

The new Spanish industrial policy: innovation, external economies and productivity

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1. Introduction

This article gives a synthesis of the economic foundations of the new Spanish industrial policy. We are currently in an **industrial transition** process, which involves changing our production function for a new model in which knowledge and innovation have a decisive role for production sectors as a whole. Industrial policy is approached as a support for this industrial transition sustained on a new conception of the government of the economy. The new structure of Central State Administration has led to **recuperating the Ministry of Industry** for designing and implementing industrial policy strategies ¹.

The **role of industrial policy** consists in governing this production change and in particular, in activating processes enabling a substantial increase in productivity. As the European Commission has pointed out (2005), the good health of the manufacturing industry is vital for economic growth. In Spain's case, it is also necessary to improve external growth, and this demands a great adaptation effort by the industrial sector which provides over 80% of our export capacity. In the new production function there has to be a greater intensity of capital, a qualification of the work factor adapting to the new needs of the economy of knowledge and, last but not least, a greater total productivity of the factors. The new industrial policy is very particularly aimed at the activation of this total productivity of the factors, strengthening innovation.

This article sets out to identify the basic features of the new Spanish industrial policy. First of all it examines its place in the reform programmes of the European Union and Spain. It then identifies the theoretical bases and in particular the notions of innovation on which a relevant part of the new strategy is designed, and as to how a new government structure adapting to this is adopted. Finally some of the new specific industrial policies are introduced, one of which is the great financial effort made to back R+D+i such as the CENIT programme, the new strategy of support for innovation of SMEs grouped in industrial districts or clusters, what are known as Innovative Company Groups (AEI) and action in new sectorial policies such as the ones stemming from transposing the Kyoto directive (national plans for assigning emission rights).

2. Need for a new industrial policy: the European and global setting

¹ The new Ministry of Industry, Tourism and Trade (MITYC) is in charge of a wide range of policies affecting productivity, including power and the information society.

The **need to have a specific industrial policy** arises first of all from being persuaded that vast and ever-faster transformations or mutations are taking place affecting most of the industrial activities all over the planet: the structure of markets is changing and the integration in large-scale economic or commercial areas is speeding up; the nature of the product, of the process, of the organisation of business and of the forms of trade are changing, with a new knowledge-based economy becoming widespread. Now, at the beginning of the 21st century, innovation is the driving force behind these transformations. Today, even more so than in that great theorist of innovation, Schumpeter's time, there is a pressing need to have strategies far from outdated interventionism processes which are able to solve the major underlying market faults in the processes of generating, adopting and disseminating innovation, or tackling certain effects stemming from the important industrial mutations.

Industry continues to fulfil an essential role in economic development. There has to be a review of the old Colin Clark – style thesis according to which there is an inexorable dynamics which would lead the economies in a first stage to reducing the weight of agriculture, then of industry, and finally of tertiarising practically all production. In the 21st century's knowledge economy there will be a place for agriculture, for industry and for services, on condition that they intensify their knowledge-dense activities.

Industry continues to lie at the heart of the globalisation process, and goes on playing a central role in the European economy. In the European Union, the manufacturing industry directly employs over 34 million people, who generate 20% of the GDP and contribute 75% of the exports. Industry also has pull-along effects that are clearly superior to those of services, in particular in intermediate consumptions. The progressive externalisation of services from industrial companies demands that any economic analysis on the weight of industry in contemporary economies needs to demarcate the industrial perimeter properly². Consequently, inferring any decadence of industry from the relative reduction in industrial employment is an enormous simplification. The industrial strategy in European motor-states, such as France and Germany, postulates the progressive specialisation in knowledge-intensive industrial sectors. Specialisation in low-intensity technology sectors entails lower innovative propensity. Strategies based on “focalisation” in sectors of the economy with high knowledge or programs with a large technological component are put forward. This focalising strategy was already implemented by Japan and the United States, and lies behind the development of new technologies such as ICTs, biotechnology or nanotechnology³.

The diagnosis of the European Commission (2005) again places **industry as the crucial sector for recovery of European competitiveness**. The new Commission has formally proposed recovering industrial policy. In the new action programmes designed to materialise the Lisbon strategy the general priorities set were: (1) making Europe a more appealing zone for investment and employment; (2) placing knowledge and innovation at the service of European growth; (3) and defining policies enabling companies to create more numerous and better qualified jobs. The Commission (2005, p.3) proposes implementing an industrial policy with the priority of “creating conditions

² For example, the calculation made for the French economy raises the economic impact of industry up to 41% of the GDP and to 51% of private employment (Rapport Beffa 2005, p. 7).

³ See Fontela (2006).

favourable for the development of companies and of innovation with a view to making the EU an attractive zone for industrial investments and job creation”⁴.

3. The “National Programme of Reforms in Spain”: the economic framework for the new industrial policy

Industrial policy in Spain forms part of the general economic policy and very particularly of the context of the **National Reforms Plan (NRP)** approved in October 2005.⁵ As part of relaunching the Lisbon strategy, the Spanish government has drawn up an NRP which sets out to reach full convergence of income per capita in 2010 and exceed the employment rate of the EU. To do this it has to make productivity grow and improve the quality of employment⁶. Among the **objectives of the NRP** the following should be stressed:

1. Increasing the ratio of investment in R+D over the GDP, exceeding 1.07% in 2004 up to 1.6% in 2008 and 2% in 2010.
2. Increasing the contribution of the private sector in investment in R+D, going from the 48% in 2003 to 52.5% in 2008 and 55% in 2010.
3. Attaining the EU-15 average in the percentage of the GDP assigned to ICT, going from 4.8% in 2004 to 6.4% in 2008 and to 7% in 2010.

A number of measures and strategic action have been adopted for fulfilment of these objectives, a major one of these being a great increase in the budgetary resources intended for R+D+i. The aim of increasing the items by at least 25% per annum has been adopted, and until the present time this is being comfortably exceeded (32% from 2004 to 2005).

The NRP covers **seven basic axes**:

1. Reinforcement of Macroeconomic and Budgetary Stability.

⁴ One should bear in mind that in the European Union 80% of the resources allotted by the private sector to R+D come from the industrial manufacturing sector. On a planetary scale the automobile sector leads expenditure on R+D, exceeding in absolute values the sector traditionally coming first, which was the pharmaceutical industry.

⁵ In March 2005 the Spring European Council was held, and, based on the *Kok Report* of November 2004, it put forward **relaunching the Lisbon Strategy**. The basic idea behind the application of the Lisbon strategy for industrial policy is that this should be sustained on a partnership between the European Union and the Member states. Aspects such as competition, the regulation of the single market or economic and social cohesion must be handled by the European Union. Apart from this, the **member States must draw up their industrial strategies in the framework of the “National Reform Programs” (NRP)**. Each Member State must present an *NRP* structured into 24 *Integrated Guidelines for Growth and Jobs 2005-2008*. The follow-up of the different NRPs by the Commission must ensure consistency between the different industrial policies. The **Commission aims to attain 3% of the expense in R+D of the E.U. GDP in 2010** and to ensure that 2/3 of this expense should be made by the private sector. Consequently, to comply with the Lisbon objectives it is of vital importance to attain the objectives of the different NRPs, and very particularly the objectives connected with R+D. See Permanent Lisbon Unit (2005).

⁶ See UPL (2005). The NRP was drawn up by a Permanent Lisbon Unit directed by a national coordinator. Mechanisms for participation in the drafting and follow-up of the Plan were established with social interlocutors, Chambers of Commerce, Parliament, Autonomous Communities and Local corporations. In 2004 the Plan for Dynamising the Economy was drafted, forming the basis for designing the NRP.

2. Strategic Plan for Infrastructures and Transport and A.G.U.A. Program
3. Increase and improvement of human capital.
4. R+D+i strategy (INGENIO 2010).
5. More competence, better regulation and competitiveness.
6. Job market and Social Dialogue.
7. Business Fostering Plan.

Although the seven axes have an important effect on industrial activity, axes 4, 6 and 7 should be stressed through their implications on industrial policy, insofar as they very intensely affect objectives and instruments of industrial policy such as the R+D+i strategy, financing the investment of SMEs and the regulation of work contracts, with a highly active participation of the Ministry of Industry in its definition⁷.

4. The new Spanish industrial strategy and the encouragement of productivity

4.1. Structural characteristics of industry in Spain

The new Spanish industrial policy sets out from an acknowledgement of four structural characteristics of Spain's industrial economy which the new industrial strategy has to cater for⁸:

1. Production specialisation in sectors with scanty knowledge intensity. Although Spanish industry is gradually reducing the relative weight of sectors with lowest technological intensity, it still has some relative specialisation in sectors of medium-high or medium-low economy sectors. In spite of all this, companies with very high levels of competitiveness and internationally competitive can be found, for example in the foodstuffs or metal industry⁹ within the sectors classified as non-intensive in knowledge.

2. Low average dimension of companies and production establishments

The dimension of the Spanish industrial company is one of the smallest in Europe: it is lower than the EU average and the average for the new countries in the extension¹⁰. The scanty average size of industrial production establishments, the small size too of big companies and the small size of medium and high technology companies makes this feature one of the fundamental questions of the Spanish industrial system. One should take into account that there is a correlation between the size of the company and the added value per member of staff.

⁷ Part of the new policy for regulation of the labour market that ought to be stressed is the new regulation for improving the quality of employment signed by Business Organisations and Trade Unions and the government on 9th May 2006, the "Agreement for improving growth and jobs".

⁸ See José Luis García Delgado (2006), Enric Genescà (2005) and (Francisco Pérez (2004).

⁹ The mechanical classification of sectors into general types, though useful for analysis, involves some major limitations. For example, sectors such as textiles have a wide range of companies that are technologically highly advanced and with great innovation capacity, while certain companies in advanced sectors such as pharmacy may suffer from low research levels. On the state of technology and innovation in Spain see Sánchez Asiaín (2005).

¹⁰ The new companies in the extension constitute a separate case, due to their large company structure being a legacy of their recent past as communist countries.

3. **Low expenditure on R+D+i** in the private sector, and prominently in the industrial sector. This is a well-known characteristic of the Spanish economy in relation with the countries in our setting ¹¹, and one which the indicators available on the effort in R+D+i all coincide in stressing (COTEC 2004 and 2006). The set of indicators on innovation also vouches for the general weakness in the innovative process of the Spanish economy as a whole, and the tendency for the distance to be accentuated in respect of the most advanced community countries (European Trend Chart on Innovation 2006). The specific qualification in this case lies in the existence of process or product innovations which do not necessarily involve the development of R+D, such as the ones based on design or fashion ¹².

4. **Moderate progress of productivity and competitiveness** of the Spanish economy. This is a basic weakness, which reflects the consequences of a model of growth that has given more attention to obtaining cost advantages of the work factor or of raw materials than in developing a new innovative production base. The scanty growth in productivity of the Spanish economy is due to a model of production growth based on intense growth of the work factor, but with little capital stock per employee, scanty average training level, and little incorporation of technical progress (Vallès 2006). In spite of this, **industrial employment in Spain has grown over the last decade and the market share of Spanish industrial exports has stood at a level around 2% worldwide**, reflecting a general good performance of industry. The improvement in the financial setting, the continuing strategy of salary moderation and the forceful demand have enabled exploitation of the industry's competitive advantages, in spite of the appearance of new competing countries such as the newly joining countries and the emerging Asiatic economies.

4.2. The new Spanish industrial strategy

In the context stated, the **new industrial policy** has the aim of contributing to the growth of aggregated productivity of our economy, attempting to take advantage of its strong points and solve the weak ones. Very specifically, affecting the **total productivity of the factors**, and especially the innovative capacity of industrial companies and industrial settings. The idea is to boost the generation of growing returns by two main channels:

1. Strengthening the advantages stemming from **scale** (economies linked to the business dimension) ¹³;

¹¹ Busom (2005).

¹² The European Union Trend Chart (2005) places Spain at n° 20 in the ranking of countries according to registration of EPO and UPSTO patents *per capita*, under the EU average. It nevertheless takes 11th place in the registration of community designs *per capita* (above France and the United Kingdom), and comes 6th in registration of community trademarks *per capita* (over all the big European countries).

¹³ One of the crucial points in the new industrial setting affecting big business lies in the consequences of the acceleration of the globalisation process that has been arising over recent years. In some of the production sectors affected by this process, such as the steel or aeronautic sector the institutional mechanisms for governing companies are still conceived not in the adaptation to the new global setting but in the construction of the European market. The industrial policy must be very particularly aware of the organisational and business changes (merger processes or takeover bids) preventing the trend towards concentration from making the markets any less competitive.

2. Strengthening the advantages stemming from the **environment**: rising returns associated with the spatial concentration of innovative small and medium-sized enterprises (Becattini 1979).

The **extension of the markets** stemming from the globalisation process affects the industrial production by underpinning production specialisation and generating increasing returns. The greater the scale of the markets, the greater the tendency towards concentration and appearance of economies of scale or range which end up in the extension of industrial production and the reduction of costs. The process has traditionally only been contemplated from the **angle of big business**, stressing the trend towards concentration of production in big transnational companies. Nevertheless, over the last two decades the existence of **industrial processes based on small and medium-sized enterprises** meeting the new conditions of extending markets in a different way has been emphasised. The Marshallian **industrial districts** explained by Becattini (1979 and 2006) or the **clusters** analysed by Porter (1990) manage to give a positive response to the challenges of globalisation by generating economies outside the company but internal to the sector or territory in which these operate. This distinction is essential for understanding the new industrial policy. On one hand, the initial disadvantages stemming from production specialisation in sectors with scanty knowledge intensity, or from low production size, may be compensated for by activating innovative processes in territorial environments¹⁴. As will be seen below, the new programmes for support of Innovative Company Groups (AEI) are above all aimed at strengthening the constitution of industrial districts or clusters, backing innovative processes¹⁵. On the side of big business and scale economies, a strategy complementary to the previous one is required, with programmes such as the CENIT, intended to foster research and development, establishing consortiums of large-sized companies.

5. Four notions of innovation in new Spanish industrial strategy

The industrial strategy based on support for innovative processes must adapt to the economic characteristics existing at any time. The economy of the first half of the 20th century, in which the notion of innovation was approached mainly by Joseph A. Schumpeter, was quite naturally highly influenced by an institutional, financial and technological setting very far from the present setting of commercial integration, opening of financial markets and accelerated technical and organisational change. Part of the prevalent vision about the strategy for fostering innovation assumes that innovation must start from research, and if possible from basic research. This supply-orientated and not demand-orientated view has a Schumpeterian substrate and for economists such as Baumol, it does not adapt to the current characteristics of the model

¹⁴ The industrial districts specialising in the production of ceramics in the province of Castellón are one of the most successful examples, based on a set of specialised small and medium-sized enterprises which compete and cooperate at the same time.

¹⁵ See Order MITC/2691/2006 (State Gazette n° 199, 21st August 2006, p.30854-30862), by means of which the conditions, system for aid and management of support measures for Innovative Company Groups are regulated.

of development. The traditional view of innovation should at least not exhaust a complex and complete industrial strategy like the one attempted to be made in advanced economies such as the Spanish one.

Furthermore, the **strategy must go both ways**. On one hand we have an orientation closer to the university and in general to scientific development, to be implemented basically from scientific political institutions (MEC/CSIC). This is a way of guiding research towards development and innovation, **taking a more business-orientated culture to the scientific world**. Apart from this, from the standpoint of industrial policy, the direction must go the other way: **taking the company towards the university and towards basic or applied research**.

In the approach proposed from the MITYC, the idea is to guide innovation from the market. In this strategy, which is becoming dominant in the European Union (and in a large part of the OECD) the core lies in fostering business R+D+i, and has a diverse and not univocal nature. In this respect, the four paradigms on the innovation process inspiring the new industrial strategy of the Spanish government are now explained. Although in theory it may seem that some of these (particularly the “Schumpeterian” and “Baumolian” ones) are alternative and mutually exclusive visions, these are actually approaches applicable to different contexts and must therefore coexist¹⁶.

1. **The Schumpeterian approach to innovation**. As this is understood by Schumpeter (1942)¹⁷, innovative entrepreneurs destroy the initial market position through their innovation and achieve a certain temporary dominant position on the market in which

¹⁶ The notion of innovation is not only increasingly becoming a plural and complex notion from a theoretical standpoint, but is also this in its recognition for statistical purposes. In July 2005 the **third edition of the Oslo Manual** (OECD 2005) came out, modifying and improving on the second 1997 edition. The Oslo Manual attempts to define a conceptual and methodological framework for compilation and construal of indicators and data connected with science, technology and innovation.

Previously restricted to innovative aspects in product and process technology in the manufacturing stage, this third edition **extends the concept of innovation** for the service sector and the sphere of non-technological innovation, including two new types of innovative activity, referring to marketing and organisation. This is highly relevant since some of the main innovations fostered from the world of business over the last twenty years belong to this same category. Hence, companies like IBM or Microsoft have taken a pre-eminent position in their sectors, not only thanks to the vast resources allotted to R+D in the strict sense, but also due to their own redefinition of their model of business.

The new Oslo Manual defines **four classes of innovation**, covering a wide range of improvements in business activity¹⁶:

1. **Product innovation**, which implies significant changes (though not involving any radical novelty) in the characteristics of goods or services. Examples of this type of innovation are the electronic bank or vehicles with reduction of contaminating emissions.
2. **Process innovation**, which includes significant changes in the methods of production and distribution. One example of this kind of innovation are cash desks with scanners or the digitalisation of printing processes.
3. **Innovation of organisation**, which refers to putting into practice new work methods, both in business practices and in organisation of the place of work or in the external relations of the company. One example of this type of innovation is the redistribution of jobs among employees.
4. **Innovation of marketing**, which reflects the implementation of new marketing methods.

¹⁷ This idea can be found in Schumpeter (1911 and 1942) and Paolo Sylos Labini (1956).

they work (creative destruction). Innovation has a sporadic nature, it is a singular event which gives rise to a new production process or a new industrial-type product. The advantages obtained by the innovative process are extended over time. This is furthermore a phenomenon polarised in space and in time, which is developed in a particular type of business structure: big companies or large-sized scientific-technological infrastructures (laboratories). This whole conception leads to industrial policy instruments wholly centred on this type of large structures, which also (like an inevitable “fatum” through the economies of scale) are the ones inevitably coming out on top in the economic world (big holdings and trusts, in a context of monopolist and oligopolist market structures)¹⁸.

2. **Baumol’s “innovating machine”**. Over the last few years, a concept of innovation understood as a permanent, recurrent and continuous process has crystallised in the theoretical sphere (Baumol 2002). This is connected with competitive settings, in a globalised economy, in which innovation is the “conditio sine qua non” for the actual survival of the company. In this approach, in which long-term growth depends on the creation and diffusion of new knowledge (Romer 1986), SMEs are not conceived as mere receptors of innovation of the big companies, but as powerful generators and amplifiers of innovation when they are located in the right settings.

3. **Innovation in Becattini’s Marshallian industrial districts**. The third attitude to innovation is understood from an approach of innovation linked not so much to the particular company but to the socio-economic setting in which this operates. This is the innovation in the “Marshallian industrial district”¹⁹. From the late nineteen-seventies, the notion of “industrial district” began to come into economic analysis, through professor Becattini²⁰. The reencounter with the Marshallian concept of industrial district (Marshall 1890) is closely connected with an appreciation of a socio-economic vector, the industrial atmosphere found in certain industrially-based cities, and theorised in Marshall’s *Principles of Economy*. In this concept, SMEs, which compete in a localised territory, are the central agents in the innovative process. In a context of “decomposability” of production processes, an industrial district consists of an extensive ensemble of small and medium-sized enterprises which compete and cooperate at the same time and manage to obtain growing returns, in an open economy setting²¹. In these settings technological and non-technological spillovers from some companies to others take place, either directly or through the different specialised phases in the production process²². The result is a fast and effective diffusion of product and process innovations, and continuous feedback of innovations²³.

¹⁸ Sylos Labini (1956).

¹⁹ An extensive explanation of the notion of industrial district and its application in different countries can be found in the monographic issue of *Economía Industrial* (2006).

²⁰ See Becattini (1979) and Becattini, Costa and Trullén (2002).

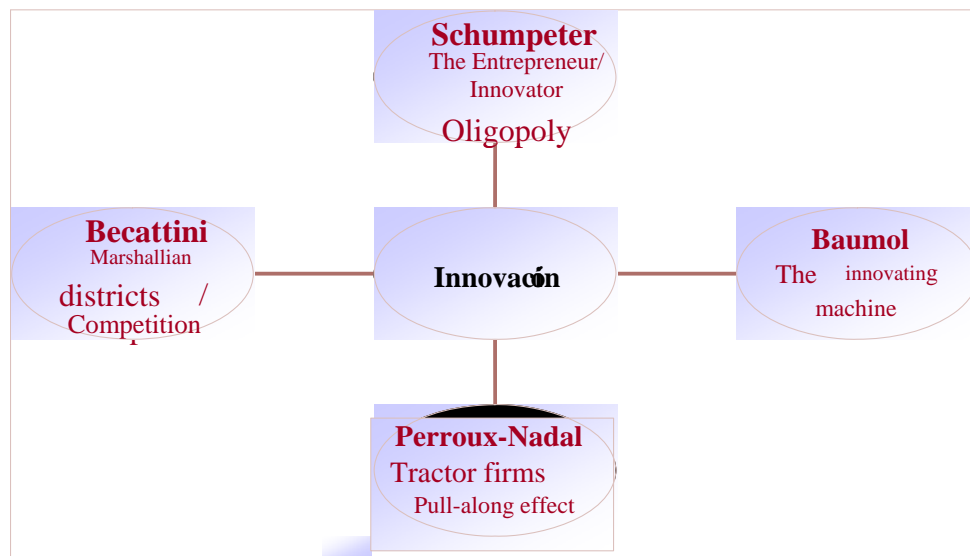
²¹ It is important to point out that the rules of the game in the industrial district enable compatibility between growing returns and competition. That is, growing returns are generated in markets with perfect competition.

²² On the response of the new competitive setting of Italian industrial districts see Signorini and Omiccioli (2005).

²³ These processes have been documented in the industrial ceramics districts in Castellón, the textile districts of (Italy), Sabadell or Terrassa. On their recent dynamics see Vázquez Barquero. For the Spanish case see Trullén (2005 and 2006).

4. **Innovation through “tractor” companies in the sense of Perroux and Jordi Nadal.** This complementary approach to the previous ones lies in the use of “pull-along effects” stemming from the presence of large “tractor” companies, particular companies which pull along the innovation of the whole set of companies in a territory²⁴. The nature of the external economies whose promotion is sought is very different from the one existing in the Marshallian setting; these are technological and pecuniary economies studied in the nineteen-fifties by Tibor Scitovsky, based on the presence of large motor industries with high pull-along effects. This strategy was used in the Poles of Development policy of the nineteen-sixties²⁵. Professor Jordi Nadal has studied the effects of the strategy of tractor industries in the textile sector in Barcelona in the second third of the 19th century²⁶.

Figure 1. The four courses towards innovation in the new Spanish industrial policy



6. A new government structure for a new innovative strategy.

The new industrial policy, which is based on a plural innovation concept like the one explained herein, requires adapting its organisation to said plurality of approaches. Amongst the changes in organisation that have been made to adapt to the new strategy we should first of all stress the creation of a new **Secretariat General for Industry** (SGI), integrating the new Directorate General of Industrial Development (previously within the DG for Technological Policy of the Ministry of Science and Technology), the

²⁴ Historically, certain tractor companies such as Bonaplata y Cia in Barcelona have acted as disseminators of process and product innovation in their environment since the beginnings of the industrial revolution. Nadal (1984). Some examples of this strategy today might be the big car companies such as SEAT in the manufacturing sector of Catalonia or PSA-Citroën in Vigo, or aeronautics companies such as EADS-CASA and Airbus in Madrid, Seville or Cadiz. This type of big companies has its importance in the strategy of not only importing technical change but of being able to generate it. They act as driving forces for innovation on a broad components industry or on an extensive set of service companies, with major external economies over the rest of the economic fabric.

²⁵ Perroux (1961-1969).

²⁶ Jordi Nadal (1984). Also see Nadal 2003.

Directorate General for SMEs (previously part of the Ministry of the Economy and Treasury) and the Centre for Industrial Technological Development (CDTI) (previously under the Ministry of Science and Technology.):

1. The **Directorate General for SMEs** has taken in a good deal of the **policies for innovation addressing SMEs**. In particular, the vision of innovation in a sense of industrial district demanded locating a significant part of said policies, (particularly the ones based on support for technology) at this Directorate General. Consequently policies like the ones for backing innovation and technology through Technology Centres are assigned to this directorate general, in which the National Innovation Company also resides. Hence, the New Plan for Business Promotion in its SME side and the strategy for support for training and development of Groups of Innovative Companies (AEI) are run from this directorate general.

2. On the other hand, the strategy of support and consolidation of major Research and Development programmes focussing on **big companies**, of a Schumpeterian kind, has been implemented from the **CDTI**, a business institution under the SGI. The **CENIT programme** is managed from this institution. The new aeronautics policy is also handled from this institution, as well as spatial policies. The CDTI nevertheless goes further than this. It is a public business concern devoted to raising the technological level of the Spanish company in general by financing projects of business R+D, promotion and management of the participation in international programmes of technological cooperation, support for transfer of technology in the business world and the creation and consolidation of technology-based companies. Its approach is not sectorial.

3. Of all the instruments designed to support the **Baumolian innovation strategy** we should stress the taxation aspects. In particular, binding reports for the Ministry of Economy and Treasury are issued from the **Directorate General**, and this constitutes an outstanding example of industrial policy of support for innovation.

4. As far as the industrial policy through tractor companies is concerned, we should stress the new configuration of **Programmes for Promoting Technological Innovation** (PROFIT) under the DGDI.

7. Main lines of action in industrial policy

This section will explain some of the new lines of action of industrial policy. It should be stressed that a relevant part of industrial policy is coordinated with the industrial policy of the Autonomous Communities. Through the Sectorial Conferences on Industry and the SME systematic coordination mechanisms are established between these two levels of government in Spain: the central administration and autonomous community authorities. One example is the coordination between both these areas of preparation of the new Innoempresa Plan. We should also mention the coordination between the European Commission and State Administration, in particular by means of the Council of Ministers of Competitiveness and other community instruments. One prominent

example has in this case been the MITYC's participation in the High Level Group CARS21, devoted to defining a European strategy for the automobile²⁷.

7.1. Measures of support for SMEs

As stems from the strategy explained up to this point, there is an evident need to guide the strategy for support to SMEs in general, and to industrial SMEs in particular, on the basis of active innovation policies. Under these premises a **policy of support for SMEs** necessarily involves improving their productivity, the modernisation of processes and management and accelerating the innovation endeavours, both technological and non-technological, so as to increase their competitiveness and foster their internationalisation.

Some of the **instruments** available to support and promote the competitiveness of SMEs worthy of mention are the following:

1. **The Business Promotion Plan**, approved in January 2006, constitutes one of the 7 basic axes in which the National Reforms Plan is structured. This plan considers 5 directives which include a total of 50 measures:

1.1. **Fostering the entrepreneurial initiative** of society: with measures like the ones addressing primary and secondary education, vocational training and university education; fostering the micro-credit, 50% discount on the business's Social Security Payments for the first indefinite worker contracted by the SME or creation of the ICO line for entrepreneurs.

1.2. **Fostering the creation of new companies and business growth**: aid for financing SMEs through the ICO with a line endowed with 7,000 million euros per annum, aid for the survival of companies in their first years, creation of an ICO line for financing business growth and reduction and simplification of corporate tax.

1.3. **Increasing innovation capacity and knowledge transfer**: through support for financing Technology Centres, the Innoempresa Programme, the scheme for support of innovative clusters or the reduction of business payments to the Social Security of SMEs for workers in R+D activities.

1.4. **Internationalisation**: fostering the export spirit. ICO-ICEX line "Learning to Export", encouraging the ICO line for internationalisation, review of financial instruments for export to bring these closer to SMEs (FAD, COFIDES, FIEX, etc.) and support for investment in human capital for exporting companies.

1.5. **Administrative simplification**: extending the network of Points of Consultancy and Initial Processing, extending the Information Centre and Network for Business Creation (CIRCE), incorporation of new processes in the Single Electronic Document (DUE) or telematic presentation of electronic notaries' public instruments at mercantile registers.

²⁷ European Commission / Enterprise and Industry (2006)

2. Groups of Innovative Companies (AEI). From the notion of “Marshallian industrial district”, a scheme is being undertaken from the Ministry of Industry to foster Innovative Business Groups (AEI) existing in Spain. The Ministerial Order, published on 21st August 2006, defines the bases on which the AEI are regulated, the system for aid and management of support measures for these new business concepts. The definition of AEI²⁸ is “the combination in a geographical space or specific industrial sector of companies, training centres and public or private research units involved in processes of cooperation exchange, intended for obtaining advantages and/or benefits stemming from the execution of joint projects of innovative nature”²⁹. The MITYC will establish for these purposes a system for accreditation and aid for AEIs, to foster their development and sustainability, as well as to optimise the formulae of public support intended to finance innovative projects with global influence put forward by these groups. The aim is for these AEI, structured as stated, to attain such a critical mass that it enables them to ensure their international competitiveness and visibility, and they are expected to be mostly formed by SMEs, as well as by big companies with major territorial establishment interested in strengthening the production chain in which they are involved.

From the standpoint of coordination, it is intended for this new policy to be supported by the work of autonomous community or local agencies. Coordination with Autonomous Communities will be of great importance for making these AEIs prosper and extend. At the same time the initiative is being coordinated with European policies like those of the Structural Funds³⁰, the new Technological Fund and the 7th Framework Programme for Research, in order for the AEIs to be able to easily adapt to the financing of these programs. Belonging to an AEI is also intended to have a positive effect on their valuation in the MITYC programmes.

It should be observed that this new instrument fosters innovation and at the same time the external economies proper to industrial districts and clusters. This is an instrument specially adapted to the needs of SMEs.

3. The Plan for Consolidation and Competitiveness of the SME in the INNOEMPRES Plan (PCCP). Until the end of 2006 the Plan for Consolidation and Competitiveness of the SME 2000-2006 (PCCP) will be under way, with the aim of incorporating the new ICTs in SMEs and promoting Innovation in advanced Business Techniques including Design, Inter-business Networks for cooperation, Quality Systems and Process Innovation (Management and Organisation of the SME). The PCCP has had an overall budget of around 500 million euros and the approval of over 18,000 projects. Around 2,000 intermediate bodies have participated in it (Technology Centres, Employers’ Associations, EBNs, Chambers of Commerce, etc.) through which some type of innovation services has been given to almost 200,000 companies. Fifteen

²⁸ *Innovative clusters* in EU terminology.

²⁹ AEIs are put forward in the Business Promotion Plan as a formula to foster and extend more quickly innovation practices to groups of companies in a position and with a will to undertake cooperative type projects. The AEIs thus facilitate the development of innovative projects, whose specificity and high overheads require a minimum critical size, which makes it advisable for these to be tackled by several companies together.

³⁰ Bellini and Landabaso (2005).

Autonomous Communities, apart from Ceuta and Melilla have benefited from the PCCP.

After the PCCP, the InnoEmpresa Plan 2007-2013 will come into force and, with its annual budget of 75 million €, introduce new measures to give incentives to innovation, quality and advanced management at SMEs. In particular, the InnoEmpresa Plan intends to direct the application of budget resources towards companies with a vocation for growth and capacity to generate innovation. The lines of action lie in three basic groups of measures: Organisational Innovation and Advanced Management, Technological Innovation and Quality and Consortium-based Innovation Projects, with all these lines considering the incorporation of advanced information technologies and communication in the company's internal and external management processes. Again innovation is at the core of the new scheme.

7.2. Instruments for fostering R+D+i.

The new economic policy has the instruments for financing R +D+i as one of its salient features. The growth of public financing for R+D+i is reaching over the 25% accumulative annual initially proposed. In the case of the batches in civil programmes managed by the Secretariat General of Industry the accumulative annual growth exceeds 30%, with 52% growth being proposed in the draft budget for 2007, up to 1000 million euros.

This support for R+D and innovation must be made through the different approaches that have been mentioned above. That is, implementing both instruments for support of new large-scale projects taking a basically Schumpeterian approach, whose prime example is the CENIT program, and supporting more permanent and recurrent or incremental innovation in traditional sectors or "*Baumol-style* innovation", which is done through two instruments, one financial- the PROFIT programme - and the other tax-based, involving deductions in company tax and in the future also the Social Security payments of the research staff³¹.

7.2.1 The "Programme for National Strategic Consortiums in Technical Research" (CENIT) is a new financial instrument intended to support joint research action of large public- private consortiums. Its management and budget execution pertain to the CDTI and it constitutes one of the main instruments in the INGENIO 2010 Program.

In the first call 200 million euros have been granted over 4 years in the form of subsidies for financing the 16 projects selected. With this public financing around a further 230 million euros in private investment is levered, coming to a total investment of 430 million. This represents a major qualitative leap in cooperation in R+D+i between companies and public centres, with over 130 million euros being assigned to Universities, Public Research Bodies (OPIs) and Technology Centres.

The participation of 175 companies (50% SMEs) and over 200 research groups representing around 800 full-time researchers is expected.

³¹ On the effects of tax incentives on Spanish business and the benefits stemming from these for SMEs see Corchuelo (2006).

The projects selected are characterised by their large size (from 20 to 40 million euros) and great scientific-technical scope and will address research planned in technological areas with a future and with major international repercussions. These developments will enable generating new knowledge which will be of use for creating new products, processes or services or for the integration of technologies of strategic interest and will improve the Spanish balance of payments.

One of the targets of subsidisable actions is furthermore fostering a more efficient access of the consortiums involved in the international programmes for cooperation in scientific research and technological development and in particular the Community R+D Framework Programme.

7.2.2. The Programme for Fostering Technical Research (PROFIT) has the main aim of raising the technological and research capacity of businesses, promoting the creation of innovative business fabric and contributing to the creation of an environment favourable to investment in R+D+i, attempting to improve the interaction between the public research sector and the business sector.

Normally around 50% small and medium-sized companies and a similar percentage of big companies apply for PROFIT, either individually or in cooperation with other agents of the science-technology-business system, mainly financing projects for technological development and industrial research.

One of the novelties of the new industrial PROFIT lies in the adoption of the *Perroux-style* strategy for support to R+D+i, that is, by fostering projects with bandwagon or carry-over effects.

There is also a specific PROFIT for **Technology Centres** in order to create a stimulus for transfer of knowledge and technology to companies and through these as specialised intermediary bodies ideal for fostering innovation at SMEs. This specific programme has the main aims of: (1) Fostering the R+D units of the Centres; (2) Fostering the technological development at companies; (3) Fostering international presence; (4) Cooperation between Technology Centres. These agglutinate companies to introduce new technologies and knowledge which raise quality and competitiveness, facing up to changes in products and processes, operative improvements or mobilising resources. They are designed from Becattini's strategy of supporting R +D+i defined in sectorially and territorially specialised technology centres.

7.3. Sectorial industrial policy

Apart from these horizontal policies for support for business structure in general, like the ones stated, MITYC has also implemented sectorial policies focussing on the sectors most exposed to exterior competition, in line with the new industrial policy designed by the European Union. These sectors are for both high technology and medium and low technology .Some examples of these sectorial policies are as follows.

7.3.1. High and Medium-High technological intensity sectors

1. The **automobile sector** generates 9.1% of the total gross added value of industry and provides 325,000 direct jobs in Spain. This country is the third biggest maker of

saloon cars in Europe and the first in industrial vehicles. The components industry provides around 60% of the value of the product, creates triple the employment of the vehicle sector and is the one most threatened by relocation³². The sector is highly dependent on Europe, the main destination of our exports (which represent 80% of the production). The Spanish plants belong to multinational groups, which conditions the industry's decision-making capacity, generates risk of relocation and creates technological dependency on the exterior, though it provides an important advantage: the existence of an extensive and complex offer which ensures economies of scale and economies of scope and favours the appearance of spill-over effects.

Some of the main measures carried out by the Ministry of Industry, Tourism and Trade intended for this sector are:

- a) Active participation in High Level Group CARS 21, created in January 2005 by the Vice-President of the European Commission, G. Verheugen, whose aim is to define a course of sustainable development and competitiveness for the automobile industry in the EU. This group received the mandate to make recommendations in the short, medium and long term, about the regulatory framework and public policies for this sector, designed to increase global competitiveness and job creation, always taking into account safety and environmental protection requirements at affordable prices for consumers.
- b) Industrial Observatories. In 2005 two Observatories for the automobile sector were created, one for the Automobile and Truck Manufacturer Sector and another for the Sector Manufacturing Equipment and Components for Automobiles, intended to provide a suitable diagnosis of the sector and a number of proposals for measures necessary, which will be taken into account in the definition of future industrial policies, in order to foster development and modernisation of these industrial sectors.

These observatories are formed of representatives of the Spanish Confederation of Business Organisations (CEOE), the Spanish Confederation of Small and Medium-Sized Companies (CEPYME), the "General Workers' Union" (UGT) and "Workers Commissions" (CCOO) and the Spanish Federation of Innovation and Technology Entities (FEDIT), apart from the MITYC, to foster the development and modernisation of industrial sectors in the sphere of the declaration for social dialogue 2004: competitiveness, stable employment and social cohesion.

2. The **aerospace sector** is a typical "locomotive" sector at the same time as being a "diffuser" of knowledge towards other sectors. It employs highly qualified staff (30% with university training and almost 50% with specialised training) and invests a high percentage of its invoicing in R+D, largely due to forming part of civil and military European projects, that is, aircraft such as Airbus, A400M, Eurofighter or Tiger helicopters, amongst others.

- a) In the aeronautical sphere, the Administration's work in this sector concentrates on financial support to businesses participating in current or planned projects, as

³² On the scale and causes of relocation in Spain see Rafael Myro (2006).

the long period for maturity of the investments required makes it vital to rely on state financing, especially for their development periods.

Spain is also firmly committed to taking a leading role in activities connected with complex structures in composites in Europe. The Government is taking on a major present and future investment commitment in these technologies, part of which is the encouragement given for the creation of the FIDAMC Composites Centre (the Foundation for Research, Development and Applications of Composite Materials), in which EADS has a 50% stake, the Ministry of Industry, Tourism and Trade (25%) and Madrid Autonomous Community (25%) and which will be set up in Getafe.

- b) In the space sector, the National System for observation of the Earth. Last December 2005, Spain announced the development of our own satellite for observing the Earth, during the Ministerial Council of the European Space Agency (ESA) held in Berlin.

The system will give this country an internationally leading role in the area of Observation of the Earth by Satellite, and will be a major contribution to European international initiative GMES (Global Monitoring for Environment and Security) as well as for the worldwide initiative GEOSS (Global Earth Observation System of Systems), which seek to ensure the continuity of global service avoiding any unnecessary duplication of capacities.

7.3.2. Medium-low and Low technology intensity sectors

Textile. The liberalisation of world exchanges and the greater presence of China have given rise to an annual growth in Spanish imports over 9% in 2005, especially concentrated on clothing (manufacturing), with a 16% increase. The increase in imports and stagnation of exports (+2%) have caused a new negative record in the trade balance, with a deficit of around -4,700 M€ (+21.5% for 2004). Exports have remained stagnant due to the scanty dynamism of the European market and the difficulties involved in the revaluation of the euro against the dollar and Asian currencies. The net loss of employment in 2005 was around 17,000 workers (-8.3% for 2004).

This is thus a sector in recession, threatened by foreign competition. For this reason the Plan for Supporting the Textile Sector has been drawn up with the cooperation of the Autonomous Communities, its main objectives being to guarantee the sector's future and keep the largest number of companies and workers possible on the market and attenuate the negative consequences for workers and territory of the adjustment of production activity and employment.

Some of the measures included in the Plan are:

a. Industrial and financial measures:

- PROFIT for the textile-manufacturing sector 2006. Budget: 4.5 M€ in subsidies and 18M€ in repayable advances.

- ICO- Financing line. To support the introduction of innovation with a view to moving towards segments less affected by international competition and supporting business concentration processes. To help companies to obtain guarantees an agreement will be reached with Compañía Española de Reafianzamiento, S.A. (CERSA), for refinancing 50% of the cost of the guarantees granted by regional Reciprocal Guarantee companies. The budget for this line is 50 million euros, for 2006 and 200 million euros for each of years 2007 and 2008, which will mean a total amount of 450 million euros for the 2006-2008 period.
 - Reindustrialisation program in zones affected by relocation or adjustment processes in the textile-manufacturing sectors, footwear, toys and furniture. Budget 1.2 M€subsidies and 51.4M€advances.
- b. Textile industrial observatory. In the line of support and strengthening of this sector the “Specific agreement for cooperation between the Ministry of Industry, Tourism and Trade, the Spanish Intertextile Council, trade union organisations “Workers’ Commissions” and “General Workers’ Union” and the Spanish Federation of Innovation and Technology Institutions for the creation of an Industrial Observatory in the Textile-Manufacturing sector” was recently signed.

Setting up and getting under way this Observatory is intended to tackle joint industrial policy actions which, by detailed analysis of the sector’s evolution, enable action to be taken with a view to achieving a model of stable growth based on the improvement of companies’ competitiveness and increase in productivity.

- c. Tax incentives for textile sample ranges (publishing the regulation governing this 18.11.2005). Due to its innovative nature, textile sample ranges are included among the activities entitling to a 10% deduction in the corporate tax quota, with no detriment to being able to qualify in other more special cases for tax incentives for Research and Development exceeding 30%.
- d. Action taken by ICEX: for increasing the export base, strengthening internationalisation strategies, creating a quality image, etc.
- e. Socio-labour measures
- f. Incentives for keeping on more elderly workers: bonuses for social security payments.
- g. Program for fostering specific employment for redundant workers from the textile sector; bonuses for finding new jobs for those made redundant and incentives for indefinite contracting of workers over >55 years.
- h. Measures for accompaniment of more elderly workers: additional cover as extraordinary aid (workers over 55 years).

7.4. Reindustrialisation

The MITYC is also sensitive to the processes of adjustment and adaptation to new situations arising in the industrial framework. To this end, it also has a programme

available for companies whose aim is to create the conditions enabling the reindustrialisation of the zones affected by labour adjustment processes of public or private companies, through professional and technical qualification of their human resources, generation of a basic technical and industrial infrastructure and strengthening the mechanisms for financing its industrial fabric.

This programme has been boosted in the last two years from a budgetary standpoint, as the financing assigned to this objectives has grown 95%, having incorporated not only new regions mainly affected by relocation processes in traditional sectors such as textile-making up, footwear, furniture and toys.

7.5 National Plan for Assigning emission rights (PNA) ³³.

Environmental problems constitute one of the salient features defining the ground on which industry must operate. Specifically, respect for the environmental targets covered in the Kyoto Treaty constitutes one of the requisites of an advanced industry like Spain's. According to these criteria a strategy has been defined to allow respect for attaining these environmental objectives alongside respect for industry's competitiveness. The transposal of the Kyoto directive in 2004 and the adoption of National Plans for Assignment of emission rights constitute the most prominent features of the new industrial policy.

The first National Emission Assignment Plan (PNA) was drawn up between May and July 2004 for the 2005-2007 period, based on the historical emissions of the sectors in the 2000-2002 period and the reduction capacity of each sector. This assignment was made on the basis that industrial sectors must have sufficient rights to carry out increases of capacity produced in the 2002-2006 period and starting from the existing capacity. This led to the proposal for a distribution of 176.6 million tons of CO₂ for the existing facilities with a reserve for newcomers, which represented a reduction of 0.58% of the emissions for 2002.

At present the PNA2 for the 2008-2012 period is in an advanced state of preparation with a planned reduction of 37% of emissions in comparison with the base year. In this Plan work is being done on the basis that a greater adjustment effort ought to be made by the electricity generation sector through being less exposed to international competition than the industrial sector, for which purpose a sufficient assignment is planned, on condition that the Best Available Technologies are adopted, so that this PNA does not mean a burden for its future competitiveness.

8. Conclusions

This article has set out to reflect the economic foundations of the new Spanish industrial policy. It has also systematised some of the most relevant action being done through the Ministry of Industry, Tourism and Trade, in order to lead our business fabric into the structural change necessary to allow us to successfully tackle the challenges posed by today's globalised economy.

³³ See the monographic issue on the transposing of the Kyoto directive in *Información Comercial Española*, 2006.

The industrial policy is intended for the new technology and knowledge-intensive sectors (which have a tractor or pull-along effect and diffuse the technology towards the others) and to the less technology- and knowledge-intensive sectors which have exhausted their cost advantages and need to develop new skills.

The measures and action defined give special attention to SMEs, due to the fact that on one hand they constitute a high percentage of the national business fabric and, on the other through their specific problems stemming from their smaller size. Dimension is well-known by all to be one of the variables that condition productivity, innovation capacity, internationalisation and even the modes of business management; in short that dimension conditions competitiveness. For this reason measures particularly adapted to the peculiarities displayed by SMEs are put forward and new strategies are adopted based on the cooperation between SMEs in the style of the Marshallian industrial districts and clusters.

It has also been explained how to seek dimension by means of support for the National Strategic Consortiums in Technical Research (CENIT Program), which constitutes an outstanding example of financial support for creation of major R+D+i projects fostered by big companies.

Furthermore, some examples of action in key sectors of the Spanish economy have been described, significant either through their competitive situation – as is the case of the textile sector- or through their strategic importance – such as the aeronautics and automobile sectors.

All the previous measures have several common denominators, as regards their objectives, some of which are:

- A common framework as regards the challenges faced by our industry: globalisation, the risk of relocation, the exhaustion of cost advantages, low productivity or the prevalence of sectors with little technology intensity.
- Fostering innovation as the main driving force behind competitiveness.
- The need to increase the technological base of companies, as main source of future sustainability.
- And lastly, aid for generating economies external to the SMEs by means of creating Groups of Innovative Companies (AEI) or the support for strategy based on Technological Centres, in order to solve the limitations stemming from the smaller business scale mentioned above and support the generation of external economies by means of cooperation.

At the Ministry of Industry, we trust that the set of measures that have been put forward will enable us not only to maintain but also to exceed the good economic results of the last few years, turning the threats jeopardising the sector into new opportunities for our companies, providing them with the necessary instruments to develop key skills in their future competitiveness. The support for **innovation** in its multiple forms and development of **external economies** like the ones explained should allow setting the Spanish industrial economy on a course of sustained growth of **productivity**, the basis on which new competitive advantages can be constructed.

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