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Promoters of the innovative character of a region: The role of university and enterprises in the Basque country

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**PROMOTERS OF THE INNOVATIVE CHARACTER OF A REGION:
THE ROLE OF UNIVERSITY AND ENTERPRISES
IN THE BASQUE COUNTRY**

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SUMMARY

The aim of the paper is to analyse the relationship between two important organisations as subjects of innovation, Universities and Enterprises, in the context of a peripheral region of Europe, the Basque Country. These institutions play an important role in the future competitiveness and the process of growth of any region, by increasing technological and innovation based strengths.

Following a systemic approach, the interactions between both organisations are also crucial for regional socio-economic development. This has been the main assumption on which our empirical analysis is based. Having as background the European Commission's programme (DGXII) „Universities, Technology transfer and spin-off activities- academic entrepreneurship in different types of European regions“ in which we within our research team have taken part, this paper tries to analyse whether the University of the Basque Country is undertaking a proactive role in encouraging the growth of small technology-based firms, as it is the case in other countries. The fact is that in the Basque Country, due to the current University pattern, academics do not have many facilities to forge contacts with industry, so that the constraints found in this interaction process are of special interest for the analysis. At the same time, and as a conclusion, although the Science and Technology Policy carried out by the Regional Government is nowadays changing into promoting links between University and Industry, some shortages still remain, which, from our point of view, should be overcome and are therefore underlined in this paper.

1. INTRODUCTION

Nowadays, it is widely accepted the relevant role that Technological Innovation plays in the development of the economy of any territory. In the conventional Economic Theory developed along this XX century, the process of innovation has mainly been considered an exogenous element to production processes. In that way, the interest for its study dropped away, although the most classical economists, such as Smith, Marx or Marshall, were well aware of the role played by technology and took it into account in their analyses. Besides, the emphasis put during the first half of the twentieth century in the long run steady state "equilibrium" configurations left aside the contributions made by some economists who considered that technical change played an important role in the economic development process. This is, for example, the case of Schumpeter, who argued for the dynamic character of technical change and for its strong effects on any economy, as it was the principal weapon of competition in many industries; in that way, he stressed the role of innovation and the need of its comprehension (Nelson, 1987).

Therefore, the most generalised analyses have held for decades that new technologies were adopted by the firms in a mechanical and immediate way, without taking into account how they were generated and spread within the economic system. However, the study of innovations and their processes of diffusion, are no more a forgotten field in applied economics or economic policy (Freeman, 1992), as they are getting the level of importance that they deserve. In this context, the researchers in this area accept that innovation is a complex and interactive process integrated within the productive system, and they have started to analyse it from a dynamic point of view and endogenous to the system.

Likewise, we understand that diffusion of technologies requires parallel changes in work and production organisation, and sometimes, it needs to go along with cultural and/or routines and habits changes to be completely adapted to the conditions of its productive environment, which is specific and in constant process of change (Cooke, Etxebarria, Gómez, 1997). As one of the results of this process, the modifications that innovation generates cover further than the change brought about exclusively in the productive sphere.

On the other hand, due to the swiftness with which the generation and introduction of innovations into the productive system is taking place, currently there is not a universally accepted formal theory to be applied on these processes and valid to explain its role in economic development. In general, there is only an attempt to gather all the elements observed in the real

behaviour of certain innovation systems, and so explained on the basis of empirical studies, by establishing an analytical framework (Nelson y Winter, 1982).

Nowadays, the internalisation trends are getting more and more deep and the European framework is progressively leaving less manoeuvring margin to the National Economic Systems. In this context, the Regional Innovation Systems are being developed as useful analytical tools to understand the role regions play in the consolidation of technical change and innovation in certain places, since the nation-state framework is not the only one to influence this development (Cooke and Gómez, 1998).

At the same time, from a systemic approach to the process of technological innovation, we consider that firms play a very active role in the innovative process being basic and fundamental subjects in it. Anyway, they are only a part of a group of interrelated elements that constitute the development process (Gómez, y Borja, 1996).

Within this group of organisations which shape the innovation system, it is remarkable, from our point of view, the role played by the Public Sector (PS) as a whole, and in particular by the Education Sector, as main subjects of the innovation process of a specific territory.

Although the Public Sector is not, on the whole, the object of the following pages, we would like to mention that sometimes economic analyses simplify extremely the role that the PS fulfils in the economic evolution of a certain territory, minimising the real role that it playsⁱ. However, the PS keeps an influential dimension in the development strategies of any nation, even in the economies where a neo- liberal system is defended, although it is not sufficiently recognised.

Within the Education Sector, in this paper we only highlight the role played by Universities. They are very relevant organisations from the view point of the generation of knowledge and its subsequent diffusion to the technological and productive environment. More specifically, we focus on the perception that university academics, all of them considered researchers by Law, have of their relationship with the entrepreneurial structure, as later on it will be described.

In this way, we must keep in mind that the existing University pattern in the Basque Country, and in Spain in general, comes from the influence of the napoleonic model of University, rather inbred, centralist and bureaucratic (Monreal, 1998), located by tradition very far away from social and economic needs of society, and mainly concentrated on training and research due to scientific and not social interest.

At the same time, the big differences between the entrepreneurial and the university cultures in our country may be considered a basic explanatory factor to understand the results obtained along the empirical work shown in the following pages. This study tries, in consequence, to analyse the relationship between two important organisations in the innovation system: University and Enterprises, in the territorial setting of the Autonomous Community of the Basque Country (CAPV), and it is based on the results obtained in the European Research Project „Universities, Technology Transfer And Spin-Off Activities - Academic Entrepreneurship In Different Types of European Regions“ (Targeted Socio- Economic Research) within the IV Framework Program of the European Commission (DGXII).

2-METHODOLOGY.

Following the purpose of deepening in the existing relationship between the academics and industry, the analysis made in the following pages is based on an empiricalⁱⁱ research. It studies the responses obtained by the academics of the faculties considered the most active in its relationship with industry in the Public University of the CAPV. These are Science Faculty, Medicine&Pharmacy, Architecture, Computer Science and Technical Schools of Engineering.

The method used consisted on a questionnaire sent to all the academics of the faculties mentioned above (1.574 academics) which was focused on the relationship they have maintained so far with industry and their perception of the university atmosphere as a proactive or passive element in this context.

Once all the responses obtained were analysed, the best cases were taken and after a face to face interview with them, the obstacles found by the academics in their relation with industry were studied. This has given us the base to make proposals that tend to solve these constraints.

3- THE BASQUE MAIN ORGANIZATIONS RELATED WITH INNOVATION IN THE CAPV.

The State of the Autonomies is the basic characteristic of the administrative decentralisation that took place in Spain with the political reform of middle seventies. This is a complex framework where Autonomous Communities with different competencial levels existⁱⁱⁱ, whose development was materialised in the following Statutes of Autonomy.

Coming into effect of the competencial capacities gathered in these rules should, at the same time, be negotiated with the central government for its real implementation. The Spanish Constitution just gathered potential capacities to share power between the different administrative levels. In the case of the CAPV, it is considered together with the Foral Community of Navarra, the only ones with Foral Historic Rights as it is determined by their basic^{iv} institutional rule and gives them a singular character (Razquin, 1989).

Their main economic competence is the capacity of tax collection that permits them to have a bigger amount of resources available for the public expenses than to the rest of the Autonomous Communities. In practice, however, the competencial transference processes have suffered lots of constraints and nowadays, two decades after the approbation of the Autonomous Statute, some competencies have not been transferred yet.

Scientific and technical research is an exclusive competence of the Basque Autonomous Community although always in co-ordination with the Central State, but it is still in process of being transferred. Also, education training has already been transferred, but inside the parameters of the plans marked by the State.

Within this framework, nowadays, there are public institutions that are related with the Basque innovative process. With the purpose of framing University in its context, we will briefly describe the policies implemented by the Basque Government in this subject and the role that the University of the Basque Country plays, focusing our interest in the last one.

In the decade 1982-1992, the technological and industrial policy implemented by the **Basque Government** had three main objectives: the expansion of R&D in the Basque firms, the increase of the infrastructures as a support of technology, and the creation of the technology centres. In this period, the university as a technology supplier did not take part in the objectives of this plan.

In 1993 the industrial technology plan was born and it was in force until 1996. This plan was principally divided in three parts: The first one, showed the Basque Industrial and Technology Policy compared with the Spanish and the European Community one. In the elaboration of this part the University of the Basque Country (UBC) participated with the technology centres and other agents. In the second part of the plan, a demand analysis and technological supply was

made, where for the first time, the UBC was included in the supply side. In the third part, the programs, projects and other activities that were to be carried out, were enumerated.

This Plan was exclusively oriented to the industrial sector, and its main objectives were to establish a stable financial framework for the Technology Centres. On the other side, in 1981 the scientific policy was born, and until 1996 it was characterised by supporting basic research by means of financing the University.

Nowadays, the Department of Science Policy of the Basque Government, is aware that there are too few researchers and technologists in the Basque Country, as "there are just 5,3 per thousand active inhabitants while in the European Union there were 10,5‰ in 1994, that is twice. On the other hand, there is a scarce relationship between the scientific, technologic and productive environments, being particularly worrying the isolated technologic situation of the University of the Basque Country and its limited contact with the Technology Centres and the enterprises"^v (Goni, Director of Science Policy, 1998).

That is why, the Basque Government is trying to overcome these problems by joining these two kinds of policies (Scientific and Technological) in the Science and Technology Plan (1997-2000), although the financial resources are rather limited. This Plan is oriented towards the entrepreneurial sector as a whole, and it proposes, among its objectives, to integrate the University within industrial research. With the same aim of approaching and transferring the technology originated at University to the firms in accordance with the needs of the latter, three University- Enterprise Programs have been launched.

This Plan gathers a set of activities which play a notorious role in technological innovation, such as basic and industrial innovation, technology development, training, and so on, with the objective of getting the right incorporation of new technologies to enterprises, its utilisation and commercialisation. In summary, this plan^{vi} supposes a radical change in the technological policy of the Government, showing an integrated vision between Science and Technology.

The University of the Basque Country is a public funded institution that was established in 1968 as University of Bilbao to provide the region with an Institution of Public Higher Education. It changed its name to UBC in 1977, and it is considered the most important Higher Education Institution in the Basque Country. It provides an education offer in Humanities, Science and Technology. And its main aim, during the first decades was to train students more than research due to the lack of financial resources and the progressive massification of

students.

The stable relations between academics and enterprises in Spain have started rather recently, as they have been ruled by law for the first time, in 1983, when the University Reform Law (URL) came into force. By means of this Law, the University Departments and the academics, through the former, are allowed to sign contracts with individuals, public and private entities, in order to carry out scientific, technical or artistic jobs (art. 11, URL). Therefore, from that time on, academics can legally collaborate with private enterprises to develop jobs for them or to engage in common tasks.

As a consequence of this Law, in 1989, it was created the figure of the Industrial Liaison Office under the name "Office of Research Output Transfer" (OTRI), that belongs to a network of Offices promoted by the National Plan of R&D impelled by the Central Administration. Its main task consists on the management of the contracts signed by the University academics and the enterprises or other public/private organisations. The OTRI of the Basque Country has been an object of special attention in the questionnaire sent to the academics within this research project.

Since 1979, that is before the URL was passed, in the CAPV there was an organisation created to fulfil the same function that later on OTRI has had during the last decade. It is the Foundation University- Enterprise, called "Euskoiker", who has tried to encourage and promote this sort of relations between the UBC and enterprises. Currently, this is strongly linked to the Engineering School of the UBC.

Nowadays, the role of the university as a „supplier“ to industry is overlapped by the Basque Technology Centres, specially by the ones Under the Protection of the Basque Government, and also by some Sectorial R&D Centres. This is due to the context where they were born, (around Engineering Schools or as an initiative of the Local Administration), with a very centralist Spanish University pattern. And on the other hand, the role that the Basque Technology Policy attributes to them as there was a necessity to carry out R&D focused on the needs of the Basque enterprises.

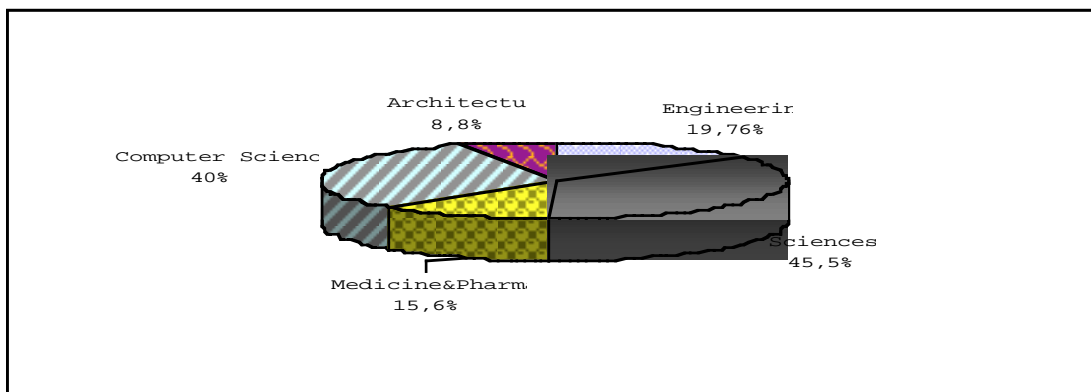
4- EXPERIENCES OF ACADEMIC ENTREPRENEURSHIP IN THE CAPV

Beginning to summarise the empirical work carried out in this project, and taking specially into account that the questionnaire was sent to all the academics who work for the previously

mentioned most active faculties within the UBC, the number of respondents was very different among those faculties.

In Figure 1^{vii}, it can be clearly appreciated that Sciences and Computing faculties are the most representatives for the study, due to their high level of responses (45,5% and 40% respectively), followed by Engineering (19,7%), Medicine and Pharmacy (15,6%). On the other hand, due to the low level of responses obtained from the academics of the Faculty of Architecture, we have considered that it is not representative enough and that is why it will not be analysed.

Figure 1: Percentage of respondents for each faculty.



One of the most flashing results obtained from these questionnaires and pointed out in Table 2 shows that almost half of the academics have never had any contact with industry^{viii} (49,1%).

Among those academics who have had contact with industry (50,9%), it can be observed that in half of the cases the promoter of that relationship has been the entrepreneurial side.

On the other hand, it shows that the academics who belong to Engineering and Computing faculties are those who have contacts with industry in a more active way and in a higher level. However, it is also remarkable that in every faculty the main promoters of the relationship are the enterprises and not the academics.

Table 2 : Percentage of respondents who have had some contact with industry.

Contact with industry	% de respondents				
	Eng. n =109	Scienc. n =178	Me& Ph n =54	Comp. n =36	Average N=377
No direct contact	35.8	54	66.7	50	49.1
Direct Contact	64.2	46	33.3	50	50.9
* Due to academic interest	(11.9)	(7.3)	(5.5)	(13.9)	(9.4)
* Due to industrial interest	(23.9)	(27)	(24.1)	(19.4)	(25.5)
* Both	(28.4)	(11.7)	(3.7)	(16.7)	(16)

* Breakdown of those respondents who have had some direct contact with industry.

Among the most common entrepreneurial activities carried out by academics, the results of Table 3, show that Large Scale Scientific Projects are in the first place (56,2%), followed by the Research Contracts (47,6%) and external teaching (40,9%).

At the same time, it is remarkable the limited importance of activities carried out by enterprises created as a consequence of researches developed at University (Spin-off firms), as they only represent the 3.2% of the total, being just in some cases in the Engineering and Science faculties and with percentages really low.

Table 3 : Percentage of responses about the kind of entrepreneurial activities carried out by those who have had contact with industry.

Entrepreneurial activities	% of responses *				
	Eng. n =97	Scienc. n =146	M& Phar n =37	Comp n =27	Average N=307
Large Scale Scientific projects	45.4	69.2	51.4	37	56.2
Research Contracts	54.6	50	29.7	37	47.6
Consulting	47.4	38.4	21.6	44.4	39.6
Patents and Licensing	2.1	4.1	0	3.7	2.9
Spin- Off	5.2	3.4	0	0	3.2
External Teaching	56.7	28.8	37.8	51.9	40.9
Sales	1.0	2.7	0	3.7	1.9
Testing	5.2	12.3	5.4	3.7	8.3
Other	9.3	4.8	8.1	11.1	7.1

*The percentages show the proportion of respondents who have had some contact with entrepreneurial activities in an independent way, as many of the respondents are involved in more than one activity.

5.- SOME REFLEXIONS ABOUT THE RELATIONSHIP UNIVERSITY-ENTERPRISE IN THE CAPV.

5.1.- CULTURAL DIFERENCES

The existing cultures in the entrepreneurial and university environment respect to new knowledge and its diffusion are very different. The entrepreneurial context is characterised by the firm's appropriation of the research results made by them alone (in their R&D departments) or in collaboration with other organisations. These results are considered a private good, whose possession, first in exclusive, permits them to develop a competitive advantage respect to the rest of firms, until the novelty is spread, copied and sometimes, improved by other enterprises. Frequently, the practice of patenting, the exclusivity in the know-how of some entrepreneurial practices, or in general, certain confidentiality maintained with the purpose of delaying the diffusion of that new knowledge, is used. Also, the research results made by the firms have to be validated by the market, that is, commercialised. It is like that because the purpose of the economic resources investment in research is to be able to obtain an economic profitability that is going to be measured in function of the success it has in the market.

However, the University research culture is not characterised, in general, by the achievement of an economic profitability, but its aim is to advance in the extension or diffusion of scientific knowledge. This implies that the research results are spread through its publication, because once the research is realised, its output are considered as a public good to which everybody could have access, discussed and improved.

Also, we have to take into account that for academics it is not necessary to have their research results validated by the market, because the main motivation to realise it, it is not its commercialisation, and they do not need it for continuing working. The academics motivation varies, in general, between the interest for deepening in knowledge and the improvement of the curriculum vitae, but in almost all the cases, are interested in the diffusion of their results as much as possible. This clashes with the firm's interests of maintaining their research results inside the working sphere of its own enterprise.

Another aspect that differences both cultures is, on one side, the policy developed by university, of promoting education, teaching and supporting everything that improves the Curriculum Vitae and on the other side, of „allowing making“ to academics, without taking part in the orientation of their research. However, the firm plans and directs their research and collaborations to those

fields where it thinks it is going to obtain bigger probabilities of success in the results. Also, where it considers that the accumulated knowledge, fruit of the research made, will permit them in the future to compete in R&D with firms that are advancing in those researches.

These different cultural conceptions about the fruits of the work made, is an obstacle to the collaboration between both organisations. One of the main ways of solving it would be a cultural change made by university and its academics, and an increase of the trust entrepreneurs have in the research made in university, because in lots of cases the relation is decelerated due to this distrust.

Besides, even inside the roles played by University we can find an existing tension between the importance given to teaching and research by society and university authorities. Society only gives value to teaching without taking into account the significant role played by research in University. Otherwise, University authorities are opposite to them, considering that the main way to improve the university work is by research. This, in fact, will have effects on the current unbalanced situation that we will show in the next pages.

5.2- CONCRETE EXPERIENCES.

In a posterior phase of the study we got the best cases of academic experiences who have combined their academic work with the entrepreneurial one. As a consequence of their great experience in both contexts, their opinions have been valued as important references for the CAPV about the characteristics and obstacles that exist in this relationship. Anyway, the chosen cases are not a representative sample of the academic group, because most of them do not have any relations with industry, as we said before.

These cultural differences mentioned above, are materialised in the next paragraphs where the constraints found by the academics^{ix} in their relationship with industry are gathered.

Constraints found in the relationship:

- ⟨ One of the main obstacles found by the academics once they decided to have relation with industry, it is the inefficiency showed by the OTRI of the UBC. This is due to the bureaucratic system of procedure in which the University is immersed. Also, the

hierarchical level of the authorities in University, and the infravaloration suffered by the OTRI (having as a consequence the lack of resources), decelerate the beginning of the formal relations of the academics with the social-economic external environment of the organisation. University does not adopt a proactive and dynamic aptitude in the relations between academics and the entrepreneurial world, although University does not interfere in their development once they are established.

- ⟨ There is a lack of a university policy to promote the areas that industry is interested in. On the other side, university promotes mainly all those activities that are interesting for knowledge promotion in the International Scientific Community (publications, congress, etc.) without giving enough value to the important role that the activities directly related with the entrepreneurial world have (contracts of co-operation with firms, Spin-off activities, etc). These activities could have a big repercussion in the social and economic framework of the region. Once the best cases were studied, we deduced that university mainly focuses its interest on basic research. This activity should not be the main or the only one, because the research focused on the firm's needs is considered completely necessary by the academics. This necessity appears by two reasons: on one side, because it increases the firm's competitiveness and on the other side, because it is helpful for using this derivative knowledge of the entrepreneurial practice for the students' training and their future incorporation to labour market.

- ⟨ In the UBC we can not appreciate an intention of encouraging the students to research during the university training. This leads to a necessary cultural change for improvement in the education system, and for increasing the scientific knowledge that could be afterwards transformed and incorporated in the productive system. University does not seem to appreciate that the client of this organisation is not only the student in the actual training phase, but it also has to consider the future necessities focused on the industrial environment, where the professional work will be realised.

- ⟨ The possibilities of the research academics to focus their efforts on the satisfaction of the social demands is restrained by: the lack of planning in the research activity, as University just manages the administrative procedures of research, and the lack of resources destined to research, although nowadays, it finances some research projects too.

⟨ For decades, inside the basque entrepreneurial culture there has been a productivist tradition centred in production, without caring about research and development because almost every innovation was copied, so it was not considered necessary. This has generated that entrepreneurs usually underestimate the science knowledge. Nowadays, this situation has completely changed, the basques firms are obliged to improve their competitiveness by doing R&D, but this productivist culture has not socially changed so fast, as it needs time to evolve.

6- CONCLUSIONS AND POLICY IMPLICATIONS.

Although in the paragraph above, the obstacles found by the academics in their relation with industry have been already described, with the purpose of giving some suggestions to bring closer this relation, now these constraints will be reviewed. First of all, and as one of the main problems found, it is the inefficiency showed by the OTRI. Second and as a consequence of the university culture, it is remarkable the great importance that university gives to knowledge promotion, forgetting the possible application of their research to the entrepreneurial environment, turning to applied research and not being limited to the basic one. Also, another obstacle is the lack of resources destined to it, specially, given by the Basque Government.

We can also say that all these mentioned cultures are immersed in a global context. It will not be possible to overcome all the constraints found in this study unless a big effort is made to change the social culture that implies will, trust and time.

As a last conclusion, we would like to remind the reader, that the research summarised in the previous pages, it is a consequence of the experience of some academics that are dedicating lots of working hours to research in university and who know very well this organisation. In this way, this study is fundamentally empirical and it does not pretend to offer absolute conclusions, but to give some elements to discuss what should be the role that university has to play in the economic development of its industrial environment.

Policy Implications :

⟨ The social demand for research is much higher than the immediate request that enterprises do for it, as there is a latent demand that it is necessary to know in advance. It would be convenient the existence of researchers, some of them devoted exclusively to research, to

solve those problems, paying special attention to tomorrow's problems, not just to current ones. On the other hand, there should be a number of academics that apart from teaching, take part in research as, in that way, they would know much better which the industrial needs are and they would be able to train better their students, who would be in better conditions to get into the labour market.

- ⟨ In order to mitigate one of the main hindrances found (inefficiency of the OTRI due to University bureaucracy) it would be suitable to promote the creation of more intermediate bodies between both organisations, such as for example, research institutes or agencies. However, in the Basque Country the bureaucratic requirements to set up one of them are very high, and that is why its presence is very limited. On the other hand, due to this scarcity, there has been a big impulse of the Technology Centres.

- ⟨ Due to the high difficulty to create this kind of intermediate institutions between University and enterprises, it would be interesting, from the point of view of tightening this relationship, to create a Technology Transfer Office in each Faculty. This way, due to the wide knowledge of its intervention area and the proximity to academics, it would be able to follow closer the steps given by the researchers and to handle them all the information related to the collaboration projects offered by both sides in their knowledge area.

Annex

Table 1: Number and percentage of respondents for each Faculty.

Faculty	N= 418	Respondents rate
Engineering	n= 117	19,76%
Sciences	n= 196	45,5%
Medicine & Pharmacy	n= 61	15,6%
Computing	n= 38	40%
Architecture	n= 6	8,8%

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NOTES

ⁱ The Public Sector, in its broad sense, fulfils a set of functions that are essential for the development of a territory. Among them, we will highlight the following two, as they are closely related with the object of this communication:

- The provision of the material conditions of production, that is, communication infrastructures (transport and telecommunication ones), ground infrastructure (industrial estates) and technology infrastructures. The PS has become one of the main suppliers of general scientific potential for the development of scientific and technical advances. It also provides financial resources to enterprises in order to promote the implementation of technological developments inside the industries. As a consequence, the main growth policy carried out by the PS is an infrastructure policy.

- The establishment and warranty of general legal relationships. That is, the legislation that allows the economic and social actors to work within certain regulatory rules. They provide stability and a reference framework in the performance of all the economic and social groups and the relationship among them, as for example, by means of a tax and labour legislation.

ⁱⁱ All the data related to the questionnaire mentioned above have been exploited by the research team of the Department of Applied Economy in the University of the Basque Country, composed by: Professor Mikel Gomez Uranga, Miren Gurutze Intxaurburu, Leire Ozerin, Eva Velasco, Yolanda Jubeto and Begoña Garcia and are part from the Work Package n°7 of the Researching Project financed by the DGXII of the European Commission „Universities, Technology Transfer And Spin-Off Activities-Academic Entrepreneurship In Different Types Of European Regions“.

ⁱⁱⁱ Some of them denominated of "quick path" and others of "slow path," whose maximum levels of competencies are gathered in the 1978 Spanish Constitution.

^{iv} Statute of Autonomy of the Basque Country, 1979 and *Ley Organica de Reintegración y Amejoramiento Del Régimen Foral Navarro*, 1982.

^v Taken from an article published in "El Mundo del P.V". 1998

^{vi} The preparation and the development of this plan, it is supported by the European Commission through the RIS (Regional Innovation Strategies) Programme of the XVI General Direction of Regional Policy.

^{vii} The number and percentage of responses obtained in each Faculty is gathered in Table 1 of the annexe.

^{viii} This data includes those academics that have not responded to this question in the questionnaire, therefore they have been considered as not having any relationship with industry.

^{ix} An academic of the Science Faculty who created a Spin-off firm and another from the Engineering Superior Technical School who has established several research contracts with local, national and multinational enterprises, were interviewed. Although these academics are not a representative sample, because most of them do not have relation with industry, are very important to detect the constraints in their relation with industry.

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