

competition meant that competitors could spring full blow from other industrial sectors and countries around the world. Uncertainty about the shape of future markets, about the sources of competition and about the nature of the technological trajectory have all intensified.

For the firm, as knowledge-based competition shortened product life cycles, eroded the frontiers between industries and introduced sharp discontinuities in technological trajectories, the costs and risks of R&D rose and planning became an uncertain enterprise. This increased the need for both critical mass in order to compete globally and for flexibility, to avoid being locked into a technology while competitors moved in new directions -- IBM has never quite recovered from its failure to recognize the importance of personal computers that the fledgling Apple introduced in 1977.

The new mode of competition thus stimulated the formation of intra-national and inter-national strategic partnerships in R&D , production and marketing alongside more traditional internalization and internationalization strategies of the firm. These alliances served to reduce the costs and risks of knowledge production and enabled firms to window on new technologies. Networks of alliance partners now compete with each other in several industries and may become the basis for what elsewhere I have called networked, knowledge-based, global oligopolies.

The new mode of competition also shaped the transformation of older one-way, sub-contracting relationships in which a principal gives designs and specifications to its agent into two-way supplier-client relationships in which suppliers are drawn into joint research and collaboration in the design of new products for their clients, merge inventory and quality control systems for just-in-time delivery and take on additional responsibility for the manufacture of whole modules subsequently assembled into