

INNOVATION AND INTERNATIONALISATION POLICIES IN SPAIN
SPECIAL CONSIDERATION OF LESS DEVELOPED AREAS

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1.- INTRODUCTION.

Before entering into the description and assessment of the Spanish experience with regard to policies oriented to the innovation and the internationalisation of the economy, it is important to stress some basic features of the Spanish structure in which they operate.

First of all, we must recall the general low level of resources devoted to R&D and innovation in Spain. In fact, all available indicators give account of the relative backwardness of the Spanish economy compared to the average of European countries. Thus, the amount of R&D expenditures as part of GDP was around 0.85% in 1997. However, it is more relevant to stress that the situation is relatively worse in the business sector; two data can be shown: on the one hand, the number of firms regularly carrying out R&D activities in 1994 was less than 2,000, on the other, the percentage of innovative firms in Spain is one of the lowest of the EU; according to the Community Innovation Survey, and taking into consideration only firms with more than 20 employees, that ratio was 30% in Spain, compared to 34% in Italy, 67% in Germany and 57% in Holland.

A second characteristic has to do with the concentration of technological activities. Although it is not very different in other countries, it is a very significant fact that in 1995, three regions (Madrid, Cataluña and País Vasco) concentrated 77.6% of firms total R&D expenditures. On the contrary, all regions objective 1 accounted for only 18 % of firms' expenditures. Moreover, within that group there are several regions (Extremadura, Canarias, Cantabria, Murcia, etc.) which had a very marginal participation; each of them below 1 %.

The third element we want to emphasise is that the process of internationalisation is rather new for Spanish firms and scarcely extended, although there are signals of a growing tendency in the last years. All indicators point to the fact that the opening up through foreign trade is still less developed than in most advanced European countries and, more importantly, the process of outward FDI is less generalised in the Spanish productive system. Although it is not directly the object of this report, it is important to mention that the reverse process (the penetration of inward FDI) is much more developed, so Spain is one of the European economies which has been most successful in receiving FDI in the last decades. In fact, foreign companies play a crucial role in many manufacturing (and service) sectors and in the process of commercial opening up.

Taking into account the previous facts, in the following pages this report will address, first, innovation policies organised at the central level and their impact on less developed regions; secondly, policies regarding the process of outward internationalisation of Spanish enterprises and, finally, new regional policies of some less developed regions, oriented to enhancing local technological capabilities or to facilitating the process of entering into new international competition.

2. SUPPORTING STATE POLICIES FOR TECHNOLOGICAL INNOVATION.

2.1 ANTECEDENTS.

The existence of policies for promoting technological innovation is relatively recent in the Spanish economy. Since the last decades of the nineteenth century, until the 1960's,

the Spanish industrialisation process went through a phase dominated by nationalism and protectionism . This stage was characterised by an import substituting policy in which the resort to foreign technology was an indispensable element , as a consequence of the obstacles the national system had to produce the technological inputs needed for the incipient industrialisation.

From the Technology Policy point of view, we should name two initiatives: On the one hand, the attempt to create an infrastructure of national research through the Consejo Superior de Investigaciones Científicas¹. On the other, the establishment of some restrictions with regard to the importation of technology, due to the shortage of foreign currency.

The development of inner capacities was poor, and the dependence on foreign technology was firmly located in the Spanish productive structure (Braña, Buesa, Molero, 1984). From the regional perspective, it must be kept in mind that industrialisation was highly concentrated in three regions: Cataluña, País Vasco, and Madrid. Thus, there was an important economic and technological backwardness in a significant part of the Spanish territory.

The wave of strong development and industrialisation that was consolidated in 1960-74, meant an increase in the technological weakness of the system, and consequently the continuation of the importation of technology. This came in three ways: two of them allowed the access to “embodied” technology – the purchase of capital goods which were scattered during that period , and foreign direct investments-. The third one consisted of the acquisition of “disembodied” technology by means of technology transfers , the use of licences, and so on.

From the industrial and technological point of view, novelties were reduced to a first few promoting instruments: mainly the setting up of research associations and the “Planes Concertados”². The associations were established as an instrument to link the firms of the same sector, and the plans were the first attempt to develop a scientific and technological collaboration between firms and public research centres. The results of both measures were modest for the economy as a whole, and did not mean any change in the industrial and technological backwardness of a large number of Spanish regions (Molero, 1982).

By the end of this phase, in 1973, an important law was promulgated trying to deal with the restrictions imposed by the imported technology. This law, like others of Latin America and Portugal, attempted to: reduce economic expenses, remove the abusive clauses of the technology transfers contracts, and create a learning system which could facilitate the establishment of methods to develop national technologies. Results regarding the first two objectives were poor, whereas the latter consideration was nearly non existent (Sanchez, 1984; Buesa, Molero, 1990).

2.2 PRESENT INSTRUMENTS FOR PROMOTING INNOVATION.

Two events which had a severe impact on the Spanish industrialisation pattern took place by the middle seventies. On one hand, the international economic crisis which had a particularly important effect on Spanish economy, and showed its main structural defects such as technological weakness. On the other, the political transition period and

¹ National Council for Scientific Investigation.

² Concerted Plans

the establishment of democracy meant the beginning of socio-economic policies that were “pending”. Among others, the need to promote initiatives for a wider scientific and technological domestic production, embedded in an increasing consciousness of the need to open up the Spanish economy, mainly by the integration of Spain in the European Union.

The first important initiative was the starting of the Centro para el Desarrollo Tecnológico e Industrial (CDTI)³ in 1978. This institution, which is a dependency of the Ministry of Industry, has the basic objective to promote technological innovation of firms as a way to resolve an historical deficiency that obstructed the capabilities of the Spanish companies for competing in the international market. Nowadays, CDTI is still an essential piece of the Spanish technological policy, and it manages a number of instruments for its purposes. The main one is to give soft credits for companies’ projects of technological development, once these projects have been carefully evaluated.

The second outstanding measure was the promulgation in 1986 of the Ley General de Fomento de la Investigación Científica y el Desarrollo Tecnológico⁴. The importance of this law was that it led to significant readjustments in previous existing institutions and gave way to the implementation of national R&D plans. The first one started in 1988; now a days the fourth one is in process. These plans were conceived as a substantial change in the political purposes because they attempted to mobilise all social agents through the creation of the Consejo Asesor para la Ciencia y la Tecnología⁵. On the other hand, from a regional point of view, the plan provides for the creation of a Consejo General de la Ciencia⁶ as a co-ordinating element between the central policy and those others elaborated by autonomous regional governments as a consequence of the promulgation of the Spanish constitution.

Nevertheless, in spite of their ambitious design, National Plans have not been able to incorporate many other innovation promoting instruments which depend on other ministries. Particularly important is the Ministerio de Industria y Energía⁷, because it has substantial resources regarding innovative activities⁸.

We must highlight that, from the firms’ point of view, these “external” programmes - together with the actuation of the CDTI- are much more important than those included in the National R&D Plan. Most of the programmes and resources of the National Plan are orientated to the field of research, and consequently to universities and public centres. The initiatives concerning productive firms are concentrated in two elements: the Proyectos Concertados, (R&D projects in which firms and public centres collaborate and which are a modernisation of the Planes Concertados that started in the sixties), and intermediary actions between public centres and firms, such as the creation of the Red de Organismos de Transferencia de Resultados (OTRIS)⁹ within universities and public centres.

As with the Ministry of Industry we can mention the current trend of many programmes

³ Centre for Industrial and Technological Development

⁴ General Law to Promote Scientific Investigation and Technological Development

⁵ Advisory Council for Science and Technology

⁶ Science General Council

⁷ Ministry of Industry and Energy.

⁸ Since 1997, until 1999, this activities are known as ATICA (Support to Technology, Security and Industrial Quality).

⁹ Network of the bodies transferring research findings.

of the Ministry of Defence, which as time goes by are acquiring more importance for private companies and neither are included in the National Plan.

A third constituent element of the new scientific and technological policy system derives from the starting of regional programmes, made by the autonomous regional governments. Although we will talk about them later, it is important to stress nowadays that the budgetary resources which come from the autonomies are becoming a considerable source of incentives for all kinds of firms.

Finally, we should mention that since 1986, firms also have the availability of European Funds through different means, mainly those included in the Framework Programme.

2.3 RESULTS.

It is not easy to synthesise the outcomes of a system that in a few years has suffered such a complex transformation. The aim of this section is to offer a critical balance based upon two complementary sources: official statistics and available assessment studies. In the following paragraphs we shall address some basic aspects of the Spanish economy and the participation of the firms in the innovating effort, as well as the stylised facts of the participation of different regions. A special emphasis will be placed on regional repercussions of the principal instruments exposed above.

A) General results

The valuation of the achievements and failures must be done taking as the reference point the features of the Spanish economy we discussed in the introduction. Within these determining factors the balance could be established in terms of improvements and shortages.

Among the improvements we can underline the following ones:

- A general increase in the resources devoted to technological activities. In terms of R&D expenses we can see an outstanding increase from 0.4% of GDP at the beginning of the eighties to 0.87% in 1997. This fact allowed a certain approach to

Table n° 1: TECHNOLOGY BALANCE OF PAYMENTS
(Receipts and payments as percentage of Business Enterprise R&D)

		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Germany	Receipts/BERD	9,43	10,26	11,60	12,61	12,58	20,24	20,00	20,35	21,15	29,02	28,23	28,75	31,25	32,97
	Payments/BERD	14,93	14,46	15,67	16,37	17,73	22,73	22,44	24,06	29,70	30,19	34,36	40,48	44,10	42,42
France	Receipts/BERD	10,08	11,48	12,95	15,43	14,18	13,01	12,62	13,25	14,07	13,21	12,54	12,66		
	Payments/BERD	11,02	13,39	14,35	17,22	16,87	15,64	16,22	16,66	16,96	17,47	17,64	17,57		
Italy	Receipts/BERD	5,42	5,01	4,75	5,69	4,79	5,26	5,87	11,84	9,13	10,12	20,44	19,47	22,42	26,96
	Payments/BERD	15,57	18,67	19,24	19,45	18,16	17,01	15,37	21,86	18,39	17,59	34,28	35,34	39,18	46,78
United Kingdom	Receipts/BERD	7,13		10,38		12,58	10,79	12,68	12,83	15,03	14,94	18,47	25,87	29,33	34,81
	Payments/BERD	5,90		8,14		11,18	9,80	14,01	13,99	16,50	19,75	18,22	23,91	26,28	29,64
Spain	Receipts/BERD	26,45	19,89	25,89	24,42	22,31	21,94	16,54	13,60	18,61	17,79	27,82	36,70	62,04	
	Payments/BERD	82,99	100,01	125,22	99,60	89,54	91,13	91,64	102,99	103,67	96,78	98,82	147,10	133,54	
Portugal	Receipts/BERD	19,78	15,07	16,52	14,64	15,10									
	Payments/BERD	139,39	153,99	163,41	125,49	138,41									
Belgium	Receipts/BERD	47,95		69,18		78,79	85,37	74,77	81,32	115,53		115,59			
	Payments/BERD	56,05		80,39		91,38	97,87	105,07	116,76	150,25		141,42			
Netherlands	Receipts/BERD	30,68	19,58	93,63	106,42	99,79	85,30	85,39	96,89	124,14	155,17	204,10	252,29		
	Payments/BERD	47,05	35,43	105,10	123,41	125,47	88,58	82,50	97,45	134,84	149,56	248,37	249,47		
Denmark	Receipts/BERD	39,28	59,88	50,73	49,92	66,44									
	Payments/BERD	26,21	51,50	51,89	55,21	58,28									
Austria	Receipts/BERD	5,14			7,54	7,05				9,08					
	Payments/BERD	21,35			25,71	26,87				27,61					
Sweden	Receipts/BERD	3,24		6,19		5,55		6,01		8,01		7,41		18,25	
	Payments/BERD	3,04		2,83		3,13		1,81		1,40		3,95		2,05	
Finland	Receipts/BERD	1,41		1,63	0,94	1,17	1,43	4,00	4,93	4,90	4,50				
	Payments/BERD	26,32		27,52	26,75	28,57	30,00	31,83	31,13	30,77	31,83				
Norway	Receipts/BERD	10,21	6,88	11,06	6,21	5,53		9,88		16,11		17,51			
	Payments/BERD	17,79	18,00	20,64	16,89	14,94		28,77		19,72		25,31			
United States	Receipts/BERD	8,07	5,36	4,96	4,43	4,32	6,48	9,24	11,45	12,51	15,16	16,03	18,40	18,86	
	Payments/BERD	0,72	0,76	0,81	0,85	0,77	1,14	1,72	2,51	2,29	2,86	3,61	4,60	4,47	
Japan	Receipts/BERD	5,99	6,57	7,34	7,51	5,67	4,18	3,65	3,57	4,64	4,94	4,93	4,98	4,89	5,48
	Payments/BERD	8,89	10,04	8,51	7,62	7,10	4,87	4,80	4,53	4,65	5,41	5,26	5,45	4,44	4,40

Source: OECD and own elaboration,

the average European levels.

- A growth in the number of firms carrying out technological activities. R&D statistics show an increase from around 500 to nearly 2000 in the last fifteen years.
- A change in the structure of the Spanish foreign trade, with a growing weight of exports of higher complexity goods, and a lesser sharing of traditional products (Alonso, 1999).
- An increasing trend of technology exportation, mainly in association with different kinds of technical assistance. (Casado, 1995; Molero, 1996).
- The consolidation of an institutional system for innovation support and the setting up of interface structures between different agents (COTEC, 1998).

Nevertheless, shortages are also remarkable; among them we can underline the most important ones:

- The convergence process previously described has been insufficient and the relative distance is still notable (Buesa, Molero, 1998). Furthermore, the increase of the effort during the eighties has suffered a remarkable stagnation in the first half of the 1990's.
- The approach is much less evident when we look at indicators closer to the technological and productive activity. If we use patent data the distance to leading countries is bigger than the one shown by the R&D indicators. This is because R&D incorporates a significant amount of the public sector activity. In fact, one characteristic of the Spanish innovating system is the smaller presence of the private firms sector compared to other countries. In recent years it is below 50% of total resources devoted to scientific and technological activities.
- In spite of the upgrading tendency of the system to create technological inputs, the resort to foreign technology is still an extraordinary important structural feature. As can be appreciated in table 1, Spain stands out among OECD countries for a double characteristic: The importation of technology related to domestic R&D is very relevant, but, in contrast to what happens in other countries (usually of a small size), this fact is not compensated for with a strong flow of technology exportation (Molero, 1999).
- From an institutional point of view, the new system has some non negligible limitations, among which we can mention two: first, the non co-ordination between the institutions which are responsible for the programs, particularly between regional agencies and central government institutions. Secondly, the potentially available resources of the public research sector have many difficulties to be transferred to the firms.

B) Uneven regional participation.

The general trend described presents wide differences on observing the role of different regions, particularly of those which have a lower level of industrialisation. On table 2 we have picked up some central data: the first two columns refer to the participation of each region in national R&D resources; globally, and concerning the firms' sector. The third column summarises the participation of each region in the resources of the II R&D National Plan, and the following ones, their participation in projects financed by CDTI.

The first remarkable issue is the strong concentration of the technological activity in the three most industrialised regions: Madrid, Cataluña, and Pais Vasco together accounted

Table nº 2: Percentages of each region of national figures

REGIONS	R&D Expend. 1987	Business R&D 1987	II R&D Plan funds	National N° of CDTI Projects 1984-94	Firms with N° projects with CDTI Funds 1984-94
Andalucía	9,8	4,7	9,8	4,6	3,9
Aragón	2,1	2,0	3,2	2,4	2,4
Asturias	1,5	1,0	2,4	3,5	3,0
Baleares	0,6	0,0	0,6	0,4	0,4
Canarias	2,0	0,6	1,0	0,3	0,2
Cantabria	0,9	0,6	1,5	0,9	0,8
Castilla-León	3,7	2,4	3,1	2,1	1,6
Castilla La Mancha	2,2	3,1	0,4	1,6	1,0
Cataluña	21,7	28,5	22,9	34,5	33,1
C:Valenciana	6,5	3,8	8,2	7,2	6,8
Extremadura	0,8	0,1	0,5	0,5	0,3
Galicia	3,5	1,8	3,6	3,1	2,7
Madrid	32,2	34,3	31,4	25,3	29,5
Murcia	1,5	1,2	1,4	1,6	1,2
Navarra	1,5	1,7	1,4	3,6	3,4
Pais Vasco	8,8	13,9	8,2	7,7	9,2
La Rioja	0,4	0,3	0,4	0,7	0,6

Source: Own elaboration.

for 77% of the firms in 1997. Such concentration is opposed to the weight of those regions in the value added (41 % in the same year), and is higher than the concentration of R&D expenses. Therefore we can deduce that the participation of the backward regions is even smaller when we only take into account the technological activity directly related to firms.

The concentration also means an unequal participation in the National Plan resources. In fact, the regional distribution of this participation, is nearly the same as the distribution of R&D activities, (the correlation coefficient is 0.995). Thus, we can assert the Plan has not been orientated to compensate for the differences and to promote the participation of agents of backward regions; on the contrary, it has contributed to the consolidation of groups and firms which already had a favourable starting position.

The CDTI action is of special importance because, in contrast to the plan, this institution only manages aid to firms after their demand through submitting projects of technological development. Data related to the number of firms that have participated in the eleven years taken into account in the analysis, reproduce the territorial inequality, insofar as aid is concerned. Nevertheless, regional concentration

is a bit smaller than that observed in the column of firms' resources. Even so, the companies of regions objective 1, only reach 25% of the total. Even smaller is the participation of those regions if we consider the number of projects, which only reaches 21.5% of all financed projects.

To sum up, the starting of a supporting central policy for technological development, although it had a certain impact to mobilise general resources, does not seem, until this moment, to have been an efficient instrument either to improve the conditions of relative backwardness that characterise the less favoured regions, or to create in them a new business dynamism to be the base for overcoming that backwardness¹⁰.

2.4. IMPACT ON THE FIRMS.

Once we globally know the participation of the enterprises, the interest is centred on the description of some results of the investigations which have evaluated the efficiency of some of the already mentioned instruments. We shall discuss particularly two complementary aspects: first, the impact of CDTI activity on the technological capacities of the firms. Secondly, the results of the activities of the OTRIs.

In the first case, data come from an evaluation of eleven years 1984-94, which allows us to have a long term view¹¹. The most outstanding features of the CDTI's policy could be summarised as follows:

- The CDTI has made a positive contribution to the upgrading of the technological level of Spanish firms. In fact, after its creation, the body under consideration has been able to collaborate with a considerable number of firms (around 2000 between 1984 and 1994) which constitute a crucial part of the innovatory business sector.
- The way in which the CDTI collaborate can be positively evaluated since it plays an active role in stimulating firms to undertake and evaluate innovative projects. Furthermore, the financial mechanism, through loans has been a new modality compared with subsidies because the rate of return is linked to the success of the project; in the absence of private venture capital it has been rather positive.
- evaluating the degree of difficulty expressed by firms in financing their innovatory projects without the help of the Centre shows that this rises as the size of firms in the survey decreases, although, in any case, one can talk of a considerable average degree of difficulty. the largest -sized firms behave in a substantially different way to those other three categories of firms: CDTI financing has enabled a greater percentage of these large firms to reduce their own R&D costs compared to their initial forecast, and many fewer, proportionately, have increased them. This suggests that CDTI's public financing may have been used by some firms to replace more expensive funds.
- The total amount of funding obtained from the CDTI for financing projects is more highly appreciated by firms with one compared to those with two or three projects,

¹⁰ This does not mean that the dynamic is equal in those areas with a smaller level of industrialisation. As we shall discuss later, there are some interesting cases of a greater dynamism; but those are nearly always related to other type of policies.

¹¹ The global results are in Molero et al (1995). The basic statistic data are available in Molero & Buesa (1997), and a synthesis of the results related to the firms can be consulted in Molero & Buesa (1998^a).

and more in the latter than in the group of the most regular. Also more highly among those with private national capital than among public or foreign-financed ones.

- In general terms, it can be stated that CDTI loans have had greater influence in the generic stimulus to R&D than in the technological orientation of the company.
- The maximum assessment among aims corresponds to product development, followed by that of improving - or at least maintaining- the firm's competitive position and the opening up of markets. In any case, CDTI firms - which to a large extent base their innovatory strategy on the development of new products, that is on quality and differentiation - thus seem more inclined to seek to maintain or improve their competitive position and the opening up of new markets (that is, commercial aims) than in the merely immediate financial objective of reducing costs.
- Firms seem to have a particular appreciation of "internal" technological exploitation- of having available a bigger base of knowhow or improving staff training- rather than increased technological co-operation with other firms or even with Public Research Centres.
- In the last period there seems to exist a more risk-averse policy, there was a reduction in the size of projects and this probably reduced the level of the innovations achieved.

2.5 RELATIONSHIPS BETWEEN FIRMS AND PUBLIC CENTRES.

Technological resources transferring from public research centres have always been amongst the elements for developing a policy strategy since it was born at the beginning of the sixties. From R&D National Plans that issue becomes a crucial factor within the creation of specialised interface organisms, particularly the OTRIs.

Since its creation in 1988, today there are around 100 OTRIs. 48 of them belong to universities, 13 to public bodies, 20 to university-firms foundations and 29 to firms associations or technological centres. In 1997, the 61 belonging to the public sector (universities and research centres) signed 13,865 contracts for 32,033 million pesetas. 9,900 of them are contracts with firms accounting for 13,550 millions pesetas. Even admitting that activities and resources of the OTRIs have grown in this decade, still today " the resources devoted are much lower than they should be for an efficient commercialisation of the available technology in their own institutions and totally unsuitable to "market pull" strategies which are more appropriate to its objective" (COTEC, 1999 a).

One of the few available studies refers to the activity of the Fundación Universidad Empresa in Madrid¹² in 1989-97. Insofar as Madrid is the place in which a majority of public research is concentrated, that investigation allows us to extract some interesting characteristics for later analysis of technology transfers processes from public centres (COTEC, 1999 a).

- Small and medium firms had a 53.5% participation.

¹² University-Firm Foundation

- Up to 84% of the firms declared that they had their own previous R&D activities. It highlights the role of firms who had devoted to this activity more than 5% of their sales.
- Chemical and Pharmaceutical firms are the most active ones.
- Most of the companies have important export activities. 48% of them declare that they devote a significant percentage of their sales to foreign markets.
- There is a noticeable participation of multinational firms: around 30 % of sample firms had foreign sharing.

The perception of these firms of their contracts with public centres has these characteristics:

- In general terms, firms are quite in favour of having contracts with public centres.
- They admit the importance of those bodies for the innovative activities of the firms.
- However, firms do not realise in those contracts benefits directly related to incomes, market shares, costs and exportations. This appears to demonstrate there is not a direct relation with economic elements determining companies' strategies.

A more accurate way to come closer to the importance of the collaboration with research centres has been achieved by including in the analysis of the technological activity of innovatory companies a question related to the way of organising R&D activities (Molero and Buesa, 1998). The options of the answer were to carry on R&D in their own firms, to collaborate with other firms and to collaborate with public research centres.

The findings show how those firms give a medium importance to the collaboration with public centres; in fact, measuring on a Liker scale from 1 to 5, this collaboration has a valuation of 2.73, a bit lower than the mean. However, there are no statistical differences between firms of different sizes or from different regions. Depending on the firm's financial strength, the only sub-group that concedes a higher valuation than the average is the one from *public firms*. About the sector of activity, the firms with higher answer values belong to : *Agriculture and Fishing, the Pharmaceutical Industry, Metal Products, Commercial Services and Other Services*.

3.- STATE POLICIES TO PROMOTE SPANISH FIRMS' INTERNATIONALISATION.

3.1. - ANTECEDENTS.

From the late fifties the international opening up of the Spanish economy has been characterised by a process which has experienced different stop and go movements according to the evolution of the economic situation. Since the signing of the Acuerdo Preferencial (Preferential Agreement) with the EEC that opening process has become more marked, reaching a crucial state with the signing of the Tratado de Adhesión a la Europa Comunitaria (Joining Agreement for Entering into the European Community) in 1986. In general terms, commercial liberalisation of the Spanish economy can be classified as irregular during its evolution. (Alonso, 1989).

Throughout the sixties and the first half of the seventies commercial policies were characterised by maintaining high tariffs on imports, limiting the entrance of foreign products through restrictive commercial regimes and taxation agreements which penalise importation compared to national production.

As far as exporting is concerned, instruments used for its promotion in those years were very diversified and complex. Their objective was to increase the exports of a country that showed a historical lack of structural competitiveness and tried to reduce this deficiency through "artificial" mechanisms. Among them, can be mentioned the "improvement traffic", which was a tax giving a positive and different treatment to those imports that would later be included in sales abroad. We could add a fiscal instrument that reduced export taxes through the Impuesto de Compensación de Gravámenes Interiores¹³, which disappeared in the first half of the eighties.

With regard to financial instruments, the use of credits for exporting was very common, although the funds were insufficient at the end of the seventies. Similar was the case of exports insurance, which over decades proved to be a very useful instrument. For this reason, the Compañía Española de Seguros de Crédito a la Exportación (CESCE¹⁴) was created at the beginning of the seventies, and today is still operative.

Finally, instruments dealing with organisational issues and the promotion of external activities acquired a more relevant role in supporting exporting activity with the creation of the Instituto de Comercio Exterior (ICEX)¹⁵ at the beginning of the eighties.

Concerning actions dealing with direct investments, it was not until 1973 that the first legislation was adopted. This contemplated a certain degree of liberalisation of outward direct investments – which had to be previously authorised - and was more suitable to the evolution and real necessities of the Spanish economy. In 1974 this legal norm was complemented with the liberalisation of investments linked to the promotion of exports. Later on, in 1979, a complete liberalisation of outward direct investments was established.

In 1986, the degree of liberalisation of capital movements, and their adaptation to the European Community normative, was amplified. To be more explicit, in the 1992 Plan, some measures were incorporated concerning the expansion of Spanish capital abroad. Those measures have increasingly evolved since the second half of the eighties (Sanchez, 1993).

3.2- PRESENT INSTRUMENTS.

Since the early the nineties some important changes in the configuration of internationalisation policy took place. This was basically due to the recognition of the of firms' needs to make an important effort of adaptation in which this policy must play a relevant roll. The new panorama of reduction of trading barriers, market

¹³ Domestic Tax Compensation.

¹⁴ Spanish Insurance Company of Export Loans.

¹⁵ Exterior trade institution.

globalisation, wider mobility of productive factors, goods and services, and, in general, the environment of more international competitiveness, ended in the awakening of the necessity of a “change of mentality” that brings with it the opening of the firms to an international competitive culture.

In 1992 the Plan de Apoyo a la Internacionalización de la Empresa¹⁶ was created with this objective and with the aim of helping those firms that were to start an international course (see table 3). Nevertheless this plan had a limitation because it was directed only to firms that would be internationalised by having a permanent establishment abroad, not to firms which could carry out other ways of internationalisation such as exporting or technology transfer abroad. The plan is based on the recognition of the reduced technological and financial capacity, common to SMEs and, therefore, the obstacles these firms find in tackling an international strategy.

Later on, in 1994, due to the ending of the transitional period of adhesion and to the changes that the new situation implies in terms of the existence of the Common Market as a home market, the necessity was raised of improving the performance of the administration regarding trade and investment activities. For this reason, new ways of acting started. These actions were supposed to answer in a more adequate way the obligations that Spanish firms should face, complementing, reorienting and amplifying the measures taken in 1998 Plan (Martinez, 1994).

In this sense, the purpose is to reduce the insufficient internationalisation and to provide an structural character to the foreign expansion of the companies. To achieve those objectives, there should be a continuous policy which will no longer be based on defensive instruments and which implies the necessity of rethinking the use of some of the aforementioned measures. Basically, those taken in 1994, are based on a wider collaboration between firms and the administration. They introduce institutional instruments designed to consolidate the internationalisation supporting system that completed the already existing ones. Similarly, these were strengthened in two senses: the first one is the approach to aspects connected to trade promotion, creating, for example, the Programa de Promotores¹⁷, and reinforcing aspects such as quality and external image. The second one refers to deepening of existing measures (fiscal, investment and information ones among others), putting the emphasis on issues such as: a wider use of the risk's cover and credit systems, the exploitation of trading opportunities, the upgrading of the level of compromise and regularity of exporting firms, the promotion of the international expansion of SMEs and the improvement of services offered by the ICEX¹⁸(Alonso and Donoso, 1995).

Finally, in 1997, the Proyecto 2000 para la exportación¹⁹ was undertaken. The fundamental elements of the project are: *an improvement of the management of trading policy through a more fluent exchange of information between the Administration and the economic sectors, a wider use of the financial instruments for investing and for the support to the firms through improvements in the information*

¹⁶ Plan for the firm's internationalisation.

¹⁷ Promoting programme.

¹⁸ Overseas Trade Institute

¹⁹ Although the name is Plan for Exporting, it also includes measures for the promotion of direct foreign investment.

and promotion systems in a way that these arrive especially to small and medium firms, (*Plan 2000 para la Exportación, page 11*).

The Plan was elaborated jointly by the firms and the administration with the aim of achieving high co-ordination levels. The main innovation of the Plan 2000 is centred

Table 3: Programmes and instruments of the Plan de Apoyo a la Internacionalización de la Empresa 1992.

Programmes	Instruments
I.-Trading Programme.	-Plans of the firm (logistic support, supply of information, financing) -Consortia of exporting (consortium in origin, destination, promotion and sales)
II.-Financial Programme.	-Promotion of COFIDIES (share capital increase and budgetary endowment). -Modernisation of the policy of investment of CESCE. - Corporación Bancaria Española (CBE) (creation of a department for investment risks and diffusion of inversion projects). - Marketing campaigns. - Priority of the Fondos de Ayuda al Desarrollo (FAD) - Promotion of international leasing and factoring. - Development of co-operation deals with some countries.
III.-Fiscal Programme.	- Deduction by direct foreign investments. - Elimination of double taxation. - Treatment of the risks suffered by the firms with a foreign establishment (losses in the first financial years).
IV.-Program of Information.	- Sensitising campaigns (trips, publicity) - ICEX (promotion of the division of co-ordination of investments and creation of a sole window). -Specialisation of trading offices and creation of business platforms. -Maximise the return of supplies
V.-Training Programmes.	-Education (languages, promote exchanges, create the specialisation of international economic relationships) -Training and integration of new foreign trade specialists.

on the recognition of the relevance of a pro-active trading policy which allows a wider presence of Spanish firms in the international markets, while a more defensive protection is less efficient in a total liberalisation context.

The instruments used are basically the following:

- Institutional co-operation
- Technical assistance to exportation
- Access to sources of information
- The impulse to the diversification of exports to emerging markets
- The use of financial instruments as the Convenio de Ajuste Recíproco de Intereses (CARI²⁰),
- FAD credits and the export insurance credit
- The promoting of the participation of Spanish firms in projects financed by multilateral bodies
- Measures dealing with outward investment encouragement
- The support to the network of commercial offices abroad

Between 1992 and 1997 the Spanish internationalisation policy has had some changes. We can see them by looking at the differences in the conception of the plans that we have discussed, and also in the different emphasis and novelties regarding the instruments which have been used hitherto.

If we consider the first aspect, the main conceptual difference between the Plan de Apoyo a la Internacionalización de la Empresa and the Plan 2000 para la Exportación could be summarised as follows:

- 1.- The Plan 2000 is broader than the Plan de Internacionalización both in the aspects that it covers and in the number of measures it uses.
- 2.- The Plan 2000 is designed for a wider group of firms, covering exporting and investing firms whereas the Plan de Internacionalización only considered the latter group of companies.
- 3.- In the elaboration of Plan 2000 priority is given to the relationship between the Administration, the associations involved and the firms. This is a bottom-up process that was not in the Internalisation Plan, in which the decisions were studied and taken by the Administration.
4. -This Internalisation Plan did not fix periods for the implementation of the policies while the Plan 2000 does include time calculations.
5. - Finally, the Plan 2000 clarifies the management and responsible units of each of the decisions, trying to avoid administration mismanagement and hence allowing an easier process of continuous follow up.

3.3.- SOME RESULTS OF INTERNATIONALISATION POLICIES.

It is not possible to analyse the global impact of internationalisation policies, given the lack of information and evaluation studies. However, we can have a preliminary approach to the issue through the number of firms that have taken part in some sub-programmes.

This is the case of the PIPE-2000 programme²¹ -included in the Plan 2000 for exports-whose central objective is to involve 2,000 new firms in regular exports activities between 1997 and 2000.

²⁰ Agreement for Reciprocal Adjustment of Interests.

²¹ Programme of starting export activities.

Table 4 allows us to point out the following characteristics:

- From 1997 to 1999 more than 1,600 firms have been involved in the programme. About 41 per cent of them are from Andalucía, Cataluña and Comunidad Valenciana. More than one third are in the industrial products sector.

Table 4: Some results of PIPE-2000. 1997-1999

REGION	NUMBER OF FIRMS	PERCENTAGE
Andalucía*	232	14.12
Aragón	70	4.26
Asturias*	44	2.68
Baleares	17	1.03
Canarias*	76	4.62
Cantabria*	36	2.19
Castilla-La Mancha*	70	4.26
Castilla-León*	87	5.29
Cataluña	230	13.99
Comunidad Valenciana*	208	12.65
Extremadura*	27	1.64
Galicia*	166	10.10
La Rioja	35	2.13
Madrid	119	7.24
Murcia*	76	4.62
Navarra	50	3.04
País Vasco	100	6.08
TOTAL	1643	100.00
MACROSECTOR	NUMBER OF FIRMS	PERCENTAGE
Industrial products	575	35
Consumption goods	476	29
Agroindustry	378	23
Services	99	6
N/d	115	7
TOTAL	1643	100.00
SIZE (Employment)	NUMBER OF FIRMS	PERCENTAGE
10-20	591	36
20-30	394	24
30-40	213	13
40-50	149	9
More than 50	296	18
TOTAL	1643	100.00
TRAINED PERSONNEL	NUMBER OF PEOPLE	PERCENTAGE
Promoters	262	14.90
Tutors	324	18.43
Collaborators	1172	66.67
TOTAL TRAINED PERS.	1758	100.00

Source: Own elaboration from ICEX data.

(*): Regions Objective 1

- A majority of firms (60 %) have fewer than 30 workers, which corresponds to the objective of promoting export activities in small companies.
- Objective 1 regions account for 52 per cent of all the firms involved in the programme.
- Finally, more than 1,700 persons have followed courses concerning entry and development of export strategies in new foreign markets.

Another factor for which we have some partial data is the number of exporting consortia from 1985 to 1998. As in the case of PIPE 2000, the consortium is an instrument created to reduce the limitations for exporting associated with the small size of the firms.

Table 5: Number of consortia. 1985-1998

	1985-1991	1992-1998	TOTAL
REGION	Number	Number	NUMBER
Andalucía*	4	7	11
Aragón	1	7	8
Asturias*	0	2	2
Baleares	1	0	1
Canarias*	2	4	6
Cantabria*	1	0	1
Castilla-La Mancha*	2	6	8
Castilla-León*	2	3	5
Cataluña	9	20	29
Comunidad Valenciana*	1	0	1
Extremadura*	2	2	4
Galicia*	2	2	4
La Rioja	9	11	20
Madrid	1	4	5
Murcia*	3	1	4
Navarra	29	45	74
País Vasco	4	44	49
Various regions	7	12	19
SECTORS/ACTIVITIES	Number	Number	TOTAL
Agroindustry (fresh prods.)	15	13	28
Agroindustry (transfrom.pr)	10	25	35
Capital goods	13	25	38
Fashion	0	8	8
Home equipment	8	24	32
Culture	4	2	6
Industrial products	20	43	63
Technology and projects	1	10	10
Textil and leather	6	9	15
Wine and alcohol	3	3	6
Services	0	3	3
Multisectors	0	7	7
TOTAL	80	171	251

Source: Own elaboration from ICEX data.

(*): Regions objective 1.

As Table 5 shows, the number of consortia was 251, of which only 32 per cent were signed in the first half of the period. Four regions –Cataluña, Madrid, Pais Vasco and Valencia- concentrate 68 per cent of them. Broken down by sectors, two thirds of the agreements are in agro-business products, capital goods, home equipment and industrial products. However, the regions objective 1 have signed only 18 per cent of the consortia. It means this instrument has a limited impact precisely in regions which need that kind of aid the most.

A general (and preliminary) balance can be summarised as follows: First, given the small number of exporting firms in the Spanish economy –around 14,000, not all of them regular exporters-, the number of companies participating in the aforementioned programmes is relatively high. Secondly, policies and instruments are oriented basically to small firms. From these two considerations the general design of the policies seems to follow the correct way. Nevertheless, the lack of ex -post evaluations do not provide the necessary feedback in order to make a deeper assessment and, therefore, to have a mechanism to improve the original conception of the actions. Lastly, it is possible to see how the concentration of the participants in the PIPE 2000 as well as in the Consortium programme is very high, either by regions or by industries. We think this is an additional proof of the difficulties most small firms face - especially if they are located in less developed areas- for getting access to programmes which theoretically are a positive instrument to support the establishment of international strategies.

4.REGIONAL POLICIES FOR INNOVATION AND INTERNATIONALISATION.

4.1 REGIONAL TECHNOLOGICAL POLICY: A GLOBAL VIEW.

The already mentioned 1986 law for General Promotion and Coordination for scientific and Technique Activities included a regional perspective concerning the promotion of scientific and technological activities as well as the co-ordination between regional and national policies.

From this legislation there has been different regional Plans to promote scientific and technological innovation, especially since 1989. Autonomous Communities which started earlier to elaborate Research and Development programmes are synthesised in table 6. Later, most of the regions have elaborated this kind of actions.

In general terms, Innovation Plans in different regions have been inserted in a legal framework which allows their own development. The main objectives for most of the Plans can be synthesised as:

- To find out a proper environment for innovation, which was not common in most of the regions.
- The setting up of technological centres to support innovation.
- Incentives for Scientific Investigation.

- Promoting quality and industrial design.
- Support for small and medium firms looking for chances through developing or adopting new technologies.
- Promotion of new technology.
- Creation of technological infrastructures.

The most frequent tools are the followings:

- Subsidies and low interest rates credits.
- Creation of Technology Transfers Offices (OTRIs).
- Grants to researchers as well as supporting agreements between universities, public research centres and firms.
- Creation of technological parks to make easier the relationship between firms and their environment.

As far as resources from technological innovation policies are concerned, there are three categories to consider. The first one refers to the ones devoted by those regional governments, the second consists of resources from the Central State through National Plans²², and the third one coming from EU funds (FEDER and Framework Programmes).

Table 6: First Plans for innovation in the Spanish regions.

Regions	Years	Name of the Plan
Andalucía *	1990-1993	I Andalusian Research Plan
	1996-1999	II Andalusian Research Plan
Asturias *	1989-1993	I Regional Research Plan
	1994-1999	II Regional Research Plan
Cataluña	1989-1993	I Catalanian Research Plan
	1994-1999	II Catalanian Research Plan
Galicia *	1993-1996	Research and Development for Galicia
	1997-2000	
Madrid	1990-1993	I Regional Research Plan
	1991-1993	Regional Industrial Research Plan
	1994-1997	II Regional Research Plan
	2000-2003	III Regional Research Development Plan
Navarra	1992-1994	Regional Investigation Plan in Navarra
País Vasco	1989-1992	Strategic Technology Plan
	1993-1996	Industrial Technology Plan
	1997-2000	Science and Technology Plan in Euskadi
Valencia *	1994-1998	Science and Technology Plan in Valencia

(*)Regions objective 1.

Font: Fonfría et al., 1998 y Durán, 1999

In general terms, regional funds vary considerably and depend on contributions coming from the other two categories; co-financing innovation is the most common method for regional policies. As we can see in table 7, CCAA's contribution to public

²² These funds are managed by CDTI at a national level.

funds is limited, that is why its effort is looking not very satisfactory yet. The majority of these public funds still come from EU and central administration.

Finally we show the fields in which each region is most interested. Table 8 has been elaborated with those action fields that have been emphasised in each region. Of course these are not the only ones, but they are the most important as revealed by the times they appear in each region planning. Also, many of them are considered as a very strong developing point for the future and as bases for technology that can be used in new *technological paradigms* in a long term consideration.

As we can see, a great proportion of CCAA is more interested in these four action lines: improvements in production process and in product quality (71%), environment (65%), computers and information technologies (59%), grants for small and medium firms development (59%) and agro-business (58%). Close to these fields which could be called *top priority* ones, there is another group of action lines which is quite important as well: health and agro-business related technologies. In the opposite direction, those fields in which the intensity is lower are biotechnology (18%), energy (24%), humanities (35%) and human resources (35%).

The question arising after these results is whether it is true that these are the fields which are going to have a greater development in a near future, and if this happens, to what extent regions working on them are having strategic positions to get advantages for having a better position and possibilities of development?²³ This situation would be highly positive because the lines that have been discussed seem to be the ones with a greater projection. Nevertheless, this optimistic situation has to be qualified by other reasons such as:

- There is a lack of co-ordination in some of the policies, which leads to duplications in resources uses and hence to a second best exploitation of them.
- There exists the necessity of increasing the effort in R&D tasks, not just from public administrations but also from firms as innovatory agents in order to make the industrial field in which they are inserted more dynamic²⁴.
- Also the establishment of some clear long term strategy is needed - through aforementioned programmes - which plan the path within which different actions must go on in science and technology fields.
- There is not an agreement between scientific, technological and industrial fields.
- Finally, it is still needed to expand relationships between different regions as well as in the international level, in order to let them know about new initiatives, to collaborate in new projects and to take advantage of accumulated knowledge and resources.

4.2.- CURRENT POLICY TOOLS.

²³ The evaluation after the results of the policies towards the firms enables us to know the adaptation to the proposed objectives, which are done towards having a better competitive position. The analysis of a particular case can be consulted in Fonfría (1996).

²⁴ Buesa and Molero (1992).

In recent years, policies of regional (autonomous) governments we have described before have known an additional impulse, due to availability of European funds. These have given a bigger margin to these governments so they can approve more ambitious Plans. The RIS-RITTS initiative has been very important to that end insofar as it is oriented to supply better technological infrastructures to the European regions, particularly to the less developed ones. It is a noticeable fact that most regional governments have taken these initiatives to analyse their innovation system, in both the public and firms sector.

The newest feature of these initiatives is its global character, coming from the concept of the Innovation System. This has permitted recent plans to be not restricted to give certain financial help to the firms; on the contrary, they try to include more institutional aspects as well as relationships between agents of the system. It is too soon to evaluate the efficiency of these initiatives, because most of them are in a previous study phase or have been introduced in recent months. We can say they have been well received in society because rather a large number of agents and bodies have been consulted.

It should be pointed out that the potential impact will depend on the economic and technological level of the areas in which this is implanted; the case of the highest developed areas (Madrid, Cataluña or País Vasco) is completely different from those more depressed territories, with less economic activity or less participation in national tools that have been described in section 2.

Table 7: Public funds designated to innovation depending on their origin for some of the CCAA. (Autonomous Communities). (mill. ptas.)

CCAA	Funds from CCAA	Funds from central Administration	FEDER (1989-99)	Framework Programme (1989-99)
Andalucía *	2630,9 (1990-96)	14108,5	17376,6	8326,1
Aragón	729,5 (1989-99)	6611,4	2223,0	1836,8
Asturias *	2694,9 (1988-95)	5374,2	5591,0	1452,7
Castilla La Mancha *	675 (1995)	2059,7	6811,7	428,7
Castilla León	n.d	5637,0	11793,1	1690,1
Cataluña	15207,2 (1993-96)	56979,1	6662,5	20866,2
Galicia *	n.d	5830,8	6311,8	1883,3
Madrid	10558,4 (1994-98)	40536,2	20020,7+	48197,1++
País Vasco	39722,0 (1998-96)	19260,3	9300,9	2426,5

(*): Regions objective 1.

(+):1989-93.

(++): 1990-98.

Font: self elaboration from Durán, 1999 and Fonfría *et al*, 1998(*):

In the same direction, albeit with less extension and depth, a number of regional governments have used different instruments to improve their firms competitiveness. Generally they consist of measures for encouraging exports and less frequently they include other forms of internationalisation.

In the following pages we are going to synthesise some of the most outstanding initiatives taken by two of the less developed regions (in both cases, Objective 1): Castilla La Mancha and Canary Islands communities. The intention is not to apply to other regions the details of the policies of those governments; these are just a couple of examples of what we have talked about before, and the new way of making regional policies more firm oriented.

a) Castilla la Mancha.

The origin of recent initiatives is the Pacto Industrial (Industrial Pact) 1996-99, which is based on an agreement between political parties, trade unions, and firms' organisations to improve the industrial development of a region which is one of the least developed in Spain. The Pact anticipated three great areas in which it could act,

Table n° 8: Main areas of interest of technological policies by regions

	Environment	Health	Humanities	Biotechnology	Agro-business	Energy	Computing and information technology	Human resources	Production and quality	SMEs	Culture
Andalucía	*	*	*		*		*		*		
Aragón	*	*	*	*	*		*		*	*	*
Asturias	*	*			*		*			*	*
Cantabria	*									*	
Castilla León					*		*	*	*	*	
Castilla La Mancha	*			*	*				*		
Cataluña	*	*	*	*	*		*	*	*	*	*
C. Valenciana	*	*	*		*			*		*	
Extremadura											
Galicia	*				*				*		
I. Baleares						*	*				*
I. Canarias						*	*		*	*	
La Rioja									*		
Madrid	*	*	*			*	*	*	*	*	*
Murcia+									*	*	
Navarra		*			*			*	*		
Pais Vasco	*	*		*	*	*	*	*	*	*	
% each line over total regional	65%	53%	35%	18%	58%	24%	59%	35%	71%	59%	29%

Source: Own elaboration

with a great emphasis on the *Promotion of Economic Activities and Entrepreneurial Competitiveness*.

To develop this Plan there are different programmes, but for our purposes it is important to point out two: *Programme for Innovation and Technological Development and Programme for Foreign Trade and Internationalisation*. In the first one we can find some specific actions among which we have to mention the drawing up of: *Regional Technological Plan, Increase in Technological Demand, Innovation in the Regional Administration, Regional Information and technological Support and Technological Infrastructure Endowment and Supporting Services*.

In the Program of Foreign Trade and Internationalisation there are many ways of promoting those activities within local firms, mainly through exports and paying special attention to SMEs.

In the current year, 1999, both objectives have been achieved with the starting of the Regional Plan to Improve Foreign Activities (PRAE) and the promotion of the Regional Plan for Innovation in Castilla La Mancha (PRICAMAN). In both cases, it is too soon to know the results, albeit we can have a draft picture of their priorities and capacity for affecting the firms of the region by describing their contents.

About the PRAE, there is an especial emphasis in promoting foreign trade and the internationalisation of the firm, not just because of current international conditions but because the initial level of foreign activities is very low. To repair this, there are three different programmes. Information, Training and Promotion. The Promotion Programme is the most ambitious one and "it is oriented towards the small and medium firms to create the previous conditions to make easier the access to foreign markets for these firms which are not exporting at the moment, and also to participate and give financial help with actions of international promotion". From the fourteen actions observed, we can see just a small reference about the establishment of some of these companies abroad, which means that the Plan is just to promote exports. It is consistent with the present situation in which traditional industry dominates and small firms look to the domestic market.

More ambitious, at least in theory, is PRICAMAN, already approved by the European Commission within the RIS-RITTS programme. Among its basic features can be underlined the agreement between the economic and social agents and the demand-side orientation. The objectives can be summarised as follows:

- To create a coherent situation in which private and public initiatives get closer.
- To define a technological strategy and a support Plan in both the short and long term.
- To define specific actions, improving old programmes and creating new ones.
- To create a co-ordination body involved in technological development actions and innovation in Castilla La Mancha.

PRICAMAN is based on a wide diagnosis of the science-technology regional system which places this region below the national average in R&D and innovation resources, even admitting the positive evolution of this zone in the last few years. Also the Plan stresses the lack of scientific-technological tradition, the very poor infrastructure and small number of researchers, the lack of interface bodies, and, the most important one:

the reduced number of firms with enough knowledge and financial resources to work with research centres. As a positive aspect one must emphasise the creation of a number of technological centres, the existence of harmonising socio-economically important elements, the advance in some of the ranges in firms' co-operation, and actions carried out by the Regional Government to support the PRICAMAN in the last few years.

The Plan is based on three strategic axes: *the generation and application of innovation, the creation and consolidation of the infrastructure to support innovation and the integration of the regional system or innovation*. All these are synthesised in ten programmes with a expiry date of four years from January 2000.

From the financial point of view, it will represent a noticeable effort, because the regional government has planned to invest 15,410 million pesetas in those four years plus a similar amount from the central administration and European Union programmes. All together make a total investment in innovating actions in the region's firms of 33,000 million in year 2000 to 47,000 million in year 2003.

b) Canary Islands

To a great extent the Canary Islands case is very similar to the Castilla La Mancha one. As before, we have a previous regional policy tool which is *The Development Plan for Canarias 1993-1999*. In this Plan some initiatives were considered to improve the technological situation, especially in R&D. As in the other case, Canarias is a region with scarce importance in the whole Spanish scientific structure, as we can see in table 2. Also in this case the Plan is achieved with European funds coming from the RIS-RITSS programme.

The sequence of methods and the orientation of the *Strategic Plan for Innovation in Canarias* (PEINCA) are very similar to the one we have described before in PRICAMAN. It carried out a profound diagnosis of the regional system of innovation upon which it is possible to implant a strategy with the basic objectives of the Plan. Again, it is important to insist on the new orientation about the concept of an innovation system. On the one hand, it must be remarked the aim of leaving the linear approach and reinforcing the idea of the complexity of the innovation process. On the other, the Plan emphasises the importance of the environment of the firm and the interface mechanisms.

The strategic lines of PEINCA are four:

- *The development of innovation supporting tools* to respond more efficiently to the Canarias firms' demand.
- *The development of technological resources of Canary Islands*, the main objective is to boost the technological supply of the region.
- *The development of new technology based firms*, to deal with the insufficient regional capacity to create innovating firms.
- *The co-ordination of policies and resources to improve innovation*. To establish common objectives to promote technological activity.

PEINCA has a duration of seven years (2000-2006) and it is estimated to move 49,970 million pesetas in the whole period. Just 70% of this investment will come from new

sources because the rest of it will come from existing funds to be integrated in the new Plan. In the strategy designed there is an interaction to use a very strong contribution from structural European funds, which grew to 12,800 million pesetas in the 1994-1999 period. And probably there will be an increase in the contribution coming from other European and national innovation programmes, thanks to the promotion activities developed by interface bodies and supply institutions.

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Table n° 1: TECHNOLOGY BALANCE OF PAYMENTS
(Receipts and payments as percentage of Business Enterprise R&D)

		1981	1982	1983	1984	1985	1986	1987	1988
Germany	Receipts/BERD	9,43	10,26	11,60	12,61	12,58	20,24	20,00	20,35
	Payments/BERD	14,93	14,46	15,67	16,37	17,73	22,73	22,44	24,06
France	Receipts/BERD	10,08	11,48	12,95	15,43	14,18	13,01	12,62	13,25
	Payments/BERD	11,02	13,39	14,35	17,22	16,87	15,64	16,22	16,66
Italy	Receipts/BERD	5,42	5,01	4,75	5,69	4,79	5,26	5,87	11,84
	Payments/BERD	15,57	18,67	19,24	19,45	18,16	17,01	15,37	21,86
United Kingdom	Receipts/BERD	7,13		10,38		12,58	10,79	12,68	12,83
	Payments/BERD	5,90		8,14		11,18	9,80	14,01	13,99
Spain	Receipts/BERD	26,45	19,89	25,89	24,42	22,31	21,94	16,54	13,60
	Payments/BERD	82,99	100,01	125,22	99,60	89,54	91,13	91,64	102,99
Portugal	Receipts/BERD	19,78	15,07	16,52	14,64	15,10			
	Payments/BERD	139,39	153,99	163,41	125,49	138,41			
Belgium	Receipts/BERD	47,95		69,18		78,79	85,37	74,77	81,32
	Payments/BERD	56,05		80,39		91,38	97,87	105,07	116,76
Netherlands	Receipts/BERD	30,68	19,58	93,63	106,42	99,79	85,30	85,39	96,89
	Payments/BERD	47,05	35,43	105,10	123,41	125,47	88,58	82,50	97,45
Denmark	Receipts/BERD	39,28	59,88	50,73	49,92	66,44			
	Payments/BERD	26,21	51,50	51,89	55,21	58,28			
Austria	Receipts/BERD	5,14			7,54	7,05			
	Payments/BERD	21,35			25,71	26,87			
Sweden	Receipts/BERD	3,24		6,19		5,55		6,01	
	Payments/BERD	3,04		2,83		3,13		1,81	
Finland	Receipts/BERD	1,41		1,63	0,94	1,17	1,43	4,00	4,93
	Payments/BERD	26,32		27,52	26,75	28,57	30,00	31,83	31,13
Norway	Receipts/BERD	10,21	6,88	11,06	6,21	5,53		9,88	
	Payments/BERD	17,79	18,00	20,64	16,89	14,94		28,77	
United States	Receipts/BERD	8,07	5,36	4,96	4,43	4,32	6,48	9,24	11,45
	Payments/BERD	0,72	0,76	0,81	0,85	0,77	1,14	1,72	2,51
Japan	Receipts/BERD	5,99	6,57	7,34	7,51	5,67	4,18	3,65	3,57
	Payments/BERD	8,89	10,04	8,51	7,62	7,10	4,87	4,80	4,53

Source: OECD and own elaboration,

Table nº 2: Percentages of each region of national figures

REGIONS	R&D Expend. 1987	Business R&D 1987	II National R&D Plan funds	Nº of Firms with CDTI Projects 1984-94	Nº projects with CDTI Funds 1984-94
Andalucia	9,8	4,7	9,8	4,6	3,9
Aragon	2,1	2,0	3,2	2,4	2,4
Asturias	1,5	1,0	2,4	3,5	3,0
Baleares	0,6	0,0	0,6	0,4	0,4
Canarias	2,0	0,6	1,0	0,3	0,2
Cantabria	0,9	0,6	1,5	0,9	0,8
Castilla-Leon	3,7	2,4	3,1	2,1	1,6
Castilla La Mancha	2,2	3,1	0,4	1,6	1,0
Cataluña	21,7	28,5	22,9	34,5	33,1
C:Valenciana	6,5	3,8	8,2	7,2	6,8
Extremadura	0,8	0,1	0,5	0,5	0,3
Galicia	3,5	1,8	3,6	3,1	2,7
Madrid	32,2	34,3	31,4	25,3	29,5
Murcia	1,5	1,2	1,4	1,6	1,2
Navarra	1,5	1,7	1,4	3,6	3,4
Pais Vasco	8,8	13,9	8,2	7,7	9,2
La Rioja	0,4	0,3	0,4	0,7	0,6

Source: Own elaboration.

Table 3: Programmes and instruments of the Plan de Apoyo a la Internacionalización de la Empresa 1992.

Programmes	Instruments
I.-Trading Programme.	<ul style="list-style-type: none"> -Plans of the firm (logistic support, supply of information, financing) -Consortia of exporting (consortium in origin, destination, promotion and sales)
II.-Financial Programme.	<ul style="list-style-type: none"> -Promotion of COFIDIES (share capital increase and budgetary endowment). -Modernisation of the policy of investment of CESCE. - Corporación Bancaria Española (CBE) (creation of a department for investment risks and diffusion of inversion projects). - Marketing campaigns. - Priority of the Fondos de Ayuda al Desarrollo (FAD) - Promotion of international leasing and factoring. - Development of co-operation deals with some countries.
III.-Fiscal Programme.	<ul style="list-style-type: none"> - Deduction by direct foreign investments. - Elimination of double taxation. - Treatment of the risks suffered by the firms with a foreign establishment (losses in the first financial years).
IV.-Program of Information.	<ul style="list-style-type: none"> - Sensitising campaigns (trips, publicity) - ICEX (promotion of the division of co-ordination of investments and creation of a sole window). -Specialisation of trading offices and creation of business platforms. -Maximise the return of supplies
V.-Training Programmes.	<ul style="list-style-type: none"> -Education (languages, promote exchanges, create the specialisation of international economic relationships) -Training and integration of new foreign

trade specialists.

Table 4: Some results of PIPE-2000. 1997-1999

REGION	NUMBER OF FIRMS	PERCENTAGE
Andalucía*	232	14.12
Aragón	70	4.26
Asturias*	44	2.68
Baleares	17	1.03
Canarias*	76	4.62
Cantabria*	36	2.19
Castilla-La Mancha*	70	4.26
Castilla-León*	87	5.29
Cataluña	230	13.99
Comunidad Valenciana*	208	12.65
Extremadura*	27	1.64
Galicia*	166	10.10
La Rioja	35	2.13
Madrid	119	7.24
Murcia*	76	4.62
Navarra	50	3.04
País Vasco	100	6.08
TOTAL	1643	100.00
MACROSECTOR	NUMBER OF FIRMS	PERCENTAGE
Industrial products	575	35
Consumption goods	476	29
Agroindustry	378	23
Services	99	6
N/d	115	7
TOTAL	1643	100.00
SIZE (Employment)	NUMBER OF FIRMS	PERCENTAGE
10-20	591	36
20-30	394	24
30-40	213	13
40-50	149	9
More than 50	296	18

TOTAL	1643	100.00
TRAINED PERSONNEL	NUMBER OF PEOPLE	PERCENTAGE
Promoters	262	14.90
Tutors	324	18.43
Collaborators	1172	66.67
TOTAL TRAINED PERS.	1758	100.00

Source: Own elaboration from ICEX data.

(*): Regions Objective 1

Table 5: Number of consortia. 1985-1998

	1985-1991	1992-1998	TOTAL
REGION	Number	Number	NUMBER
Andalucía*	4	7	11
Aragón	1	7	8
Asturias*	0	2	2
Baleares	1	0	1
Canarias*	2	4	6
Cantabria*	1	0	1
Castilla-La Mancha*	2	6	8
Castilla-León*	2	3	5
Cataluña	9	20	29
Comunidad Valenciana*	1	0	1
Extremadura*	2	2	4
Galicia*	2	2	4
La Rioja	9	11	20
Madrid	1	4	5
Murcia*	3	1	4
Navarra	29	45	74
País Vasco	4	44	49
Various regions	7	12	19
SECTORS/ACTIVITIES	Number	Number	TOTAL
Agroindustry (fresh prods.)	15	13	28
Agroindustry (transfrom.pr)	10	25	35
Capital goods	13	25	38
Fashion	0	8	8
Home equipment	8	24	32

Culture	4	2	6
Industrial products	20	43	63
Technology and projects	1	10	10
Textil and leather	6	9	15
Wine and alcohol	3	3	6
Services	0	3	3
Multisectors	0	7	7
TOTAL	80	171	251

Source: Own elaboration from ICEX data.

(*): Regions objective 1.

Table 6: First Plans for innovation in the Spanish regions.

Regions	Years	Name of the Plan
Andalucía *	1990-1993 1996-1999	I Andalusian Research Plan II Andalusian Research Plan
Asturias *	1989-1993 1994-1999	I Regional Research Plan II Regional Research Plan
Cataluña	1989-1993 1994-1999	I Catalanian Research Plan II Catalanian Research Plan
Galicia *	1993-1996 1997-2000	Research and Development for Galicia
Madrid	1990-1993 1991-1993 1994-1997 2000-2003	I Regional Research Plan Regional Industrial Research Plan II Regional Research Plan III Regional Research Development Plan
Navarra	1992-1994	Regional Investigation Plan in Navarra
País Vasco	1989-1992 1993-1996	Strategic Technology Plan Industrial Technology Plan

	1997-2000	Science and Technology Plan in Euskadi
Valencia *	1994-1998	Science and Technology Plan in Valencia

(*)Regions objective 1.

Font: Fonfría et al.,1998 y Durán,1999

Table 7: Public funds designated to innovation depending on their origin for some of the CCAA. (Autonomous Communities). (mill. ptas.)

CCAA	Funds from CCAA	Funds from central Administration	FEDER (1989-99)	Framework Programme (1989-99)
Andalucía *	2630,9 (1990-96)	14108,5	17376,6	8326,1
Aragón	729,5 (1989-99)	6611,4	2223,0	1836,8
Asturias *	2694,9 (1988-95)	5374,2	5591,0	1452,7

Castilla La Mancha *	675 (1995)	2059,7	6811,7	428,7
Castilla León	n.d	5637,0	11793,1	1690,1
Cataluña	15207,2 (1993-96)	56979,1	6662,5	20866,2
Galicia *	n.d	5830,8	6311,8	1883,3
Madrid	10558,4 (1994-98)	40536,2	20020,7+	48197,1++
País Vasco	39722,0 (1998-96)	19260,3	9300,9	2426,5

(*): Regions objective 1.

(+):1989-93.

(++): 1990-98.

Font: self elaboration from Durán, 1999 and Fonfría *et al*, 1998(*):

Table n° 8: Main areas of interest of technological policies by regions

	Environment	Health	Humanities	Biotechnology	Agro-business	Energy	Computing and information technology	Human resources
Andalucía	*	*	*		*		*	
Aragón	*	*	*	*	*		*	
Asturias	*	*			*		*	
Cantabria	*							
Castilla León					*		*	*
Castilla La Mancha	*			*	*			
Cataluña	*	*	*	*	*		*	*
C. Valenciana	*	*	*		*			*
Extremadura								
Galicia	*				*			
I. Baleares						*	*	
I. Canarias						*	*	
La Rioja								
Madrid	*	*	*			*	*	*
Murcia+								
Navarra		*			*			*
Pais Vasco	*	*		*	*	*	*	*
% each line over total regional	65%	53%	35%	18%	58%	24%	59%	35%

Source: Own elaboration

RESUMEN

Este trabajo trata de analizar desde un enfoque valorativo las principales líneas de las políticas tecnológica y de internacionalización llevadas a cabo en los últimos años en la economía española. En él se tratan, desde el ámbito nacional y regional, tomando algunos ejemplos para el caso de regiones menos desarrolladas, aspectos relativos a la financiación, las formas de implantación, y el análisis de los resultados más relevantes obtenidos por la aplicación de las distintas políticas. Se incluye igualmente una breve descripción de la evolución en los últimos años de las principales líneas de política.

Palabras clave: política tecnológica, políticas de internacionalización, políticas regionales.

ABSTRACT

In this work we analyse the main trajectories of the technological and internationalisation policies carried out in Spain in the last years. The analysis takes into account the national and regional levels, specially in the case of less developed regions. The aim of the paper is to study the results of these policies jointly with the financial and organisational tools utilised by the policy makers.

Key words: technological policies, internationalisation policies, regional policies.

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