

8 Conclusions and Recommendations

The main conclusions that in our opinion define the current aeronautical sector are the following:

- In the territories studied, the sector has been developed under the *state shade* according to "state policy" tradition.
- Causes of this previous affirmation are to be found in the necessity of a national defence, as a public good for any country. Aviation, in its origins, tends towards military industry.
- Aeronautical firms were either public or closely regulated. Only since the 90's, and by obvious political reasons, the sector tends to distance itself from the state influence, although the bond is still important. Parallel, the pre-eminence in military activity yields to civil aviation, becoming the latter chief in the aeronautical field.
- Despite its origin and state development, that is, far away from the market, the sector has always maintained a high level of applied knowledge. It is a sector with high levels of human capital and technical development that, with access to a sufficient public financing, was able to obtain processes and products at the highest level of efficiency.
- The sector has been characterized by high quality and reliability levels in its products and component. Actually, the modern procedures of quality control in the industry in general are born and developed around the aeronautical sector. All firms involved in the sector must have the necessary qualification to provide products according to demanding specifications of quality. Quality certifications are an innovation guarantee.
- The aeronautical sector is probably the industrial sector that has developed in a greater way the financial and productive organization among firms belonging to it. Thus, it is frequent to see how firms involve themselves with financial risk in the airplane development. The final and manufacturing assembler seeks industrial partners with this same peculiarity of assuming financial risk in the project. Quite often the situation of a firm in the knowledge chain moves along with its acceptance of financial risk.
- Parallel, the manufacture of an airplane implies the use of different origin technologies, industrial or service, that are not usually strictly reflec-

ted in the aeronautical or space statistics. The combination of these technologies is carried out through complex processes of subcontracting or shared contracting. The industrial organization of the aeronautical sector has, thus, developed extremely flexible collaboration methods in contrast to other industrial branches. Together with the division of the product unit (airplane), in specific tasks between the participant firm network, and focused in a set of subcontracting relations (either contracted or achieved through the situation of the firm in the knowledge chain), other methods of enterprise participation are recurrent. Among them we can mention outsourcing, spin offs, start ups, gathering of firms in groups of knowledge management, mobility of human capital between firms, continuous formation inter-firms, etc. Together, they all carry out a common practice in the sector of airplane manufacture with excellent results in the fulfilment of objectives. The territories studied perform many of the methods exposed above.

- The greatest effort in the sector corresponds to design, industrial planning, creation of a suppliers network and advancing through the different production phases of the learning curve. Once the machine "has flown", its components and its basic industrial structure remain immutable throughout the rest of its existence. In those conditions, innovation in the sector takes place in manufacture and maintenance processes, in designing auxiliary machines to support the model and, mainly, in quality control of different airplane components.
- In general, the studied firms of the sector hold sufficient productive capabilities for its output to reach quality levels. This may happen even in those firms with small technological level.
- The restructuring necessity that reached the aeronautical sector at the beginning of the 90's speeded up the concentration in the sector and between countries. The launching of the firm model surrounding Airbus and, at the end of the decade, the emergence of Eads, which along Boeing becomes the greater world-wide airplane constructor, is accelerated.
- The consortium EADS is currently subordinated to a new and drastic process of rationalization in the relations with its suppliers. There exist an aim to promote the externalization of airplane production but, at the same time, a drastical reduction of suppliers is also sought. The purpose of the decision is to reduce both production and transaction costs in order to obtain a greater flexibility in the productive processes of the consortium.
- The decision of EADS to reduce the amount of suppliers represents a threat for current small and medium enterprises in the sector. A possible