videotex and Teletext equipment, and a manufacturer and licenser of specialized chips, engage in R&D. As a whole, the telecommunications equipment sector accounts for 20 per cent of industrial R&D done in Canada.[13]

The success of telecommunications equipment firms is reflected in sales abroad, as Tables 1 and 3 indicate. However, exports, most of which are to the U.S., no longer provide an adequate picture of the involvement of Canadian firms in foreign markets. Increasingly, Canadian suppliers of telecommunications equipment are serving the U.S. market from production facilities located in the U.S. The globalization of firms as well as markets is driving a wedge between a firm's exports and its foreign sales.

The factors leading Canadian firms to invest in, rather than export to, the U.S. are likely to operate far more strongly for Canadian firms wishing to make sales in the EC. For one thing the EC external tariffs on telecommunications equipment, which range from 5.1 to 7.5 per cent, will be unaffected by Europe 1992. For another, even the expected liberalization of government procurement policies will only apply to suppliers with some substantial ratio of EC content. But perhaps most compelling is the fact that it is not enough to simply employ scientific know-how to find and develop niches in a technological sense. It is also important to identify and find niches in a market sense -- which will require the appropriate contacts and market savvy as well as marketing organizations, demonstration facilities, and an ability to provide after-purchase services. Language and marketing differences require a local base of operations. Being there, having a "presence," may count as much as having something to sell there. In short, the European market requires a "presence" that the American market often does not. We shall return to this issue later.

Developments in the telecommunications equipment sector also illustrate one of the potential hazards of Europe 1992 -- the possible loss to Canadian firms of foreign and even domestic markets to world-scale firms based abroad. For example, in recent years Japan's share of Canadian telecommunications equipment imports has doubled, chiefly at the expense of U.S. imports. (Incidentally, the EC's telecommunications equipment trade position with Japan has also deteriorated since 1983, with over 50 per cent of the deficit due to EC imports of facsimile equipment.) If Europe 1992 accomplishes its aim of creating world-scale and internationally leading telecommunications and computer firms and of putting the Community at the forefront of technological developments in the field, not only will sales in Europe by Canadian firms be threatened but the Canadian telecommunications equipment market may be invaded by EC as well as Japanese and U.S. firms.

The loss of domestic markets need not mean a decline in employment. If Europe 1992 succeeds in creating world-scale firms, they are as likely to "invade" Canadian markets via investment in facilities as through exports to Canada from EC-based plants. Something similar has happened in the EC itself, helped along by trade policy instruments; the EC has used anti-dumping complaints and rules of origin based on the concept of "most substantial transformation" to curtail Japanese exports of facsimile, VCR and photocopier equipment. As a result Japanese corporations have begun to invest heavily in the EC.

3.2 Computer Services and Software

The other important subsector for which Europe 1992 should create opportunities comprises the computer services and software equipment industries. These are the fastest growing segments of the computer industry, as Figure 14 and Table 15 indicate. In the process of growth, a