International Trade and U.S. Competitiveness in Services

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Introduction

Many Americans believe that growth in the services sector of the U.S. economy comes at the expense of U.S. manufacturing industries and U.S. blue collar workers. Others believe that growth in services is the answer to the decline in manufacturing production and employment. Data, presented here and in other works, indicate that the expansion of the service economy is evidence for neither "deindustrialization" nor movement toward a "post-industrial society." Kutscher and Personick (1986), for example, demonstrate that the shift to services has been a relative one: i.e., absolute levels of manufacturing employment have not declined appreciably over the last twenty years. Figure 1 shows these trends. So growth in services creates a new layer of economic activity without displacing the older industrial base.

In this report, we will argue that growth in exports of services is less important for its direct impact on employment levels than it is for securing U.S. jobs in the face of a changing world market. Trade in services -- because it creates a necessary infrastructure for U.S. firms operating abroad -- affects the market position of U.S. firms internationally and, in so doing, not only protects U.S. jobs from competitive inroads but also expands opportunities for trade in goods thereby enhancing U.S. employment levels. In addition, the international competitiveness of U.S. service industries enhances the competitiveness of certain strategic manufacturing industries, as manufacturing and services are becoming increasingly interdependent.

Defining the Service Sector

The services sector, also called the tertiary sector, is one of

three divisions, or categories, of economic activity. The primary sector, which encompasses agriculture and mining, is characterized by industries devoted to extracting raw materials from the natural environment to be used as inputs to the secondary sector. Process industries comprise the secondary sector; industries in this sector include food, drug, and chemical processing; paper and steelmaking; and oil refining in addition to other goods-producing entities. Secondary sector products range from thimbles and thread to automobiles and bombers. All other products -- mostly intangibles -- fall into the tertiary, or service, sector.

The tertiary sector creates employment at various levels of skill, just as in manufacturing. Examples of services activities which generate mostly low-skill jobs are personal services (such as automobile leasing, fast food enterprises, and child care), transportation, shipping, construction, and some business services (such as "back offices" of financial services firms, consumer credit reporting, stenographic services, security, building maintenance, and personnel employment services). In contrast, high-skill services jobs exist in banking, insurance, accounting, data processing, information and telecommunications services, advertising, education, health care, technical and professional services (such as engineering, legal, and management consulting services), and some government services.

Although personal services and other low-skill and low-wage activities contribute a great number of jobs to the U.S. economy and comprise a significant portion of the GNP, they are not traded internationally to any significant degree. Because the United States is generally a high-wage country, it is difficult for American

industries which depend on low-wage labor to compete at home or in international markets with products produced in countries with lower wages. The services are not unlike manufacturing in this respect, though many services which depend on low-wage labor are not traded. In addition, it is likely that U.S.-based firms which are active abroad will not use low-skill workers from the U.S. when they can hire local low-skill workers much more cheaply. Thus, if one is concerned about the potential for generating domestic employment through trade in services, one should probably focus on those activities which involve a relatively high value-addition on the part of U.S. workers.

In this report, we have chosen to address only those services where the consequences for U.S. employment are significant or where technology plays a role in enhancing the competitive position of U.S. industry in the international marketplace. We are limited, of course, to discussing industries where information or data are available and there are major gaps in the availability of data. Industries included here are in four categories: (1) data processing, information services, software, and telecommunications (the information technology services); (2) financial and banking services; (3) architecture, engineering, and construction (the AEC industries); and (4) certain business services such as accounting and advertising. Other service industries, although traded internationally, have been omitted either because they have been traditionally low-growth or low-impact industries (shipping, for example, has experienced a depression since the 1973 oil crisis) or because they are technologically stagnant (real estate, personal services, education, leasing, franchising, travel). Insurance, transportation services, and media/broadcasting services have been

omitted, despite the fact that they figure fairly heavily in international services trade and that they use innovative technologies, with the hope that the four selected sectors are sufficiently representative of the more dynamic services industries.

Some Aggregate Statistics on the Services

U.S. trade in services constitutes approximately 20 percent of U.S. trade in goods. In 1984, for example, the United States exported goods worth $219 billion and services valued at $54 billion (OTA 1987, 2-3). In the last twenty years, U.S. service exports increased from $4.6 billion in 1960 to approximately $54 billion in 1984--at an annual average increase of 10.9 percent (OTA 1987, 3-8). The Office of Technology Assessment has suggested that the statistics on services trade collected by the Department of Commerce underestimate both exports and imports (see Table 1).

Exports of services by industrial countries amounted to 561 billion dollars in 1984, roughly half the figure for exports of goods by those countries (IMF 1986, 72). The industrial countries as a group are net exporters of services, with the surplus averaging around 30 billion dollars between 1978 and 1986. The developing countries are net importers of services (see Table 2).

Transportation, travel, insurance and construction services exports dominate the other sectors in U.S. services exports, as they do for most other industrialized countries. The fastest growing sector is software. Net exports of services have been declining in recent years as imports of services have increased more rapidly than exports.

Total foreign revenues (exports plus affiliate sales) show a

slightly different picture than export figures alone. Retail services, for example, have almost no direct exports but substantial affiliate sales. Retail services are second only to transportation services in total foreign revenues. Many business services, such as accounting, advertising, data processing, and software, tend to have a larger proportion of their total foreign revenues accounted for by affiliate sales than by direct exports. Besides the need to provide certain of these services through overseas facilities, either because of local regulations or the need to provide face-to-face services on a regular basis, many business services rely on affiliate sales because of their desire to maintain control over proprietary technologies. A typical practice is to license a proprietary technology to an overseas subsidiary and then to provide a service dependent on that technology to foreign customers through that subsidiary.

World trade in services is expected to show more rapid growth in the next decade for two reasons. First, the increasing expansion and sophistication of the global telecommunications infrastructure will provide new opportunities for service growth and development. Domestic information services, for example -- while currently accessible in international markets through the interconnection of foreign data networks with U.S. packet networks -- can be expected to grow and expand as additional countries develop their internal data networks. Telenet and Tymnet each sell turnkey packet networks to foreign PTTs and to multinational firms. Telenet-provided data networks, for example, have been installed in more than forty countries. Second, the movement toward liberalization of services trade will lower entry barriers for some services trade, e.g., in insurance and in legal

services. In addition, growth in services will stimulate international commerce by making other services more tradeable and by providing an infrastructure for increased trade in goods. Synergy between services trade, for example, occurs when legal services follow financial services into international markets. Trade in goods, however, also is enhanced by trade in services. Sumitomo Corporation of Tokyo, the second largest trading company in the world, signed a contract with U.S. based Telenet in May 1987 for the development of a private packet switched data network to link is more than 130 offices worldwide. The network, to be completed by the end of 1988, includes a backbone circuit linking Tokyo, London, and New York.

Total U.S. employment in services was approximately 70 million in 1985 (see Figure 1). The major portion of this employment was in low-wage, low-skill jobs such as food and restaurant services, maintenance, and retail sales. Business services accounted for only about 5-6 million of total services employment in 1985, but employment in this area has been increasing rapidly in the last decade and a half (see Figure 2). While growth in employment in financial services, information technology services, legal services, management consulting and architecture, engineering and design services has been substantial in recent years, employment in telecommunications services has declined somewhat. Revenues in all of these services industries have increased rapidly over the same period (see Figure 3), more rapidly than the growth in employment. This suggests that the business services are creating relatively high-wage employment, thanks in part to growth in productivity. A recent study of the growth of productivity in services found little difference between services and goods between 1949 and

1979 (Runyon 1985).

The point we would like our readers to take away from this section is that growth in services employment is a somewhat separate phenomenon from growth in services trade. A large proportion of new services jobs created in the last decade have been low-wage, low-skill jobs. This growth in low-wage jobs is likely to continue ("The False Paradise.." 1986). Most of the growth in services trade, in contrast, has been in sectors where high-skill jobs and high technology prevail. That is, the success of U.S. firms in increasing exports and affiliate sales in services has been the result of factors which are quite different from those that explain the rise in aggregate services employment domestically.

The growth in services trade has contributed to the growth of domestic employment in the services primarily, we would argue, in high-skill, high-wage areas. The reason for this is quite simple. Services exports which involve low-skill activities tend to create low-wage jobs overseas rather than at home. This tendency is reinforced by the relatively lower wage levels of foreign service sector workers as compared with those in the United States. Services exports which involve high-skill activities tend to create domestic high-wage jobs because if those skills existed overseas then there would be less need to import services. Restrictions on immigration and licensing of foreign-trained experts in many industrialized countries may accentuate this pattern.

The United States has become more and more specialized in the exporting of high technology goods and services. Technology plays a crucial role in maintaining the overall international competitiveness

of U.S. firms. Thus, even if trade in services does not have a major impact on domestic employment, the technological excellence of U.S. services firms, together with that of U.S. manufacturers, is vital to the maintenance of employment levels at home because it assures the continued competitiveness of those industries.

Technical innovations which temporarily decrease demand for certain types of occupations have to be introduced in order to increase productivity and maintain the competitiveness of firms in international markets. So one has to destroy jobs (in one area) in order to save them (in another). Since real wage growth depends on growth in productivity, however, it is quite likely that there has tended to be an overall shift toward relatively high-wage jobs in the labor market as a result of the adoption of productivity-enhancing innovations in both goods and services.

Each advance in industrial technology seems to carry with it a demand for both high-skill and low-skill jobs. For example, it has been estimated that two out of three new jobs in Silicon Valley were in low-skill categories -- clerical staff, maintenance workers, etc. The key problem may not be the creation of a dual society, but rather the rapidity with which skill requirements change (independently of skill levels). The rapidity of shifts in skill demands can be dealt with by adopting public policies to accelerate retraining and redeployment of workers in skill categories that are suffering from declining demand. General upgrading of skill levels through universal education has been and will remain a crucial element of dealing with industrial innovation and international competitiveness.

The International Competitiveness of U.S. Services Firms

We would like to turn in the remainder of this work to an examination of the factors which account for the competitiveness of U.S. business services in world markets. We do this in order to demonstrate the potential for growth in high-skill services jobs connected with increased trade in business services, but also to try to demonstrate some of the interdependencies that exist between services and manufacturing industries. We will also argue that maintaining the overall competitiveness of U.S. high technology industries will depend on an even-handed treatment of both manufacturing and services in public policy.

In general, U.S. firms in international markets are highly competitive; they hold a substantial market share, and they realize significant portions of their revenues from direct trade or sales of overseas affiliates. Usually, international markets attract only the largest American service suppliers (the software industry is one exception). Most of these large suppliers are multinational enterprises. In 1984, 38 percent of international AEC work, for example, was billed by a handful of the largest U.S. multinational design and construction firms (see Table 3 and Figure 3). In the same year, around 20 percent of the assets of the top 300 banks in the world were those of U.S. banks, down from 35 percent in 1970 (see Figures 5-7). U.S. financial services handled 29 percent of Eurobond issues in 1983 (see Figure 8) and 44 percent in 1984 (see Figure 9). All but four of the top thirty advertising agencies in the world were U.S. firms in 1977 (see Table 4). U.S. insurance firms accounted for approximately 45 percent of world insurance premiums in the early 1980s

(Stalson 1985, p. 94).

There has been some speculation in recent years that U.S. firms in certain services industries are likely to suffer from increased competition from the low-wage countries. One frequently cited example is the establishment in India of a telecommunications infrastructure for the exporting of customized business software, to take advantage of the much lower wages of Indian software workers. Another area where Third World countries are presumed to be likely to erode market shares is in "back office" functions, such as the processing of check receipts or simple forms of data entry (see Micossi 1986; Riddle 1986). Data on these phenomena are still too spotty to permit firm conclusions. Nevertheless, until recently the costs of telecommunications together with the lower productivity of Third World low-wage service workers has resulted in very few examples of exports of these types of services from the Third World.

The competitiveness of U.S. service firms is due primarily to the successful application of advanced computer and communications technologies, to the large size of the U.S. domestic market, to interdependencies with highly competitive U.S. manufactures (such as computers, telecommunications equipment, and commercial airframes), and (in the case of language-dependent services such as advertising, media, and software) to the prevalence of the English language throughout the world.

The United States, for example, holds a strong position in high technology exports. Most complex high technology products require a variety of services to be supplied along with the product in order to provide maximum value to the purchaser. Jet aircraft need to be

serviced, computers need to be programmed, nuclear power plants need to be maintained, software for telecommunications systems needs to be installed and maintained.

The large size of the U.S. economy enables U.S. service firms to take advantage of economies of scale that may not be available to firms that service smaller domestic markets. A good example is in data processing and information services. The very large park of business and personal computers makes it possible for U.S. firms to offer data processing and information services at lower prices than Japanese or European firms can offer. Similar logic applies to distributors of motion pictures, advertising and accounting firms, AEC and management consulting firms. The large size of the U.S. market also enables U.S.-based high technology service firms to descend their learning curves more rapidly than similar firms in other countries. One consequence of this is recognition on the part of foreign service firms of the need to have U.S. subsidiaries in order to compete in world markets.

Interdependencies with manufacturing industries also account for some of the success of U.S. service firms in international competition. The best example of this is the software industry. The interdependence between software and hardware in computing is very extensive. The basic components of computing hardware, the "chips" (more formally, semiconductors and integrated circuits), now increasingly contain built-in software which makes them more useful than chips that do not contain this built-in software for many functions. Microcode or firmware, as the built-in software is sometimes called, requires close collaboration between hardware and software designers. Thus, mere

proximity to state-of-the-art hardware firms is a great advantage to software firms. In addition, software works faster and more efficiently if it takes into account the peculiar characteristics of specific machines. Software written in machine language or assembly code is likely to outperform software written in more generic higher level languages. Again, knowledge of hardware peculiarities gives U.S. software firms an advantage over their international competitors.

It is this close interdependence between hardware and software that has made U.S. software and hardware manufacturers so concerned about the recent incursions of Japanese firms into basic components. If the U.S. hardware firms are unable to maintain their previous position as technological pioneers, then software firms will have a hard time competing with the Japanese competitors. So far, no sign of such a deterioration in competitiveness has been witnessed, as Japanese firms have not given high priority to software development. Nevertheless, there is a real concern and one which has been reflected already in public policy debates.

The number of people in the world who speak English is greater than the number of people who speak any other single language. This is partly a consequence of English imperial expansionism, but it is also a function of the widespread recognition of the need to teach English as a second language for business and scientific reasons. This means that products and services that are language-dependent, e.g. films, books, video tapes, and many kinds of generic software products, will have a larger potential world market if they are in English than if they are in any other language. In the motion picture industry, for example, it is not unusual to see films made in English even though very few

members of the cast speak that language. The large size of the global English-speaking market constitutes an advantage for international service providers who live in English-speaking countries.

In the sections that follow, the implications of U.S. trade in services for overall U.S. competitiveness will be discussed on a sector by sector basis. It will become apparent that those firms that have been technologically innovative have been the most successful in world markets. Competitiveness of U.S. firms in international markets may or may not enhance prospects for employment at home; but the key assumption here is that preserving or enhancing international competitiveness overall is a prerequisite for maintaining current levels of employment.

We will present data on revenues from international transactions in services industries in two ways -- as direct exports and as overseas sales of affiliated companies. Because many services must be produced where they are consumed, firms can be expected to do more business through affiliated companies than through direct exporting of services. The overseas affiliate sales of many business services -- for example, advertising, accounting, data processing, and some financial services -- greatly exceeds the level of direct exports. It is usually the case that a service can be exported only if it is transportable (software, for example), or if a cross-border link can be established (through movement of people or interaction through the telecommunications infrastructures).

Affiliated sales usually have a minimal direct impact on levels of U.S. employment because affiliates usually buy in the local market and staff their offices with local workers. Direct service exports, in

contrast, are likely to have a positive impact on employment since U.S. workers produce the service. For this reason, distinction between service exports and overseas revenues of affiliates may be important for assessing the impact of services trade on domestic employment. In the absence of reliable data on employment in traded services, not much more can be said on this issue.

Table 5 breaks down the foreign revenues of service firms into revenues from direct exports and from affiliate sales. We refer to this table throughout our report.

Information Technology Services

Overview

In this section, we explore the impact on the U.S. economy of international trade in what we call the information technology services: data processing, information services, software, and telecommunications. Although these sectors are related to one another technologically, some are more critical for maintaining international competitiveness than others. Data processing, for example, is a relatively mature business which is likely to suffer a decline in overall revenues and employment, telecommunications services are likely to experience little growth in employment (which is currently quite substantial) while technology continues to change rapidly and revenues continue to rise, whereas information services and software can be expected to see further rapid growth in both revenues and employment. International business in these service industries is becoming more important, especially for the larger firms, as computing and telecommunications technology diffuses throughout the world. Thus,

this section is crucial to our argument concerning the growing interdependence of services and manufacturing in the contemporary era.

The information industry is a relatively new industry based on advances in the technology of computers and communications. In the last decade, the U.S. information industry has experienced a phenomenal growth rate, increasing in volume by 800% between 1968 and 1979 (Economic Consulting Services 1981, 175). Figure 10 shows the overall performance of the U.S. information industry from 1980 to 1983. Table 6 shows employment shifts between 1972 and 1982 in several information industry subsectors.

Data processing services include batch and remote computing services, computer facilities management, and systems integration. Information services are those that add value to raw data by organizing, manipulating, and distributing it as a service. The industry encompasses electronic data bases or computerized libraries of data, collected and maintained by the provider, and sold to clients as printed or as machine readable output. Lexis, Nexis, Westlaw, and Dialog are familiar examples of such services. Software services involve either packaged (off-the-shelf) or customized computer programs or systems. Even though packaged software is beginning to look more and more like a product, rather than a service, tradition and bureaucratic inertia keep it classified under the rubric of the services. Telecommunications services involve the provision of both voice and data communications through public or private (i.e., dedicated) networks. Public telephone networks in the U.S. and in other countries rely primarily on circuit switched technology to process <u>continuous</u> analog and digital signals. Enhanced service

providers or value added network providers rely on a competing technology -- packet switching -- to provide more efficient and cost effective data communications than circuit switching allows.

OTA, in their Special Report, note that there are no official U.S. government figures on the size of the software industry in the U.S. or on the size of the market, in part, because hardware manufacturers sell so much software. IBM in 1985, for example, sold $4 billion worth of software. Nonetheless, we present, in Figure 11, an illustration of the growth of the computer software and services industry relying on data presented by the industry's trade association, ADAPSO.

Of the $110 billion in U.S. telecommunications revenues earned in 1985, $3.6 billion resulted from international telecommunications services (OTA 1987, 6-10). Although this figure represents only 3% of total telecommunications revenues, it is three times larger than revenues earned abroad by the data processing service subsector so it is not a trivial amount.

International revenues for U.S. telecommunications firms include payments to U.S. carriers by American customers on outgoing international calls as well as access payments by foreign carriers on incoming calls, although the former is sometimes considered to be a domestic rather than an international transaction. Revenues from international trade in telecommunications can be expected to increase as U.S. firms begin to establish themselves in the international marketplace.

Outlook for International Trade

The information technology services -- data processing,

information services, software, and telecommunications -- have differential impacts on world trade. The U.S. is a clear leader in the provision of information services and in software, although the dominant position of U.S. firms in the software industry is likely to decline as foreign firms move away from customized products to more standardized software packages. Restrictions on transborder data flows hamper the development of international data processing, information, and telecommunications services, but these can be expected to ease over the long term as major potential markets begin to reexamine their regulatory regimes in light of advances in technology and the potential loss to domestic firms that would result from restricted access to that technology.

Although the U.S. market has become more hospitable to competition, in many countries telecommunications services remain a nationalized industry. Yet, 75% of the world's telephones are located in nine industrialized countries so opportunities for market growth and expansion clearly exist. NEC of Japan already has a market presence in 144 of the 159 countries holding membership in the United Nations.

OTA reports that the global market for data processing is approximately $20 billion. In 1983, U.S. revenues from international trade in data processing services were approximately $1.2 billion--over 10% of total industry revenue. Between 1974 and 1984 U.S. employment in computer and data processing services grew by 250% (Howe 1986, 30). Although the annual rate of employment growth was less in recessionary than in recovery periods, employment levels increased throughout the 1974 to 1984 time period.

The same pattern of employment increases holds for information

services where the United States leads the world in the provision of electronic data bases. In 1985, the U.S. electronic data base industry earned revenues of approximately $1.9 billion, an increase of 36% over 1984. OTA estimates market growth in this industry at 14% per year, reaching $3.6 billion by 1989 (OTA 1987, 6-6). Approximately 66% of all publicly available data bases are located in the U.S., and 50% of the data base services in Europe are supplied by U.S. vendors (OTA 1987, 6-6). In 1982, foreign sources contributed approximately 19% to the revenues of U.S. data base firms.

In software, U.S. firms also are the market leaders, generating in 1982 as much as 50% of total revenues from overseas sales (OTA 1987, 6-9). In 1984, sales of U.S. software firms totalled $10.4 billion, most of which resulted from the sale of operating systems and applications software for mainframe computers. Almost 5,000 American firms develop and market computer software. Some of these firms are tied to hardware manufacturers; some are not. The industry directly employed 180,000 in 1985--almost double 1980 employment figures. This figure does not include around 300,000 additional workers in the United States who are employed as computer programmers.

The introduction of mini- and microcomputers has expanded market opportunities for computer programming service firms. According to Howe, U.S. employment in software services increased 46% between 1982 and 1984 (Howe 1986, 31). Moreover, software services revenues and employment can be expected to continue to increase as the costs of computing and telecommunicating decrease, because more people and more businesses can afford the application of computing and telecommunications technology.

Another reason for the increase in revenues and employment is the lower productivity of software production in comparison with that of hardware production. For any given dollar of expenditure on the development of hardware for large business computers, at least another dollar, on average, is spent on software for those systems (the figure is even higher for supercomputers and the large central office switches in the telecommunications equipment industry). As the hardware grows more complex, the software writing tasks also increase in complexity. Major efforts to improve the productivity of software production are underway in all major hardware and software firms. Applications of artificial intelligence techniques for teaching programming, editing programs, and simulating a variety of computing environments are already paying off. Nevertheless, it is probably not wise to expect rapid changes in the productivity of software.

One interesting consequence of declining hardware prices and steady or increasing software prices is the need for major hardware producers, like IBM, to change their expectations about revenue growth through the sale of hardware. IBM has announced that it intends to shift its activities so as to increase revenues on the software and services side of the data processing business. As hardware grows less expensive, more businesses are shifting their spending budgets in the direction of software and services to enhance their existing computing capabilities. In addition, the relative scarcity of skilled software workers has resulted in high wages, and strong efforts on the part of both software and hardware firms to increase the productivity of their software workers.

Although the U.S. industry can maintain its competitive edge in

the software industry through its skilled personnel, strong R&D programs, and flexible capital markets, U.S. firms will probably face increased competition from abroad. At the present time, France presents U.S. firms with the greatest competitive challenge, but as foreign industries in the rest of Europe and Japan move away from customized software to the production of standardized packages, U.S. market share--now 70%--will probably decline.

Unlike most other service industries where only a few of the largest firms engage in international trade, in the software sector, approximately 60% of U.S. firms reported foreign revenues in response to a survey by ADAPSO (formerly the Association of Data Processing Service Organizations, now the Computer Software and Services Industry Association). The survey found that 71% maintain a presence in the United Kingdom, 59% in Canada and in Australia, 56% in France, and 49% in West Germany. As Table 5 indicates, approximately 30-40% of total foreign revenues come from direct exports with the remainder accounted for by sales to affiliates.

U.S. Competitive Position

Restrictions on transborder data flows are particularly relevant to trade in information technology services. As Aronson and Cowhey note, there are countries who deny firms access to remote data or data processing services. Sweden and Austria are particularly strict in this respect. Brazil requires that a copy of all data bases be kept in Brazil, thereby destroying the economies of remote data base services. As a condition to interconnection with its carriers, West Germany requires some amount of local data processing (Aronson and Cowhey 1986,

3-6).

In the telecommunications subsector, telecommunications employment in the largest industrialized countries was approximately 2 million in 1985; this was not expected to grow substantially--at least with respect to services connected with the basic infrastructure. In the United States, in 1985, there were approximately 900,000 workers in telecommunications services; a large portion of which were employed to install or repair telephone equipment. The trend toward greater competition in customer premises equipment, however, including do-it-yourself installation, is reducing the demand for such workers. On the other hand, there will be an increase in employment in workers connected with the building of telecommunications equipment, especially large central office switches, and the construction of new infrastructure such as satellite reception centers, fiber optic cables and cellular telephone networks, which should offset some of the losses of jobs in the more traditional areas. Table 7 indicates projected employment levels in certain skill classes in the information technology services.

In the area of value-added services, an increase in both revenues and employment can be expected. Value added services include both information services and enhanced services, and while the industry has not drawn clear cut distinctions, information services are usually considered to be content-specific (including, for example, financial and bibliographic data bases and videotext services). Enhanced services, in contrast, refer to non-content services such as protocol conversion (which allows noncompatible computers to talk with each other), electronic mail and voice storage and retrieval services.

According to data provided by Aronson and Cowhey, the demand for enhanced services and computer services is growing rapidly. The Financial Times (April 1983) estimated that the worldwide value-added services market for U.S. based vendors was approximately $16.45 billion in 1981, estimated to reach $46.83 billion in 1986 (Aronson and Cowhey 1986, 4-14).

In the value added market, Telenet and Tymnet are the largest U.S. firms that operate global data networks based on packet switched technology. Other U.S. firms in the value added marketplace include IBM, GE, CompuServe, and AT&T. Transmission lines (fiber, cable, satellite, or microwave) that support these networks are usually leased; the equipment can be purchased either in the domestic marketplace or abroad. Enhanced services dependent on these networks include electronic mail, access to commercial data bases, remote data processing, transaction processing (credit card authorizations and clearance and other financial transactions), and videotext (shop-at-home) services.

U.S. firms in telecommunications are relatively well positioned to compete in international markets, but immediate trading opportunities in this area depend less on competitive advantage than they do on government policies regulating the telecommunications sector in various countries. Although the U.S. industry has become open to competition, telecommunications services in many countries continue to be operated on a monopoly basis. Some countries, for example, see no reason to open their telecommunications networks to international traffic generated by U.S. competitors to AT&T. Nonetheless, the Department of Commerce has predicted that international revenues will increase by

12.5% and domestic revenues by 6.8% (OTA 1986, 92).

Although telecommunications is primarily a domestic industry -- only 3% of revenues are derived from foreign markets -- there is no reason (other than government strictures) for service providers in the U.S. to be U.S. firms any more than financial services must be provided by U.S. banks. In 1985, the FCC authorized a wholly foreign-owned carrier to enter the U.S. telecommunications market -- TDX Systems, Inc., a subsidiary of Cable and Wireless North America, itself wholly owned by Cable and Wireless, PLC of the UK. In October 1986, Siemens and GTE entered into a joint venture to provide exchange carrier services in U.S. markets. Siemens, a German firm, has an 80% share in the joint venture. By the same token, a large number of U.S.-Japanese joint ventures in enhanced telecommunications services were announced just after the passage of a new telecommunications law in 1984.

Summary

In sum, U.S. prospects in the information technology services are mostly favorable. While the U.S. has a clear leading competitive position in software, the U.S. share of the international market will fall slightly as foreign competition shifts to the development of more standardized software packages. But because the total market will continue to grow rapidly, U.S. revenues and employment in software will also increase. The growth of overseas revenues (and therefore of domestic employment) in U.S.-based information, data processing, and telecommunications services depends on a lessening of foreign government restrictions regarding rights of establishing local business presence (in all three industries), cross border flows of information

(in the case of the information and data processing) and the liberalization of domestic service markets (in the case of telecommunications). There are a number of good reasons to believe that all of these changes are or will be taking place.

Banking and Financial Services

Overview

The importance of banking and financial services in the U.S. balance of payments derives primarily from the heavy positive impact of investment income on that balance. Investment income includes both profit remissions on portfolio and direct foreign investment as well as payments on bank loans. In 1985, payments on international loans and portfolio investments contributed around 50 billion dollars to the balance of payments, as compared with around 35 billion for foreign direct investment (OTA 1986, p. 22). In addition to investment income, the financial services industry contributes to the services side of the balance of payments through receipts for services like the floating of new securities, letters of credit, the exchange of currencies, and newer and more innovative products such as swaps, forfaiting and Eurocurrency loans.

Employment in the banking and financial services industry has grown rapidly in the last decade (see Figure 2). Since revenue growth has been rapid in both the domestic and international sides of the financial services, it is hard to arrive at a precise estimate of the impact of international trade on employment. Nevertheless, the very strong involvement of major U.S. banks and financial services firms in international markets would suggest that at least 10 percent of all

domestic jobs depend on international business and that this figure may have grown slightly during the recent period of heavy loaning to Third World countries.

In this section, we look at the competitive position of U.S. financial institutions in commercial banking, investment banking, securities, trading markets, and insurance services. Although these are distinct subsectors in U.S. domestic markets, in world markets, the products and activities of these various subsectors are much less clearly delineated. This is due to two factors. First, U.S. banks operating outside of the U.S. are not governed by U.S. banking regulations; they are in a position, then, to expand into financial product areas otherwise offlimits to them. Second, in many countries, commercial and investment banking are not separate endeavors. U.S. banks, therefore, have had to cross over into other banking services to lessen the competitive advantage that foreign competitors hold by virtue of their integrated structure.

U.S. banks are prohibited from engaging in both commercial and investment banking activities by the Glass-Steagall Act. Banks in Germany, Switzerland, and the Netherlands are not so limited--in these countries, banks can underwrite corporate securities and broker stocks. In the U.S., commercial banks take deposits and loan money. Yet, they also engage in broader activities: they underwrite government securities; they trade in futures and commercial paper; they manage investment funds through trust accounts; and they may engage in both brokerage activities -- through separate subsidiaries and only on a customer's instruction -- and in merchant banking activities. Commercial banks in the U.S. are clearly prohibited from investing in

common stock for their own account, from underwriting and distributing new stock issues, and from trading in stock as principals. According to OTA, foreign revenues of U.S. commercial banks came to $12.2 billion in 1984, increasing nearly 30% from 1983 to 1984 after rising 9% from 1982 to 1983 (OTA 1986, 57).

Investment banks, on the other hand, are engaged primarily in corporate finance including securities brokerage activities. That is, investment bankers advise their clients about financial strategies related to funding the business (debt and equity offerings), buying and selling assets (particularly, merger and acquisition type activities), and interacting with the financial community of investors and venture capitalists.

This domestic distinction, however, has become blurred in world financial markets over the last several years both because of technological advances that affect product offerings and because of changes in government regulatory policy that lower entry barriers. Securitization--a trend to standardize both liabilities and assets into tradeable, liquid instruments--has further contributed to this convergence.

Dufey and Tschoegl (1986), whose work forms much of the basis of this discussion, contend that U.S. based financial institutions have performed quite well in international competition and should continue to do so. Yet success in these markets depends both on a substantial capital base, on exploiting technological developments, and on top quality people. Like many other service industries, a successful financial firm is selling the skills and competencies of its workforce which are reflected in the firm's financial statistics as well as in

its reputation -- a particularly important competitive edge in financial markets.

Just as technology has provided competitive advantages for firms in the international AEC industry, developments in banking technology -- characterized by advances in computerization and communications -- have become a source of comparative advantage in financial services as well. International banking -- one of the first services traded -- has been growing at a rate in excess of twenty percent per year for the last twenty years (OTA 1987, 4-2). According to an International Monetary Fund study, about 25 large banks form the core of the international banking market and account for 60% of the management of the bond and security market and over 50% of all bank lending (OTA 1987, 4-24).

According to Dufey and Tschoegl, there has been a significant change in the contribution of various countries to the census of the world's largest banks. This is evident in Figures 5 through 7. These changes are due to several factors, including the differential rates of growth of the home economies, the growth of international banking itself, and the effect of exchange rate changes. Exchange rates particularly affect rankings because rankings are based on balance sheets denoted in national currency and converted to U.S. dollars (Dufey and Tschoegl 1986, 43).

The United States has lost ground since 1970, and Japan has gained it. Within Europe, France has gained and the United Kingdom has lost position. The strengthening of the U.S. banks' share between 1980 and 1984 is to a very great degree a reflection of the strength of the dollar. Figure 12 shows the current position of U.S. banks among world

competitors, based on a recent survey by American Banker. While the U.S. has the greatest number of banks in the top 500, Japan controls the largest percentage of assets (28.8%).

Outlook for International Trade

Banks go abroad for two main reasons: to follow their corporate clients and to provide financial services in support of international trade in goods. Banks that follow their customers abroad have an information advantage over competitors because data about the firms and its markets already exists in their files and is available quickly and at low cost. Thus, the bank is better able than others to respond to its customers' needs. In fact, as Dufey and Tschoegl suggest, if the bank does not follow, it gives other banks an entree to its customers because of the loss of effectiveness in providing some services at a distance.

Today, virtually all capital markets exhibit a three-tiered structure characterized by a domestic market, a foreign segment in which nonresidents participate under regulations established for foreigners in a particular national market, and an external segment involving transactions in some foreign jurisdictions. These market tiers differ in interest rates, practices, and risks, arising primarily from the differences in regulatory constraints imposed on each.

Foreign banking presence takes many forms. Representative offices, "shell" branches, agencies, and branches are legally part of the parent. By contrast, affiliates, subsidiaries, and consortia are separate legal utilities.[1] According to Dufey and Tschoegl, during the decade of the 1960s, much international borrowing and lending, and even

substantial national activity, moved out from under the jurisdiction of national authorities. By locating the market for credit outside the country where the currency was legal tender, transactions moved to jurisdictions that offered more hospitable regulatory climates. For instance, markets for U.S. dollar-denominated loans, deposits and securities in jurisdictions outside the United States largely avoid U.S. banking and securities regulation. These are "offshore," "Euro," or more properly "external" markets, in contrast to the "onshore," "internal," or national markets.

The international position of U.S. banks is most easily explored by investigating their competitiveness with respect to certain banking products. Several products and services are offered internationally: Eurosecurities (including Europaper, -bonds and -notes); trade financing through forfaiting, letters of credit, and banker's acceptances, swaps, standby letters of credit, and cash management. In many instances, advanced computer and communications technologies have

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[1] Representative offices perform liason, customer-solicitation, and information-gathering services for the parent while agencies make loans and take foreign deposits. Shell branches are simply booking offices located in foreign countries. They do not administer the business carried on their books and have no contact with the local market. Full branches, in contrast, can make loans and take deposits. They are the most widely used legal form of presence. Typically, branches are backed by the larger asset and capital base of the parent. Most banks tend to prefer branches to subsidiaries because they are flexible, less costly, and allow the parent to exercise direct control.

An affiliate is a bank in which the foreign bank has less than majority control while a subsidiary is one in which the foreign parent has at least majority ownership. In a consortium, several banks join together to form a new venture, generally with no one bank having more than 50% of the ownership. Consortia are usually a response to situations where there are gains from pooling resources. In all three cases, the entities are separately incorporated and frequently located in a jurisdiction different from that of one or more of the foreign parents (Dufey and Tschoegl 1986, 52).

been instrumental in the development of these services, which suggests a synergistic effect: so long as the U.S. maintains leadership in the information industry, U.S. financial firms have a unique opportunity for maintaining a competitive advantage in their respective markets.

U.S. Competitive Position

The U.S. banking industry, like the AEC industry, holds both advantages and disadvantages in the world marketplace. Disadvantages stem from the restraints on universal banking imposed by the Glass-Steagall Act, from restrictions on the cross border flow of data, and from full disclosure requirements of U.S. banks. For example, in the market for international equities, competitors must be in at least the top three equity markets in the world, i.e., New York, London, and Tokyo. Unlike U.S. investment banks and the European universals, U.S. commercial banks cannot be in the securities business in the largest market, New York; they are prohibited by Glass-Steagall.

Restrictions on the cross border flow of data impedes the operation of international cash management systems which are based on integrating data originating in a number of countries. Likewise, U.S. laws that limit the privacy of holders of financial assets deter investors who prefer to work through foreign institutions and in foreign centers where they can avoid the disclosure of their holdings and activities.

U.S. banks, however, have an equal number of advantages in the market for international finance. The size of the U.S. domestic market results in opportunities for developing innovative products and in a sophisticated system of control and clearing. Moreover, the size of

the U.S. domestic market and the U.S. share of world trade result in a high volume of transactions which provides a powerful incentive for banks worldwide to hold dollar demand deposit accounts in the United States.

As Dufey and Tschoegl point out, once the basic position of a vehicle currency has been established, a number of derivative and reinforcing phenomena occur. Because private foreign exchange transactions clear through dollar balances, official monetary institutions, which wish to intervene in the foreign exchange market will hold a sizeable proportion of their balances in that currency also. It is expensive to convert reserve assets into liquid balances when needed. Once volume builds, financial markets in the vehicle currency become even more attractive because of the increase in liquidity, expansion of ancillary services, growth of the institutional base, etc. These phenomena are akin to economies of scale and externalities often observed in other industries.

One of the most significant advantages that U.S. banking institutions hold is a technological one. Advances in communications and computerization have been applied by U.S. banks to the financial services sector in advance of their application by most foreign firms. Although these systems are easily imitated, the innovator benefits by establishing a reputation for innovativeness as well as by being first in the market.

One final advantage that firms have is that English is rapidly becoming the world's commercial language. As a result, ambitious professionals regardless of country have an incentive to develop at least a working knowledge, if not fluency, in English. As a result,

U.S. and other English speaking institutions can draw on a wider pool of able and ambitious people than can institutions based in other languages. This is a significant advantage in financial services because the skills of the banker represent the edge that any firm holds in the market.

Summary

The prospects for U.S. trade in international financial services are bright. The U.S. holds leading market shares in many of the banking products or subsectors discussed above: Eurocurrency syndications, Eurobonds, Euronotes, letters of credit, banker's acceptances, swaps, and cash management. U.S. banks have been instrumental as product innovators in several of these banking products. In addition to this, U.S. firms appear to be well positioned to hold these leads due to their technological aggressiveness and the attractiveness of U.S. firms to highly competent financial professionals. Although no data on the employment impact of international trade in financial services are available, the sector appears destined to grow as banks expand their services geographically or as they develop new financial products. Figure 13 shows the trends in U.S. domestic employment in the banking industry, some of which results from international activities.

Architecture, Engineering, and Construction

Overview

The forthcoming (1987) Office of Technology Assessment (OTA) study

on international trade in services provides the best source of information on the competitiveness of U.S. AEC firms in the international marketplace and the ramifications of this for U.S. employment. In brief, OTA concludes that the competitive position of U.S. AEC firms has diminished over the last six years and will probably continue to do so. Part of the decline in U.S. competitiveness arises from external causes: a shrinking world marketplace, the emergence of new competitors, and the international debt crisis which has had a dampening effect on new construction. Yet, part of the decline in the market strength of U.S. AEC firms is due to the industry's failure both to invest in new construction methods and technology and to take advantage of existing technological developments.

The Japanese, for example, lead the world in soft ground tunneling techniques while hard rocking tunneling is dominated by the Austrians, Swiss, Finns, and Norwegians. Other techniques such as prefabrication and modularization, and pre-stressing and post-tensioning techniques for concrete have been developed in Europe in conjunction with post World War II rebuilding efforts. Not only do these technologies give foreign competitors a better position in the world marketplace, but they also provide opportunities for foreign AEC firms to enter the market in the United States.

The one area in which U.S. AEC firms excel is in the management of large scale construction projects, particularly in procurement and logistics. Here the use of computer and communications technologies have provided U.S. AEC firms with a decided advantage in the marketplace, although these advantages are probably insufficient in overcoming construction technology disadvantages. Yet, loss of

competitiveness in the AEC industry is troublesome not only because of the losses suffered by the industry itself, but also because AEC loss of market strength can affect supplier industries linked to international AEC markets.

Outlook for International Trade

The AEC industry is both a service-producing and a goods-producing industry. The service portion, broadly called project design and engineering, includes architectural and engineering design, drawings and specifications, and project feasibility studies -- all part of the pre-construction phase. Additional services are provided both during and after construction -- in project management, and in training, operations, and maintenance. The actual construction of the project, or the goods-producing component of the industry, involves site preparation, earthmoving, fabrications, and erection operations.

The importance of the services portion of the AEC industry becomes evident when one considers that early involvement in a project may lead to later trade in both goods and services. An industry rule of thumb assigns about 1% of total project costs to feasibility studies; 10% to design and engineering; and between 2% and 6% for construction management (OTA 1987, 5-8). Although the linkage between design and construction is not particularly strong for U.S. firms -- only 43% of the international projects commissioned to U.S. designers were subsequently handled by U.S. contractors -- a stronger link exists between U.S. design and U.S. equipment exports. An Eximbank study showed that almost 81% of the equipment required for AEC projects was purchased from the U.S. when a U.S. firm provided the design of the

project (OTA 1987, 5-10). Further, when U.S. equipment is specified, sales of U.S. spare and replacement parts follow, particularly if the equipment is proprietary. In that case, too, contracts for training, maintenance, and operation also follow from trade in design and equipment.

The data, however, indicate that the largest portion of purchases on projects involving U.S. firms are for non-U.S. goods and services. A 1985 Price Waterhouse study provided evidence that only 10% of the revenues from foreign projects were used to purchase U.S. goods and only 7% were transferred to U.S. contractors for professional services (OTA 1987, 5-12). In 1983, foreign revenues of $19.6 billion resulted in $1.9 billion worth of U.S. goods purchased and $1.4 billion of subcontracted services. In 1982, $21.7 billion of revenues translated into $2.8 billion worth of U.S. goods and $8 million in subcontracted services. Further, although U.S. AEC firms often specify U.S. made equipment, the structural gap between U.S. AEC design and equipment firms results in designers or contractors having little incentive to use U.S. goods, especially if they are more costly in the absence of export credits (OTA 1987, 5-25).

According to OTA, only about a thousand United States AEC firms engage in international business. Design firms generated total revenues of approximately $40 billion in 1984 with about $1 billion coming from overseas projects. Total revenues for construction firms came to approximately $313 billion in 1984, $4-$6 billion from overseas projects (OTA 1987, 1-35). This represents a decrease from the 1982 construction revenues of $8.8 to $9.2 billion (OTA 1987, 5-6). Table 5 shows that 60-65% of foreign receipts result from direct exports of

services with the remainder accounted for by affiliate sales.

Approximately 211 design firms reported foreign billings in 1984 and about 60 to 66 construction firms had foreign contracts in either 1984 or 1985 (OTA 1987, 5-6). Foreign contracts accounted for 21% of the work of the top 400 U.S. construction firms in 1985 and approximately 20% of the total receipts of U.S. design firms. Figure 14 shows the changes in the percent of foreign contracts of U.S. firms from 1970 to 1980.

Although U.S. AEC firms faced a boom market for U.S. construction exports in the mid 1970s, the market share of U.S. firms in the 1980s has been more volatile, fluctuating between 30% and 40%. Table 3 shows these shifts for the years 1980 through 1984. The 1984 market shares for major competitors are shown in Figure 4. U.S. positioning in the international construction industry, however, is not uniform across project types. Although the U.S. dominates the market for process plants, Korea has the greatest share of the market for general building projects, followed by France and Germany. Korea, in fact, has claimed an increasing portion of the world AEC market over the last two decades: Korean exports increased from $11 million in 1966 to over $8 billion in 1980. By 1983, Korea had captured fully 11% of the international AEC consulting market (OTA 1987, 5-14).

In the area of heavy construction and civil works, data from the World Bank show a decline in U.S. participation in heavy construction as well. In 1980, U.S. firms received $53.1 million, or 3.2%, of World Bank disbursements for civil works projects. By 1985, these figures had dropped to $38.7 million, or 1.4%. Japan and Italy had stepped in to claim the difference. Disbursements to Japan for civil works

increased from $32.6 to $104.1 million; Italy realized contract gains of $100 million, from $50.2 to $151.5 million (OTA 1987, 5-15).

These data clearly demonstrate that the structure of the international AEC industry is shifting. As indicated above, some of this shift is the result of technological advantage, but other factors are at work also.

First, the market for large scale construction projects is shrinking due in part to deteriorating economic conditions in the less developed countries (LDCs). Poorer LDCs have faced a credit crisis that has hampered their ability to finance new projects, and the richer LDCs -- primarily the oil-producing countries -- demand fewer large scale projects in part because many infrastructural and industrial facilities are already in place. The recent loss in oil revenues for the richer LDCs has affected their overall level of expenditure as well.

These conditions are reflected in the decline in the growth rate of countries in the developing world. While LDCs enjoyed an average annual growth of 6% between 1967 and 1976, this rate had slipped to 1.5% by 1983. This situation has been compounded by the indebtedness of developing countries. The International Monetary Fund has provided data indicating that the external debt of developing countries has increased from $332 to $828 billion between 1977 and 1984 (OTA 1987, 5-18). Yet, as indebtedness has grown, the ability of many nations to service their debt has diminished. Although the problem may be a cyclical one, an economic upturn will not greatly increase the fortunes of U.S. AEC firms because of the structural shifts in AEC international markets.

In addition to a shrinking market, U.S. firms face increasing competition in the AEC international marketplace. Many countries have become more self reliant as their domestic AEC firms have matured. World Bank disbursements for civil works originating in the host country, for example, have increased from $1.1 to $2.1 billion between FY 1980 and FY 1985 (OTA 1987, 5-20). Some of these firms -- South Korea is notable in this respect -- have started to export AEC services and now compete with U.S. firms in third countries.

Ironically, it is probably the case that U.S. AEC firms have unwittingly contributed to the development of competitors by providing AEC experience for workers from other countries. Because of high U.S. labor costs, the proportion of U.S. labor on international jobs is relatively small -- with U.S. nationals serving mainly in high level managerial and technical positions. Manual and semi-skilled labor for most U.S. AEC projects overseas was provided by the host country or by third country nationals. For example, U.S. firms employed Koreans on projects in the Mideast as a matter of course. Data from a Price Waterhouse study indicate that U.S. workers comprise only about 30% of the labor on U.S. international projects. In 1983, U.S. AEC firms hired 45,000 U.S. and 99,000 non-U.S. workers (OTA 1987, 5-8).

AEC exports directly provide about 1% of total AEC industry employment. Coincidental sales of equipment, however, add to U.S. employment figures. In 1982, export sales of heating, plumbing, and structural metal products accounted for 4.3% of that industry's workforce. In construction and mining machinery, exports contributed to 31.2% of the labor force; and in engines and turbines, 33.6% (OTA 1987, 5-8).

U.S. Competitive Position

Because of labor costs disadvantages, U.S. firms have concentrated on professional services in order to gain an edge in international AEC markets. U.S. firms remain leaders in design and engineering; and although they have fallen behind in construction technologies, they also maintain an edge in project management and logistics -- although this factor may become irrelevant as fewer large scale projects are undertaken. Nonetheless, management expertise is one way for U.S. firms to overcome labor cost disadvantages since expertise in this area can increase the productivity of construction workers. Inventory control, procurement, and scheduling methods have been used to overcome the downtime that plagues many construction projects. In other words, U.S. competitiveness depends strongly on the quality of applications of a variety of technologies. Competitive difficulties of U.S. AEC firms can usually be traced to technological deficiencies relative to their competitors, since U.S. firms generally can not compete on the basis of lower labor or financing costs.

The prospects for U.S. trade in the AEC industry sector are unencouraging. In the short run, a decrease in the rate of growth among the developing countries, a shrinking world market, and the growing indebtedness of the newly industrializing countries will diminish opportunities for U.S. sales abroad. An economic upturn, however, is unlikely to improve the fortunes of U.S. AEC firms because of the structural shifts occurring in the industry, i.e., an increase in the number and in the technological sophistication of competitors. The U.S. advantage in construction management is probably not

significant enough to turn this tide. Further, although U.S. design and engineering firms are highly competitive, the competitive impact from these subsectors is tempered by the structure of the U.S. AEC industry which negatively affects the constructability of projects.

Although the international AEC industry directly employs few Americans outside of management and professional ranks in its overseas projects, the ramifications of decreasing competitiveness will become most apparent in the ranks of domestic U.S. equipment suppliers who served these markets formerly.

Business Services

Overview

This section includes a discussion of selected business services that contribute to trade in international services -- accounting, advertising, and air freight and passenger services. Data processing and architecture and engineering services -- although often discussed in the context of professional business services -- were discussed above. Although technology makes it possible to store services and thus produce them at a distance from the market in which they are sold (packaged software, for example), there are also forces, according to Noyelle and Dutka, that push toward face-to-face relationship between producers and consumers. Many of the services offered in the professional business service sector fall into this category, i.e., they require a local presence. Legal services and accounting practices are both examples of products with this characteristic. Although there are occasional impediments to the scope of the services professional

firms may offer in a local market -- for example, that the certification of accounts and the preparation of accounts be two separate lines of business -- such restrictions usually apply to both domestic and foreign firms.

As was the case with banking and financial services, the demand for business services originated with the largest U.S. industrial firms. As these companies expanded their markets abroad, the demand for business services -- on a global basis -- increased. In many cases, according to Noyelle and Dutka, U.S. firms created the market. The modern accounting industry is largely an Anglo-Saxon (US/UK) innovation; international law is a field developed by U.S. firms.

The accounting industry includes services such as financial and managerial accounting, tax accounting, auditing, and some management consulting and data processing services. Like their cousins in financial services markets, U.S. accounting firms followed their clients overseas in order to provide services for subsidiaries of U.S. based multinational corporations. For example, the 1957 merger of Coopers (UK), Lybrand (US) and McDonald (Canada) into Coopers and Lybrand was a result of Coopers' need to follow Unilever into North America and Lybrand's need to follow Ford to Europe. As Noyelle and Dutka note, Coopers and Lybrand (Europe) has been expanding along the western coast of Africa to follow Unilever's expansion into that area (Noyelle and Dutka 1986, 19).

Most of these foreign operations are largely autonomous partnerships of the largest U.S. accounting firms. This is due to the fact that accounting is culture sensitive, i.e., regulations, standard practices, and tax laws vary from country to country. Obviously,

little in the way of accounting services is exported since the market requires a local presence geared to local conditions and practices.

Although trade is unimportant in terms of direct employment, revenues to the Big Eight accounting firms from foreign sales are highly significant. Table 8 sets out these figures. OTA's Special Report (1986) notes that Big Eight foreign billings were $3.8 billion in 1984, $3.6 billion in 1983, and $3.5 billion in 1982. As a percentage of total billings, sales to affiliates account for 40-45% (OTA 1986, 50). Because firms for which accounting represents the major portion of receipts were included in the U.S. Census of Service Industries for the first time in 1977, the principal source of data on the international operations of the accounting industry consists of the research efforts of individual scholars and journalists. There are no data available regarding employment levels in the accounting industry.

Advertising, like accounting, is also culture sensitive and, therefore, garners little in terms of export revenues for U.S. based firms. Again, as in accounting, local personnel serve local markets, and most U.S. affiliated firms operate autonomously from the parent both in terms of production and billing. Table 5 shows that most of the foreign revenue in this sector comes from affiliate sales.

The U.S. dominates the world market for advertising. According to data published in Advertising Age, as of 1977, the market outside the U.S. was split approximately equally between transnational and local agencies. Of transnational revenues, approximately 90% came from Western Europe and Japan. Table 4 clearly illustrates this point. Of the top 30 agencies in 1977, all but four were U.S. firms. Since then, Saatchi and Saatchi Compton PLC of the U.K. has penetrated this

ranking. Just 12 years old, Saatchi and Saatchi is now the eighth largest advertising agency in the world.

An indication of the expanding role of advertising in the world economy is its growth in the U.S. Job growth in advertising in the U.S. during the last decade was twice the average growth of all industries. U.S. advertising industry employment increased 48% between 1974 and 1984 (Howe 1986, 33).

A 1981 report by Economic Consulting Services notes that the highly competitive environment of international advertising has resulted in a market strategy for U.S. firms where U.S. agencies attempt to gain minority ownership in profitable, locally owned companies when expanding into marginal foreign markets. The benefit to the local agency results from the increased prestige of being associated with a major international firm. The U.S. agency benefits from the contacts and experience of the local agency in the local market (ECS 1981, 86). As U.S. agencies expand their foreign presence via minority ownership strategies, revenues to U.S. firms will increase although employment levels likely will remain unaffected. Figure 15 shows the changes in the U.S. advertising industry from 1975 to 1980 with respect to both domestic and foreign billings. Table 9 shows 1980 foreign versus domestic market billings for the top ten U.S. advertising agencies.

Outlook for International Trade

The expansion of business services into foreign markets depends to some extent on a lessening of restrictions regarding ownership, movement of personnel, scope of services offered, and transfer of

payments (Noyelle and Dutka 1986, 28). With respect to the presence of accounting firms, for example, most countries require that affiliates be set up as national partnerships, but they usually permit these firms to be part of international affiliations.

International transfer of payments is a necessary part of doing business among an international network of affiliates, yet transfers are often subject to restrictions. Often transfers are necessary in order to share the cost of products developed jointly or to handle intrafirm billing when several branches contribute to the completion of an assignment. Payments, however, can be restricted in two ways: by heavily taxing international transfers or by limiting the value of transfers to some proportion of direct capital investment. Since professional services are labor- rather than capital-intensive, this latter problem presents a severe restriction.

With respect to the movement of personnel, visa restrictions sometimes can have the affect of hampering a firm's ability to transfer personnel either for temporary duty assignments or among a company's offices on a more permanent basis. As Noyelle and Dutka note, this is particularly problematic when countries link the right to practice to citizenship requirements or to professional certification requirements. Visa, then, are issued on the basis of whether or not an individual can meet domestic licensing restrictions.

Although it is sometimes the case that countries have established policies that require domestic firms to do business with domestic service providers, e.g., when countries require that the accounting business of the public or nationalized sectors go to local partnerships, these practices have not been major impediments to trade

in services. As Noyelle and Dutka note, these "buy national" practices have come more as an effort to promote infant service industries rather than to prevent foreign firms from participating in the local market. Nevertheless, they do have a negative effect on the size of the local market for foreign firms.

Summary

Trade in business services can be expected to expand as U.S. service providers follow their international accounts overseas. This is particularly the case where a multinational corporation's staff services require some sort of firm-wide integration -- such as in accounting or legal services. Low-skill services required by businesses -- for example, security and maintenance -- do not require corporate-wide integration. The direct employment impact of trade in business services on domestic employment, however, is likely to be negligible since these services must be performed locally to meet the professional licensing requirements or laws of particular host countries. The main significance of increased trade in business services is that it will continue to reinforce the international competitiveness of both services and manufacturing firms that are based in the United States. The international competitiveness of these firms is a prerequisite for maintaining and expanding employment levels at home.

Summary and Conclusion

In this report, we have investigated services trade in five

sectors: AEC, financial markets, the information technology services, and certain business services. In general, U.S. service firms are highly competitive, they hold substantial market shares, and they realize significant portions of their revenues from overseas trade. In almost every instance, their success in international markets has depended on the application of advanced computer and communications technologies. This indicates a synergistic effect: so long as the United States maintains a leadership position in the information industry, U.S. service firms have a unique opportunity to maintain a competitive position in their respective markets. Yet, other factors operate here as well.

The U.S. AEC industry excels in the application of CAD techniques and in project management, in both cases by relying on advanced computer and communications technologies. Yet, these advantages are not sufficient in overcoming external market factors -- a shrinking marketplace, a host of new competitors, and the international debt crisis -- that also affect the U.S. industry's competitive position in the international AEC market. Nor are these advantages sufficient in overcoming internal factors that hamper the competitiveness of the U.S. industry -- factors such as inattention to construction R&D and the structural constraints that fragment design and construction thereby reducing the constructability of large scale projects. U.S. employment ramifications of the AEC industry's shrinking market and decreasing competitiveness will be evident in AEC supplier industries and in the loss of domestic contracts to foreign contractors.

One advantage that almost all other services, discussed here, have over the AEC industry is that international markets are expanding

rather than contracting. International banking, for example, has expanded at a rate of 20% per year for the last twenty years. U.S. banks have performed well in this market in part by relying on technological advances in computers and communications that have enhanced the provision of financial services and the development of new financial products. Growth rates in information technology services revenues are also quite high as are those for business services. Whereas the failure to keep up with technology is holding back the U.S. AEC industry, the reverse is propelling the other three sectors examined in this report forward.

The success of the information technology services -- data processing, information services, software, and telecommunications -- in international markets is clearly technologically driven. Although the world market shares of these industries can be expected to slip somewhat as foreign competitors become more sophisticated, U.S. firms are likely to maintain a leadership position through the continued application of new technologies, building upon their reputation for innovativeness and product development.

The information technology services provide the best examples of the close interdependence of goods and services in high technology. The competitiveness of the U.S. software industry is a function of the competitiveness of the U.S. computer hardware industry, and vice versa. The competitiveness of the U.S. telecommunications services industry depends on the technical excellence of the U.S. computer hardware and software industries. Increasingly, all manufacturing industries are becoming dependent on applications of computer and telecommunications technology to maintain their competitive strengths in world markets.

In business services, U.S. firms are, again, highly competitive. The Big Eight accounting firms realize almost half of their revenues from foreign operations. Foreign revenues for the top ten U.S. advertising agencies, in 1980, ranged from a low of 34% to a high of 77%. Growth in accounting and advertising revenues and employment has been considerable. It is quite likely that the competitiveness of these business services is a reflection of the strength of U.S. firms generally, as their usual main point of entry into foreign markets consists of the foreign subsidiaries of U.S. firms.

Growth in the services sector of the U.S. economy indicates neither the demise of U.S. manufacturing nor the dawn of a post-industrial society. Instead, the services and goods-producing sectors are interrelated and interdependent. Internationally competitive service industries, especially the knowledge-based services, are strongly linked to the international competitiveness of rest of U.S. industry. Thus, national policy makers should not neglect the services or implement policies with an inherent bias against services if they want to enhance the overall competitiveness of U.S. industry. The main weaknesses may well be in manufacturing, rather than services. But if these weaknesses are not addressed, the United States will witness a concomitant decline of its services industries in world trade.

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Table 1

Estimates of Service Balance of Payments, 1982-1984*

	Exports (receipts) (billions of dollars)			Imports (payments) (billions of dollars)			Net exports (billions of dollars)		
	1982	1983	1984	1982	1983	1984	1982	1983	1984
Accounting	$0.2-0.5	$0.2-0.5	$0.2-0.5	—	--	--	$0.2-0.5	$0.2-0.5	$0.2-0.5
Advertising	0.1-0.5	0.1-0.5	0.1-0.5	--	--	--	0.1-0.5	0.1-0.5	0.1-0.5
Construction	5.6	4.6	4.0-6.0	0.0-2.2	0.0-1.7	0.0-2.0	3.4-5.6	3.1-4.8	2.0-6.0
Data processing	0.1-1.2	0.1-1.2	0.1-1.2	0.0-2.0	0.0-2.0	0.0-2.0	(1.9)-1.2	(1.9)-1.2	(1.9)-1.2
Education	1.5-2.2	1.6-2.3	1.8-2.5	0.1-0.3	0.1-0.3	0.1-0.3	1.2-2.1	1.3-2.2	1.5-2.4
Engineering	1.2-1.7	1.1-1.6	1.0-1.4	0.1-0.3	0.1-0.3	0.1-0.3	0.9-1.6	0.8-1.5	0.7-1.3
Franchising	0.2-1.0	0.2-1.1	0.2-1.2	--	--	--	0.2-1.0	0.2-1.1	0.2-1.2
Health	1.0-2.5	1.0-2.5	1.0-2.5	--	--	--	1.0-2.5	1.0-2.5	1.0-2.5
Information	0.0-2.6	0.0-2.9	0.0-3.1	0.0-1.0	0.0-1.0	0.0-1.0	(1.0)-2.6	(1.0)-2.9	(1.0)-3.1
Insurance	5.6-7.7	6.1-8.2	6.9-9.1	6.3-8.6	6.7-9.1	7.4-9.8	(1.1)-(0.5)	(1.1)-(0.4)	(0.9)-(0.2)
Investment banking/ brokerage	2.1-4.8	3.2-6.4	3.2-8.5	3.6-4.1	4.3-4.8	4.3-5.6	(2.0)-1.2	(1.6)-2.1	(2.4)-4.2
Leasing	0.2-1.2	0.2-1.2	0.2-1.2	0.0-1.0	0.0-1.0	0.0-1.0	(0.8)-1.2	(0.8)-1.2	(0.8)-1.2
Legal	0.0-2.0	0.0-2.0	0.0-2.0	0.0-1.0	0.0-1.0	0.0-1.0	(1.0)-2.0	(1.0)-2.0	(1.0)-2.0
Licensing	5.2	5.2	5.5	0.7	0.8	1.0	4.5	4.4	4.5
Management/ consulting	0.5-1.1	0.6-1.4	0.6-1.6	0.6-1.1	0.6-1.1	0.6-1.1	(0.6)-0.5	(0.5)-0.8	(0.5)-1.0
Motion pictures	1.6	1.9	1.9	0.1-1.4	0.1-1.7	0.2-2.7	0.2-1.5	0.2-1.8	(0.8)-1.7
Retailing	--	--	--	--	--	--	--	--	—
Software	1.6-1.7	2.5-2.6	2.8-2.9	0.0-1.7	0.0-2.2	0.0-2.7	(0.1)-1.7	0.3-2.6	0.1-2.9
Telecommunications	1.1	1.3	1.3	1.9	2.0	2.4	(0.8)	(0.7)	(1.1)
Transportation	16.7	17.1	18.5	17.7	19.1	22.8	(1.0)	(2.0)	(4.3)
Travel	15.7	14.1	13.7	13.7	15.8	16.4	2.0	(1.7)	(2.7)
Miscellaneous	4.7	5.3	5.7	1.8	1.8	2.1	2.8	3.4	3.6
OTA total	$65-81	$67-84	$69-91	$47-61	$52-66	$57-74	$6.3-32.8	$2.7-30.7	$(3.5)-31.5
OTA mid.range estimate	$73	$76	$80	$54	$59	$66	$20	$17	$14
BEA total	$41.7	$41.8	$43.8	$32.6	$35.4	$41.5	$9.1	$6.4	$2.3

*Commercial Banking is excluded from this table; parentheses indicate negative balance; range of estimates for net exports is not that implied by ranges for exports and imports.
SOURCE: Survey of Current Business; OTA 1986, 38.

Table 2. Services Trade in Industrial and Developing Countries, 1980-86 (in billions of U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986
Industrial Countries:							
Exports	536.5	588.6	584.2	540.3	561.2	582.5	707.5
Imports	501.1	560.8	563.3	517.2	548.1	560.0	674.0
Balance	35.4	27.8	20.9	23.1	13.1	22.5	33.5
Developing Countries:							
Balance	-78.7	-99.6	-104.2	-94.4	-100.1	-88.0	-84.6

Note: Figures for 1986 are estimates; export/import data on services for developing countries were not available.

Source: IMF 1986, 72 and 76.

TABLE 3

Market Share of International Construction

(As measured by new contracts awarded to the top 250 international contractors, in billions U.S. dollars)

	1980	1981	1982	1983	1984
United States	48.3 (45%)	48.8 (36%)	44.9 (36%)	29.4 (31%)	30.1 (38%)
France	8.1 (7%)	12.1 (9%)	11.4 (9%)	10.0 (11%)	5.4 (7%)
Germany	8.6 (8%)	9.9 (7%)	9.5 (8%)	5.4 (6%)	4.8 (6%)
Italy	6.2 (6%)	9.3 (7%)	7.8 (6%)	7.2 (8%)	7.8 (8%)
Britain	4.9 (5%)	8.7 (6%)	7.5 (6%)	6.4 (7%)	5.7 (7%)
Other Europeans	9.2 (8%)	12.6 (9%)	10.3 (8%)	9.1 (10%)	7.2 (9%)
Japan	4.1 (4%)	8.6 (6%)	9.3 (8%)	8.7 (9%)	7.3 (9%)
Korea	9.5 (9%)	13.9 (10%)	13.8 (11%)	10.4 (11%)	6.8 (8%)
All other	9.4 (9%)	10.5 (8%)	8.6 (7%)	7.0 (7%)	5.9 (7%)
Total	108.3	134.4	123.1	93.6	80.5

Source: OTA 1987, 5-14.

TABLE 4

World's Largest Advertising Agencies
1977
(Millions of dollars)

Rank	Agency	Country of origin	Gross Income
1	Dentsu Inc.	Japan	212.6
2	J. Walter Thompson	United States	189.0
3	Young and Rubicam	United States	164.7
4	McCann-Erickson	United States	162.6
5	Ogilvy and Mather International	United States	127.9
6	BBDO International	United States	118.6
7	Leo Burnett	United States	116.0
8	SSC and B Inc.	United States	100.5
9	Ted Bates and Co.	United States	98.8
10	Grey Advertising	United States	97.2
11	Foot, Cone and Belding	United States	89.1
12	D'Arcy-MacManus and Masius	United States	81.4
13	Doyle Dane Bernbach	United States	74.8
14	Dancer-Fitzgerald-Sample	United States	72.0
15	Benton and Bowles	United States	70.7
16	Hakuhodo Inc.	Japan	70.1
17	Campbell-Ewald	United States	61.2
18	N W Ayer ABH International	United States	57.4
19	Kenyon and Eckhardt	United States	45.6
20	Needham, Harper and Steers	United States	41.2
21	Norman, Craig and Kummel	United States	40.8
22	Wells, Rich, Greene	United States	39.1
23	Compton Advertising	United States	38.7
24	Marsteller Inc.	United States	36.0
25	Eurocom	France	35.2
26	William Esty Co.	United States	33.0
27	Daiko Advertising	Japan	32.4
28	Ketchum, MacLeod and Grove	United States	29.9
29	Bozell and Jacobs International	United States	27.3
30	Ross Roy	United States	21.9

Source: Advertising Age; Transnational Corporation in Advertising: A Technical Paper. U.N. Center on Transnational Corporations. In Noyelle and Dutka 1986.

TABLE 5

Foreign Revenues of U.S. Service Firms, 1982 - 1984

	Direct exports (billions of dollars)			Affiliate sales (billions of dollars)			Total foreign revenues (billions of dollars)		
	1982	1983	1984	1982	1983	1984	1982	1983	1984
Accounting	$0.2-0.5	$0.2-0.5	$0.2-0.5	$3.6-3.9	$3.7-4.0	$3.9-4.2	$3.8-4.4	$3.9-4.5	$4.1-4.7
Advertising	0.1-0.5	0.1-0.5	0.1-0.5	1.6	1.7	1.8	1.7-2.1	1.8-2.2	1.9-2.3
Construction	5.6	4.8	4.0-6.0	3.2-3.6	2.9-3.3	NA	8.8-9.2	7.7-8.1	NA
Data processing	0.1-1.2	0.1-1.2	0.1-1.2	2.3-3.4	2.5-3.7	NA	2.4.4.6	2.6-4.9	2.7.5.1
Education	1.5-2.2	1.6-2.3	1.8.2.5	0.0-0.1	0.0-0.1	NA	1.5-2.3	1.6-2.4	NA
Engineering	1.2-1.7	1.1-1.6	1.0-1.4	3.6	4.0	NA	4.8-5.3	5.1-5.6	NA
Franchising	0.2-1.0	0.2-1.1	0.2-1 2	--	--	--	0.2-1.0	0.2-1.1	0.2-1.2
Health	1.0-2.5	1.0-2.5	1.0-2.5	0.9	1.1	NA	1.9-3.4	2.1-3.6	NA
Information	0.0-2.6	0.0-2.9	0.0-3.1	0.0-2.6	0.0-2.9	0.0-3.1	2.6	2.9	3.1
Insurance	2.6-3.5	2.7-3.6	2.8-3.7	9.4-11.3	10.1.12.1	11.0-13.0	12.0-14.8	12.8-15.7	13.8-16.7
Investment banking/ brokerage	0.5-1.5	1.0-2.0	1.0-2.5	10.8	7.7	NA	11.3-12.3	8.7-9.7	NA
Leasing	0.2-1.2	0.2-1.2	0.2-1.2	3.6-5.3	3.7-5.4	3.8-5.5	4.4-5.5	4.5-5.6	4.6-5.7
Legal	0.0-2.0	0.0-2.0	0.0-2.0	0.1	0.1	NA	0.1-2.1	0.1-2.1	NA
Licensing	5.2	5.2	5.5	--	--	--a	5.2	5.2	5.5
Management/ consulting	0.5-1.1	0.6-1.4	0.6-1.6	1.7	1.2	NA	1.7-2.3	1.8-2.6	NA
Motion pictures	1.6	1.9	1.9	1.5	2.0	NA	3.1	3.9	NA
Retailing	--	--	--	27.3	25.4	NA	27.3	25.4	NA
Software	1.6-1.7	2.5-2.6	2.8-2.9	3.0-4.1	3.2-4.4	3.4-4.7	4.6-5.8	5.7-7.0	6.2-7.6
Telecommunications	1.1	1.3	1.3	1.2	1.3	NA	2.3	2.6	NA
Transportation	16.7	17.1	18.5	13.5	10.9	NA	30.2	28.0	NA
Travel	15.7	14.1	13.7	0.0	0.0	0.0	15.7	14.1	13.7
Miscellaneous	4.7	5.3	5.7	5.5	6.0	NA	10.2	11.3	NA
Subtotal (excluding banking)	$60.3-73.8	$61.0-75.1	$62.5-79.4	$92.3-102.0	$87.5-97.3	NA	$156-172	$152-169	NA
Banking	NA	NA	NA	NA	NA	NA	$8.6	$9.4	$12.2
Total	NA	NA	NA	NA	NA	NA	$164-180	$161-178	NA

SOURCE: OTA 1986, 41.

TABLE 6

Employment Levels in the U.S. Information Technology Industries

(Employees in thousands)

	1972	1982	Percent change 1972 to 1982
Manufacturing			
Computers	145	351	+142
Office equipment	34	51	+ 50
Radio /television receiving sets.	87	63	- 28
Telephone and telegraph equipment	134	146	+ 9
Radio and television communications equipment	319	454	+ 42
Electronic components	336	528	+ 57
Totals, manufacturing	1055	1593	
Services			
Telephone and Telegraph	949	1131	+ 11
Computing	149	360	+141
Radio and television broadcasts	68	81	+ 19
Cable television	40	52	+ 30
Totals, services	1206	1624	

Sources: Bureau of Industrial Economics; U.S. Industrial Outlook, 1984; FCC Interview, 1984. In OTA, Information Technology R&D, 1985.

TABLE 7

BLS Manpower Estimates

Base year: 1982	1995	
Electrical and electronic engineers:		
320,000	Low	531,000
	Moderate	528,000
	High	540,000
Computer specialists:		
Programmers:		
226,000	Low	465,000
	Moderate	471,000
	High	480,000
Systems analysts:		
254,000	Low	469,000
	Moderate	471,000
	High	480,000
Technicians:		
55,000	Low	106,000
	Moderate	108,000
	High	108,000
Computer operators:		
211,000	Low	366,000
	Moderate	371,000
	High	378,000

Source: Nardone,T. 1984. Bureau of Labor Statistics, personal communication. In OTA, Information Technology R&D, February 1985.

TABLE 10

Revenues of the Big Eight Accounting Firms, 1977
(millions of dollars)

	Worldwide Revenues	U.S. Revenues	Foreign Revenues
Peat, Marwick, Mitchell	516	365	151
Coopers & Lybrand	490	256	234
Price Waterhouse & Co.	479	245	234
Arthur Andersen & Co.	471	351	120
Deloitte Haskins & Sells	410	220	190
Arthur Young & Co.	390	210	180
Ernst & Ernst	385	285	100
Touche Ross & Co.	350	185	165
Total	3,491	2,117	1,374

Source: Bernstein P. 1980. Current Development in U.S. International Service Industries. U.S. Department of Commerce. In Economic Consulting Services 1981, 72.

TABLE 12

Billings and Gross Income of the Ten Largest
U.S. Advertising Agencies, 1980

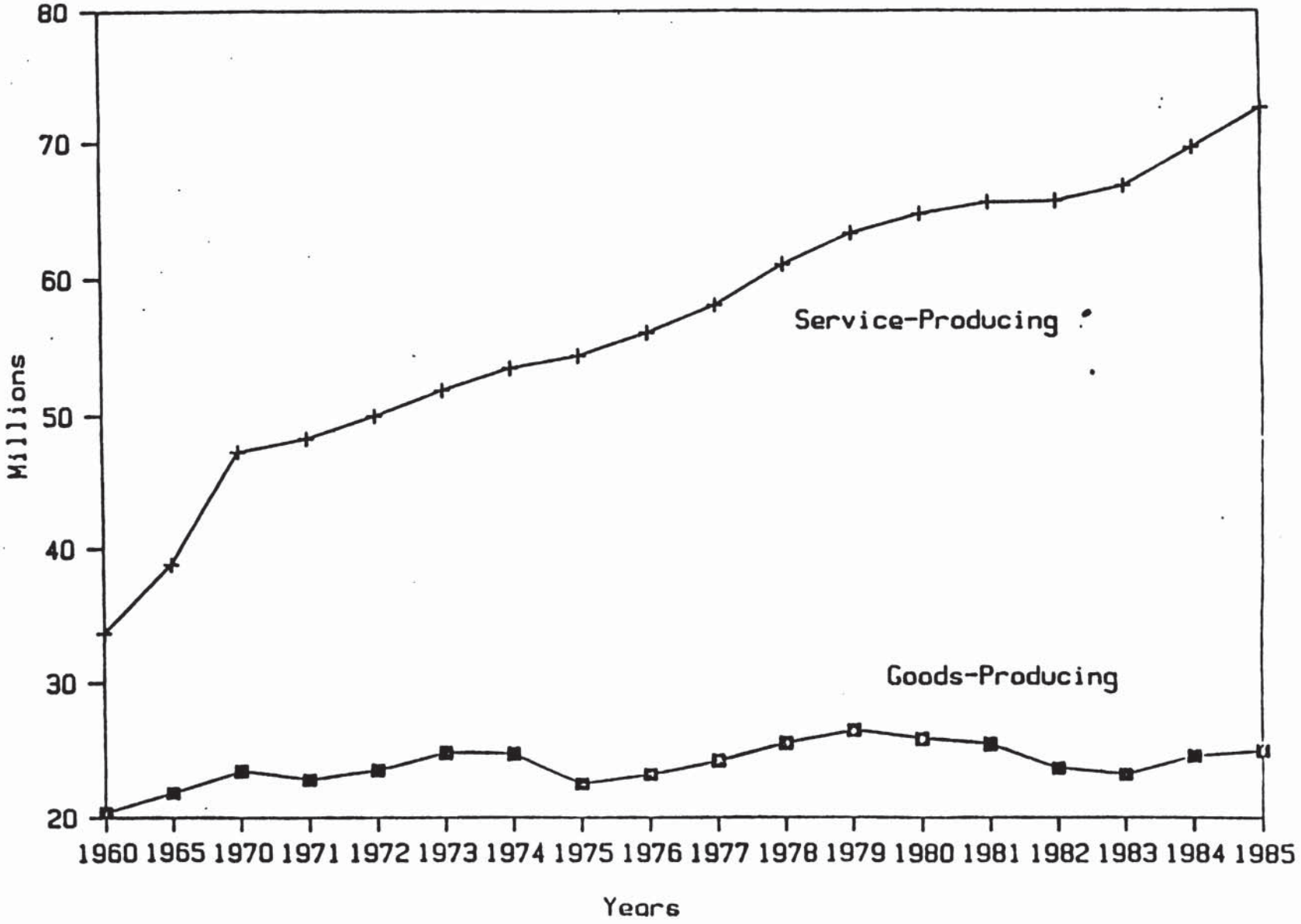
(millions of dollars)

World Income Rank*	Agency	Billings			Gross Income		
		World wide	Foreign	Percent Foreign	World wide	Foreign	Percent Foreign
1	Young and Rubicam	2,273.2	939.5	41.3	340.8	140.8	41.3
2	J. Walter Thompson Co.	2,137.7	1,218.8	57.0	322.5	184.7	57.3
3	Mccann - Erickson	1,792.1	1,361.1	76.0	268.7	204.1	76.0
4	Ogilvy and Nather Int'l	1,661.9	824.8	49.6	245.9	120.4	49.0
5	Ted Bates and Co.	1,404.1	683.8	48.7	210.6	102.6	48.7
6	BBDO International	1,305.0	498.6	38.2	175.6	69.8	39.7
7	Leo Burnett Co.	1,144.8	410.2	35.8	169.7	61.5	36.2
8	SSC&B	1,111.8	857.4	77.1	166.7	128.6	77.1
9	Foote Cone & Belding	1,117.6	368.3	33.0	164.3	55.2	33.6
10	D'Arcy-MacManus & Masius	1,045.3	596.0	57.0	156.0	88.6	56.8
	Total	14,993.5	7,758.5	51.7	2,220.8	1,156.3	52.1

*Based on World Gross Income for 1980.
Source: Advertising Age, March 18, 1981. In Economic Consulting Services 1981.

Figure 1

U. S. Employment 1960-1985

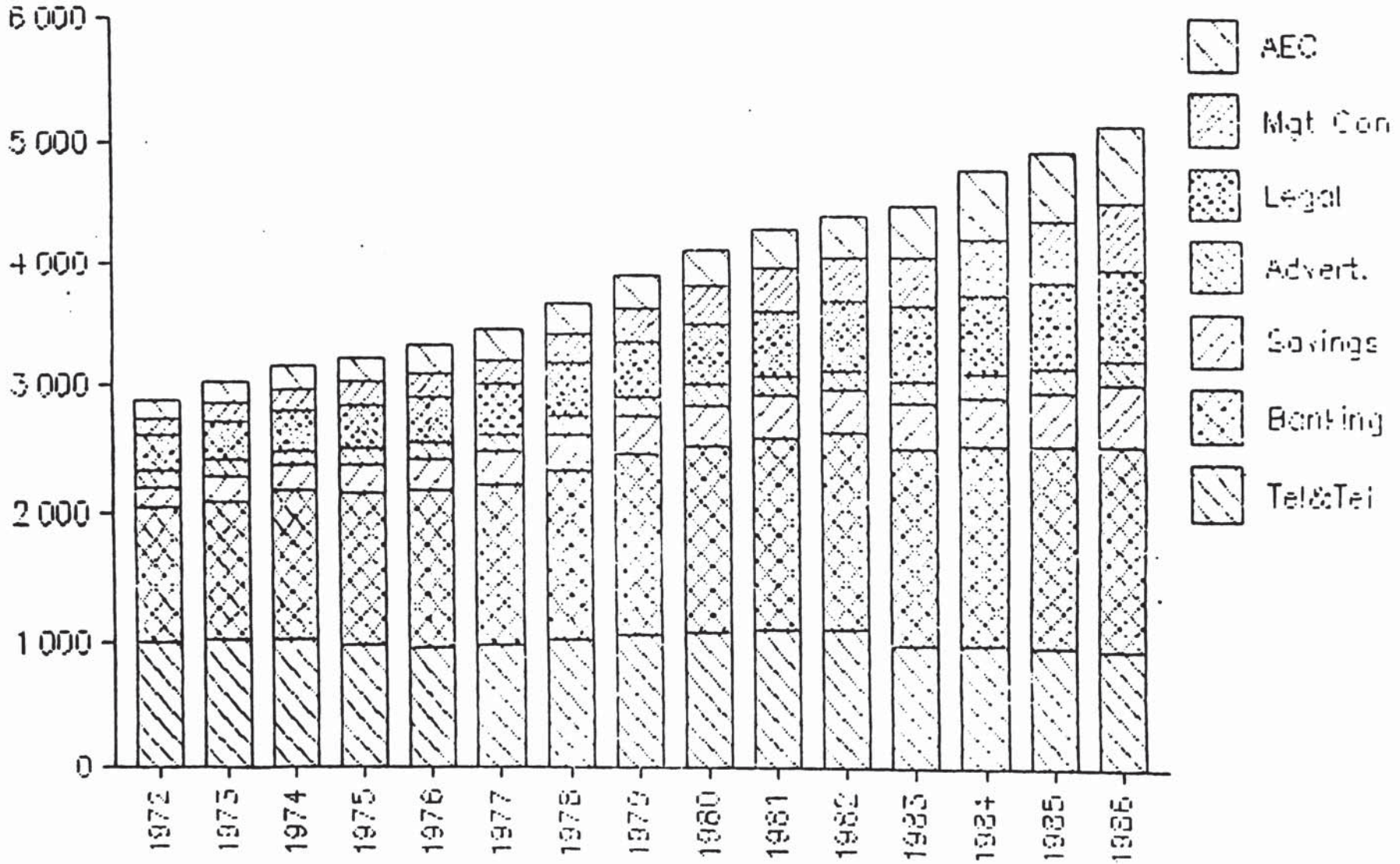


Source: Employment and Earnings, various issues.

Figure 2.

Employment in Business Services

(in thousands)

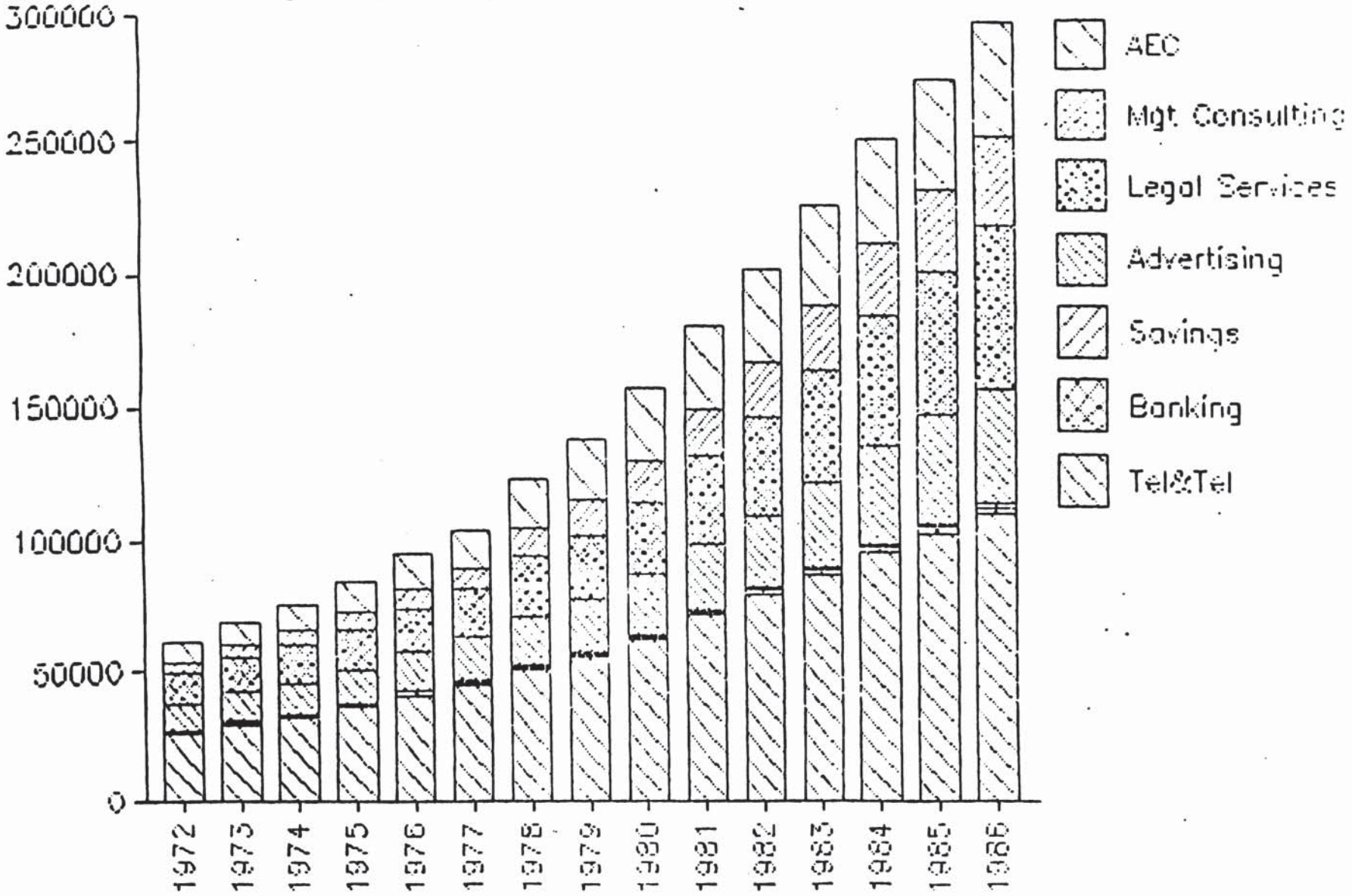


Source: 1986 U.S. Industrial Out[illegible] (Washington DC: U.S. Dept. of Commerce)

Figure 5.

Total Revenues in Business Services

(¥ Millions)

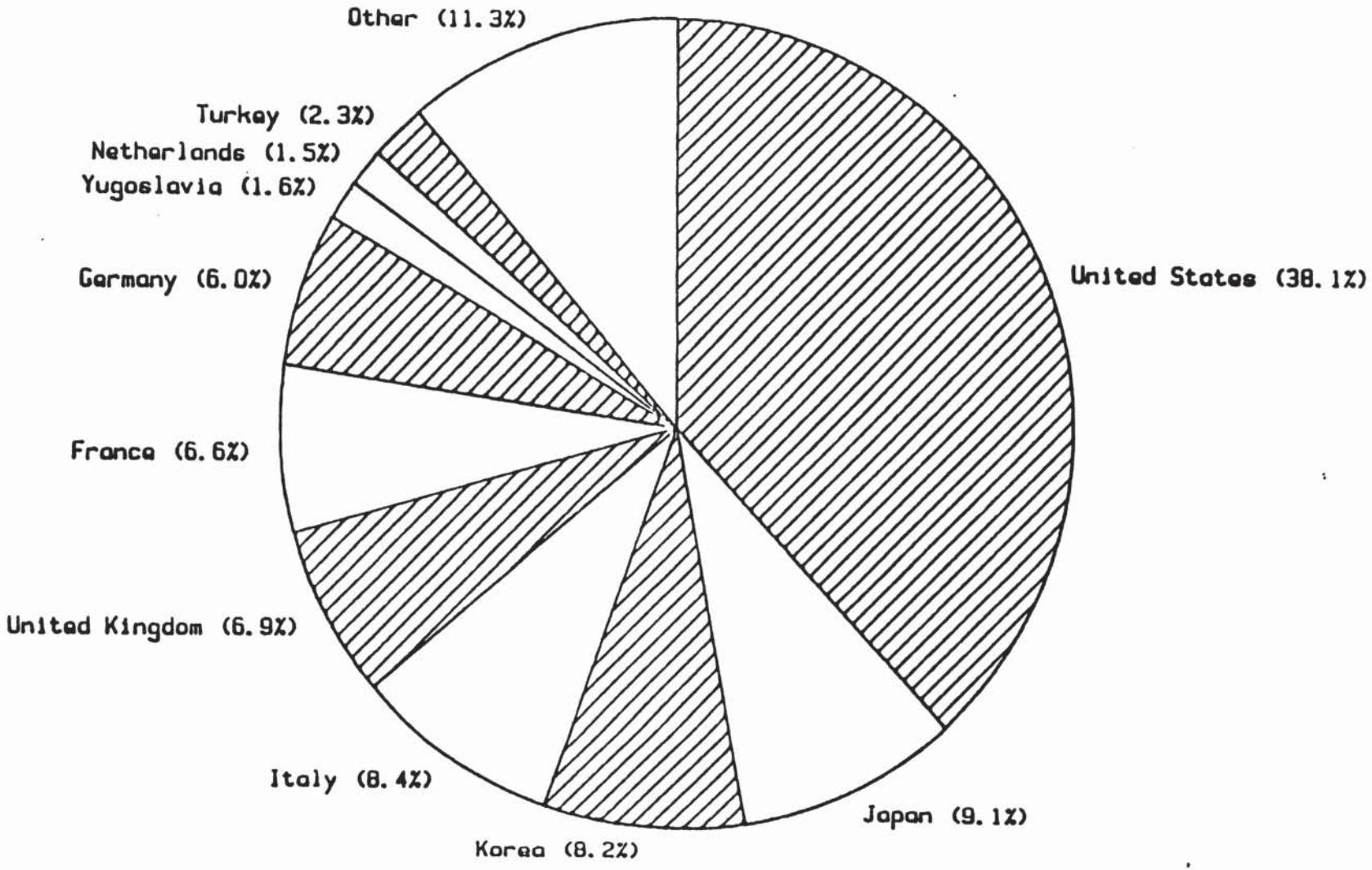


Note: Banking Revenues do not include interest income.

Source: Same as Figure 1.

Figure 4

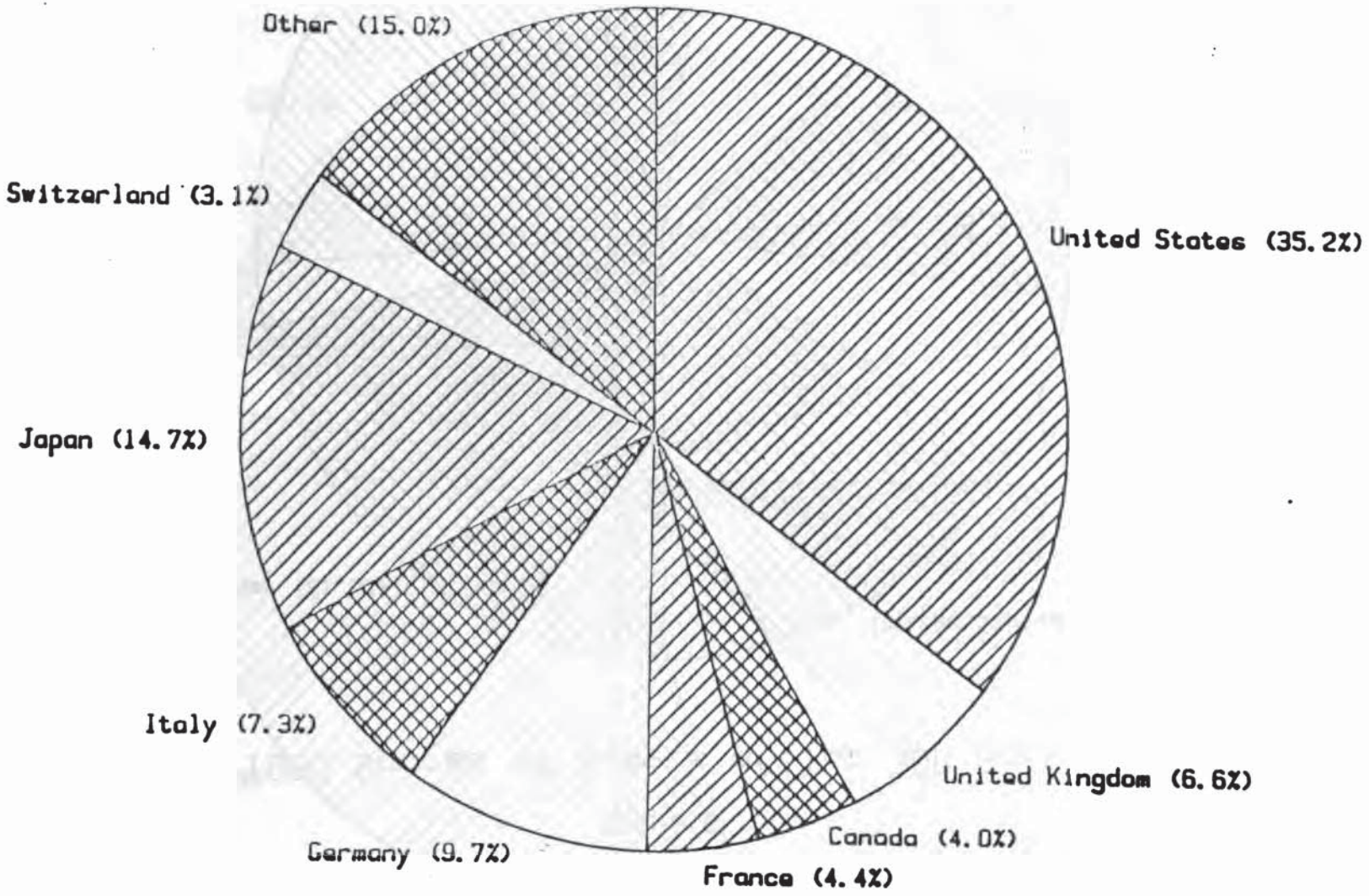
International Contractors Market Share
1984 Export Market



Source: Engineering News Record, July [illegible]. In OTA 1987, Chapter 5.

Figure 5

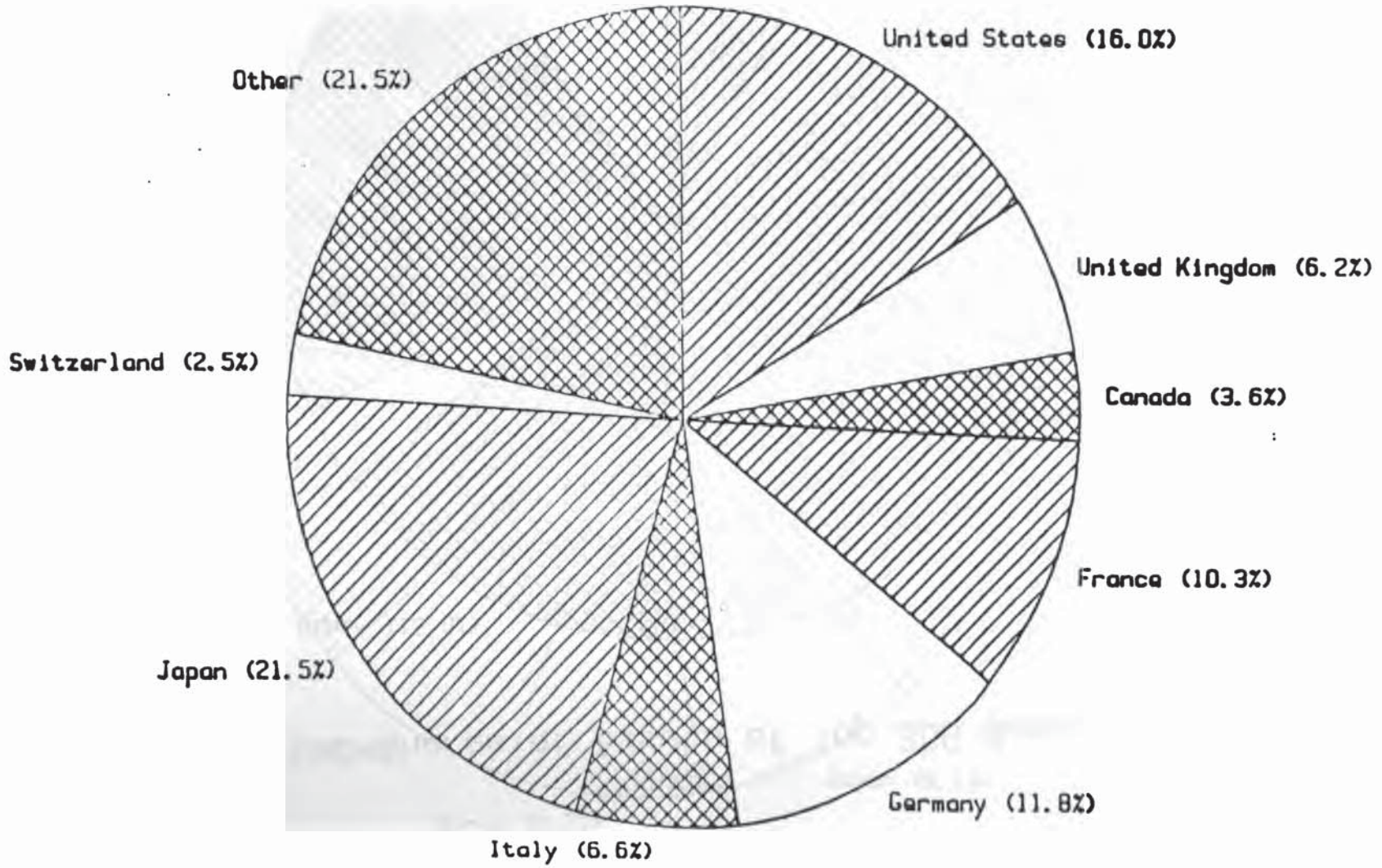
1970 Shares of Assets of Top 300 Banks



Source: The Banker. In Dufey and Tachoegi 1988.

Figure 6

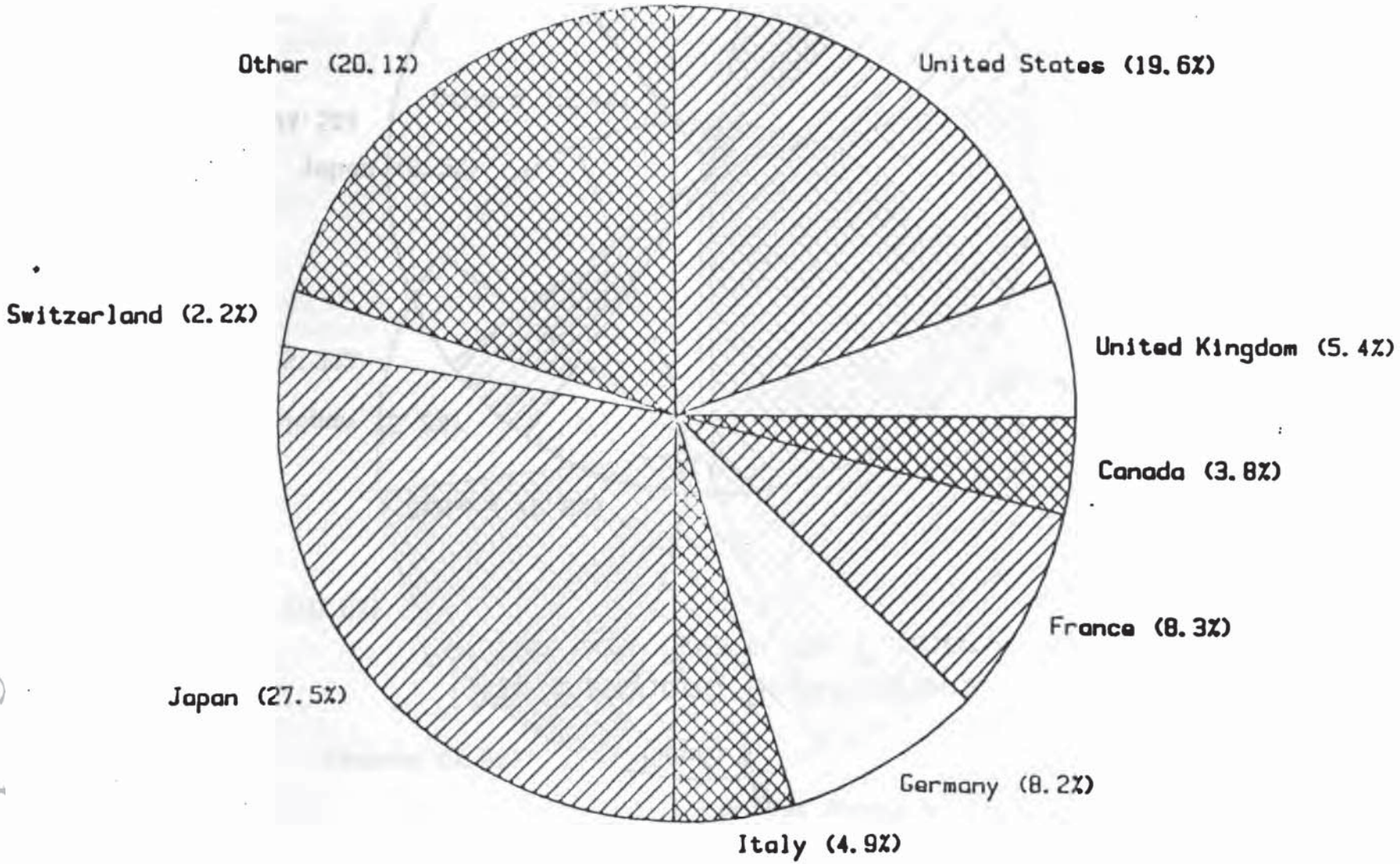
1980 Shares of Assets of Top 300 Banks



Source: The Banker, Dafey and Technoexport 1980.

Figure 7

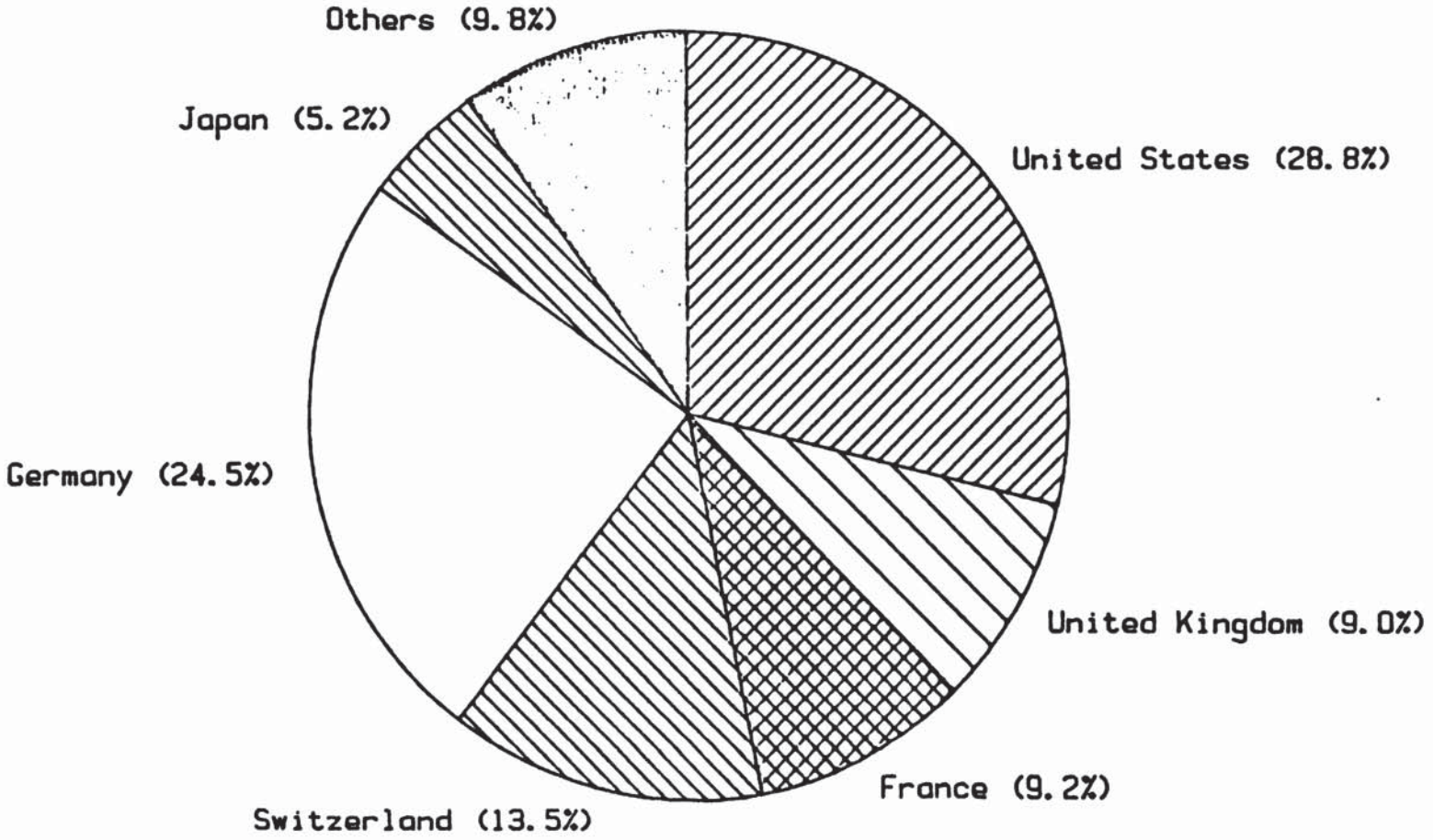
1984 Shares of Assets of Top 300 Banks



Source: The Banker, in Dufey and Tschoegl 1985.

Figure 8

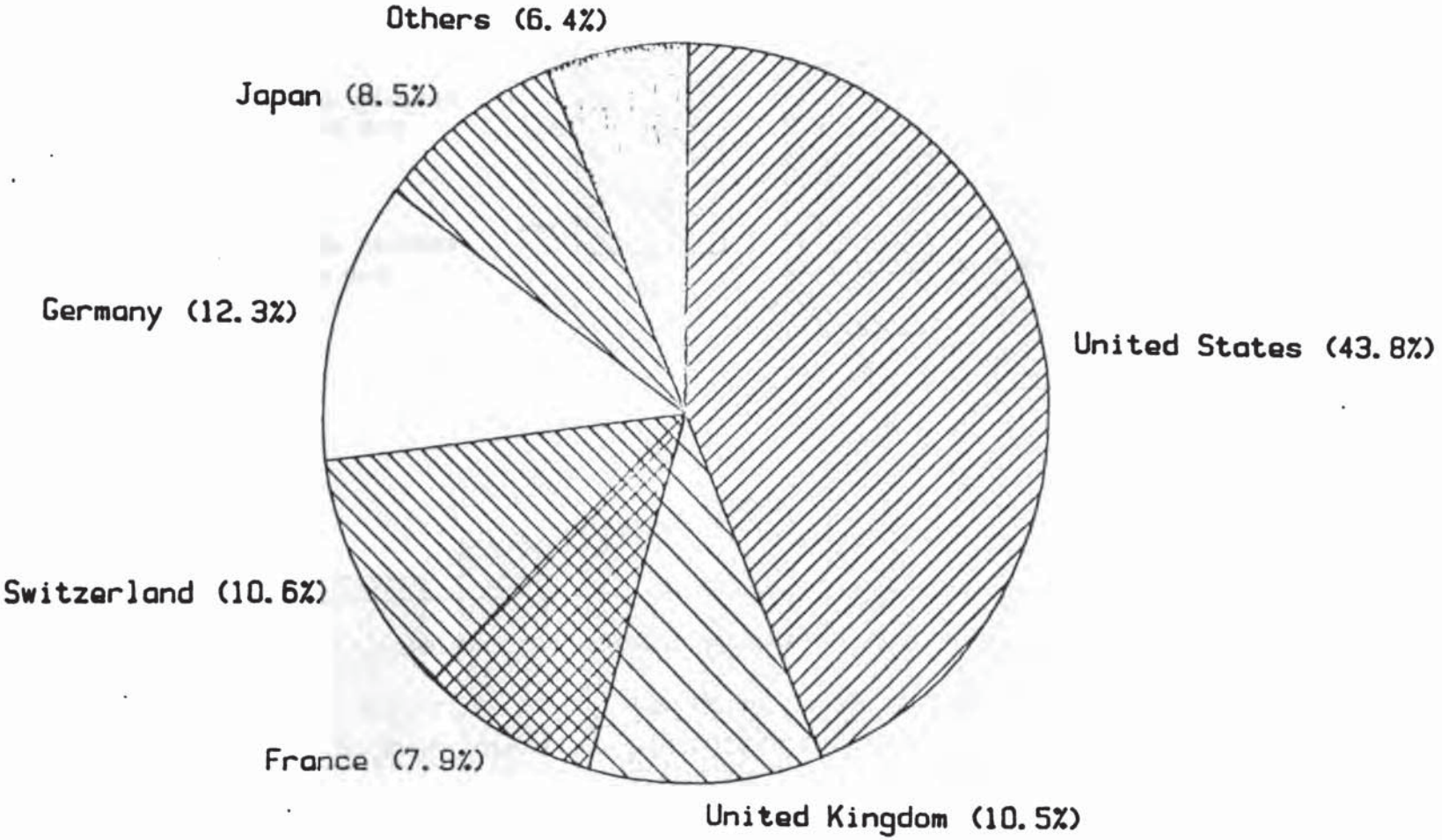
1983 Eurobond Bookrunners
Percentage Share by Country



Source: Euromoney. In OTA 1987.

Figure 10

1984 Eurobond Bookrunners
Percentage Share by Country



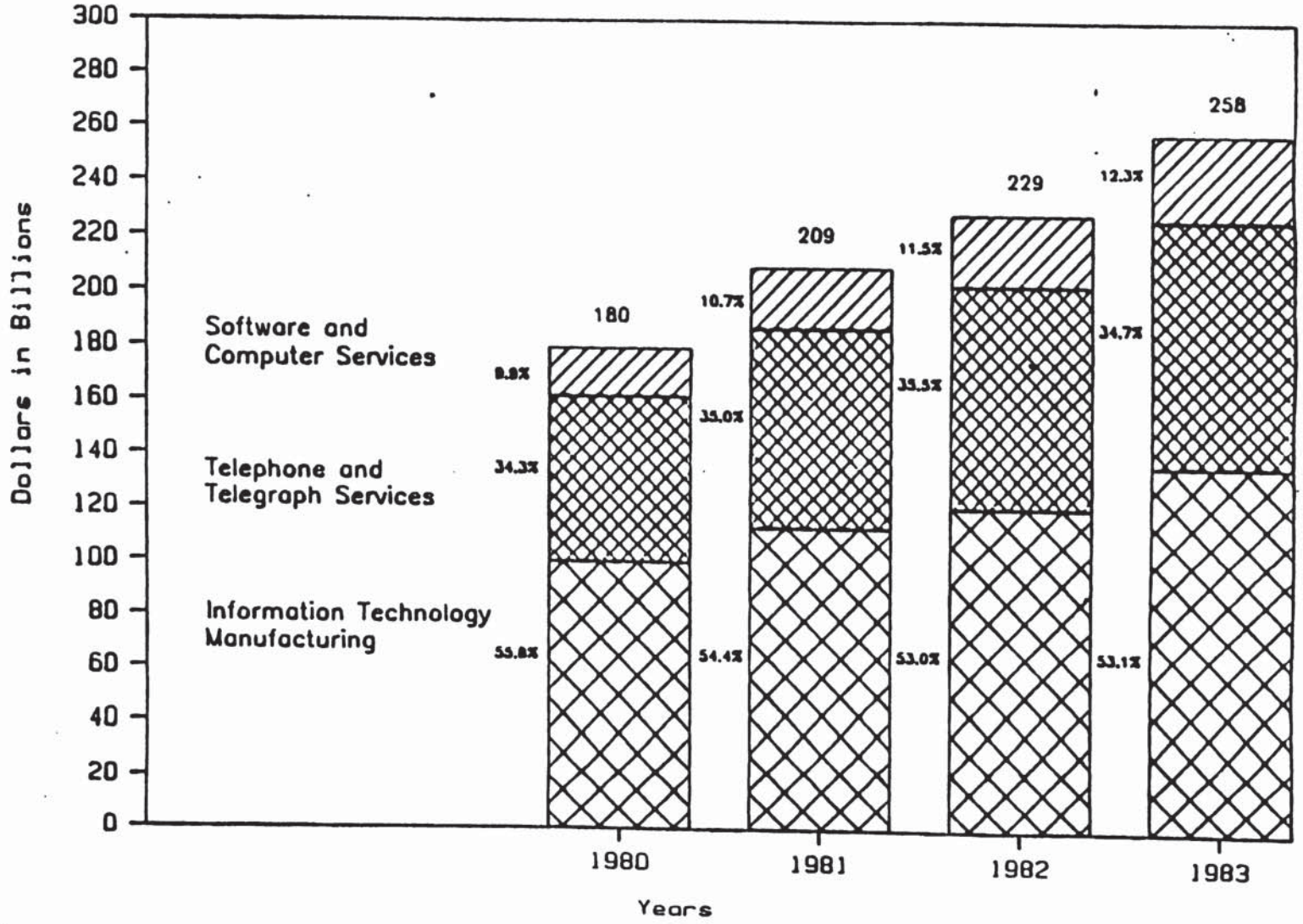
Source: Euromoney. In OTA 1987.

10

Figure 14

The Changing Structure and Growth of the U.S. Information Industry

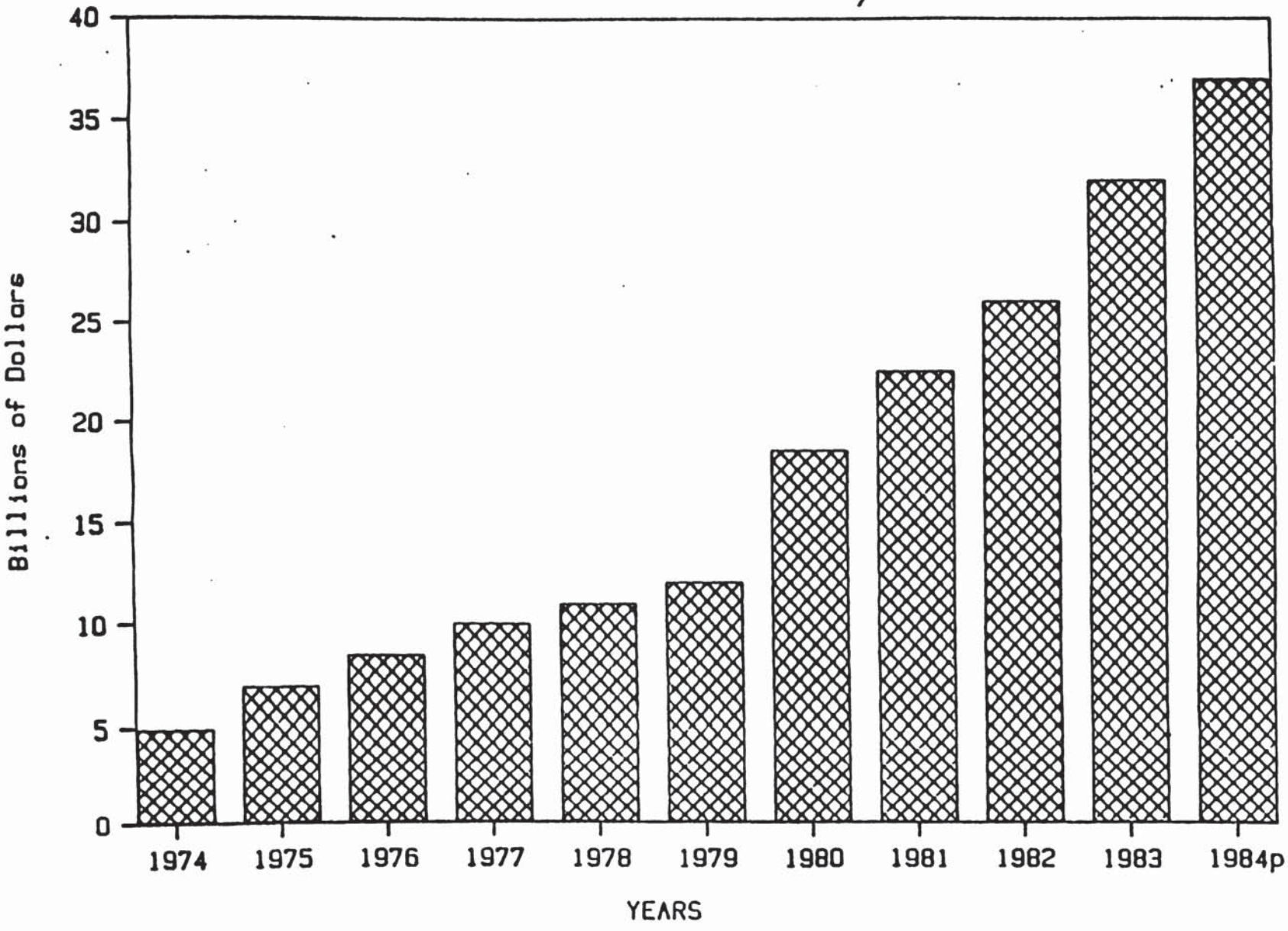
Information Industry Revenues; 1980–83



Sources: ADAPSO; U.S. Industrial Outlook, 1983. [illegible] in OTA, Information Technology R&D. February 1985.

Figure 18 11

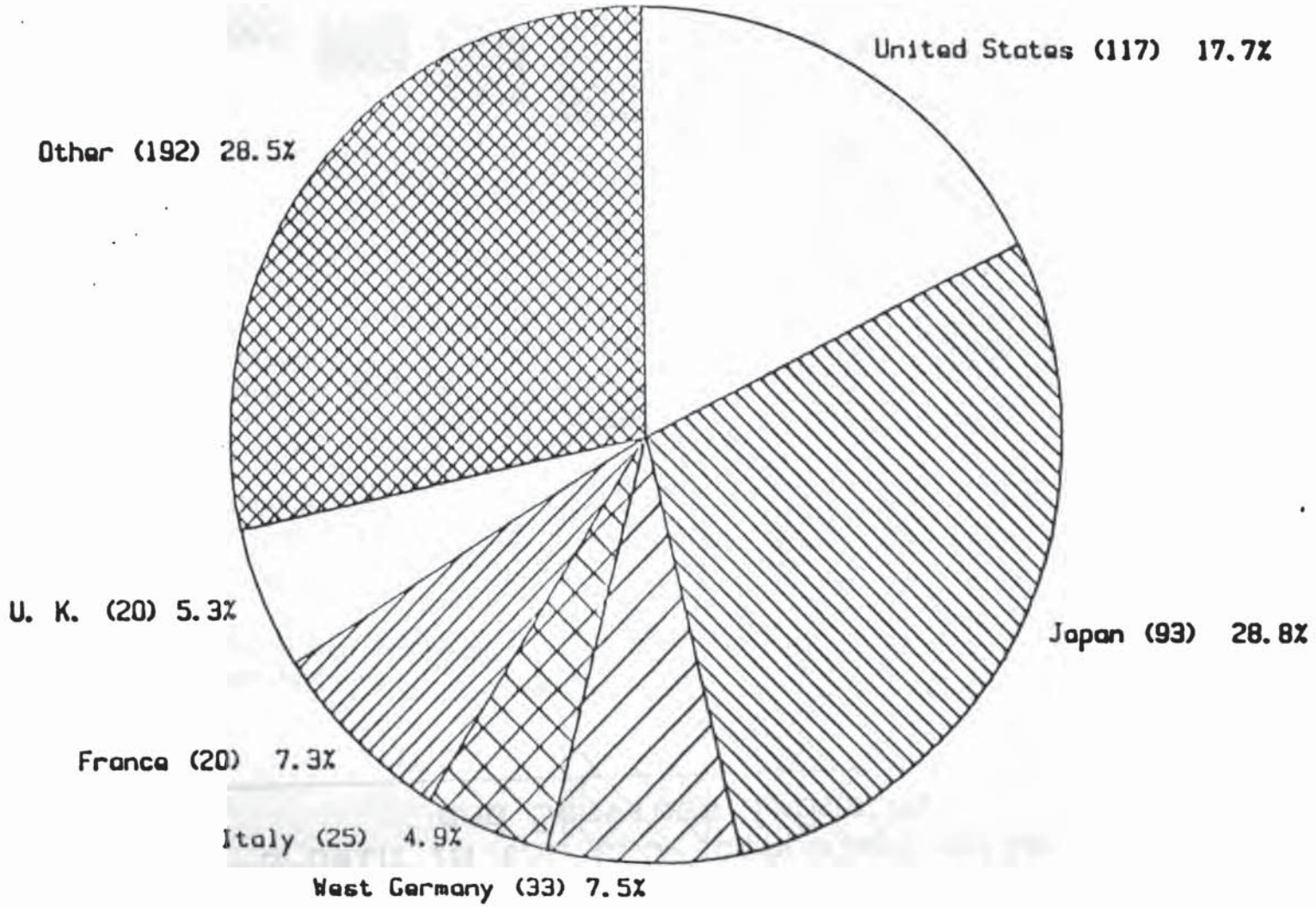
Growth in the U.S. Computer Software and Services Industry



Source: ADAPSO 1984 Annual Report

Figure # 12

Distribution of Assets for World's 500 Largest Banks*

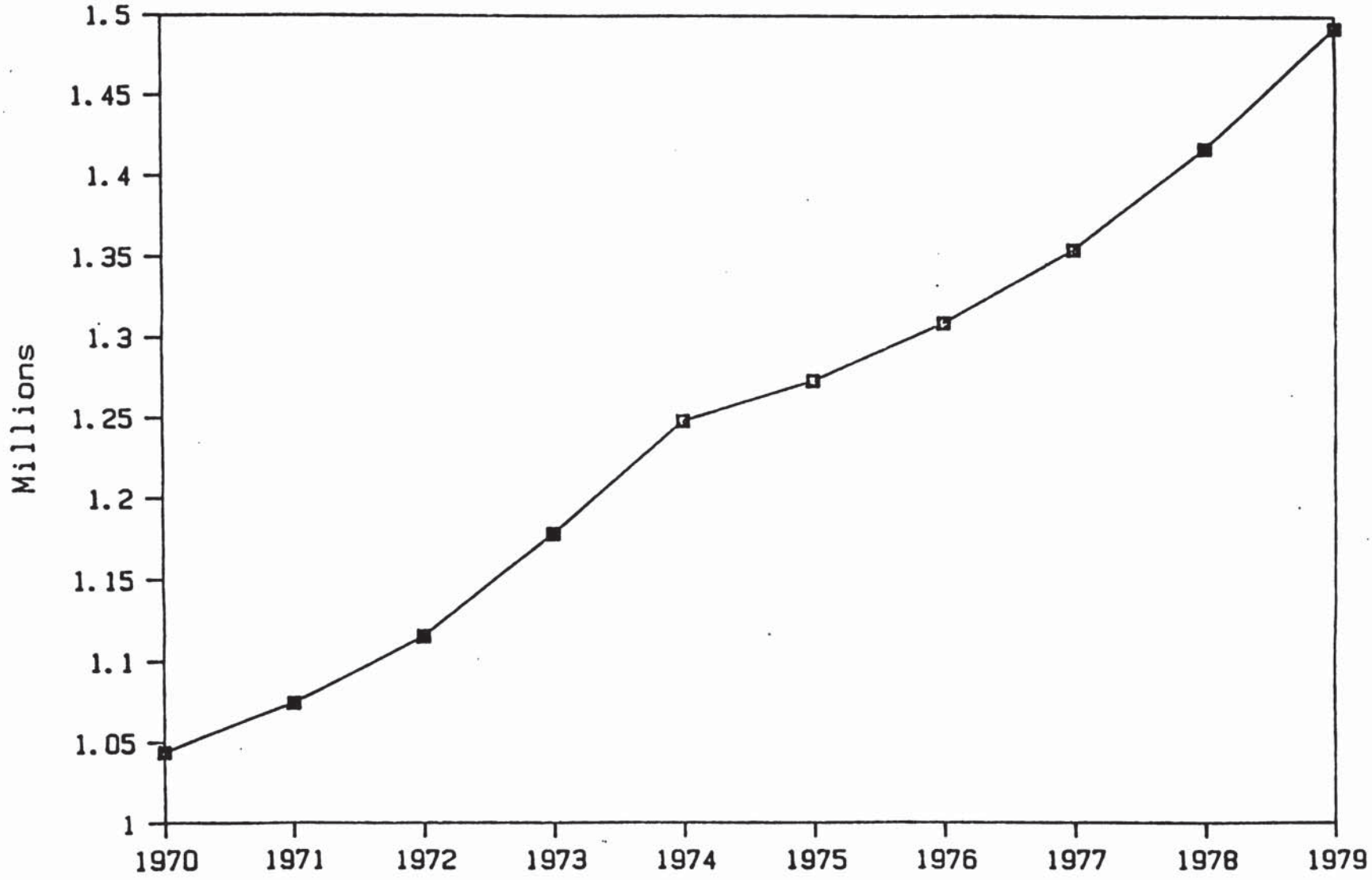


* Parentheses indicate number of banks

Source: American Banker, July 1985. In OTA 1987.

Figure 13

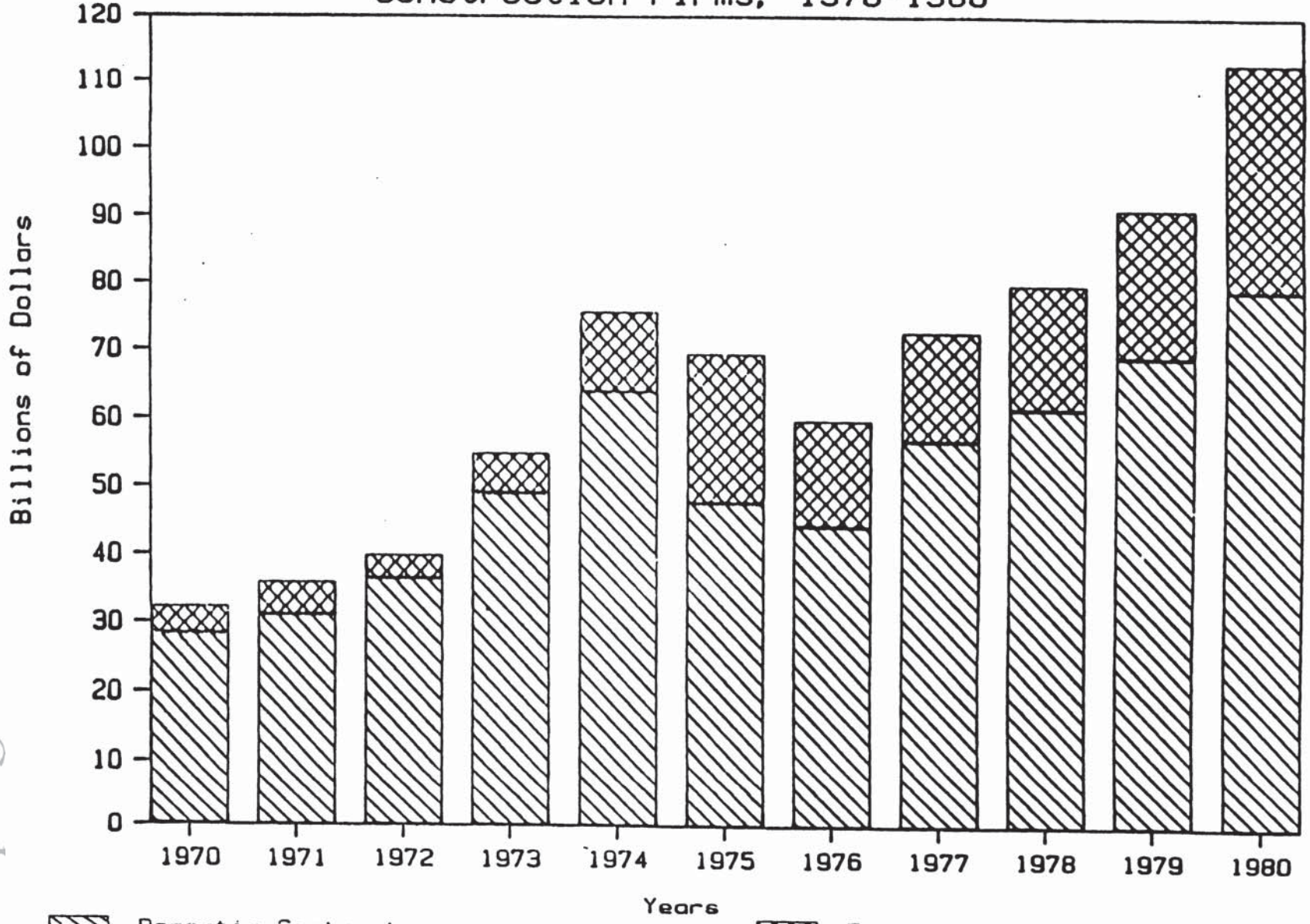
Employment in the U.S. Banking Industry



Source: Employment and Earnings. In Economic Consulting Services 1981.

Figure 2.14

Contracts of Top 400 U.S. Construction Firms, 1970-1980



Source: Engineering News Record, 1981, in Economic Consulting Services 1981.