subsidies for R&D and encouragement of joint government-industry research projects aimed at developing new technologies.

The industries targeted since 1975 are only a small part of Japan's economy. Neither automobiles nor consumer electronics (TVs, stereos, VCRs and so on) are part of the high technology area that has been the focus of research joint ventures. So the Japanese consumer products that have made Japan's export success so visible do not reflect the new industrial policy. Japan has, however, become a significant producer of some products in which recent industrial policy has played a key role. The most famous of these is semiconductor chips.

- **Japanese Targeting of Semiconductors (mid 1970s to end 1980s)**

Semiconductor chips, complex electronic circuits etched at microscopic scale onto chips of silicon, are key components of many new products. Until the mid 1970s, the technology for making such chips was largely a U.S. monopoly. Japan made a deliberate effort to break into this industry, with the government sponsoring joint research projects and at least initially providing a protected domestic market. In the late 1970s and early 1980s, Japanese producers shocked their U.S. competitors by taking a dominant share of the market for one kind of chip, random access memories (DRAMs).

That Japan targeted semiconductors, and that the industry achieved a large market share, is known. What is hotly disputed is how much support the Japanese industry actually received, how decisive that support was, and whether the policy helped Japan and/or hurt the United States. We know that not much government money was provided: the subsidy component of the targeting was actually quite small.[38] We also know that explicit protection of markets in Japan, by tariffs and quotas, was mostly removed after the mid 1970s. Some would argue that, in fact, the Japanese semiconductor industry succeeded with little government help.[39]

Others argue that more subtle government help was crucial.[40] The proponents of this view argue that the joint research projects were a highly effective way of improving the technology. They also argue that the Japanese market was effectively closed through a tacit 'buy-Japanese' policy discreetly encouraged by the government. As evidence, they note that U.S. firms had a much smaller market share in Japan than in either the U.S. or Europe.

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[38] This point is made by Richard E. Baldwin and Paul R. Krugman, in Richard Feenstra, ed., *op. cit.*, 1988. They maintain that: "... Japanese policy did not involve large subsidies. The tools of policy were instead encouragement with modest government support of a joint research venture ...."

[39] See James C. Abegglen and G.Stalk, Jr., 1985, *op. cit.*, for this view.

[40] See commentators, such as Tyson, *op. cit*, 1992; C.V.Prestowitz, *op.cit.*, 1988.