring experiments taking into account the importance of tacit knowledge and the proximity of economic activities. New economic geography can encompass integration and dispersion effects of economic activity at the world level.

Concerning globalization, economists – especially new institutional economics and new international economics – and policy-makers also took into account the increasingly central role played in the period by market institutions. Here again, this new form of globalization changed substantially the contents of economic policy. On one hand, the most partisans of competition policy found a way to cope with these new international phenomena by extending the notion of social optimum at the international level. They considered that there was only one optimal environment for business, market and competition, and therefore that the reduction of obstacles to business⁴ and to international trade and investment was now the only admissible policy. On the other hand, an increasing number of economists expressed doubts about the existence of optimal institutions and considered there was a room to analyze the state as a game player. These economists therefore argue that instead of defending a unique extended competition policy it is better to favour a form of public intervention defined as a “strategic commercial policy” (consisting in a renewal of the infant industry arguments) or active industrial policy, which implies that there is no “one best way” but some space for a range of diversity among institutional designs according to the various national histories and trajectories (see for instance Krugman and Obstfeld, 2009; Rodrick, 2009 or Amable, 2005). This second conception was rightly interpreted as a new element of neo-liberal misconceptions and contributed to the weakening of its promoters.

In the field of innovation, comparative studies concerning national systems of innovation developed by evolutionary economists permitted to the

4 Like the list provided by WB *doing business* criteria: reduce time to start a business, time to deal with construction permits, time to get electricity, time to register a property, time to export, time to enforce contracts, time to hire and fire an employee, and time to resolve insolvency.

taking into account of national specificities in the bundle of national institutions related to the strength of globalization as well as the development of local clusters or geographical areas. These studies also led assessment of whether international competition rather favoured variety or convergence of the systems of innovation and performances across nations. The 1990s cannot therefore be interpreted as the end of neo-liberal policies but we should also avoid to under-estimate during the period the importance of the rise of new industrial policies often inspired by evolutionary or neo-institutionalist economics.

The results of competition policies at the beginning of the 21st century are balanced. If the only policy objective is indeed to influence the business environment in order to improve competitiveness, effects appear to be insufficient to allow all participants to support international competition and to proceed to structural transformations in a growing background context of environmental imperative. By continuing to emphasize competition through the notion of competitiveness, competition policies favoured industrial strategies at an international level which generated desindustrialization and the development of strategies of financialization by the big industrial firms. The specialization in research, services and finance which was favored finally appears to be unfit for establishing a balance in the world exchanges (Prodi, 2010; Artus and Virard, 2011; Cohen, 2009, pp. 237-250). The competitiveness policies also affected public finance. For instance, in the E.U. (27), the average of taxes on corporate income passed from 35% in 1995 to less than 22% in 2012. The result is "that of jurisdictions competing against each other and generating a prisoners dilemma; investment is diverted from other locations, but little new investment may be created. If all countries use policy there may be little net effect on outcomes but considerable transfer of resources to firms" (Barba Navarreti and Venable, 2013, p. 8).

The new economic phenomena which emerged in the 1990s and at the beginning of the 21st century (generalized innovation, globalization) did not imply the end of competition policies. Quite the contrary, they contributed to enlarge the purpose of these policies including a more extended definition of the social optimum target. This enlargement however had to face the rise of various new research fields and approaches which were not compatible with the objectives of a competition policy. Therefore, in

the 1990s and at the beginning of the 21st century, the credibility of this policy became less convincing.

However at the end of the 2000s things evolved. The economic effects of the subprime mortgage and current economic crisis put at the centerstage the “proactive”, sectoral industrial policies (CE, 2012, p. 8) and drew an avenue to change substantially the contents of the economic conceptualization of industrial policies.

4. NEW TRENDS IN INDUSTRIAL POLICY: STRUCTURAL CHANGE AND ECONOMIC ANALYSIS

The economic and financial crisis which took place at the end of the 2000s and still exerts its effects to-day drastically influenced the world economy and especially the economies of the European Union. This crisis renewed the interest devoted to manufacturing industry since, as Aiginger noted, industry was and is both characterized by “a statistical decline and [its] maintained importance” (Aiginger, 2007, p. 302). In the main developed countries, the part of industrial jobs and of industrial added value in GDP clearly declined durably, a decline accentuated after the subprime crisis, but the importance of industry in exports was maintained. Since the 1980s around 70% of the world trade and 85% of the research and development investments are still implemented in the industrial sectors. Moreover, the effects of industry on firm services and the number of indirect jobs related to them grew and the importance of hybridization of industry and services (as regards products as well as productive organization) increased drastically. This is why, according to a report of the European Commission, “to a large extent industry can help rescue the EU economy from the crisis” (CE, 2012, p. 32), the new objective being to re-industrialize the European economy with the ambition of reaching 20% for the part of industry in the European GDP about 2020 (from 16% in the average to-day and 11-12% for older industrial economies like UK or France) (*ibid.*).

This renewal of industrial policy accelerated the previous tendencies which prevailed till the beginning of the 2000s. Competition policy was

no longer the unique and central form of industrial policy. On one hand, its characterization changed drastically trying to incorporate new elements such as generalized innovation. On the other hand, it was more and more contradicted by new approaches which were trying to take economic structural change into account.

4.1. Economic structural change in the 2000s: new borders in industry and firms

The financial crisis revealed the danger of a global economic strategy of specialization mainly based on the development of finance, research and development and services. The innovation policies focus – often coupled with a rise of financialization – was finally deceptive. In fact, between 2000 and 2004, the American growth was weaker in the information and communication technologies sectors than in the other sectors (Kohler, 2006, p. 102). The innovative sector corresponded to only 0,4% of the US added value and the sector of semi-conductors represented about 0,5% of employment in developed countries (McKinsey Global Institute, 2010). Some type of specialization weakened economies and made them sensitive to external shocks. For instance, in contrast with UK and France, some economies like those of Germany and Japan were able to preserve intermediary manufacturing activities which permitted them to participate in the new international division of productive processes in a more advantageous way. On the contrary Greece and Spain were much more affected by the “sovereign debt crisis”: their growth was essentially based on domestic services and construction industry, and their energy and manufacturing goods imports could not be compensated for by tradable services surplus (Artus and Virard, 2011). Moreover, innovation is not sustainable without strong industrial production support since we know to-day that both activities are always strongly connected. As a consequence “external constraints are back and imply the return of the imperative of re-industrialization” (CAE, 2011, p. 46).

But this re-industrialization has to be put in perspective with the economic structural change that occurred, and played and is still playing an essential role in the debates related to industrial economics and policy. Economists as different as Fontagné, Mohen, Wolff (2014), Naudé (2010a, 2010b) and Rodrik (2007) recently resituated the notion of structural change in an historical perspective. For these authors, it is clear

that economic growth also implies in the long run a “fundamental process of structural transformation” (Naudé, 2010a, p. 1). This process concerns the sectoral evolution of technology, the relations between different sectors of the economy and the implication for consumption and income as the theorists of structural economic change (Baumol, Chenery, Syrquin, Pasinetti...) showed a long time ago in the 1960s and still stress nowadays.⁵ It naturally generates debates “on the sources of total factor productivity (TFP) growth, the extent and determinants of convergence in per capita incomes, the nature of technological progress and innovation, the role of manufacturing in growth and development, the rise of the service sector in value added, of agglomeration, clustering and urbanization, and other issues” (Naudé, 2010a, p. 2).

From this perspective, the novelty of contemporary structural change is first related to the relation between industry and services. During the Golden Age decades, we all know that the part of agriculture decreased in the growth domestic product of developed countries, first in favour of industry and then more and more in favour of the sector of services. However, in the last two decades, the border between services and industry has become less and less distinct. First, new technologies such as information and communication technologies reinforced substantially the importance of the intermediary sector of industrial services which contributed to confuse the border. Second, an increasing number of industrial firms are classified within the service sector but their activity in this sector is generated by the subdivision of the industrial value chain at the international level (Fontagné, Mohen and Wolff, 2014, p. 1). This redefinition of the border between industry and services has important effects on the relationship between firms, services and industry, creating new activities in which some firms or parts of firms tend to specialize in production which are not material but contribute to industry, as “factoryless goods producers” (Fontagné, Mohen and Wolff, 2014, p. 2). This new type of economic structural change also appears at the “local” level with the emergence and the evolution of clusters and therefore of inter-firm relations favoured by new forms of state intervention and of industrial financing (especially through new types of public subsidies and of venture capital):

5 For an appraisal of the analytical contributions of the theories of economic structural change, see Arena and Porta, eds. (2012). See also the introduction of the special issue, Dutraive (2016).

the borders between firms are here transformed, pointing out another crucial aspect of economic structural change.

All these transformations obviously imply a new industrial policy. First, it is necessary to correct what appear to be *ex post* misleading strategies in the domain of industrial policy (Andreoni and Gregory, 2013). The excessive decline of some industrial sectors in some developed countries has led to a loss of knowledge and capabilities which will not be restored easily. Industrial policy will therefore be useful to a re-orientation of structural change in order to strengthen specific knowledge-intensive sectors, areas of economic activities, regions, clusters, technologies and even industrial services, especially in new types of economic activity. Second, during the financial market crisis, the difficulties met by banks and the emerging economic recession led many banks to reduce their lending to firms in order to repair their impaired balance sheets. The main consequence is that debt financing has become more expensive and difficult to obtain, so has financing through capital markets. Risk capital financing was also reduced substantially. The effects of the financial crisis on financing still remain significant in many developed countries since the industrial sectors which are strongly impacted are precisely those in which knowledge-based and high-technology investments are important and costly. Industrial policy answers to this problem are a great challenge and related to the role of state in financing mechanisms: it is necessary to stop a mechanism in which innovative firms cannot invest what will be necessary to promote economic growth and long-term investment.

Here, the novelty is not only related to the fact that the old opposition between horizontal and vertical policies is less and less meaningful but can also be found in the increasing difficulty in this context to reduce industrial policy to competition policy: this latter type of policy is indeed inadequate to bring answers to the challenge implied by a new form of structural change. The new paradigm of industrial policy is less systematic and dogmatic than before and more and more pragmatic and adapted to the contexts. For instance, even before the crisis outbreak, in a report dated 2005, the European Union defended a specific “matrix approach” combining horizontal policies aiming at improving competitiveness in all sectors in terms of broad measure (generic and independent from market specificities; contributing to the elimination of market failures; favouring endogenous

growth...) and sectoral policies that acknowledge sector differences necessitating specific measures (Aiginger, 2007; O'Sullivan, Andreoni, López-Gómez and Gregory, 2013). Mac Kinsey reports (2010, 2012) also considered that public policies could not provide identical solutions for the whole variety of sectors and argued that distinctions had to be made between "tradable sectors" corresponding to globalized oligopolistic markets and "non tradable" ones being related to domestic ones: the basic idea is that it is difficult for public authorities to control tradable sectors while it is easier to control the latter. Moreover, Kinsey defined industry in an extensive way (including trade and services) and considered that employment is created in majority in domestic and local services rather than in high technological sectors. Obviously the contents of industrial policies must take these distinctions into account and therefore face a differentiated international structural change which has outdated competition policies.

4.2. New analytical developments in industrial policy in the 2000s

In order to better understand the nature of the economic structural changes which are impacting economies at local, national and international levels, economic theories had to adapt and provide new developments.

Even if it is not really new, the literature on market failures and welfare economics tried to renew its contents and message taking into account new phenomena related to economic structural change. First it combined micro-economic analysis and more macroeconomic tools related to the theories of economic endogenous growth. An interesting example of this analytical tendency is given by the contribution of Elie Cohen to the Round-Table of the OECD that we have already referred to (Cohen, 2009). E. Cohen notes that some usual assertions concerning the supposed inferiority of state regulation as regards economic efficiency are debatable (Cohen, 2009, p. 226). Now for E. Cohen as for new industrial microeconomics, both markets and the state can fail to find an efficient allocation, as the financial crisis of the end of the 2000s and its financial market failures showed. Finally, E. Cohen contested the idea of the universal superiority of competition, "some forms of competition implying a negative impact on innovation" (*ibid.*). Aghion and his co-authors (Aghion, Dewatripont, Du, Harrison and Legros, 2012; Aghion, Boulanger and Cohen, 2011) also combined micro and macroeconomic tools to show that it was to-day

useless to have “existential” debates on the advisability of industrial policy vs. competition policy. Their point of view is that industrial policy must precisely target the sectors where competition and innovation were crucial and define therefore an industrial policy which favoured welfare, avoided market failures but also contributed to global endogenous growth.

Second, the literature on market failures and economic welfare also focused on the problems related to new markets, the creation of which was not spontaneous but submitted to the regulation of (national, international or local) public authorities as it is the case for instance in the “green” economy with the markets of licenses to pollute or carbon taxes; these markets being not only governed by the objectives of self-interest but also by the purpose of public interest, and the conciliation of these objectives requires in its turn the use of the theory of market failures as well as of public economics to cope with the essential presence of substantial externalities. The literature on market failures and economic welfare was also used to cope with research and development and knowledge based activities. Here again, externalities are at the center of knowledge markets; the first are monetary externalities related to the increase of quasi-rents or of the amount of sales in a sector generated by the research and development expenses in another sector (see the mechanisms of inter-sectoral diffusion of new technologies); the second are knowledge externalities generated by knowledge itself, characterized as a social good (see for instance the case of science-related industries and how the bio-technological paradigm replaced the chemical paradigm in the pharmaceutical industry). The knowledge externalities mentioned above cannot be coped with through market mechanisms. These mechanisms have to be completed through state intervention: innovation subsidies, incentives to create technological areas or public purchase contracts provide tools to complete possible failures which cannot be avoided in a pure market economy.

Third, coordination failures provided a further analytical field to explain some aspects of economic structural change. Thus, for instance, the notion of cluster provides a good example of these possible failures which industrial policy can help to avoid. In this context, the analytical task of the literature on market failures and economic welfare is to look for a characterization of the best possible coordination of firms and economic activities in a given geographical space (Fontagné, Mohen and Wolff, 2014, p. 8). Finally, public authorities can play an essential role when mergers and

acquisitions are realized at the international level; firms are not able to assess what national welfare is and the state can again give its help to contribute to evaluate and then contribute to favour this welfare (*ibid.*). Finally, this assessment of welfare by the state is also useful to try to ensure international competitiveness since this notion does not only concern firms but nations (Aiginger, 2006, p. 122).

In spite of these advances, substantial limits however remain when one looks for the foundations of a new industrial policy using the literature on market failures and economic welfare. This literature has the merit of replacing the opposition between perfect and imperfect competition by a continuum of possible forms of economic coordination including various types of imperfect competition but also inter-firm coordination schemes and differentiated state interventions (Arena and Dutraive, 2016). This continuum allows industrial policy to be approached in relation to all the possible specific cases. This point of view may appear to conciliate analytical rigour and realism. However, as Gabszewicz et Thisse (1999) already noted a long time ago this continuum provides a patchy set of models the global consistency of which is far to be obvious and which is neither robust nor generalizable. Finally, economic structural change is not analysed as such in this literature but only through its effects on economic coordination.

In comparison, evolutionary economics which seek to understand the logic of industrial dynamics is better equipped to study economic structural change in relation to the sectorial specificities and interactions. One example is provided by Malerba (2007) in which in a “history-friendly” framework, economic dynamics is related to the diverse industries. We can also refer to a paper of Castellaci (2007) which relates technological regimes and sectoral differences of productivity. These differences depend on different conditions of technological appropriability, different levels of technological opportunities, various levels of education and capabilities, degrees of openness to international competition and firm sizes. Several other examples of this type of contribution can be considered. Thus, Davies, Rondi and Sembenelli (2001) proposed a matrix of the market shares of the main European industrial firms according to two criteria: the sector to which they belong and their national origins. Thanks to this matrix, it is possible to follow the evolution of the degree of diversification or specialization, of the geographical location and the level of multinationalization

in European industry. This matrix helps to understand some aspects of European structural change and to elaborate the foundations of an industrial policy which is entirely different from a competition policy, based on coordination at the European level. In a close analytical framework, Cantwell and Iammarino (2001) show how, in an economy submitted to a quick process of globalization and economic integration (as in Europe), regions create geographical connections with other territories either in the same country or in another European country utilizing multinational firms efforts towards technological change. Here again, national countries and the European Commission are necessarily interested in the formation of clusters and networks and can act on productive organization to reinforce emerging connections with the help of adequate industrial policies as “the smart specialisation strategy” illustrates, in which regional dimension is a part of European policy (especially to prevent duplications in clusters). Finally, Malerba, Nelson, Orsenigo and Winter (2001) focused on the specific case of increasing returns industries as, for example, those which are impacted by digital technologies. In this context, competition is obviously analysed through the definition of anti-trust policies but also the definition of a program of subsidies allowing the development of new forms of technological organization.

All these examples focus on different aspects of economic structural change as such (technological, geographical). In this context, industrial policies cease to be first competition policies and can contribute to the re-orientation of technological change and of its forms, and a policy of coordination across different regions at the European level. Moreover they are much more eclectic trying to specify industrial policies taking into account institutional devices, industrial sectors, contexts or the nature of agents.

5. CONCLUSION

Two major conclusions can be drawn from our contribution.

First, it is clear that industrial policy is a complex reality which expresses economic observations, political considerations and analytical interpretations. It is not surprising therefore that various points of view are

defended to understand it, that they do not coincide and form a matter of debate. These points of view also evolved with time but often persisted and overlapped. It is not therefore easy to untangle the strings of arguments and discussions in the matter of industrial economics and policy to-day.

Second, our contribution showed a surprising evolution in time of the notion of industrial policy. The starting-point of this evolution was the beginning of the 1980s when most of economists and policy-makers tended to discard industrial policy and to insist on competition policy. The present situation shows that the central issue of industrial policy has become to-day the understanding of how public authorities can help our economies to favour a form of economic structural change which can help the world economy, the various countries and smaller and local areas to generate growth, innovation and employment. The evolution we tried to point out is striking because it gives the impression that reality obliged economists to adapt their analytical contributions, whichever these were *a priori*. In matter of economic policy, contributors are thus condemned to understand *ex post* instead of explaining and foreseeing *ex ante*. The examples of the concepts of pure competition and economic structural change are significant from this point of view. The developments devoted to both of them show that the progressive explanatory weakening of the former and the sudden rise of the latter were as much the result of economic change in the real world as the conclusion of analytical debates between different economic approaches or schools of thought.

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