

my research, I have attempted to focus on what has been termed "precompetitive" R&D. This would include research from basic to applied and the early stages of product/process development.

## 2.2 Typology

There are a number of ways in which consortia can be divided into types or categories, such as number of partners, degree of cooperation, stage of cooperation, degree of organisational interdependence and degree of ownership and control.<sup>12</sup> The OECD has done some work on classifying inter-firm cooperation for the purposes of establishing various databases on inter-firm agreements. An article by François Chenais, which appeared in *STI Review*, comments on the high degree of variability of terms used to categorize inter-firm agreements in the literature, perhaps reflecting the variety of responses that firms can give to the need to access technology and markets.<sup>13</sup>

Joint ventures are described in industrial economics as "operations whereby a legally independent and autonomously managed business enterprise is set up by two or more parent companies to run a clearly defined set of activities in the common interest of the founding firms."<sup>14</sup> Research joint ventures are, therefore, "arrangements in which some firms agree to share the expenditures and the benefits associated with a given research project."<sup>15</sup>

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and government research facilities. The application of basic research in the production of new technologies and innovations remains predominantly in the hands of firms. The innovation network model, however, identifies numerous feedback loops within this system, as opposed to a linear transmission of information from 'producers' of basic science to 'black box' research and development facilities of firms."

<sup>12</sup> John Hagedoorn is in charge of the research program Technology, Diffusion and International Competitiveness at the Maastricht Economic Research Institute on Innovation and Technology (MERIT). In "Organizational Modes of Inter-firm Co-operation and Technology Transfer", *Technovation*, 10:1 (1990), he classifies modes of co-operation by degree of organizational interdependence. Under my broad definition of consortia, the first three types of Hagedoorn's typology would constitute technology consortia where the objective of the co-operation is the creation of new knowledge, i.e., on the frontier. This includes joint ventures, research corporations, joint R&D and technology exchange agreements.

<sup>13</sup> François Chenais, "Technical Co-operation Agreements Between Firms", *STI Review*, OECD, (October 1988), p.55.

<sup>14</sup> *Ibid*, p. 55.

<sup>15</sup> Jean Tirole, *The Theory of Industrial Organization*, (The MIT Press: Cambridge, Ma. 1992), p.413.