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TYPE: ACTION  
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DIRECTORATE STATUS

STATUS I

\*\*\*\*\*

FROM: HILL, J. French: SPECIAL ASSISTANT TO THE PRESIDENT

TO: DR. D.A. BROMLEY

DATE OF  
CORRESPONDENCE: 09/28/92

SUBJECT: HE IS FORWARDING HIS COMMENTS ON THE OSTP REPORT ON  
SMALL HIGH TECH COMPANIES.

\*\*\*\*\*  
DIRECTORATE  
ASSIGNED: DIRECTOR'S OFFICE

STAFF  
ASSIGNED:

*Comments to  
Dave Cranmer  
10/2/92*

*301 948-5603*

ACTION  
REQUIRED: AS NECESSARY

STAFF  
ACTION:

*None necessary*

\*\*\*\*\*

OSTP DUE DATE: 10/15/92  
DATE COMPLETED:

SENDER'S DUE DATE:  
STAFF DUE DATE  
DATE COMPLETED/DEPT:

*Changes will  
be considered*

\*\*\*\*\*

COPIES TO: D. Allan Bromley

*for Report  
by Dave Cranmer*

\*\*\*\*\*

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OSTP RECEIVED: 10/01/92 DEPT RECEIVED:  
FILE: P-EOP-WHITE HOUSE MEMORANDUM

CENTRAL FILES:



## THE WHITE HOUSE

WASHINGTON

September 28, 1992

MEMORANDUM FOR D. ALLAN BROMLEY

FROM:

J. FRENCH HILL 

SUBJECT:

Report on Small High Tech Companies

I have had the opportunity to read your report entitled *A Profile of Small High Technology Business in the United States* and find it is a good contribution to the subject. I have a handful of comments I would like to share.

- Page six, second paragraph, you state: ...the total disbursement of venture money has declined by nearly 80% from 1987 to the present. My question is, isn't the amount raised less also? Also, please see the attached two articles on increasing venture funds. Don't forget this is a cyclical business. Recent IPOs have replenished capital stocks.
- Page seven, first paragraph. I question whether concerns about U.S. competitiveness are growing. The Administration has (and is) developing policies to enhance our continued competitiveness.
- Page eleven, fifth paragraph. Note the misspelling of "dollar" in line 10.
- Page eleven, sixth paragraph. "...in the Federal government... in line three needs clarification. What do you have in mind here?
- Page nineteen, the second paragraph and sixth line where you state "...the computer software sector has the lowest percentage of exporting firms." I would make mention of copyright protection issues. Could it also not be counted fully due to software being sold with hardware in an export market?
- Page twenty, the word "Economic" in the name of the second source, listed at the bottom of the chart, is misspelled. Also, I don't believe Clyde Prestowitz is a particularly good source for a Bush Administration document.
- Page twenty-one, line ten after "...high technology firms." After "firms", please add "as they are the largest foreign direct investors overall."



- Page thirty-one, last paragraph on line five. I think the sentence would be better worded by saying "number" instead of "numbering".
- Page thirty-four, first paragraph and page thirty-five, first paragraph. Note that the figures I've highlighted do not match.
- Also on page thirty-five, insert "capital" between "high" and "gains" under the first bullet in the box.
- Page thirty-six, paragraph three. Substitute "millionaire" for "wealthy" in the first line. In the second line, begin with "Approximately" or spell out "32%".
- Also on page thirty-six at the bottom, I would not use the tag lines highlighted in the chart. Again, at the bottom of the chart, where the word "wealthy" appears, substitute "millionaires". Remember, income over around \$60,000 is in top two percent.
- Page thirty-seven, first paragraph. The last sentence needs clarification. Who wouldn't be?
- Page thirty-eight, fourth paragraph. Insert "type of" in the third line between "same" and "technology". In line four of same paragraph, substitute "increase" for word, "hike".
- Also on page thirty-eight, referring to the chart, note that venture capital is a cyclical business and always has been. The chart offers only a very narrow picture. Show more history.
- Page thirty-nine, delete "Despite this important contribution..." on down. See highlighted area.
- Page forty. Insert "capital" between "Adverse" and "gains" under the first bullet, and again between "high" and "gains" in the next line.
- Page forty. Under the third bullet, first line, delete the first line through recessionary and insert "Economic Conditions: The sluggish". Also delete "and gloomy outlook".
- Page forty, in the last paragraph. Substitute "Some" for "Other", change "investments" to "investors" and insert after "investors" "engaged in their primary business of". Substitute "may" for "probably" and insert "be" between "not" and "doing".
- Page forty-four, last four paragraphs. Please update text for actual legislation.

- Page fifty-one, second paragraph. Debt financing is always hard for "young firms" -- especially high-tech firms with few, if any, hard assets.
- Page fifty-two. Difficulties are cyclical.
- Page fifty-three, paragraph four. When listing agency, put commonly used initials afterward if you will be referring back to those agencies using initials. Also, when discussing overregulation, mention the President's regulatory moratorium and the Council on Competitiveness' efforts.
- Page fifty-four. Delete everything here since you mention this on page fifty-six in the conclusion.
- Page fifty-six, the second paragraph, last line. Development of incubators and research parks should be encouraged by what method?





Executive Office of the President  
Office of Science and Technology Policy

*not for release  
or distribution.*

# A Profile of Small High Technology Business in the United States

INTERNAL REVIEW COPY

Joseph S. Broz  
David C. Cranmer  
Mark F. DeSantis

Handwritten text, possibly a signature or date, located in the upper right quadrant of the page.



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## Highlighted Results

- There are estimated to be approximately 75,000 to 100,000 small, high-technology firms in the U.S.
- There are estimated to be 1.75 million direct employees in small, high-tech firms; 10.8 million in high-tech enterprises overall.
- Small high-technology firms:
  - are much more innovative than larger firms with 1/2 of all major technological innovations deriving from small firms;
  - historically have created 2 to 3 times their proportional share of new jobs;
  - facilitate increased productivity in all businesses through innovative products that improve efficiency;
  - provide products that in themselves create or stimulate new industries; and
  - grow very rapidly (both employment and assets).
- Angel (informal, non-professional) investors and venture capitalists play complementary roles in financing small, high-technology businesses. Angel capital appears to be (by a large multiple) the largest source of risk seed and start-up capital for small businesses.
- Angels are not always wealthy - one study states that up to 1/3 of investors in small businesses earn under \$60,000/year.
- Angels are dominant investors in the seed-level phase of new companies; venture capitalists become important in later follow-on investments (the start-up or later phases). Equity-oriented SBIC's and SBIR funding pick-up in the start-up phases.



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# Executive Summary

Small high technology business is one of the most important, yet least understood, elements of our nation's economic foundation. While the major contributions of small business to the economy and to improving our way of life are often self-evident, the contributions of small businesses engaged in the development of high technology products and services are sometimes less clear. This report attempts to expand our understanding and appreciation of the small high technology business sector of the economy. It is hoped this report will provide greater insight into this issue and serve as the basis for future action by the Administration on matters affecting the formation and development of small, technology-based enterprises.

This study estimates that roughly one and three-quarters of a million employees work in approximately 75,000 to 100,000 small, high technology firms throughout the United States.<sup>1</sup> A significantly larger number of individuals and businesses are either suppliers or customers to these businesses. While the small high technology business sector represents only a few percent of the total number of small businesses in the United States, and only 3% to 4% of the total small business sector work force, the economic, technological, and social impact of these technically based firms is profound. Many of the technology products in use in our daily lives — including the personal computer used to create this manuscript — were initially derived from a small high technology business.

The availability and reliability of information on small high technology firms is poor when compared to information on other sectors of the U.S. economy, and better information is critical if this economic sector is to be fully understood. Nevertheless, the data gathered for this study do provide an approximate profile of small high technology businesses in the United States. It is clear from this profile that these firms have a number of unique characteristics and needs, and information about these needs should be made readily available to public policy makers.

The first, and perhaps most striking, finding of this study is that small high technology businesses are a significant and continuous source of product and process innovation. A large and growing body of research indicates that new, small firms are a major force for technological change in our economy by innovating, in general, more efficiently than their large-



er counterparts. Equally important, several studies, in general,<sup>23</sup> indicate that small firms have more new products per dollar of sales, and a higher percentage of total sales generated by new products. Small firms consistently obtain more patents per research and development (R&D) dollar than larger firms, and account for half of all major technical innovations in the United States.

Secondly, small high-tech firms are dynamic in the creation of new jobs. In the decade between 1976 and 1986, employment growth in the high-tech sector was the highest of any sector of the economy. Small high-growth, high technology firms contributed over one-third of all new jobs in the high-tech sector, and firms with fewer than 20 employees accounted for fully half of this growth. In total, high technology companies contributed nearly *four* times their expected share of new jobs, and the trend continues today.<sup>4,5</sup> Once dominant basic U.S. industries, such as steel, autos, and consumer electronics, have all lost significant market share in the last five years. For example, from January 1989 to September 1991, durable goods manufacturers lost 8.3% in total employment. In contrast, during the same period, small and mid-sized technology manufacturers *increased* employment by 10.6%.<sup>6</sup>

Lastly, a few small high technology businesses will one day become some of our nation's largest corporations; Apple, Hewlett-Packard, and others were established, in many cases, based on innovative products inspired by the company's founders. Small high technology businesses are the seeds for our future, as evidenced by the fact that almost half of the largest industrial firms in the U.S. are now replaced by new "upstarts" every five years.<sup>7</sup> Of the 1400 largest high-technology firms in the United States, 41% have been created since 1980, 31% since 1983, and 14% since 1987.

The importance of small high-tech firms to the U.S. economy cannot be overstated; competition in the global economy will inevitably mean that many of the most successful technology firms will eventually succumb to competitive pressure, and as a consequence, a viable pool of smaller firms must be available to replace these firms with newer, updated technology products. The small business sector, and the high technology sector in particular, is a major component of the nation's engine for technological change,<sup>8</sup> and small high-tech firms are engaged in many of the critical technology areas that are key to U.S. competitiveness. One study reported that small high-tech businesses account for half of all major U.S. innovations, and further, that the innovative technology derived from these firms is more than twice as likely to be licensed, purchased, or converted to economically viable products than innovations from large high-tech firms.<sup>9</sup>



## The Importance of Small High-Technology Firms

- *Innovation* – Small high-technology firms are much more innovative and produce more patents per employee and R&D dollar than do larger firms (2 to 8 times). One-half of all innovations derive from small firms.
- *Rapid Growth* – Small high-technology firms contributed at least 2-3 times their proportionate share of new jobs as compared to other sectors of the economy in the period 1986-1991 and grow rapidly.
- *Important Products* – High technology products are used throughout the entire economy and generate a "leverage effect", facilitating increased productivity and stimulating the formation of entirely new businesses. Two-thirds of venture-financed, small high technology firms are involved with Federally identified "critical technologies" that are key to U. S. competitiveness.

## Financing Small High-Tech Ventures

Despite these apparent advantages, a good deal of economic risk is associated with new, small technology-based firms, and perhaps more risk than is generally associated with other types of entrepreneurial activity. As a result, traditional financial institutions tend to shy away from investing in these businesses. In response, a separate, high technology finance market has taken shape over the last two decades that includes private individual investors (or "angels"), professional venture capitalists, initial public offerings of stock ("IPO's"), and proprietorship capital. The available information on this market shows that:

- Informal ("angel") investors and venture capital funds play complementary roles in the financing of new technology-based firms.<sup>10</sup> Angels are important in the seed-level phases of new companies, and venture capitalists generally become important in later follow-on investments, although some venture capitalists still engage and specialize in seed-level investments.
- A significant number of small high-tech start-ups in the U.S. currently have great difficulty obtaining, or lack altogether, sufficient seed and start-up capital.<sup>11</sup>

In comparing the two major seed-level financing sources, we note that, for small businesses in general, the total available informal "angel" investment is *three to ten times* the total amount of professional venture capital.<sup>12</sup> A similar ratio is likely to hold true for the high technology small business investment market as well.<sup>13</sup>



but hasn't the amount  
varied less also...

The data indicate that informal angel investors in small high-tech businesses are *not* exclusively from the upper-class; in fact one-third of such investors earn under \$60,000 annually and have a net worth of less than \$500,000. The preponderance of informal capital over venture capital demonstrates the close link between high technology financing and macro-economic factors such as tax policies (low capital gains tax and personal savings incentives) and the international performance of the U.S. economy.

While some categories of high-tech companies (i.e., biotechnology concerns) are still successful in attracting professional venture investment even at the seed and start-up levels, the total disbursement of venture money has declined by nearly 80% from 1987 to the present. Only new firms that are relatively well-established and offer expected rates of return well above average have adequate access to funding — a trend likely to continue into the immediate future.<sup>14</sup> At the very least, this trend has the effect of drawing funding away from more mundane, but technologically important, business opportunities,<sup>15</sup> and at its worst, is stifling technological innovation in the United States.

In addition to the availability of financing, this study has endeavored to broadly characterize those factors that can either foster or impede the growth of a small high-tech firm. Internal factors such as poor business plans and incompetent management are cited as the most common reasons for business failures and are coincidentally, the most common reasons for venture capitalists rejecting a specific investment.<sup>16</sup> External factors such as the regulatory environment for product approval and public underwriting, as well as the macro-economic climate, including interest rates and unemployment, all dramatically affect the success rate of small firms.

Related to financing impediments are trends regarding foreign investment and foreign acquisition of small, high-tech firms. General estimates can be made from data on foreign direct investment and outlays made by U.S. affiliates of foreign-owned firms. The Japanese have been the most active investors in the last four years, having acquired 399 U.S. high-tech companies during this period — the majority of firms are presumably small from the data available for this analysis. Computer firms, followed by semiconductor firms, were the most common targets for acquisition. Recently, the rate of foreign acquisition activity has slowed in the United States reflecting, perhaps, a downturn in the Japanese economy. The number of venture-backed firms acquired has fallen dramatically — a 75% decrease last year.

Finally, the effectiveness of incubators and research science parks in fostering the entrepreneurial growth of small high-tech firms is examined. Currently, incubators do not play a major role in the development of U.S.-based small high-tech firms, as only some 3,600 businesses are involved in them, however the future looks promising, particularly when viewed



against a purported better-than-average success rate for incubator graduates and the projected growth rate of incubator facilities. Research parks play an only slightly larger role in the small, high-tech business picture at present, but are also likely to continue to grow in participation. This study encourages the establishment of efficient enterprise centers that can improve the chances of success for small high-tech firms by providing valuable services, advice and infrastructure support.

## Conclusions

Small high technology businesses occupy a unique and critical position in our economy. It is estimated that there are 75,000 to 100,000 small high-tech firms in the U.S. They are a predominant and continuous source of technology, product and process innovation and are dynamic in the creation of jobs. Many of our nation's largest technology corporations were founded on a single innovative product as small businesses, and not established as subsidiaries of larger companies. Many small high-tech firms are concerned with technologies that are critical to maintaining U.S. competitiveness.

Financing new technology-based firms appears to be problematic at present; both informal sources of funding and venture capital currently appear to be in short supply as a consequence of market correction factors and the extreme sensitivity of the informal investment market to unfavorable tax and macro-economic factors. While some companies, (especially in biotechnology) are still very successful in attracting professional venture investment, the total pool of venture money has sharply declined. Only those firms with the highest potential return, and generally at a more mature phase, can consistently attract financing according to the data reviewed.

A number of broadly-defined factors determine the ultimate success of an entrepreneurial high-tech venture. Internal factors, such as management issues, as well as exogenous factors, such as the macroeconomic environment, appear to be the most important determinants. The rate of success can apparently be enhanced by improving the overall nurturing and management assistance a firm receives through the initial critical phases of development. Incubators and science research parks may to enhance the rate of company success by shared critical services and infrastructure improvement. The development of incubators and research parks should be encouraged.

Foreign acquisition of U.S. firms is currently dominated by the Japanese, particularly in the area of computer-related businesses and semiconductor firms. A recent slowdown in acquisition rates probably reflects the economic downturn in Japan but the rate is still significantly above the 1988 levels when the upward trend began.

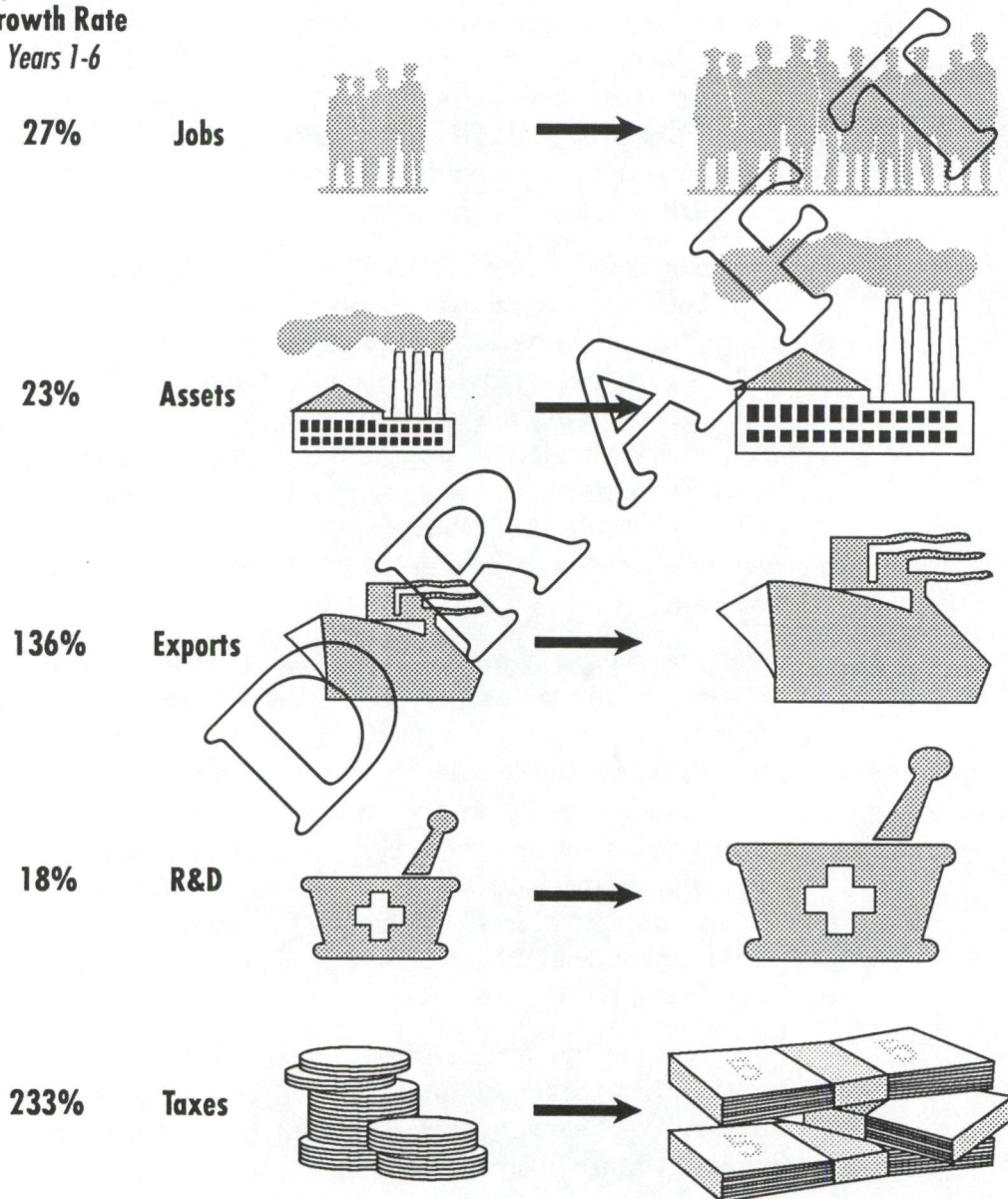


## Overall Benefits to the Economy From Small High Technology Companies

The economic benefits from small, venture-backed, high-technology companies were summarized by a 1991 NVCA\* survey.

The companies surveyed exhibited the following average characteristics (between 1986 and 1991):

**Compound Annual  
Growth Rate  
Years 1-6**



\*National Venture Capital Association Second Annual Economic Impact of Venture Capital Study, Coopers & Lybrand and Venture Economics, 1991.

# Introduction

*"The advancement of agriculture, commerce, and manufactures by all proper means will not, I trust, need recommendation; but I can not forbear intimating to you the expediency of giving effectual encouragement as well to the introduction of new and useful inventions from abroad as to the exertions of skill and genius in producing them at home."*

President  
George Washington,  
First Annual Message to  
Congress

January 8, 1790

The role of small business in science and technology continues to draw attention as concerns about U.S. competitiveness grow. Small high technology businesses — firms with fewer than 500 employees whose principal focus is the development of technology-based products — typically have a number of economically attractive attributes. Small high technology businesses innovate faster and more frequently than virtually any other type of business, regardless of size or economic sector. Also, these firms enjoy exceptional rates of growth, both in sales and in employment. Their size allows small high technology firms to respond quickly to rapidly changing market demands. In turn, this flexibility allows for the formation of formal and, more often, informal entrepreneurial networks, and as a consequence, small high technology businesses have an impact on the national and international economy that their diminutive size belies.

This report characterizes small high technology businesses and attempts to describe their impact on the U.S. economy. The goal of this report is to place small high technology business in the context of the U.S. small business sector, and to present recent national economic trends in the high technology sector.

This report also aims to show the full economic and technological contribution of the small high technology sector to our nation's competitiveness. Issues critical to the continued success of the small business sector, and the small high technology sector in particular, are discussed. Major impediments to the formation, growth, and development of small technically-based businesses are also outlined and described. Indications of appropriate measures to relieve these impeding factors are provided.

## Objectives of the High Technology Business Profile

1. To characterize small, high technology firms within various industries in the U. S. (with regard to the number of firms, type, and employment).
2. To establish the importance of the small, high technology sector to the U. S. economy and its role in international competitiveness.
3. To identify major financing and operating impediments to the formation and growth of small high technology businesses.



# Characterizing Small High Technology Businesses

## Availability of Information and Working Definitions

### What is a Small High Technology Business?

- "Small" means fewer than 500 employees.
- "High Technology" means specific technical products and/or services whose industries are generally defined by a series of Standard Industrial Classification (SIC) codes. Formal definitions exist for each of the databases used in this analysis.
- A "business" is defined as the top most firm in a group of establishments thereby eliminating small subsidiaries of larger companies from consideration in the study.

Defining with some degree of accuracy the economic, organizational and technical characteristics of small high technology firms is critical to understanding this unique sector of our economy. While there is a fair amount of anecdotal information surrounding high technology business, most of the available empirical information lacks sufficient detail or clarity for useful analysis. Inconsistencies in terminology across data sources, as well as differences in data collection methodology, further complicate the sifting and ordering of information.

To increase accuracy, three primary sources were used: the U.S. Small Business Administration, and two private database services: Cognetics, Inc. and CorpTech, Inc.<sup>17</sup> An effort was made to corroborate these sources with a separate state-by-state survey (conducted in-house by the Office of Science and Technology Policy (OSTP)). The largest discrepancies found in this comparison were generally rectified quite easily by the originators of the information through definition changes. For example, while the number of small high technology firms varied from 50,000 to 90,000, a comparison of the sources demonstrated that this reflected differences in the definitions of "small" and "high technology" used in each.

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This report defines small high technology businesses as follows:

- A small business is a firm with less than 500 employees.
- A high technology business is defined by the various database sources as follows:
  - (a) The Small Business Administration employed in a study of high-tech businesses a series of four-digit SIC codes as shown in Table 1 to establish the high technology industry sectors.
  - (b) The CorpTech, Inc. database derives from a detailed partition of over 3000 product codes that specify one or more product or service type for each technology.
- For this study, the Cognetics, Inc. database was filtered through an alternate set of SIC codes that is only slightly different from that presented in Table 1.
- The necessary distinctions regarding a firm and an establishment have been made. A firm is the parent of a group of establishments, and an establishment may belong to only *one* firm. An establishment is an operating entity that may be, but is not necessarily, a subsidiary of a larger company. However, this document will use the terms "business" and "firm" equivalently and interchangeably.

The above definitions for a small high technology business were used uniformly throughout the analysis presented herein, and in the cited studies unless otherwise noted.



Table 1

# Standard Industrial Classification Codes and Industries Used in Office of Technology Assessment Definition of High Technology<sup>18,19</sup>

|      |                                            |      |                                                      |
|------|--------------------------------------------|------|------------------------------------------------------|
| 1311 | Crude petroleum and natural gas            | 3574 | Calculating and accounting equipment                 |
| 1321 | Natural gas liquids                        | 3576 | Scales and balances                                  |
| 2812 | Alkalies and chlorine                      | 3579 | Office machines, nec                                 |
| 2813 | Industrial gases                           | 3622 | Industrial controls                                  |
| 2816 | Inorganic pigments                         | 3623 | Welding apparatus, electric                          |
| 2821 | Plastics materials and synthetic resins    | 3624 | Carbon and graphite products                         |
| 2822 | Synthetic rubber                           | 3629 | Electrical industrial apparatus, nec                 |
| 2823 | Cellulosic man-made fibers                 | 3651 | Radio and TV receiving sets                          |
| 2824 | Organic fibers, non-cellulosic             | 3652 | Phonograph records                                   |
| 2831 | Biological products                        | 3661 | Telephone and telegraph apparatus                    |
| 2833 | Medicinal chemicals and botanical products | 3662 | Radio and TV communication equipment                 |
| 2834 | Pharmaceutical preparations                | 3671 | Electron tubes, receiving except cathode rays        |
| 2861 | Gum and wood chemicals                     | 3672 | Cathode ray television picture tubes                 |
| 2865 | Cyclic crudes and intermediates            | 3673 | Electron tubes, transmitting                         |
| 2891 | Adhesives and sealants                     | 3674 | Semiconductors and related devices                   |
| 2892 | Explosives                                 | 3675 | Electronic capacitors                                |
| 2893 | Printing ink                               | 3676 | Electronic resistors                                 |
| 2895 | Carbon black                               | 3677 | Electronic coils and transformers                    |
| 2899 | Chemical preparations, nec                 | 3678 | Electronic connectors                                |
| 2911 | Petroleum refining                         | 3679 | Electronic components, nec                           |
| 3482 | Small arms ammunition                      | 3721 | Aircraft                                             |
| 3483 | Ammunition except for small arms           | 3729 | Aircraft engines and engine parts                    |
| 3484 | Small arms                                 | 3728 | Aircraft equipment, nec                              |
| 3489 | Ordnance and accessories, nec              | 3761 | Guided missiles and space vehicles                   |
| 3511 | Turbines and turbine generator set units   | 3764 | Space propulsion units and parts                     |
| 3519 | Internal combustion engines                | 3769 | Space vehicle equipment, nec                         |
| 3531 | Construction machinery                     | 3811 | Engineering, scientific, research instruments        |
| 3532 | Mining machinery                           | 3822 | Environmental controls                               |
| 3533 | Oil field machinery                        | 3823 | Process control instruments                          |
| 3534 | Elevators and moving stairways             | 3824 | Fluid meters and counting devices                    |
| 3535 | Conveyors and conveying equipment          | 3829 | Miscellaneous measuring/controlling devices          |
| 3536 | Hoists, cranes, and monorail systems       | 3832 | Optical instruments and lenses                       |
| 3537 | Industrial trucks, tractors, and trailers  | 3841 | Surgical and medical instruments                     |
| 3561 | Pumps and pumping equipment                | 3842 | Surgical appliances and supplies                     |
| 3562 | Ball and roller bearings                   | 3843 | Dental equipment and supplies                        |
| 3563 | Air and gas compressors                    | 3851 | Ophthalmic goods                                     |
| 3564 | Blowers and fans                           | 3861 | Photographic equipment and supplies                  |
| 3565 | Industrial patterns                        | 3873 | Watches, docks, and parts                            |
| 3566 | Speed changers, drives, and gears          | 7372 | Computer programming and software                    |
| 3567 | Industrial furnaces and ovens              | 7374 | Data processing services                             |
| 3568 | Power transmission equipment               | 7379 | Computer services, nec                               |
| 3569 | General industrial machinery               | 7391 | Research and development laboratories                |
| 3572 | Typewriters                                | 7397 | Commercial testing laboratories                      |
| 3573 | Electronic computing equipment             | 8922 | Noncommercial educational and research organizations |

nec = not elsewhere classified

Sources: (a) William K. Scheirer, "The Population and Birth Rates of High Technology Firms, 1976-1986", U.S. Small Business Administration, March 1989.

(b) C. Arrington, C. Harris, and M. Odle, "Formation and Growth in High-Technology Firms: A Regional Assessment", U.S. Office of Technology Assessment, contained in *Technology, Innovation and Regional Economic Development*, Congress of the United States, July 1984.

## Other Considerations of This Analysis

The difficulty in assessing the impact of small high technology businesses extends beyond the availability of information. To reiterate, this report focuses on firms that perform research and development (R&D) and on firms that manufacture products with a high concentration of sophisticated technology. However, exclusive focus on the developers of high technology, by necessity, excludes the equally important — and frequently not so obvious — users and implementors of advanced technology.

For example, a firm producing a product such as chocolate chip cookies would generally not be considered a high technology company, despite the fact that this company may use one of the most sophisticated and advanced decision support systems in existence that employs satellite-linked inventory control. Similar examples of firms employing high-technology, but not developing technology, are readily available.

The difficulty in distinguishing high technology companies from other types of businesses is further complicated by the problem of defining just what should be considered high technology. Frequently, physical objects such as microprocessors or cellular phones come to mind. However, high technology can also mean sophisticated processes and knowledge, as well as material outputs. Very little research currently exists examining this aspect of small high technology business development.

Comparing anecdotal insights with available statistical information reveals yet another level of complexity in the available information. This involves the issue of self-reporting by businesses on their high technology-related activities. Research and development budgets are frequently cited as indicative of the level of technological development being performed in a particular business; however, many large and small high technology organizations frequently understate the actual amount of high technology-related research and development performed.

Further, activity levels based on R&D budgets fail to take into account the full level of managerial and individual commitment of a firm's employees. For example, many small businesses fail to report a formal research and development expenditure even though the majority of the effort of the firm's employees is dedicated to technology development! This is because the *entire* budget for the firm is effectively devoted to R&D, not just a division of the firm. Since no *separate* R&D budget exists, "zero" is often the reported budget for the "R&D department" of such firms which is completely misleading as an indicator of the level of research activity. Another, more significant case involves the use of surveys to determine dollar levels of R&D. While such surveys collect the dollar value of formal R&D in a company, they fail to pick up the "informal" R&D which happens much more in small firms than in large ones. sp

Such difficulties in data acquisition and management were encountered in the development of this report and serve to underscore the need for increased information management in the Federal government for this important sector of the economy.



# National Trends in Small High-Tech Businesses

## Estimates of Sector Size

Approximately 75,000 to 100,000 of the 20 million small businesses in the United States could be considered, by our definition, as small high technology businesses. These firms have between 1.5 and 2.0 million employees by our estimates.<sup>20</sup> As Table 2 shows, small high technology businesses represent between 89% and 98% of all high technology businesses, depending on the source of information, and approximately 15% of the total high technology work force. The remaining 85% of high technology employees work for large high technology business organizations. This is indicative of the fact that most large high technology businesses are manufacturers that employ a large proportion of skilled labor.

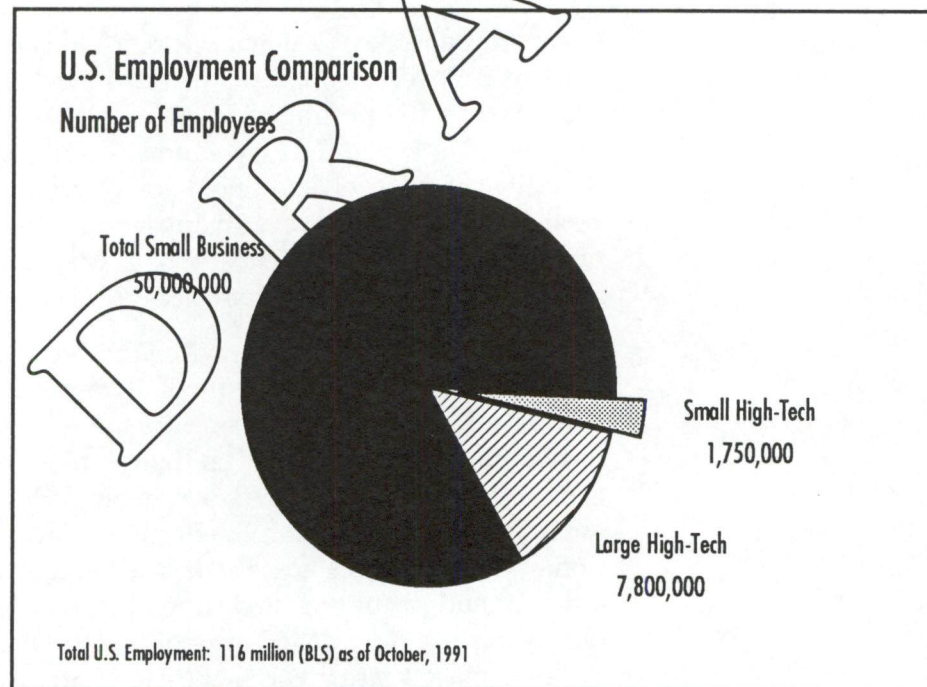


Table 2

**Number of Businesses and Employment Figures for  
Small Business, Small High Technology Business  
and All High Technology Business**

|                                              | <b>Cognetics<br/>(1991)</b> | <b>CorpTech<br/>(1991)</b>  | <b>U.S. Small<br/>Business<br/>Administration<br/>(1988)</b> |
|----------------------------------------------|-----------------------------|-----------------------------|--------------------------------------------------------------|
| <b>Small Business</b>                        |                             |                             |                                                              |
| Total Number of Businesses <sup>21</sup>     | 7,000,000                   | Not Available <sup>22</sup> | 6,200,000                                                    |
| Total Employment                             | 69,000,000                  | Not Available               | 50,000,000                                                   |
| <b>High Technology Business<sup>23</sup></b> |                             |                             |                                                              |
| Total Number of Businesses                   | 51,000                      | 57,000                      | 92,000                                                       |
| Total Employment                             | 9,300,000                   | 10,800,000                  | 8,800,000                                                    |
| <b>Small High Technology Business</b>        |                             |                             |                                                              |
| Total Number of Businesses                   | 49,000                      | 51,000                      | 90,000                                                       |
| Total Employment                             | 1,500,000                   | 1,900,000                   | 1,800,000                                                    |

NOTE Total number of businesses reported by the SBA includes 1.3 million corporations and over 1.9 million partnerships. Additionally, there are 13.8 million sole proprietorships (not counted in these figures) making a total of 20 million small businesses in the U.S.

Geographically, new high-tech companies are highly concentrated with 65% of these businesses located in 10 states. When ranked by venture capital disbursed in 1991, the top states are indicated in Table 3.

It is clear that California leads in the number of new small high-tech businesses — a fact further shown by data in Figure 1 published for the technology fields examined.<sup>24</sup>



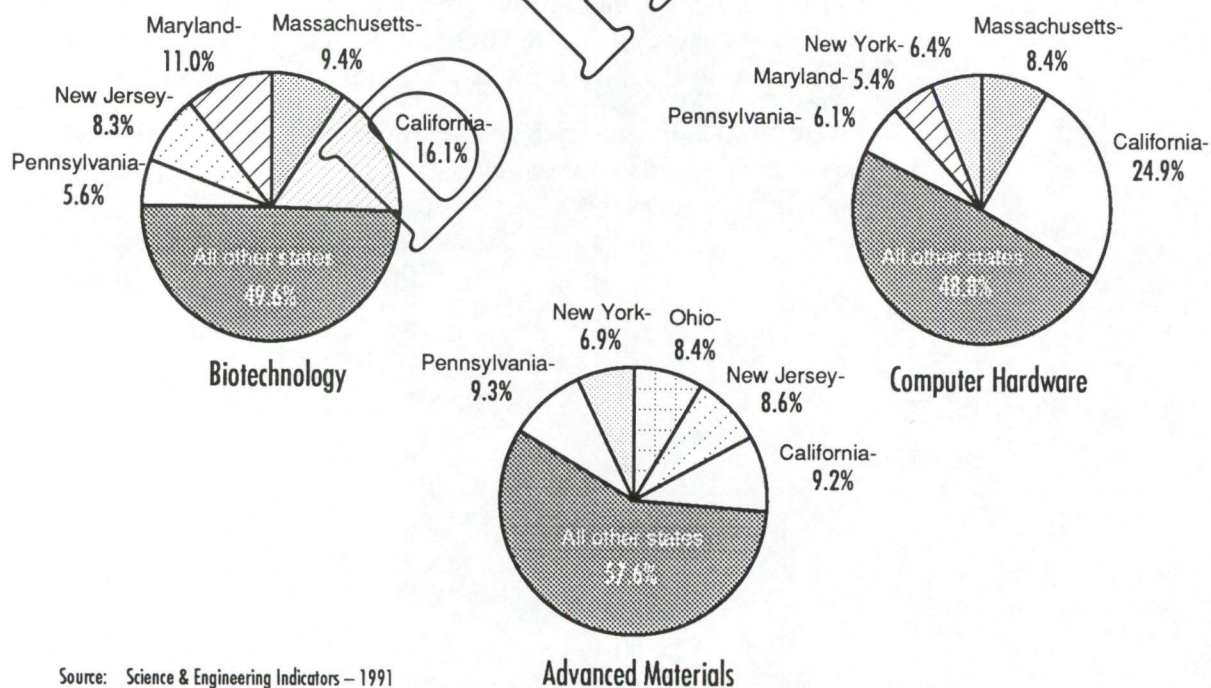
Table 3  
Top Ten States Receiving Venture  
Capital Disbursements in 1991

| Rank | State         | Dollars Invested<br>(\$ millions) |
|------|---------------|-----------------------------------|
| 1    | California    | 661                               |
| 2    | Massachusetts | 155                               |
| 3    | Texas         | 91                                |
| 4    | Arizona       | 47                                |
| 5    | New Jersey    | 36                                |
| 6    | Maryland      | 34                                |
| 7    | Minnesota     | 64                                |
| 8    | Colorado      | 32                                |
| 9    | Pennsylvania  | 28                                |
| 10   | Oregon        | 26                                |

Source: Venture Economics Publishing Co., 1992.

Figure 1

### U.S. Locations of Companies Active in Three Technology Fields

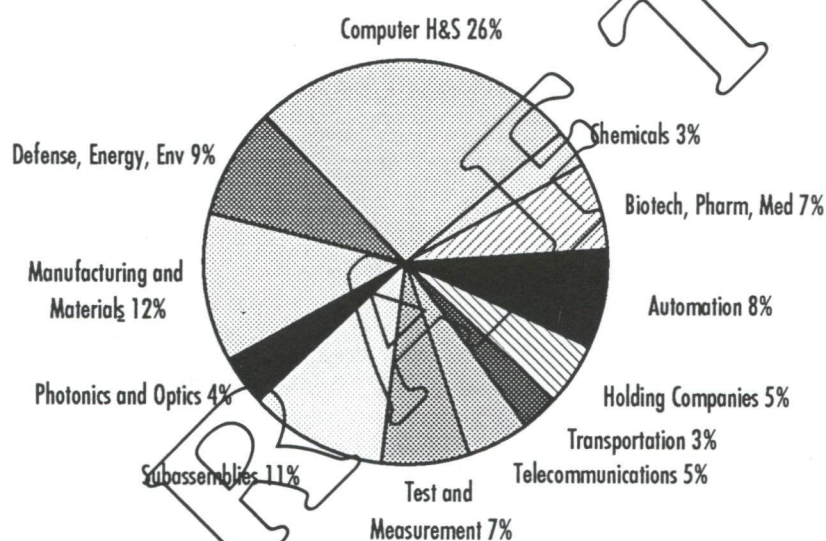


## Industry Groupings

Small high technology businesses include a broad range of industries, as indicated in Figure 2. The largest number of firms are found in two industry groupings: computer hardware and software, and electronic subassemblies, test equipment, and components; however, this is dynamic and changes rapidly. Interestingly, these businesses bridge the spectrum of physical and biological sciences, and include those technologies identified as critical or emerging in a number of recent reports.<sup>25</sup>

Figure 2

### What Technology Areas Constitute Small High Technology Businesses?



Source: CorpTech, Inc., 1991. (May be strongly database-dependent and subject to some systematic error, however, general investment trends are probably well indicated.)

## Patterns of Growth in Small High-Tech Firms

This report employed several methods for assessing prior growth patterns and predicting future trends for small high technology businesses. A recent report examined the birth and death rates for all high technology businesses from 1976 to 1986 and concluded that the number of new high technology business formations will continue to exceed failures for the foreseeable future leading to a net growth rate of 0.5% per month, or 6% per annum.<sup>27</sup> This trend is exemplified in Table 5, which summarizes the findings of that report. The second column in the bottom half of that table is the number of closures for both small and large high-tech businesses during the period 1976-1980. Since the study compared the 1980 file to the 1976 file, only the closures of firms that existed in 1976 are represented. A firm that opened after 1976 but closed before 1980 would not



appear in either the closures or the start-ups data on Table 5, which the author attempted to correct by assuming a factor for such events. The ratio of firms that did not close, to the original number, is the four-year survival rate defined by Scheirer in this study. Under the assumptions stated and outlined by Scheirer, his analysis estimates the annual survival rate to be 95% with firms half-life of 12 years. This differs from the 40% survival rate over six years for all small businesses quoted by Kirchhoff and Phillips.<sup>28</sup> The data are too sketchy to determine which figure is closest to the actual survival rate, which is likely to vary as a function of time, and certainly differs between the small high-tech sector and the small business sector in general.

From Table 4, we also find that the largest growth occurred in firms having fewer than 100 employees. Smaller growth rates were more characteristic of firms of over 1000 employees. As a result, the vast majority of new firms formed within the examined decade are small businesses employing fewer than 100 employees. The highest rates of growth in new business formation are also found in small businesses.

Table 4  
Number of High Technology Firms by  
Employment Size in 1976 and 1986<sup>29</sup>

| Employment Size | Number of Businesses |            | Annual Growth<br>Rate (percent) |
|-----------------|----------------------|------------|---------------------------------|
|                 | 1976                 | 1986       |                                 |
| 1-99            | 50,245               | 83,550     | 5.22%                           |
| 100-499         | 2,554                | 3,789      | 4.02%                           |
| 500-999         | 292                  | 459        | 4.63%                           |
| 1,000-9,999     | 432                  | 520        | 1.87%                           |
| 10,000 and up   | <u>133</u>           | <u>135</u> | <u>0.15%</u>                    |
| TOTALS          | 53,656               | 88,453     | 5.13%                           |

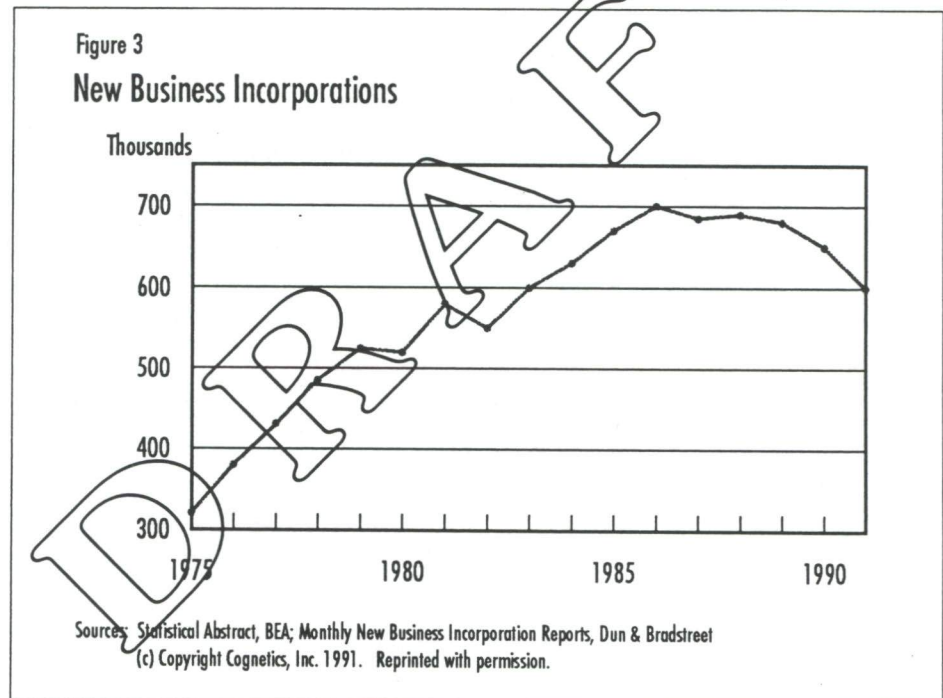
  

| Type of<br>Business | Number<br>in 1976 | 1976-80  |           | Annual Rates |       |
|---------------------|-------------------|----------|-----------|--------------|-------|
|                     |                   | Closures | Start-ups | Survival     | Birth |
| Small Businesses    | 52,799            | 10,668   | 20,719    | 95%          | 12%   |
| Large Businesses    | 857               | 50       | 46        | 99%          | 1%    |

Source: Scheirer, U.S. Small Business Administration, Ibid.

More recent figures regarding replacement rates for all businesses show a continuation of prior trends.<sup>30</sup> The percentage of high technology businesses compared to all businesses has been growing, constituting 1.1% in the period from 1981 to 1983, 1.25% in the period from 1984 to 1987, and approximately 1.5% in the period from 1988 to the present. Growth is also seen for small high technology businesses compared to all small businesses, as well as for all high technology businesses compared to all U.S. businesses.

In Figure 3, we see that in the period from 1985 to 1989, the number of companies incorporated, on average, dropped sharply compared to the preceding five year period for all industry groupings. The causes of this precipitous decline are not clear — venture capital market corrections and changes in the capital gains tax may have had some effect on the level of new incorporations.



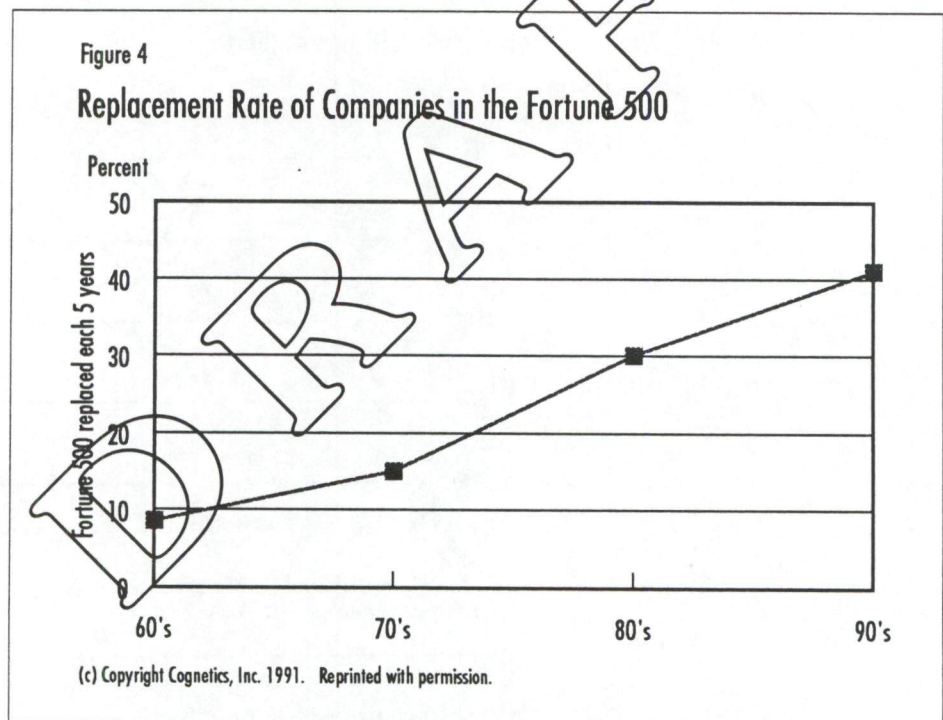
Growth in the emergence of new incorporations is a critical indicator of the health of the small business sector. Of all large high technology firms (those with over 500 employees), 41% have been created since 1980, 31% since 1983 and 14% since 1987.<sup>31</sup> These data show that high technology firms are much more likely to develop quickly than high-growth firms in general.

Figure 4 plots the percent of the *Fortune 500* that are replaced by new "upstarts" every five years starting in the 1960's.<sup>32</sup> As the Figure shows, the replacement rate was approximately 8% in the 1960's, jumped to 30% in the 1980's and has approached 40% at the beginning of this decade. Almost



half of the largest industrial firms in the U.S. are now replaced by new firms every five years. For high technology businesses, approximately 25% of the established firms are replaced every five years.

High technology businesses are growing much faster than all U.S. businesses, when measured in terms of a "growth index" that combines absolute growth with the percentage change in employment. The percentage of high-tech companies exhibiting very high growth (defined as a growth index greater than 20% per year) is much greater than the percentage of all U.S. companies exhibiting very high growth (9% of high-tech companies versus 2% of all U.S. companies).<sup>33</sup> While the percentage of business closures is about the same for high technology businesses and all U.S. businesses over the period from 1986 to 1991 (23% and 21%, respectively), the percentage of high technology businesses that are start-ups (15%) is greater than the percentage of all businesses that are start-ups (9%).



One method for developing some insight into future growth of the small, high-tech segment of the U.S. economy is to examine the ratio of size to age as a measure of a firm's relative growth. This "precociousness index" demonstrates high technology businesses are more precocious or grow at a relatively high rate compared to all U.S. businesses. The data reviewed show that small high technology firms historically have demonstrated the potential to grow faster than firms in all other U.S. business sectors, both large and small.

## Small Business Sales Volume

The average high technology business has a somewhat larger sales volume than the average non-technically-based business.<sup>34</sup> Specifically, 18% of high technology businesses report annual sales of over \$5 million, while only 4% of all U.S. businesses report sales above \$5 million. In addition, 6% of high technology firms report annual sales of over \$20 million. The same ratios remain for the total sales of small high technology businesses as compared to all U.S. *small* business.

The importance of the small, high-tech sector to the U.S. economy is underscored by their performance measures as shown in Table 5. Noting the sales volume per employee figures, employment growth rates, and number of jobs created, we can see that computer hardware and software remain predominant segments of the small high-tech business sector, but interestingly, the computer software sector has the lowest percentage of exporting firms. All computer-related small companies, including software, added about 250,000 new jobs during 1990.

Table 5  
Performance Measures for Newly Formed Companies Active  
in Certain High-Tech Fields: 1990<sup>35</sup>

| Field                | Employment growth rate during past year | Number of jobs created during past year | Annual sales per employee | Percentage of companies exporting over 10 percent of total sales |
|----------------------|-----------------------------------------|-----------------------------------------|---------------------------|------------------------------------------------------------------|
| Automation           | 12.6                                    | 58,471                                  | \$126,330                 | 40.7                                                             |
| Biotechnology        | 10.6                                    | 16,468                                  | 86,063                    | 43.9                                                             |
| Computer hardware    | 14.5                                    | 148,304                                 | 172,752                   | 42.9                                                             |
| Computer software    | 13.9                                    | 103,479                                 | 107,992                   | 32.1                                                             |
| Advanced materials   | 5.8                                     | 32,452                                  | 155,198                   | 44.4                                                             |
| Photonics and optics | 8.4                                     | 27,654                                  | 103,592                   | 36.8                                                             |
| Telecommunications   | 12.7                                    | 61,280                                  | 117,679                   | 43.9                                                             |

Source: Derived from the CorpTech Database, published in *Science and Engineering Indicators*, 1991.

Copyright reasons?



## Foreign Acquisition of High Technology Firms (Both Large and Small Businesses)

- Foreign direct investment for acquisitions rose steadily and sharply from 1985 to 1989.<sup>1/</sup>
- The Japanese are by far the largest acquirer of U.S. high-technology firms. 65% of all high technology acquisitions in 1991 went to Japanese investors.<sup>2/</sup>
- Computer firms are the largest acquisition targets, followed by those including semiconductors and telecommunications.
- Over 1/3 of acquisitions occur in the first four years, and 60% before the firms are 10 years old.<sup>3/</sup>

1/ Fahim-Nader, Bureau of Economic Analysis, U. S. Department of Commerce, 1991.

2/ Economic Strategy Institute, High Technology Acquisitions, Summary Charts, May 1992.

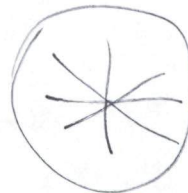
3/ Cognetics Inc., 1991.

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who is this?

Clyde P.

Not a Super Source  
for a Bush Admin.  
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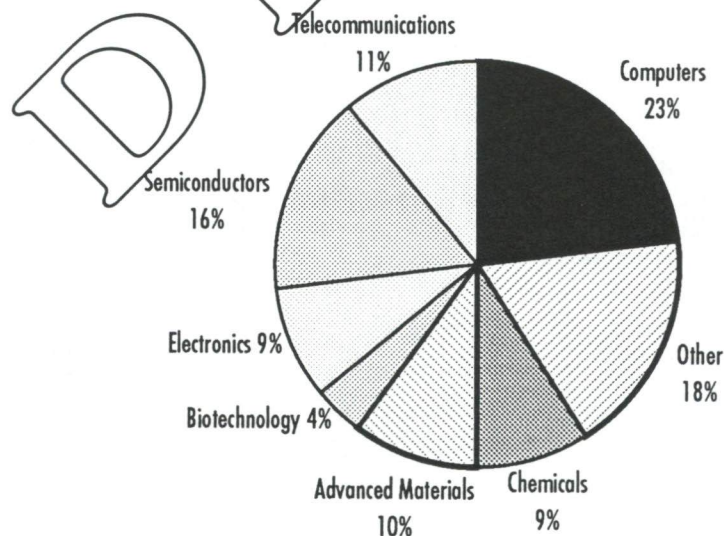


# Foreign Acquisition of High Technology Businesses in the U.S.

The total outlays of foreign direct investment to acquire U.S. businesses of all kinds and sizes rose steadily and sharply from 1984 to 1989.<sup>36</sup> In this period, total outlays increased more than four-fold from \$12 billion to over \$56 billion. On average, almost 75% of the total outlays were made by U.S. affiliates of foreign owned firms, the remaining 25% were made by foreign direct investors. In 1990, foreign outlays for acquisition decreased somewhat but remained substantially higher than they were before 1988, and nearly one-third of the acquisition outlays were for manufacturing firms. The Japanese and British currently are the largest acquirers of U.S. high technology firms. Table 6 presents data on the ownership of companies active in high-tech fields operating in the United States.<sup>37</sup>

(as they are largest foreign direct investors overall)

Foreign Acquisitions of U.S. High Technology Firms by Industry



Sources: Economic Strategy Institute, 1991.



Table 16

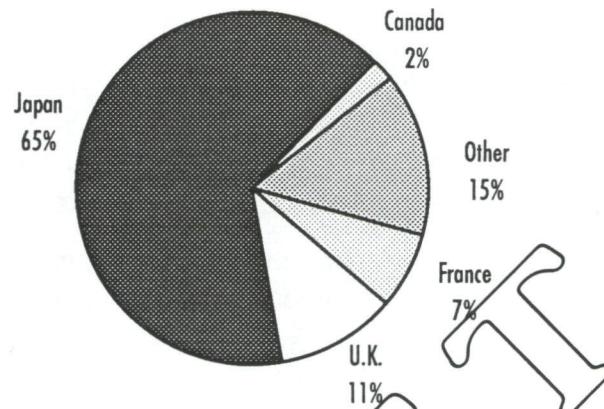
# Ownership of Companies Active in High-Tech Fields Operating in the United States, by Country of Ownership: March 1991

| Country                   | All fields | Automation | Bio-technology | Computer hardware | Advanced materials | Photonics & optics | Software | Telecommunications |
|---------------------------|------------|------------|----------------|-------------------|--------------------|--------------------|----------|--------------------|
| Number of companies       |            |            |                |                   |                    |                    |          |                    |
| Total .....               | 30,919     | 3,413      | 974            | 4,541             | 2,302              | 1,673              | 7,095    | 2,424              |
| United States .....       | 27,412     | 3,066      | 868            | 4,212             | 1,957              | 1,471              | 6,887    | 2,182              |
| Other Foreign owned ..... | 3,507      | 347        | 106            | 329               | 345                | 202                | 208      | 242                |
| United Kingdom .....      | 813        | 70         | 17             | 56                | 85                 | 53                 | 73       | 53                 |
| Japan .....               | 600        | 66         | 15             | 101               | 42                 | 51                 | 16       | 66                 |
| West Germany .....        | 560        | 79         | 20             | 34                | 82                 | 36                 | 15       | 17                 |
| France .....              | 269        | 26         | 6              | 23                | 40                 | 12                 | 23       | 24                 |
| Switzerland .....         | 242        | 28         | 8              | 17                | 23                 | 13                 | 16       | 6                  |
| Canada .....              | 246        | 20         | 4              | 16                | 18                 | 9                  | 22       | 27                 |
| The Netherlands .....     | 144        | 5          | 8              | 17                | 23                 | 11                 | 10       | 12                 |
| Sweden .....              | 170        | 21         | 8              | 12                | 40                 | 5                  | 8        | 6                  |
| Taiwan .....              | 35         | 0          | 0              | 10                | 0                  | 2                  | 1        | 6                  |
| South Korea .....         | 22         | 1          | 1              | 6                 | 1                  | 0                  | 1        | 3                  |
| Percent                   |            |            |                |                   |                    |                    |          |                    |
| Total .....               | 100.0      | 100.0      | 100.0          | 100.0             | 100.0              | 100.0              | 100.0    | 100.0              |
| United States .....       | 88.7       | 89.8       | 89.1           | 92.8              | 85.0               | 87.9               | 97.1     | 90.0               |
| Foreign owned .....       | 11.3       | 10.2       | 10.9           | 7.2               | 15.0               | 12.1               | 2.9      | 10.0               |
| United Kingdom .....      | 2.6        | 2.1        | 1.7            | 1.2               | 3.7                | 3.2                | 1.0      | 2.2                |
| Japan .....               | 1.9        | 1.9        | 1.5            | 2.2               | 1.8                | 3.0                | 0.2      | 2.7                |
| West Germany .....        | 1.8        | 2.3        | 2.1            | 0.7               | 3.6                | 2.2                | 0.2      | 0.7                |
| France .....              | 0.9        | 0.8        | 0.6            | 0.5               | 1.7                | 0.7                | 0.3      | 1.0                |
| Switzerland .....         | 0.8        | 0.8        | 0.8            | 0.4               | 1.0                | 0.8                | 0.2      | 0.2                |
| Canada .....              | 0.8        | 0.6        | 0.4            | 0.4               | 0.8                | 0.5                | 0.3      | 1.1                |
| The Netherlands .....     | 0.5        | 0.1        | 0.8            | 0.4               | 1.0                | 0.7                | 0.1      | 0.5                |
| Sweden .....              | 0.5        | 0.6        | 0.8            | 0.3               | 0.4                | 0.3                | 0.1      | 0.2                |
| Taiwan .....              | 0.1        | *          | *              | 0.2               | *                  | 0.1                | *        | 0.2                |
| South Korea .....         | 0.1        | *          | 0.1            | 0.1               | *                  | *                  | *        | 0.1                |

\* = less than 0.05 percent

Source: Derived from the CorpTech Data Base, Corporate Technology Information Services, Inc., as reported in Science and Engineering Indicators - 1991.

### Foreign Acquisitions of U.S. High Technology Firms by Country



Sources: Bureau of Economic Analysis, U.S. Department of Commerce, 1991; Economic Strategy Institute, 1992.

Table 7

### Foreign Acquisition of U.S. High Technology Firms October 1988 — April 1992

|             | Advanced<br>Materials | Aero-<br>space | Chemicals | Computers | Electronics | Semi-<br>conductor<br>Equipment | Semi-<br>conductor | Telecommuni-<br>cations | Biotech-<br>nology | Other | Cumulative<br>Totals |
|-------------|-----------------------|----------------|-----------|-----------|-------------|---------------------------------|--------------------|-------------------------|--------------------|-------|----------------------|
| TOTALS      | 63                    | 32             | 54        | 142       | 56          | 39                              | 60                 | 64                      | 27                 | 71    | 608                  |
| Japan       | 40                    | 19             | 25        | 93        | 33          | 30                              | 51                 | 31                      | 17                 | 60    | 399                  |
| UK          | 11                    | 5              | 6         | 13        | 10          | 1                               | 1                  | 13                      | 2                  | 3     | 65                   |
| France      | 2                     | 4              | 11        | 8         | 2           | 2                               | 2                  | 5                       | 2                  | 3     | 41                   |
| Canada      | 0                     | 3              | 3         | 4         | 1           | 0                               | 1                  | 2                       | 0                  | 0     | 14                   |
| Taiwan      | 1                     | 0              | 0         | 8         | 0           | 0                               | 1                  | 1                       | 0                  | 0     | 11                   |
| Germany     | 0                     | 1              | 4         | 0         | 1           | 1                               | 3                  | 3                       | 2                  | 2     | 17                   |
| Switzerland | 1                     | 0              | 1         | 3         | 0           | 1                               | 0                  | 3                       | 3                  | 2     | 14                   |
| Australia   | 2                     | 0              | 0         | 1         | 1           | 1                               | 0                  | 2                       | 0                  | 0     | 7                    |
| South Korea | 0                     | 0              | 0         | 3         | 1           | 0                               | 0                  | 0                       | 0                  | 0     | 4                    |
| Netherlands | 1                     | 0              | 1         | 1         | 0           | 0                               | 0                  | 0                       | 0                  | 0     | 3                    |

Source: Economic Strategy Institute Database  
1100 Connecticut Avenue, N. W., Suite 1300  
Washington, DC



Table 7 shows total foreign acquisition of U.S. high technology companies (both large and small) by industry and by country for the period from October 1988 through April 1992. The Japanese were the most active investors, acquiring or investing in 399 U.S. high technology companies during this period.<sup>38</sup> Computer firms were the most popular choice among foreign investors who invested majority interest in (or acquired) 142 enterprises ranging from software producers to hardware manufacturers. Semiconductor firms, or firms manufacturing semiconductor equipment were the targets of 99 acquisitions followed by telecommunications firms, advanced material companies, electronic firms, and chemical groups.

Foreign investors, in general, preferred to make investments of 51% or more, thereby receiving controlling ownership of these enterprises. Japanese investment, however, tended to be more evenly split between majority control and minority interests in companies according to the Economic Strategy Institute Report.<sup>39</sup> Table 8 shows these results on minority versus majority ownership.

Table 8

**Economic Strategy Institute Database — Acquisition of U.S. High Technology Firms Between October 1988 and April 1992**  
**Mode of Investment (Minority VRS Majority Ownership)**

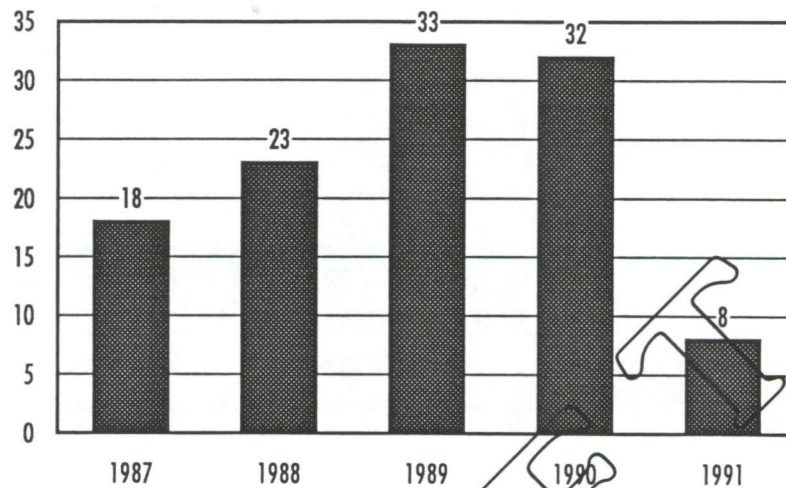
|                                                       | All Firms | Japanese Firms |
|-------------------------------------------------------|-----------|----------------|
| Number of investments resulting in majority ownership | 319       | 189            |
| Number of investments resulting in minority ownership | 203       | 162            |

86 of the 608 firms did not specify whether it was majority or minority acquisition.

Interestingly, foreign acquisition of venture-backed companies (largely high-tech firms) dropped off by 75% in 1991 according to the Venture Capital Journal.<sup>40</sup> As seen in Figure 5, just eight U.S. venture-backed companies were purchased by overseas investors last year compared to 32 in 1990. This decline in mergers and acquisition activity is said to reflect internal banking, real estate and stock market difficulties in Japan that has caused an economic retrenchment in that country.

Figure 5

## Acquisitions of U.S. Venture-Backed Companies by Foreign Acquirors



Source: Venture Economics Publishing, 1992

The above data do not relate explicitly to the acquisition of *small* high technology based enterprises, however a reasonable approach to this issue is to assume that the rate of acquisition is in direct proportion to the percentage of businesses of a given size within a specific industry grouping. Specifically, using the average revenue figures from Table 9, (or the average purchase price with an assumed price/sales ratio of 3:1), for the key technology sectors where data are available, average revenues are below \$50 million — a reasonably assumed cutoff for a small business. This presumes a \$100,000 per man-year average, or can be assumed from average

Table 9

**Average Revenue, Purchase Price and Age of Acquired,  
Private Venture-Backed Companies in 1991  
(Domestic and Foreign Acquisition)**

|                | Average<br>Revenue<br>(\$ Millions) | Average<br>Purchase Price<br>(\$ Millions) | Average<br>Age<br>(Yrs.) | Number of<br>Acquisitions |
|----------------|-------------------------------------|--------------------------------------------|--------------------------|---------------------------|
| Computers, H&S | 40.9                                | 43.7                                       | 7.8                      | 18                        |
| Electronics    | Undisclosed                         | 30.5                                       | 6.9                      | 8                         |
| Communications | 23.8                                | 60.1                                       | 7.4                      | 5                         |
| Biotechnology  | 16.8                                | 23.5                                       | 8.9                      | 6                         |

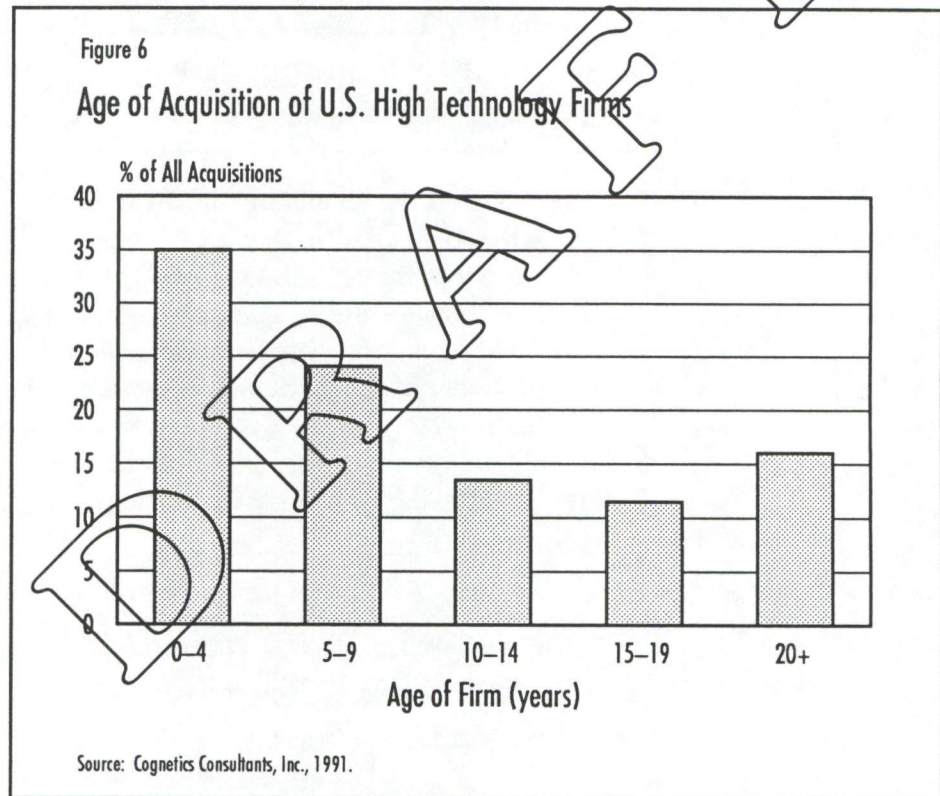
Source: Venture Capital Journal, February 1992



sales per employee data. Both methods indicate that the majority of acquisitions probably involved small high-tech businesses.

The stage of development at which firms are acquired is critical to understanding the nature of small firm growth. Figure 6 follows the age at which firms were acquired during the period from 1986 to 1991. The data support the contention that, as the degree of innovation and technology increase, the percent of firms seeking capital at a younger age goes up. Also, almost 60% of high technology acquisitions occur before the firm is 10 years old, and over one-third occur in the first four years.

Rapidly growing, small technology-based companies have a high need for capital that reaches them vulnerable to acquisition when other sources of funding are unavailable.



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# Innovation and Small High Technology Business

A wide array of anecdotal evidence and several studies of empirical data show that small firms innovate more often and more efficiently than do larger businesses. This capacity for innovation is probably even greater for the sub-group of small high technology firms.

A 1984 survey conducted for the Small Business Administration found that in 1982, there were 2.4 times as many small firm innovations as large firm innovations per employee.<sup>41</sup> This study also found that innovations from small firms were twice as likely to be licensed or purchased by others as those from large firms, although the number of such cases was limited for both large and small firms. Further, small firms are more inclined to sell their innovations to the private sector rather than the military or civilian government.

An earlier study showed that small firms having fewer than 1,000 employees were responsible for almost one-half of the major U.S. innovations during the period from 1953 to 1973.<sup>42</sup> This same study also showed that small firms (defined by these authors as having less than 1,000 employees) had a ratio of innovation to R&D employment that was four times that of larger firms, and a ratio of innovation to sales that was one-third greater than for larger firms. A final point was that the cost per R&D employee (scientist or engineer) was almost twice as great in the large firms compared to the smaller ones.

A more recent study supports these conclusions, showing that small manufacturing firms (again defined by these authors as firms with fewer than 1,000 employees) developed a new product for every \$10 million of sales which is 7.8 times the rate for all firms.<sup>43</sup> The small firms also had 2.1 new products for each million dollars of R&D, which was 3.5 times the rate for all firms.

The reasons for the high level of innovation in small high-tech firms are varied. This phenomena has been ascribed to the fact that managers of small R&D firms have greater economic incentive to innovate while the bureaucracy of larger firms demands that technical improvements to products be held to a certain minimum range of variation or within prescribed limits. Large firms may also tend to overspecialize their research efforts in comparison to a small firm, and contact between customer requirements



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and the technical design groups may be closer in a smaller firm as compared to a large organization, where the sales force and technical groups may have little contact (i.e. even separate locations). Finally, smaller firms are often more product-innovation oriented as compared to large firms, which places emphasis on process innovation in the manufacturing cycle. This effect tends to artificially lower the perceived innovation level of larger firms.

Certainly, the data demonstrate the innovative forces behind the small, high-tech business and the retention of competitive high technology capability in the United States requires support of this important economic sector.

DRAFT

# The Employment Impact of Small High Technology Businesses

## Job Creation by Small High Technology Firms

- Small high technology firms have a disproportionately positive impact on job creation:
  - small businesses represent 99% of all U.S. businesses and created 70% of all new jobs between 1986 and 1991; but
  - while small high-technology firms represent only 1% of all U.S. businesses, they created 6% of all jobs between 1986 and 1991.\*

\* Cognetics Inc. (Dun and Bradstreet listings, 1991)

To set the stage for the total employment impact of small high-tech businesses, it is worthwhile establishing the employment impact of small businesses in general. The United States Small Business Administration<sup>45</sup> estimates that small businesses represent 99% of all U.S. businesses and accounted for an estimated 90% of net private sector job growth measured in 1990.

Small high technology firms are one of the most dynamic job creating sectors in the economy. Over 400,000 jobs were created in the small, high-tech sector in 1990.<sup>46</sup> Recent data indicate that domestic small high technology companies contribute almost four times their expected share of new jobs. For a recent one-year period, 40% of the jobs created were in the computer-related industries. Seventy-six percent of the total number of high technology jobs created were in companies of between 50 and 500 employees.

In aggregate levels of job creation, it is apparent that the small high technology sector makes a proportionally large contribution. Table 10 shows the new jobs created by high technology firms and high-growth firms that existed in 1986 and 1991.<sup>46</sup> When job creation in small high technology firms is compared to that in large high technology firms, we find that small high technology firms created all new high-tech jobs between 1986 and 1991. Larger firms lost over 88,000 positions.



In the period between 1976 and 1986, small high-tech firms contributed 839,000 (38%) of the 2.2 million new jobs in high technology industries and expanded 81.8% in terms of capital assets. These figures show growth that is twice as fast as that for the economy in general over this period.

Table 10

**Job Creation in the High Technology/High-Growth Sector over  
5-year Period for Firms Existing in 1986 and 1991<sup>17</sup>**

|                          | All High<br>High Technology Firms<br>(New Jobs Created) | High-Growth,<br>High Technology Firms<br>(New Jobs Created) | All High-Growth Companies<br>in the United States<br>(New Jobs Created) |
|--------------------------|---------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------|
| Company Size (employees) |                                                         |                                                             |                                                                         |
| 0-500                    | 170,293                                                 | 270,729                                                     | 5,568,547                                                               |
| 500+                     | -88,400                                                 | 332,644                                                     | 3,460,480                                                               |
| TOTAL                    | 81,893 <sup>18</sup>                                    | 603,373                                                     | 9,029,027                                                               |

Source: Cognetics, Inc., 1991.

# Financing Small High Technology Business at the Early Stages

In the last two decades, a highly specialized and dynamic capital market has formed for financing technology ventures. Within this market there are two highly complementary sources of enterprise financing: informal ("angel") capital and venture capital.

The informal investor capital market is an invisible and relatively inefficient market comprising a highly dispersed and disaggregated population of middle-income to wealthy individuals.<sup>49</sup> These individuals typically have been entrepreneurs themselves and are generally knowledgeable, careful investors. Their investment behavior and preferred strategies for investing in seed and start-up ventures are extremely diverse. Two aspects of the angel capital market stand out, however, as distinguishing common features:

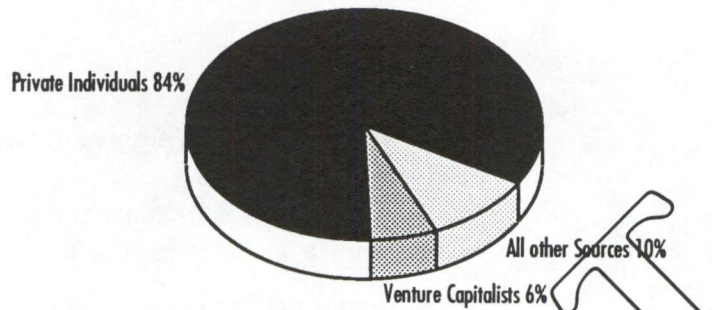
- The total size of the angel market may be anywhere from 3 to 10 times the size of professionally managed venture capital in terms of dollar volume; and
- The angel investor market is extremely fragile and sensitive to changes in tax structure, regulatory impediments and macro-economic factors. Anecdotal evidence gathered in several reports shows that even slight movements in the regulatory environment can choke the growth of this market.

The venture capital market represents professionally managed funds that are invested in high technology enterprises that range from seed-level deals to mature companies needing bridge financing prior to an initial public offering ("IPO"). Recently, the venture capital market has suffered an enormous decline in the level of investment activity in the numbering investment and size of total disbursements. In 1989, there were roughly 600 venture capital funds in the United States with about \$30 billion under management. At the peak year of 1987, this market invested about \$4 billion into some 3,000 ventures. In 1992, the National Venture Capital Association Directory lists 201 active venture funds, and slightly over \$1.4 billion of investments were made in 1991.



### Who Invests Seed Capital in Small High Technology Businesses?

Percentage of Seed Stage Financing  
Rounds involving less than \$250,000



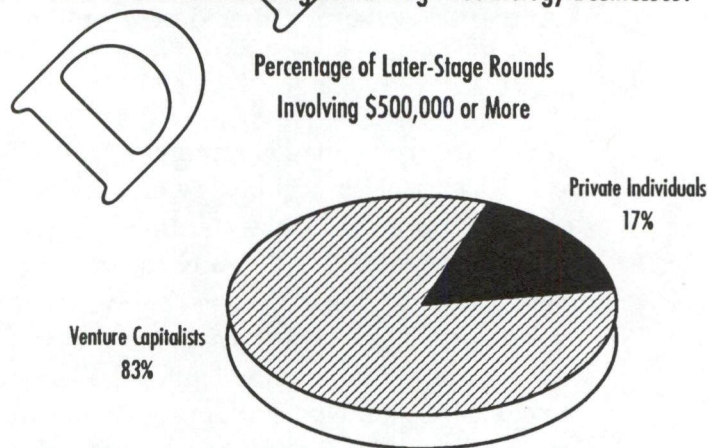
Private "Angel" investors bear the  
burden of the seed investment load.

Source: American Council for Capital Formation, Center for Policy Research: The Critical Role of Taxable Capital Gains for Entrepreneurial Start-Up Companies, Freear and Wetzel, 1988.

As is the case for the informal angel market, venture capital sources are also extremely sensitive to over-regulation, changes in the tax code, and to general macro-economic factors.

### Who Invests in Later-Stage Small High-Technology Businesses?

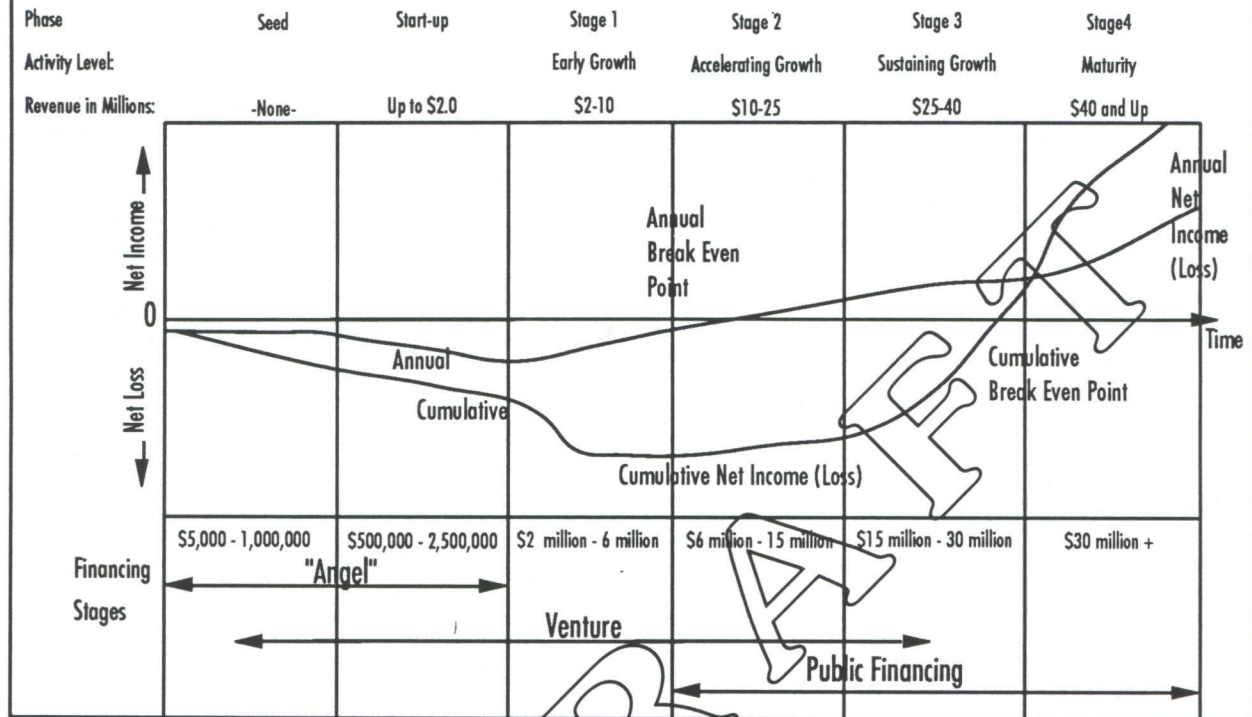
Percentage of Later-Stage Rounds  
Involving \$500,000 or More



Institutional venture capitalists provide most  
of the financing for later stages.

Source: American Council for Capital Formation, Center for Policy Research: The Critical Role of Taxable Capital Gains for Entrepreneurial Start-Up Companies, Freear and Wetzel, 1988.

# Life Cycle of A New Enterprise Model of A Growing and Successful Company The 3 Key Financing Stages: Angel, Venture, IPO



Details regarding each of these components of the technology financing market are given in the following sections.

## Informal Investment

Stage and deal size distinctions cause individual investors and venture capital funds to play complementary rather than competing roles. Table 1 shows the results of an analysis of historical financial data on 284 small high technology businesses in New England.<sup>50</sup> The data in this table are believed consistent with national averages and can be extrapolated to represent the nation as a whole for a first estimate of the size of informal investment in new, technology-based enterprises.



Table 11  
Rounds Invested in Small High Technology

|                             | Private<br>Individuals |              | Venture Capital<br>Funds |              |
|-----------------------------|------------------------|--------------|--------------------------|--------------|
| By Size of Round<br>(\$000) |                        |              |                          |              |
| < \$250                     | 102                    | (58%)        | 8                        | (5%)         |
| \$250 - \$499               | 43                     | (24%)        | 14                       | (8%)         |
| \$500 - \$999               | 15                     | (8%)         | 31                       | (18%)        |
| > \$1,000                   | <u>17</u>              | <u>(10%)</u> | <u>120</u>               | <u>(69%)</u> |
| TOTAL                       | 177                    | (100%)       | 173                      | (100%)       |
| By Stage                    |                        |              |                          |              |
| Seed                        | 52                     | (29%)        | 11                       | (6%)         |
| Start-up                    | 55                     | (31%)        | 38                       | (22%)        |
| First                       | 29                     | (16%)        | 56                       | (32%)        |
| Second                      | 26                     | (15%)        | 46                       | (27%)        |
| Third                       | 10                     | (6%)         | 19                       | (11%)        |
| Bridge                      | <u>5</u>               | <u>(3%)</u>  | <u>3</u>                 | <u>(2%)</u>  |
| TOTAL                       | 177                    | (100%)       | 173                      | (100%)       |

A 1983 survey of 3,665 families of all income groups resulted in an estimate of 2 million families in the U.S. (2.5% of all households) that make informal equity investments in privately held businesses totaling to \$300 billion, an average investment of about \$150,000 per household.<sup>51</sup> Individual investors are estimated to invest over \$30 billion per year in over 400,000 ventures. By comparison, in 1987 venture capital funds were investing about \$4 billion annually, with an average investment of \$1 million.

Another study examined the rate of informal venture investing based on a sample of 435 investors. From the findings, the researchers estimated that 720,000 investors annually made 439,000 informal investments with a mean dollar value of \$66,700.<sup>52</sup> These numbers imply an annual flow of informal equity capital of \$32.7 billion.

According to Cognetics, Inc., entrepreneurial ventures include about 50,000 high potential start-ups each year, and 500,000 private companies growing at rates above 20% including 80,000 with annual growth rates above 50%. The equity financing needs of these high-growth ventures exceed \$50 billion per year.



needs to  
match P  
34

Several recent studies have attempted to profile the typical informal investor.<sup>53</sup> The investor profile is confirmed by three separate surveys of the informal investor market conducted by the Small Business Administration between 1985 and 1988.<sup>54</sup> All of these studies show that the total market is huge but highly fragmented and localized, and the investors are unusually diverse, displaying a wide range of personal characteristics and investment behavior. Investment capital from individuals appears to be the largest source of external equity capital for small businesses; annual investment is anywhere between 3 to 10 times the \$4 billion (1987 figure) invested annually by venture capital companies.<sup>55</sup>

However, the available information cannot conclusively confirm whether this ratio of informal capital to venture capital is also true for the small high technology sector. Nevertheless, it appears that, at the very least, the total amount of informal investment in the small high technology sector is equal to or exceeds the total annual investment by venture capital. The following profile information is taken from the previously cited surveys: The average informal investor is 48 years old (with an age range of 30 to 80 years old) and has a bachelor's degree. In fact, almost half of all informal investors have a graduate degree, and have some general business experience in sales, marketing, finance, or research and development.

### Profile of Informal "Angel" Investor

- Tax-sensitive investor (easily hurt by high gains tax)
- 70-80% are self-made entrepreneurs <sup>1/, 2/</sup>
- 20-25% regularly recycle their funds into new ventures <sup>3/</sup>
- Informal investor dollar pool is 3-10 times the total professional venture capital pool for all small business. <sup>4/</sup> This is likely to be true for small, high-technology firms at the seed financing stage as well, but has not been conclusively demonstrated by statistical analyses.

<sup>1/</sup> Sullivan, M. K., Ph.D. Dissertation, University of Tennessee, August 1990.

<sup>2/</sup> Gray, T. A., U. S. Small Business Administration, Presented at OECD Meeting, Paris, July 1990.

<sup>3/</sup> Personal communication, W.E. Wetzel, Angel investor researcher, December, 1991.

<sup>4/</sup> Freear and Wetzel, University of New Hampshire, April 1991.



I would not call these "tag lines"

(Approximately 100,000)

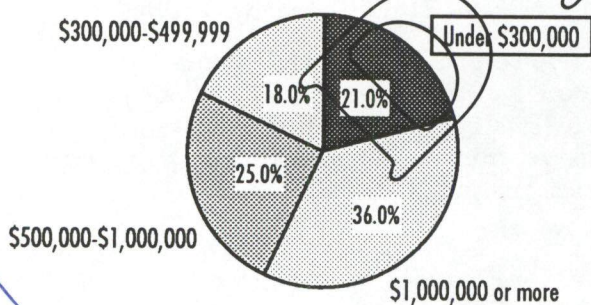
Half of informal investors have full-time managerial experience in entrepreneurial ventures with a median of two years. One study found that most informal investors have had previous experience in start-up enterprises.<sup>56</sup> A similar 1989 study examined the motivations of informal investors and found that earlier experience in starting a firm was strongly associated with a greater commitment to financing start-up ventures.<sup>57</sup>

Three-quarters of the informal investors have annual household incomes in the range of \$50,000 to \$299,000 with 23% in the \$100,000 to \$199,000 range. These income ranges are supported by another recent study which found that over half of the investors had annual incomes in the \$100,000 to \$249,000 range.<sup>58</sup> Most investors have a substantial net worth. Almost one-third of informal investors have a net worth of between \$1 million and \$2.5 million and one-quarter have a net worth exceeding \$2.5 million. The median net worth for investors was \$1 million to \$1.5 million.

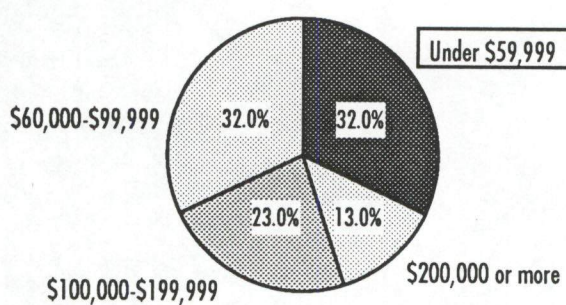
Surprisingly, the data also indicate that not all angel investors are wealthy individuals. 32% of angel investors earned under \$80,000 annually, according to a 1990 SBA study.<sup>59</sup>

These informal investors are usually very active with a median number of two investments in 36 months. They typically provide loan guarantees as well as their own knowledge and experience to the firms. Although most proposed projects are rejected, a substantial number are accepted (3 out of 10).

### Are All "Angel" Investors in Small Businesses Wealthy Individuals? No!



Distribution of Investors by Family Net Worth



Distribution of Investors by Total Annual Family Income

Surprisingly, while they have generally higher-than-average incomes, these individual investors are by no means always "wealthy".

Source: Gray, T. A., U. S. Small Business Administration, Presentation at OECD Meeting, Paris, July 1990.

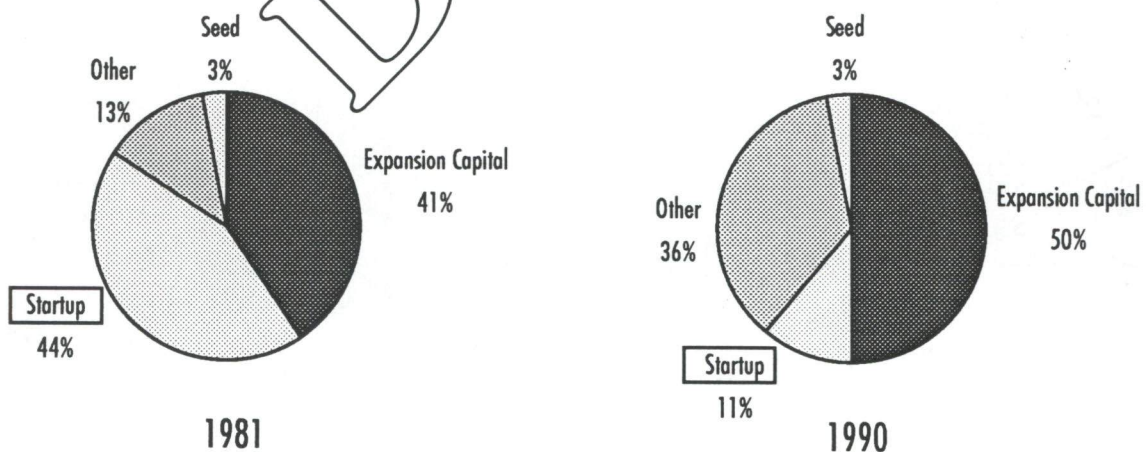
The informal capital market is large and evolving. Most investors are successful business people interested in investing in other businesses to expand and diversify their business and investment activities. They are knowledgeable, careful investors and have been satisfied with the performance of their past investments. In fact, the studies show that the majority would be interested in investing in more deals if presented with viable opportunities. } ??

## Venture Capital

Venture capital is the other primary source of early funding for high technology businesses. However, a small firm must show sufficient promise before venture capitalists invest in a firm. Venture capital is a relatively recent phenomenon with the first venture capital investments arising in the early 1960s. However, recent trends indicate that the venture capital market is currently undergoing significant changes. At present, the total U.S.-based venture capital portfolio is approximately \$30 billion. The stage of the company at which the investment is made is later than it was a decade ago. The most recent figures are indicative of current trends in venture capital investing: later-stage deals, fewer start-ups, and risk-aversion.<sup>59</sup> Venture capitalists generally provide funding increments anywhere between \$1 million and \$100 million, depending on the stage of development. Some seed-level specialists provide smaller infusions of money. Table 11 shows the typical stages of investment for venture capital for small high technology firms.

Figures from the industry further indicate that 91% of the venture capital investments for 1988 were related to later stage development or expansion.

**Venture Capitalists Grow Risk-Averse**  
(Percentage distribution by financing stage)



Professional venture capital in start-up financing is declining

Source: Venture Capital Journal, July 1991.



Venture capital is a cyclical business and always has been.

type of

increase

what was it before?  
Very narrow picture

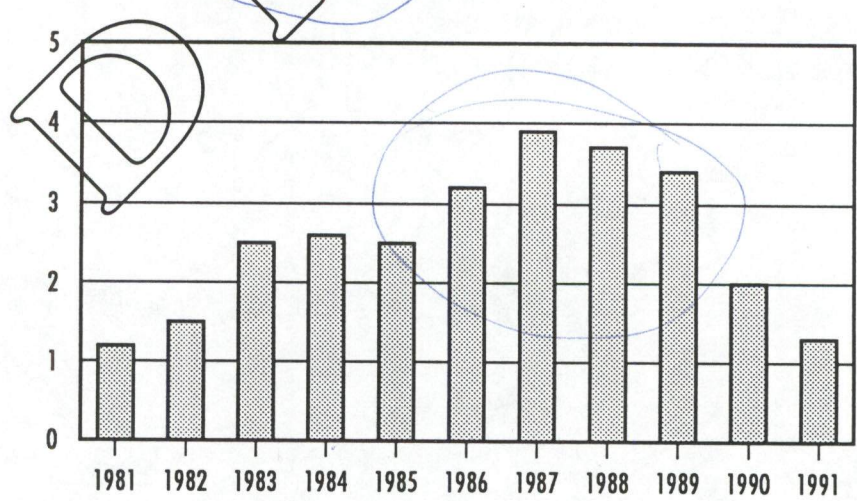
The \$3 billion included contributions from pension funds (47%); corporations (12%); endowments (11%); individuals (8%); insurance companies (9%); and foreign sources (13%). The share contributed by pension funds has been generally increasing, while the portion of venture funds coming from individual investors declined.

While there are some reported discrepancies in the total available venture capital, current information indicates that the total available venture capital has decreased sharply. For example, the available venture capital declined from an all-time high in 1987 of approximately \$4 billion to a total of \$1.4 billion in 1991.<sup>60</sup>

This trend of decreasing availability of venture capital is being mirrored internationally as well.<sup>61</sup> For example, the total amount of Japanese-based venture investment in U.S. companies declined from an all-time high in 1989 of \$320 million to a low of \$97 million for 1991.

The trend toward decreasing investment is attributed to factors ranging from a correction to excessive speculation on the part of venture capitalists (too much money in the same technology companies) to changes in the tax laws (hike in capital gains tax in 1986). An example of the former is when venture capitalists during the mid-1980's were invested in 35 companies, all of which were developing computer disk drives. In the end, only a few of these companies survived; the rest failed, taking with them the venture capital.

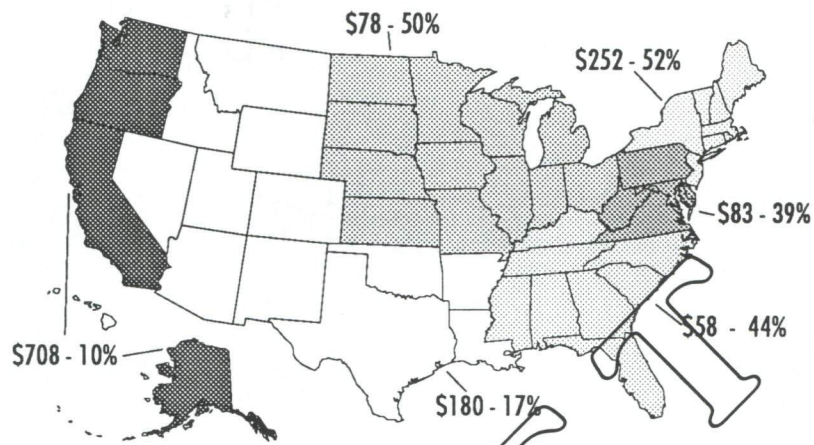
Venture Capital Disbursements Continue to Decline in 1991



Source: Venture Economics Publishing Co.

### Venture Capital by Regions

(Dollars invested in millions, 1991, percent change from 1990)



Source: Venture Economics Publishing Co.

Apart from the difficulties inherent in data collection and the problems in definition, it is apparent that small high technology businesses occupy a unique and critical position in our economy. They are the fulcrum for economic and technological change. As a consequence, these businesses have become a critically important societal institution. Despite this important contribution, the financing of small, high-tech businesses remains in a rather primitive state of information transfer within the principal capital markets, and the venture and informal markets suffer dramatically, and often unpredictably, from changes in tax, regulatory, and economic conditions.



## Some Possible Reasons for the Decline of Angel and Venture Capital in the United States

- Adverse <sup>capital</sup> gains and general tax policy.

### A high <sup>capital</sup> gains tax:

- Discourages investment by tax-sensitive angel investors
- Limits small firm liquidity
- Impacts institutional and professional venture capitalists through investment liquidity and limits downstream public offering (IPO) participation by individuals
- Reduces attractiveness of stock options as a draw to top caliber management
- Angel investors cannot expense 100% of their capitalized losses against their ordinary income under the current tax code.

- Market correction: Over-valuation and imprudent investments during the 1980's have slowed the commitment of money to venture funds.

- ~~Poor economic conditions~~ <sup>Economic Conditions: The sluggish</sup> ~~A recessionary economy and "gloomy" outlook~~ probably has caused angel investors to become more cautious.

~~Other angel investments~~ <sup>are engaged in their primary businesses of</sup> (real estate, retail, etc.) ~~are probably not~~ doing well at present, thus contributing to the shortage of available funds.

may

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# A Brief Overview of Other Financing Sources: SBIR and SBIC Programs

## The SBIR Program

The Small Business Innovation Research (SBIR) Program is designed to assist small businesses that are involved with Federal agencies in their external research efforts. Eleven Federal agencies with \$100 million or more of extramural R&D obligations are required to set aside 1.25% of these funds for small businesses. The basic program is structured as follows:

- Phase I of the program provides up to \$50,000 for concept development. Additional money from angels, founders, or venture sources can be combined to augment total funding.
- Phase II allows up to \$500,000 for prototype development, again often supplemented by outside investment sources.

In the first eight years of the program, the Small Business Administration<sup>63</sup> reported \$2.3 billion was awarded to small firms for a total of 13,712 projects.



Table 12  
Small Business Innovation Research (SBIR) awards,  
by technology area and selected agency: FYs 1983-1989 (cumulative)

| Technology Area <sup>1</sup>            | Total | Dept. of Defense | Dept. of Energy | Dept. of Health and Human Services | NASA | NSF | Other <sup>2</sup> |
|-----------------------------------------|-------|------------------|-----------------|------------------------------------|------|-----|--------------------|
| Total (1983-89) percent.....            | 100   | 100              | 100             | 100                                | 100  | 100 | 100                |
| Computer information, analysis.....     | 22    | 26               | 10              | 15                                 | 26   | 18  | 19                 |
| Electronics.....                        | 21    | 27               | 18              | 6                                  | 20   | 16  | 12                 |
| Materials.....                          | 16    | 18               | 25              | 6                                  | 15   | 24  | 14                 |
| Mechanics of vehicles & facilities..... | 7     | 10               | 4               | 1                                  | 12   | 4   | 4                  |
| Energy conservation and use.....        | 12    | 10               | 28              | 3                                  | 15   | 10  | 6                  |
| Environmental & natural resources.....  | 7     | 5                | 10              | 4                                  | 7    | 13  | 20                 |
| Life sciences.....                      | 16    | 4                | 4               | 64                                 | 4    | 15  | 25                 |
| millions of current dollars             |       |                  |                 |                                    |      |     |                    |
| Total (1983-89).....                    | 2885  | 1389             | 337             | 513                                | 371  | 136 | 139                |

1 Distributions are based on the cumulative 1983-89 value of awards, not on the number of awards granted. Within each of the broad technology areas listed, SBIR awards are assigned to more specific technology areas, including multiple technology areas. Therefore, the dollar distributions include overcounting of awards assigned to multiple technology areas.

2 Includes Departments of Agriculture, Commerce, Education, and Transportation, the Environmental Protection Agency, and the Nuclear Regulatory Commission.

Source: Office of Innovation, Research, and Technology, Small Business Administration. *Small Business Innovation Development Act: Seventh Year Results*, (Washington, DC: SBA, 1990), Science and Engineering Indicators, 1991.

## The SBIC Program

A recent review of the SBIR program<sup>64</sup> reported that a "healthy" level of commercialization had been achieved, and that one in four SBIR program participants was successful in commercialization six years after receiving Phase II funding. Further, the companies surveyed reported a 50% growth level in the period between the Phase I award and the Phase II award.

Despite the positive assessments that the SBIR program has generally received, it is hardly a substitute for a robust venture capital industry, as it is often misperceived, nor does it play a significant role in the overall small, high technology financing picture when compared to the \$30 billion annual informal capital market. However, some notable success stories have evolved from the program – successes that could be strengthened and multiplied with a vigorous venture capital community and a sustained level of angel investment activity.

The SBIR program should be viewed as complementary to sources of funds from the private sector. It augments a unique segment of the universe of small Federal contractors performing critical R&D for government agencies.

**T**he Small Business Investment Company (SBIC) program has provided government-backed venture capital for 33 years through qualified business licensees.

The historical success of the SBIC program has been the subject of recent debate. Proponents cite statistics revealing that the total return to the government has been positive over the life of the program, while opponents cite the demise of several SBIC's and the consequent loss of private and Federal funds. Both pictures fail to accurately assess the full scope of the SBIC program.

Stepping aside from the debate, some facts about SBIC's are available: (1) In 1990, \$391 million of disbursements to small business investment companies were made; (2) Since its inception in 1959, \$8.5 billion has been disbursed to 55,000 small businesses using \$2.6 billion in government borrowings and generating an internal rate of return of 7.6% while creating 1,000,000 jobs. Unfortunately, nearly \$1 billion in government leverage held by 519 SBIC's has been liquidated due to poor reporting, poor auditing and excess leverage.



update text for actual bill.

### Disbursements to Small Business by Small Business Investment Companies (SBICs) 1980 - 1990 (Millions of Dollars)

| Year      | SBICs Disbursement Amount | Year      | SBICs Disbursement Amount |
|-----------|---------------------------|-----------|---------------------------|
| 1990..... | 545.9                     | 1984..... | 425.5                     |
| 1989..... | 542.4                     | 1983..... | 412.9                     |
| 1988..... | 614.4                     | 1982..... | 322.9                     |
| 1987..... | 537.9                     | 1981..... | 332.7                     |
| 1986..... | 75.9                      | 1980..... | 295.2                     |
| 1985..... | 434.6                     |           |                           |

Source: U.S. Small Business Administration, Investment Division.

Despite the difficulties the program has experienced, there is presently a movement to restructure the program to encourage SBIC's participation in equity investments in young, high-tech companies.

Under the current program, the SBIC must invest interest-bearing debt into the long-term equity of small companies that do not generate periodic or fixed yields. Servicing the debt during the growth phase is difficult and there is therefore said to be an inherent mismatch between the debt instrument and the desired investment goals of the SBIC. That is, there exists a disincentive for SBIC's to make long-term equity investments in high-risk ventures.

The proposed new program would provide for a structure using a preferred security as the financing instrument. The determined or non-interest bearing security would encourage investment in long-term equities and is proposed as a viable alternative to the interest-bearing debenture. Redemption of the preferred security would occur in 10 years at 100% par value plus accrued dividends, leading to potentially high returns to the SBIC.

The SBIC program has generated notable business successes and is likely to continue to generate successful graduates such as Intel, Federal Express, Apple, Cray Research and others who benefitted at early stages from SBIC funds. However, the efficiency of the funding mechanism for small, high-tech firms can likely be improved.

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# Incubators, Science, Industrial, and Research Parks

**B**usiness incubators provide shared tenant rental space and support services to small seed or start-up firms. The services offered by incubators are designed to assist young entrepreneurial ventures with technical and business plan development, and management consulting, accounting, and marketing services. Less commonly, services such as seed capital funds, tenant loans, and access to sophisticated computer processing equipment are available.

The purpose of an incubator is to nurture a newly started business through the critical phases of early development, thereby enhancing the chance of commercial success. New entrepreneurs generally lack the key management and organizational skills necessary for the success of their venture. In an incubator environment, high-tech entrepreneurs can learn these skills, or have them provided at low cost, while their businesses are getting started. A supportive business environment is the characteristic element that defines a well-run incubator.

In addition to small business incubators, research parks and private industrial parks support both start-up and mature high-tech business development, as well as provide lease space to large established corporations. Research parks generally are attached to a university or have a strong university affiliation. This distinguishes them from industrial parks, which are usually private-sector developments, having only informal ties to a university community.

## Incubators

In 1991 there were more than 450 operating incubators in the United States and Canada.<sup>65</sup> An average of four or five facilities have been opened each month since 1986 according to the National Business Incubation Association in Athens, Ohio. The average incubator has eight small, (often high-tech) tenants in a shared space of about 2,300 square meters. The small companies are able to sell products to other firms within the incubator and can enter new lines of business without purchasing new equipment because the other entrepreneurs are generally willing to share facilities and exchange expertise. The assistance provided by the incubators helps with the technical and managerial aspects of running a small business, but the entrepreneurs also learn from watching the mistakes and successes of the other facility tenants.



About 14% of incubators are run for profit<sup>66</sup> and the average graduation rate for incubator tenants was 22% in 1989, representing 267 businesses and 1,850 jobs. Nine percent of incubator graduates failed, and on average, those incubators three years or older produced three graduates per year and had 1.3 failures.<sup>67</sup> In a recent survey, the top 11 incubator objectives according to a survey of incubator owners and managers were, in order of priority:

### Priority Objectives of Incubator Owners and Managers from Survey Data

1. Create positive environment for start-ups.
2. Create local employment opportunities.
3. Contribution to community.
4. Diversify local economy.
5. Create opportunities for Minorities/Women.
6. Technology transfer.
7. Commercialization of research.
8. Generate income from tenants.
9. Neighborhood revitalization.
10. Investment in tenant firms.
11. Generate income from intellectual property rights.

Source: NBIA, 1991.

The results of this poll show that the success of the individual businesses and the creation of jobs are the most important goals of managers and owners in the incubation community.

## Research and Industrial Parks

Research parks — or science, or technology parks as they are sometimes called — emerged as a vehicle of small, high-tech business support in the early 1960s. A research park differs from an industrial park in that it usually has an academic affiliation, whereas an industrial park generally represents a completely private-sector development or real-estate venture that often (but not always) concentrates on more mature businesses. There are presently over 130 research parks in the U.S. and 306 worldwide according to the Association of University Related Research Parks (AURRP). The distribution of research parks in the U.S. is shown in Table 13. Industrial parks number over 500 in the U.S.

Table 13  
United States Research Parks  
1990

| State              | Number of Parks | State               | Number of Parks |
|--------------------|-----------------|---------------------|-----------------|
| Alabama.....       | 3               | Missouri.....       | 3               |
| Arizona.....       | 1               | Montana.....        | 1               |
| Arkansas.....      | 1               | Nevada.....         | 1               |
| California.....    | 6               | New Hampshire.....  | 1               |
| Colorado.....      | 2               | New Jersey.....     | 2               |
| Connecticut.....   | 4               | New Mexico.....     | 3               |
| Delaware.....      | 1               | New York.....       | 11              |
| Florida.....       | 9               | North Carolina..... | 3               |
| Georgia.....       | 2               | North Dakota.....   | 1               |
| Hawaii.....        | 1               | Ohio.....           | 6               |
| Idaho.....         | 2               | Oklahoma.....       | 1               |
| Illinois.....      | 3               | Oregon.....         | 3               |
| Indiana.....       | 2               | Pennsylvania.....   | 6               |
| Iowa.....          | 3               | South Carolina..... | 3               |
| Kansas.....        | 2               | South Dakota.....   | 1               |
| Kentucky.....      | 2               | Tennessee.....      | 3               |
| Louisiana.....     | 1               | Texas.....          | 5               |
| Maine.....         | 1               | Utah.....           | 3               |
| Maryland.....      | 4               | Virginia.....       | 4               |
| Massachusetts..... | 3               | Washington.....     | 2               |
| Michigan.....      | 9               | West Virginia.....  | 1               |
| Minnesota.....     | 1               | Wisconsin.....      | 3               |
| Mississippi.....   | 1               | <b>TOTAL.....</b>   | <b>130</b>      |

Source: Research Park Statistics 1990 from the Association of University Related Research Parks.

Starting with a single project in 1951—the Stanford Research Park—the research park concept has mushroomed and resulted in the development of over 42,500 hectares of land, and the creation of 2,600 firms housed in 2,900 buildings employing over 400,000 people. By exploiting the unique relationship between the park and a university (or medical institution), private companies derive an added value by having access to the school's faculty, graduate students, computer experts, and the range of basic research that is being done by universities.



Research parks have become an effective conduit for technology transfer from the research lab to the private sector, and ultimately to the marketplace. Many universities have, in turn, invested in research parks because they provide opportunities for faculty and students to interact with colleagues in industry in a way that would ordinarily not be possible. Further, research parks can be highly profitable for the host institution, particularly important in a period of decreasing budgets.

The research park movement is now becoming international in scope with 34 countries having built or currently planning facilities. A summary of U.S. and international research parks by development type is shown in Table 14. Also, the trend today is to create hybrid parks that incorporate small R&D-based firms with light manufacturing and mature companies, all in the same environment. It is hoped that the cross-fertilization of technologies and experience level with entrepreneurial drive will benefit all tenants of the facility.

Table 14  
Summary of U.S. & International Research Parks by Type

| Type of Development | Total      | Percent    |
|---------------------|------------|------------|
| Joint Venture       | 60         | 20         |
| Not for profit      | 45         | 15         |
| University funded   | 61         | 19         |
| Private             | 44         | 14         |
| Government          | 31         | 10         |
| Other               | 18         | 6          |
| No type listed      | 48         | 16         |
| <b>TOTAL</b>        | <b>307</b> | <b>100</b> |

Source: Real Estate Forum, April 1991.

## Success Factors

Factors determining the success of an incubator or a research park can be reduced to three basic components that are common to many geographical settings:

- There must be an adequate supply of informal or venture capital in the incubator region that is supportive of, and compatible with, the types of businesses being incubated.
- Even non-affiliated industrial parks benefit dramatically from the presence of a high-quality university community that can provide an adequate supply of skilled researchers in the areas of technical interest.

- 
- The local infrastructure should be amenable to the types of businesses occupying the incubator or research park. Light manufacturing centers must have sufficient access to transportation, water, gas, and power utilities and basic material supplies.

These three criteria outline a necessary basis for incubator and research park success, but do not guarantee that sufficient conditions exist so that a facility will graduate successful companies. A recent article<sup>69</sup> discussing the "mixed success" of several specialized incubator facilities in the United States has pointed to the lack of local markets for the goods and services produced. Understandably, a specialized group of companies would have additional needs relating to their specialization that would go beyond the basic needs of capital supply, a skilled work force, and an adequate manufacturing infrastructure.

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# Some Key Impediments to the Formation, Growth, and Development of Small, High-Tech Businesses

While it is apparent that high technology-based businesses are important to our nation's economy and competitiveness, it is less clear what factors may impede or foster the growth of these firms. This is especially important when one recognizes that only 40% of high technology-based firms are reported to survive beyond six years.<sup>20</sup> An even smaller percentage of firms reach maturity and achieve the economic impact of a major company.

The impediments to maturity and technological growth are diverse and varied. For purposes of exposition, the factors affecting the success or failure of small and medium-sized technology-based businesses can be characterized along two dimensions as factors that are either *external* or *internal* to the firms. Table 15 summarizes these key factors.

Table 15  
Summary of Major Factors Affecting the Success of Small High-Tech Businesses

|                              | Internal Factors                                                                                                                                                                                                                                                                                                   | External Factors                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fostering Growth</b>      | <p>Sufficient capital at all stages of development</p> <p>Professional management expertise</p> <p>Adequate technical expertise</p> <p>Skilled labor force</p> <p>Well-defined business plan</p>                                                                                                                   | <p>Access to technology</p> <p>Strong economy</p> <p>Favorable interest rates</p> <p>Easy market access (domestic and foreign)</p> <p>Supportive infrastructure (i.e. transportation and education system)</p> <p>Strong investor exit strategy (i.e. stock offering)</p>                                                                                                                                                                                              |
| <b>Impediments to Growth</b> | <p>Lack of capital at any stage, especially seed or start-up capital</p> <p>Management failure:</p> <ul style="list-style-type: none"> <li>—poor resource allocation</li> <li>—unfocused goals</li> <li>—bad decisions</li> <li>—unexecutable goals</li> </ul> <p>Poor business plan</p> <p>Technology failure</p> | <p>Regulatory environment including:</p> <ul style="list-style-type: none"> <li>—FDA restrictions</li> <li>—SEC regulations</li> </ul> <p>Poor economic climate including:</p> <ul style="list-style-type: none"> <li>—high interest rates</li> <li>—reduced venture fund pool</li> <li>—poor product market conditions</li> </ul> <p>Inadequate job training/uneducated workforce</p> <p>Unprotectable intellectual property rights</p> <p>Lack of debt financing</p> |

## Internal Factors and Financial Impediments

The most important factor influencing the success or failure of a venture is the availability of financing. Interestingly, the second most important factor contributing to failure after a lack of initial venture financing is management failure. The lack of a clear direction for a new venture, which typically should be articulated in a detailed business plan, is also a common cause of failure. Rarely is the collapse of a new high-tech enterprise attributable to the technology alone. Management failures also generally dominate the list of factors that can impede the growth of a small firm.

Small, high-tech firms in the United States currently exhibit signs that there is an insufficient supply of venture and informal investment capital. Debt financing for these young firms is almost nonexistent at present. Venture capital has moved to predominantly later-stage deals (although notable exceptions at the seed and start-up level exist) and venture capitalists demand extraordinary rates of return on their investments, thereby leaving technologically important, but less stellar performing companies, unfunded.

The availability of capital plays a critical role in the success of small technology-based firms. Financial failures reflect the inability of a firm to find sufficient resources for the venture at the seed, start-up, venture, IPO or buy-out capital stages. Financing a new technology-based venture means that the investor accepts a level of risk in exchange for a minimum acceptable rate of return for the money (or other equity) invested in the venture. However simple this may sound, at present many new firms fail to find adequate financing because of the delicate matching required between: (1) the type and maturity-level of the firm on the one hand, and (2) the financing source, and the minimum required investment return on the other hand. Not all combinations of investor, company, maturity-level, return, and assessed risk work to the advantage of the entrepreneur seeking financing.

Major financing issues are involved when a small, high-tech company desires to move into a high-growth mode within a relatively short period of time. Having successfully navigated the seed and start-up phases of formation and expansion, such firms seek to access sources of venture capital and generally believe that they have the potential to eventually become public companies. The availability of venture capital is directly related to the quality of "deal" available: the small company must convince the venture investor of the soundness of the business plan, the marketing plan, the overall market assessment, the technological feasibility of the product, and the managerial competence of the firm.

Based on an assessment of these critical factors, the venture capitalist then generally looks for a minimum return on investment (that is usually quite high), with an exit strategy exercisable within one to seven years. Failure to meet any one of these requirements means that the new venture may not find sufficient capital to grow to the next stage.



From discussions with venture fund managers, there appears to be a significant number of start-up companies offering an investment return of 10-35% which cannot find funding in the present climate to achieve the next stage of growth. Compounding these difficulties is the fact that the amount of venture capital available for infusion has decreased by nearly 80% since the mid-1980s. Less money available to a large number of ventures allows investors to be highly selective and to raise the already stringent financing requirements placed on companies. Further, two-thirds fewer new deals in the seed and start-up phases are being venture-financed today than were financed in 1980.<sup>71</sup> (Certain exceptions to this trend exist, particularly in the biotechnology sector.)

WHY The informal capital or "angel" market has also shown signs of weakness and decreasing volume — a feature that heralds a trend having significant impact on the technology sector because of the enormous size of this market (estimated earlier to be 3 to 10 times the total venture capital pool). Since angel investors generally derive their investment funds from other entrepreneurial ventures, the availability of this type of capital is strongly dependent on the general health of the economy overall as well as being extremely sensitive to changes in tax (i.e., capital gains) policy.

Debt financing is not a major source of funding for small high-tech companies. Recent data from the American Electronics Association<sup>72</sup> (AEA) show that in a survey of 126 member companies with under \$50 million in revenues, 62 companies had some financing difficulties and 50 were actually denied loans. The AEA further reported that only 34 of 100 banks that previously lent to high technology concerns currently indicate no interest in lending to electronics firms.

The current shortage of debt capital reflects in part, the discomfort banking institutions feel lending to high-risk, high-tech ventures. Often, the time to pay-out for the venture is far too protracted for the small firms to adequately service the interest on the debt, and given the low survivability rate of these companies, banks are unwilling to assume the compounded risk. Interestingly, in recent months, even mature high-tech companies have found difficulty in procuring debt financing for growth and working capital. As banks move increasingly away from younger higher-risk companies toward old established firms, the pool of innovative, small technical firms suffers from a lack of capital for proper growth.

## External Factors and the Regulatory Environment

Access to technology, market, and infrastructure are key to a firm's ability to manufacture, sell and ship goods to the customer. During this cycle, however, regulatory constraints can become overwhelming, especially in the medical/biotechnology products area.

An additional layer of regulatory constraint occurs upon the issue of company stock for public funds. Data indicate<sup>73</sup> that a simple underwriting along the lines of a "Reg. D" offering can cost the firm up to one-third of



the total funds raised in legal fees and underwriting expenses. The Administration has recently taken measures through the Securities and Exchange Commission (SEC) to reduce the expense of public stock underwritings.<sup>74</sup> These changes promise to ease the cost and lower the critical threshold for obtaining public funds. Opening this capital source to a larger variety of companies may help ease the capital shortage that currently exists.

The proposed revisions to the rules and forms under the Securities and Exchange Act of 1934 will facilitate capital raising by small businesses and reduce the overall compliance burdens on these companies by Federal securities laws. The current small issues exemption for Securities Act registration, Regulation A, as well as the Rule 504 exemption, are targeted for revision. The proposals to modify Reg. A will increase from \$1.5 million to \$5 million the exemption dollar limit, and simplify procedural requirements. Pre-issue solicitations of interest before filing the mandated offering document will be allowed. Conditions to the use of Rule 504 of Regulation D are also targeted for streamlining.

Other factors inhibiting the growth of a high-tech firm are at least as important and, in some respects more important, but are inherent to the firm. "A good idea does not a commercial product make," was a common refrain of the entrepreneurs and financiers interviewed for this report. This study revealed a whole array of intangible factors determining the success or failure of technology-based businesses.

(FDA) Chiefly cited among all non-financial factors are Food and Drug Administration and Environmental Protection Agency regulatory compliance issues. Results from the National Technology Initiative<sup>75</sup> ("NTI") workshop programs during the calendar year 1992 revealed that many investors and entrepreneurs feel that FDA and EPA regulations are either too stringent, or involve too much time to comply with them. Simplification of these regulations would allow small firms to concentrate on the development of their products and set a definitive upper time limit for passage of their products through the regulatory cycle. The time value of money prohibits these companies from tolerating long delays in the regulatory process. (EPA)

The inter-relationships between and among the various factors further complicate the overall picture. For example, attracting investors can be dependent on the quality of the personnel in a new firm. Yet, an entrepreneur may not be able to attract talented personnel unless he or she can secure adequate financing. As another example, if the technical founder of the firm focuses too much time on the pursuit of financing, the business can suffer dramatically and lead to insurmountable management failures.



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In the near term, public policy might focus on the external impediments identified in Table 15. Over the long-term, policy should focus on those factors fostering growth that are both internal and external to the firm. It is the latter category that may yield the most potentially powerful stimulus to small high-tech businesses in the United States.

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## Conclusions

Small high technology businesses occupy a unique and critical position in our economy. It is estimated that there are 75,000 to 100,000 small high-tech firms in the U.S. They are a predominant and continuous source of technology, product and process innovation and are dynamic in the creation of jobs. Many of our nation's largest technology corporations were founded on a single innovative product as small businesses, and not established as subsidiaries of larger companies. Many small high-tech firms are concerned with technologies that are critical to maintaining U.S. competitiveness.

Foreign acquisition of U.S. firms is currently dominated by the Japanese, particularly in the area of computer related businesses and semiconductor firms. A recent slowdown in acquisition rates probably reflects the economic downturn in Japan but the rate is still significantly above the 1988 levels when the upward trend began.

A wide array of anecdotal evidence and several studies of empirical data show that small firms innovate more often and more efficiently than larger businesses. This capacity for innovation is even greater for the subgroup of small high technology firms. On average, small firms were about 2.5 times more innovative as large firms per employee. Innovations from small firms were twice as likely to be licensed or purchased as those from large firms, although the number of such cases was limited for both large and small firms. Further, small firms are more inclined to sell their innovations to the private sector rather than the military or civilian government.

Small high technology firms are one of the most dynamic job creating sectors in the economy. Over 400,000 jobs were created in the small, high-tech sector in 1990.<sup>76</sup> Recent data indicate that domestic small high technology companies contribute almost four times their expected share of new jobs. For a recent one-year period, 40% of the jobs created were in the computer-related industries. Seventy-six percent of the total number of high technology jobs created were in companies of between 50 and 500 employees. In aggregate levels of job creation, it is apparent that the small high technology sector makes a proportionally large contribution.



Financing new technology-based firms appears to be problematic at present; both informal sources of funding and venture capital currently appear to be in short supply due to market correction factors and the extreme sensitivity of the informal investment market to unfavorable tax and macro-economic factors. While some companies, (especially in biotechnology) are still very successful in attracting professional venture investment, the total pool of venture money has sharply declined. Only those firms with the highest potential return, and generally at a more mature phase, can consistently attract financing according to the data reviewed.

A number of broadly-defined factors determine the ultimate success of an entrepreneurial high-tech venture. Internal factors, such as management issues, as well as exogenous factors, such as the macroeconomic environment, appear to be the most important determinants. The rate of success can be enhanced by improving the overall nurturing and management assistance a firm receives through the initial critical phases of development. Incubators and science research parks appear to enhance the rate of company success by shared critical services and infrastructure improvement. The development of incubators and research parks should be encouraged.

Impediments to the formation, growth, and development of small high-tech businesses have been identified and classified into two categories: those which are external to the firm and those which are internal to the firm. External factors include the regulatory environment in the form of SEC, FDA, or EPA rules and regulations; economic climate factors such as interest rates, the total pool of available capital, and market conditions; and the ability to adequately protect intellectual property rights. Internal factors encompass availability of capital at any stage of development; management failures; business plans; and technology successes or failures. Lack of financing at a given stage of development is typically the most common reason for failures to grow. Rarely is the failure of a new high-tech enterprise attributable to a failure of the technology alone. Management failures dominate the list of other factors impeding the growth of a small firm.

Public policy in the near term might focus on the external impediments identified in Table 15. Over the long-term, policy should focus on some of those factors fostering growth that are both internal and external to the firm. It is the latter category that may yield the most potentially powerful solutions.

## Acknowledgements

This report would not have been possible without the contributions of a large number of people, both inside and outside the Federal government. We would particularly like to thank Jerry Feigen of Feigen and Associates, Inc.; David Birch of Cognetics, Inc.; Andy Campbell of CorpTech, Inc.; William Scheirer and Bruce Phillips of the Small Business Administration; Bill Wetzel of the University of New Hampshire; Mark Heesen of NVCA; Tip Parker of the U.S. Department of Commerce

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and by performing a survey of the twenty-five states having the highest concentration of high-tech business. This effort was undertaken to develop an independent characterization of small technically-based businesses and to corroborate the information obtained from the three data sources.

21. Total number of businesses reported by the SBA includes 4.3 million corporations and over 1.9 million partnerships. Additionally, there are 13.8 million sole proprietorships (net counted in these figures) making a total of 20 million small businesses in the U.S.
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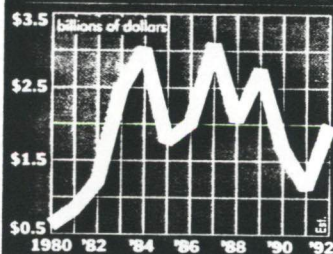
## A REVIVAL IN VENTURE CAPITAL

■ After a horrendous four years, during which the amount of money raised shriveled some 70%, venture capitalists are finally seeing a strong pickup in funds (see chart). The \$1.16 billion they've gathered from partners in this year's first half is already greater than monies raised in all of 1991.

The rise is due to offerings from follow-on funds. Also known as "serial funds" for their successive roman numerals (e.g., Smith I, Smith II), these offerings from established firms are hogging all the money because of their successful track records and because institutional investors who can pony up millions of dollars for partnerships have turned conservative. One of the largest funds this year is **Burr Egan Deleage & Co.**'s Alta V, a fund in Boston that raised \$160 million.

Peter C. Wendell, a venture capitalist who lectures on the subject at Stanford's business school, says established firms bring more comfort to their limited partners. And comfortable is what they want to be. Venture Economics, a consulting firm in Newark, New Jersey, notes that in 1985, 60% of the venture capital raised went into follow-on funds; in 1991, 95% did.

### VENTURE CAP JUMPS



FORTUNE CHART: SOURCE: PRIVATE EQUITY ANALYST, NEWTON, MASS.

Where is the money going? About 25% of it is headed for software and related services. But health care and telecommunications are also grabbing big bites.

— Alison Rogers



## ENTERPRISE

# Venture Funds Regain Appetite For Start-Ups

9/24/92

By UDAYAN GUPTA

And JEFFREY A. TANNENBAUM

Staff Reporters of THE WALL STREET JOURNAL

For much of the past four years, the venture-capital industry has been short on funds — and uncharacteristically cool toward financing very young companies.

But now the industry is picking up cash and regaining its appetite for risk. Authorities say the turnabout means that small companies in need of start-up capital may have an easier time finding it.

"All of a sudden, venture capitalists are funding new ventures again," says Joseph A. Wingard, president of the Los Angeles Venture Association, a monthly educational forum devoted to private-enterprise issues. He says that the increase in the liquidity of venture-capital funds and their return to early-stage financings dominated discussions at the group's August meeting. Until recently, many venture investors had concentrated on later-stage financings for companies launched several years earlier. Not only did they have less money to spread around, but they also were under pressure from their own investors to deliver fast returns.

But many venture funds have recently gotten more funds from their institutional investors, which have made killings from a rash of recent initial public offerings. Moreover, the funds themselves have made big money from the IPOs.

Now, many venture capitalists are sounding much like the swingers of the mid-1980s—even if some are yet to put their money where their mouths again are. "Start-ups are where most of the opportunities are and have been," says Jonathan A. Flint, a partner at Burr, Egan Deleage & Co., a Boston venture-capital firm. "You can make money by investing in mature companies, but if you want to hit a home run, you have to invest in a start-up."

For many entrepreneurs, venture capitalists' renewed interest in early-stage companies means an easier time getting money for their crucial first few years. When Dendrite International Inc., a Warren, N.J., software company, began looking for venture capital last year, no less than 14 venture funds expressed an interest. It eventually received \$7.5 million from a group led by Edison Venture Fund in Lawrenceville, N.J.

The precise extent to which venture capitalists overall are devoting money to start-ups isn't clear. But many confirm

Please Turn to Page B2, Column 3



# Venture Funds Regain Appetite for Start-Up Companies

Continued From Page B1

that they are pouring more money into start-ups, or expect to do so soon. Of the eight new investments made by Burr Egan since June, six have been in early-stage companies, Mr. Flint says. They include \$1.5 million invested in Vestech Inc., a San Francisco start-up that plans to develop technology to treat incontinence in women; and more than \$1 million in Aura-vision, a Fremont, Calif., designer of electronic chips for full-motion video in personal computers.

## Growing Piles of Money

Behind the renewed interest in start-ups is mostly the growing pile of money that venture capitalists can tap. Venture funds in the first half of 1992 raised a total of \$1.2 billion, compared with \$418 million in the year-earlier period, says the newsletter Private Equity Analyst, based in West Newton, Mass.

"Because of the bull market, a lot of funds are showing higher returns, and that has stimulated a lot of institutional investors to get back into venture capital," says G. Bradford Jones, a general partner of Brentwood Associates, a Los Angeles venture-capital firm.

The inflow of money into the industry is still well below the peak levels of 1987, "but we're up from the low point," he says.

Besides having more money, many venture capitalists have been freed of the need to finance a host of more developed companies in their portfolios that have gone public in recent quarters. "The booming market for new issues took a lot of companies out of circulation," says venture capitalist Walter Channing of CW Group, New York. For example, in the life-sciences industry, "later-stage oppor-

tunities are much fewer," says James Bochnowski, a partner in Delphi Bioventures L.P., a Menlo Park, Calif., fund.

As a result, many venture-capital funds again are willing to consider investments in younger companies. Sears, Roebuck & Co.'s Allstate Venture Capital in Northbrook, Ill., Bessemer Venture Partners in New York, New Enterprise Associates in Baltimore, and Advent International Corp. in Boston all became new investors re-

momentum. "I've heard conversations about early-stage deals, but I haven't seen the behavior — I haven't seen the deals done yet," says Gene I. Miller, a general partner of Peregrine Ventures L.P., Santa Monica, Calif. He says the institutional investors in many funds now may be accustomed to shorter-term payoffs than most start-ups promise. He adds, "I don't know how quickly they'll want to mix early-stage deals into portfolios devoted to later rounds."

But with winnings from their successful public offerings in hand, many venture capitalists certainly sound inclined to take new risks. "People have some liquidity, so they feel more comfortable rolling the dice more," says Eugene M. Weber, a principal of Weiss, Peck & Greer Venture Partners, San Francisco.

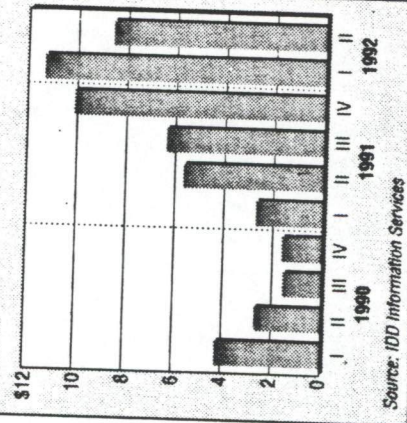
The firm says it recently provided about \$1 million toward early-stage development of Terrapin Technologies Inc., a South San Francisco biotechnology company. Mr. Weber says the swing back to such investments began last year, when "everybody was saying that not enough money was going to early-stage deals."

At the same time, many start-up entrepreneurs are trying to work smarter — tailoring their concepts to appeal to more-conservative financiers. For example, authorities say more new companies in computer technology and health care are focusing on specific problems rather than amorphous technologies. They call for smaller initial investments and expect to be profitable quicker than start-ups in broader areas.

CW's recent start-up investments include \$100,000 in Geron Corp., a Hayward, Calif., company that is working to treat age-related disorders, including skin dis-

## Cashing Out

Dollars raised in initial public offerings, in billions



Source: IBD Information Services

cently in Arris Pharmaceutical Corp., a South San Francisco biotechnology firm. And Delphi Bioventures recently led a \$5 million financing of CV Therapeutics, a Mountain View, Calif., company working on ways to treat and prevent atherosclerosis.

## May Take Months to Build

Specialists caution that the swing back to early-stage investments is still young and may require many months to build

eases, and nearly \$1.2 million in Sugan Inc. Sugan, based in Redwood City, Calif., is developing a new category of drugs that block or mimic cells.

New companies in computer technology, mostly software concerns, are being formed to solve problems in such emerging market niches as pen-based computers and mobile personal computers, says John Martinson, a partner in Edison Venture Fund. Mayfield Software Partners, a \$4 million fund formed in April by Mayfield Fund, a private venture-capital partnership in Menlo Park, says it aims to make investments exclusively in computer-software companies "at the earliest stages."

## Collins Industries Inc.

### Firm Says Contract Delays Will Reduce Net for Quarter

Collins Industries Inc. said sales and earnings for its fiscal fourth quarter ending Oct. 31 will be lower than previously estimated due to contract delays.

An analyst's report, which the company didn't disagree with, had estimated fourth-quarter net of seven cents a share on sales of \$41 million, Joseph Hebb, chief financial officer, said. The Hutchinson, Kan., maker of ambulances and other vehicles, earned two cents a share on sales of \$39 million in the year-earlier quarter. Mr. Hebb wouldn't be more specific about results for the quarter.

The company said it continues to experience delays in the approval of prototypes and the confirmation of shipping dates on significant ambulance contracts that were expected to be produced in the quarter.



THE WHITE HOUSE  
WASHINGTON

Wednesday

DATE: 8-28-92

TO: Dr. D. Allan Bromley

FROM: J. FRENCH HILL  
Special Assistant to the President and  
Executive Secretary to the Policy  
Coordinating Group  
Room 228, OEOB, x7968

Joe Proz tells me that your report on  
small high-tech companies is being  
finalized. I would like to review  
before it is released to the public.

cc: Roger Porter  
Betsy Anderson

French:

Enclosed is a draft of the  
report. It is still subject to  
revision here and will be  
circulated for comment before  
public release. I would welcome  
any comments.

Alan  
8-2-92

"Document Control"

TYPE: INFORMATION

DOCUMENT NUMBER: 9202868

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

\*\*\*\*\*

FROM: BRADY, Phillip: ASSISTANT TO THE PRESIDENT AND STAFF SECRETARY

TO: DR. D.A. BROMLEY

DATE OF  
CORRESPONDENCE: 09/22/92

SUBJECT: HE IS FORWARDING CEA NUMBERS.

\*\*\*\*\*  
DIRECTORATE STAFF  
ASSIGNED: ASSIGNED:

ACTION STAFF  
REQUIRED: ACTION:

\*\*\*\*\*  
SENDER'S DUE DATE:  
OSTP DUE DATE: STAFF DUE DATE  
DATE COMPLETED: DATE COMPLETED/DEPT:

\*\*\*\*\*  
COPIES TO: D. Allan Bromley  
INDUSTRIAL

\*\*\*\*\*  
WHITE HOUSE TRACKING #: CONTACT PERSON:  
PHONE: EXT:  
REMARKS:

OSTP RECEIVED: 09/25/92 DEPT RECEIVED:  
FILE: EOP-P-WHITE HOUSE MEMORANDUM

CENTRAL FILES:



WHITE HOUSE STAFFING MEMORANDUM

DATE: 9/22/92 ACTION/CONCURRENCE/COMMENT DUE BY: \_\_\_\_\_

SUBJECT: CEA NUMBERS --

|                | ACTION                   | FYI                                 |             | ACTION                   | FYI                                 |
|----------------|--------------------------|-------------------------------------|-------------|--------------------------|-------------------------------------|
| VICE PRESIDENT | <input type="checkbox"/> | <input type="checkbox"/>            | MCBRIDE     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BAKER          | <input type="checkbox"/> | <input type="checkbox"/>            | MOORE       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| SCOWCROFT      | <input type="checkbox"/> | <input checked="" type="checkbox"/> | MULLINS     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DARMAN         | <input type="checkbox"/> | <input type="checkbox"/>            | PETERSMEYER | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BATES          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | PORTER      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BRADY          | <input type="checkbox"/> | <input type="checkbox"/>            | PROVOST     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BROMLEY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ROSS        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| CALIO          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SMITH       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DEMAREST       | <input type="checkbox"/> | <input checked="" type="checkbox"/> | TUTWILER    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| FITZWATER      | <input type="checkbox"/> | <input type="checkbox"/>            | ZOELICK     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| GRAY           | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HOLIDAY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HORNER         | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |

REMARKS:

For your information.

RESPONSE: \_\_\_\_\_

PHILLIP D. BRADY  
Assistant to the President  
and Staff Secretary  
Ext. 2702



THE CHAIRMAN

EXECUTIVE OFFICE OF THE PRESIDENT  
COUNCIL OF ECONOMIC ADVISERS  
WASHINGTON, D.C. 20500

September 22, 1992

2 SEP 22 A 8:30

MEMORANDUM FOR WHITE HOUSE SENIOR STAFF

FROM: MICHAEL J. BOSKIN *mjb*  
SUBJECT: August Housing Starts, Commerce Department  
Release, This Morning, 8:30 a.m.

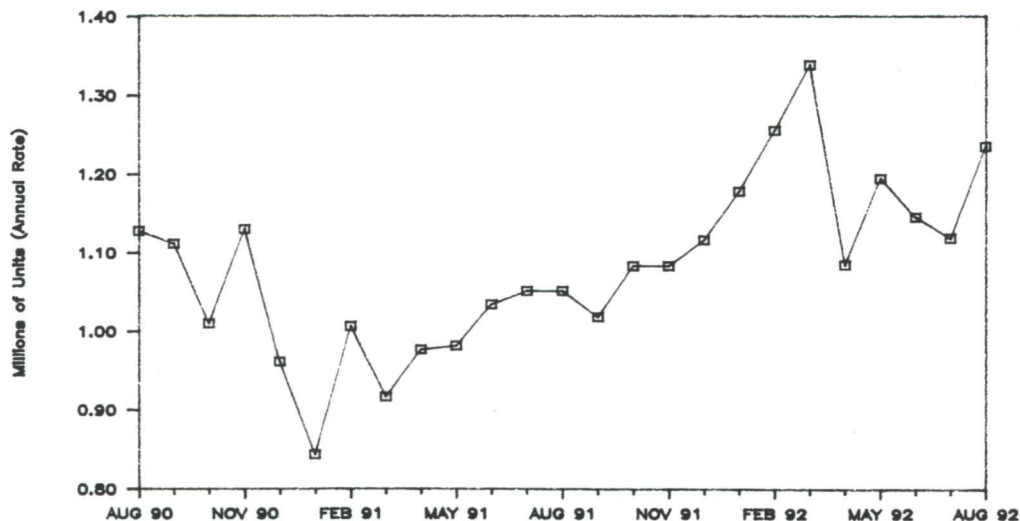
Housing starts rose by 10 percent in August to an annual rate of 1.24 million. This represents the largest month-to-month gain since February 1991 and exceeded analysts' expectations by nearly 7 percent.

Single family starts rose 9 percent and multi-family starts rose 23 percent over July's levels. Increases were registered in all regions of the country except the Northeast.

Building permits fell 2 percent to an annual rate of 1.06 million. The fall in permits was relatively greater for multi-family units.

Housing starts and housing permits for the first 8 months of 1992 are above their year-earlier levels by 20 and 16 percent, respectively. However, the August rates for both series remain somewhat below the rates attained in February and March of this year.

HOUSING STARTS





**PLEASE NOTE EMBARGO RESTRICTIONS**

**ECONOMIC SNAPSHOT FOR THE WEEK OF SEPTEMBER 21--25**

**September 22, 1992**

The Commerce Department announced today that housing starts rose by 10 percent in August, to an annual rate of 1.24 million, which exceeded analysts' expectations by nearly 7 percent. The August increase was the largest month-to-month gain since February 1991. Increases were registered in all regions of the country except the Northeast. Building permits fell 2 percent, to an annual rate of 1.06 million.

On Thursday, the Commerce Department will release the final revisions for second quarter gross domestic product. Private analysts expect real GDP growth of 1.4 percent and growth in the GDP deflator of 2.7 percent, both unchanged from the preliminary estimates. On Friday, the Commerce Department will release durable goods orders and the personal income report for the month of August. Private analysts expect durable goods orders to rise 1.2 percent. Personal income is expected to rise 0.4 percent, while personal consumption expenditures are expected to increase 0.2 percent.

**DATA RELEASED THIS WEEK:**

**Housing starts rose by 10 percent in August, to an annual rate of 1.24 million, which exceeded analysts' expectations by nearly 7 percent. Building permits fell 2 percent, to an annual rate of 1.06 million. (Embargoed until 8:30 a.m., 9-22-92)**

**TO BE RELEASED THIS WEEK:**

| <b><u>Release</u></b>                                     | <b><u>Median Market Expectation</u></b> |
|-----------------------------------------------------------|-----------------------------------------|
| GDP (2nd Q, Final)<br>(released 9-24-92)                  |                                         |
| Real GDP                                                  | 1.4 percent                             |
| GDP Deflator                                              | 2.7 percent                             |
| Advance Durable Goods (August)<br>(released 9-25-92)      | +1.2 percent                            |
| Personal Income & Spending (August)<br>(released 9-25-92) |                                         |
| Income                                                    | +0.4 percent                            |
| Spending                                                  | +0.2 percent                            |

"Document Control"

TYPE: INFORMATION

DOCUMENT NUMBER: 9202891

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

\*\*\*\*\*

FROM: BRADY, Philip: ASSISTANT TO THE PRESIDENT AND STAFF SECRETARY

TO: DR. D.A. BROMLEY

DATE OF  
CORRESPONDENCE: 09/15/92

SUBJECT: HE IS FORWARDING CEA NUMBERS.

\*\*\*\*\*  
DIRECTORATE STAFF  
ASSIGNED: ASSIGNED:

ACTION STAFF  
REQUIRED: ACTION:

\*\*\*\*\*  
SENDER'S DUE DATE:  
OSTP DUE DATE: STAFF DUE DATE  
DATE COMPLETED: DATE COMPLETED/DEPT:

\*\*\*\*\*  
COPIES TO: D. Allan Bromley  
INDUSTRIAL

\*\*\*\*\*  
WHITE HOUSE TRACKING #: CONTACT PERSON:  
PHONE: EXT:

REMARKS:

OSTP RECEIVED: 09/25/92 DEPT RECEIVED:  
FILE: P-EOP-WHITE HOUSE MEMORANDUM

CENTRAL FILES:



# WHITE HOUSE STAFFING MEMORANDUM

DATE: 9/15/92 ACTION/CONCURRENCE/COMMENT DUE BY: ----

SUBJECT: CEA NUMBERS --

|                | ACTION                   | FYI                                 |             | ACTION                   | FYI                                 |
|----------------|--------------------------|-------------------------------------|-------------|--------------------------|-------------------------------------|
| VICE PRESIDENT | <input type="checkbox"/> | <input type="checkbox"/>            | MCBRIDE     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BAKER          | <input type="checkbox"/> | <input type="checkbox"/>            | MOORE       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| SCOWCROFT      | <input type="checkbox"/> | <input checked="" type="checkbox"/> | MULLINS     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DARMAN         | <input type="checkbox"/> | <input type="checkbox"/>            | PETERSMEYER | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BATES          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | PORTER      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BRADY          | <input type="checkbox"/> | <input type="checkbox"/>            | PROVOST     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BROMLEY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ROSS        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| CALIO          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SMITH       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DEMAREST       | <input type="checkbox"/> | <input checked="" type="checkbox"/> | TUTWILER    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| FITZWATER      | <input type="checkbox"/> | <input type="checkbox"/>            | ZOELICK     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| GRAY           | <input type="checkbox"/> | <input checked="" type="checkbox"/> |             | <input type="checkbox"/> | <input type="checkbox"/>            |
| HOLIDAY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |             | <input type="checkbox"/> | <input type="checkbox"/>            |
| HORNER         | <input type="checkbox"/> | <input checked="" type="checkbox"/> |             | <input type="checkbox"/> | <input type="checkbox"/>            |

REMARKS:

For your information.

RESPONSE:

PHILLIP D. BRADY  
Assistant to the President  
and Staff Secretary  
Ext. 2702



THE CHAIRMAN

EXECUTIVE OFFICE OF THE PRESIDENT  
COUNCIL OF ECONOMIC ADVISERS  
WASHINGTON, D.C. 20500

September 15, 1992

2 SEP 15 A 8:44

MEMORANDUM FOR WHITE HOUSE SENIOR STAFF

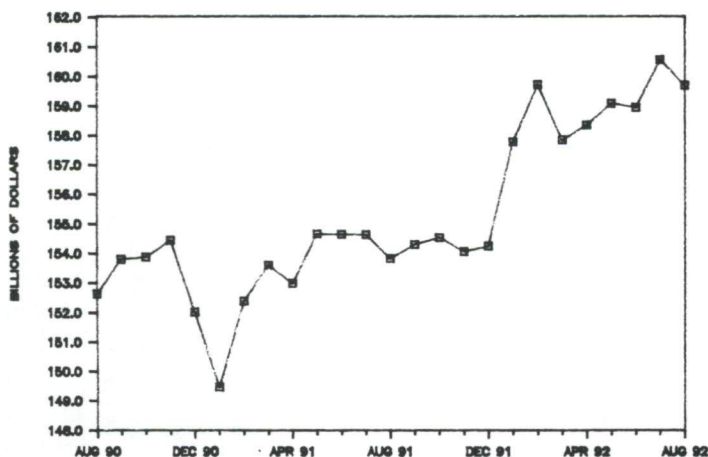
FROM: MICHAEL J. BOSKIN *mb*  
SUBJECT: August Retail Sales, Commerce Department Release,  
This Morning, 8:30 a.m.

Retail sales fell 0.5 percent in August, a surprising decline as private analysts had expected retail sales to be unchanged from July. However, sales in July were revised up to show a 1 percent increase rather than the previously reported 0.5 percent increase.

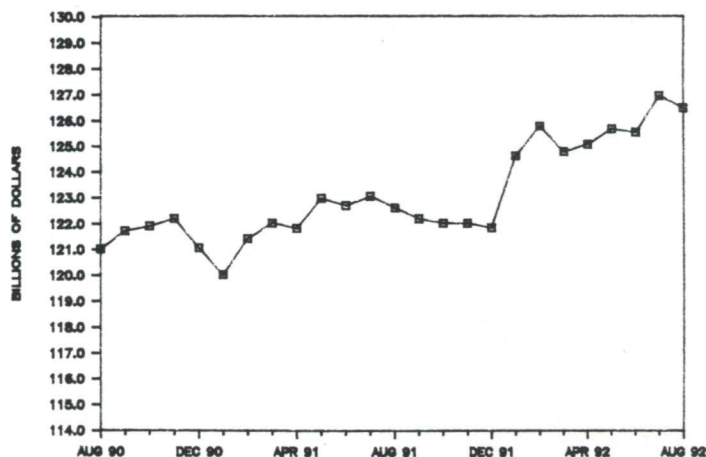
The decline in total retail sales was more than accounted for by a decline in sales of durable goods. The decline in durable goods was widespread, with all the major categories--building materials, automotive dealers, and furniture and home furnishings--registering declines. Sales of nondurable goods increased slightly.

The graphs below show that, following a large increase in January, retail sales have been on a slight upward trend with erratic month-to-month movements.

TOTAL RETAIL SALES



RETAIL SALES EX AUTOMOTIVE







THE CHAIRMAN

EXECUTIVE OFFICE OF THE PRESIDENT

COUNCIL OF ECONOMIC ADVISERS

WASHINGTON, D.C. 20500

September 15, 1992

MEMORANDUM FOR WHITE HOUSE SENIOR STAFF

FROM: MICHAEL J. BOSKIN *MJB*

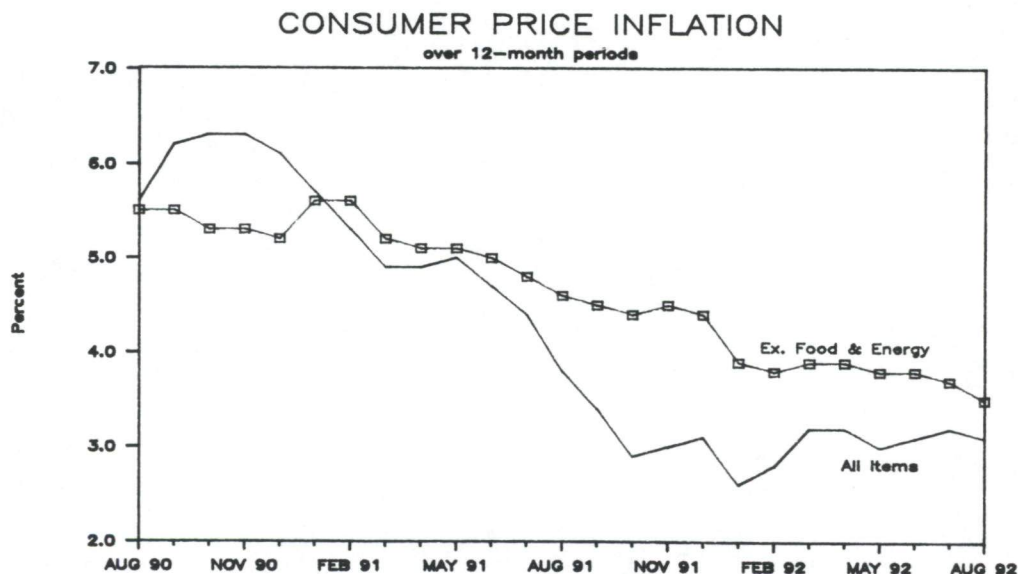
SUBJECT: Consumer Price Indexes for August, Labor  
Department Release, This Morning, 8:30 a.m.

Consumer prices rose 0.3 percent in August, a slightly higher increase than the 0.2 percent expected by private analysts. So far this year, consumer prices have been rising at an annual rate of 2.9 percent.

Core inflation--consumer price inflation excluding food and energy items--was 0.2 percent in August. So far this year, core inflation has been running at an annual rate of 3.4 percent. Over the past 12 months, core inflation was 3.5 percent, the lowest 12-month core inflation rate since August 1983.

Energy prices fell 0.2 percent in August with gasoline prices falling 1.2 percent. Food prices rose 0.9 percent, the largest increase in 2-1/2 years.

The graph below shows that consumer price inflation has been at relatively low levels for most of the past year. Core inflation has been on a downward trend for the past year and a half.



**PLEASE NOTE EMBARGO RESTRICTIONS**

**ECONOMIC SNAPSHOT FOR THE WEEK OF SEPTEMBER 14--18**

**September 15, 1992**

Today the Department of Labor reported that consumer prices rose 0.3 percent in August, bringing the inflation rate so far this year to 2.9 percent. Excluding the volatile food and energy components, inflation over the past year was 3.5 percent, the smallest 12-month increase in prices in 9 years. Separately, the Department of Commerce reported that retail sales took a surprising tumble in August; however, sales were revised up for July and June. Over the past 5 months, retail sales have been on a slight upward trend with erratic month-to-month movements.

Yesterday the stock and bond markets rallied on news of a cut in German interest rates. The Dow Jones industrial average soared 70 points, the largest increase since December.

Tomorrow the Federal Reserve will release data on industrial production for August; private analysts expect a moderate decline. On Thursday, the Commerce Department will report on the merchandise trade balance for July.

**DATA RELEASED THIS WEEK:**

**Consumer prices rose 0.3 percent in August, a slightly higher increase than the 0.2 percent expected by private analysts.** So far this year, consumer prices have been rising at an annual rate of 2.9 percent. Core inflation--consumer price inflation excluding food and energy items--was 0.2 percent in August. So far this year, core inflation has been running at an annual rate of 3.4 percent. Over the past 12 months, core inflation was 3.5 percent, the smallest 12-month core inflation rate since August 1983. **(Embargoed until 8:30 a.m., 9-15-92)**

**Retail sales fell 0.5 percent in August, a surprising decline as private analysts had expected retail sales to be unchanged from July.** However, sales in July were revised up to show a 1 percent increase rather than the previously reported 0.5 percent increase. **(Embargoed until 8:30 a.m., 9-15-92)**

**TO BE RELEASED THIS WEEK:**

| <b><u>Release</u></b>                                  | <b><u>Median Market Expectation</u></b> |
|--------------------------------------------------------|-----------------------------------------|
| Industrial Production (August)                         | -0.4 percent                            |
| Capacity Utilization (August)<br>(released 9-16-92)    | 78.5 percent                            |
| Merchandise Trade Balance (July)<br>(released 9-17-92) | -\$7.0 billion                          |



"Document Control"

TYPE: INFORMATION

DOCUMENT NUMBER: 9202871

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

\*\*\*\*\*

FROM: BRADY, Phillip: ASSISTANT TO THE PRESIDENT AND STAFF SECRETARY

TO: DR. D.A. BROMLEY

DATE OF  
CORRESPONDENCE: 09/11/92

SUBJECT: HE IS FORWARDING CEA NUMBERS FOR PRODUCER PRICE  
INDEXES AND A LABOR DEPARTMENT RELEASE.

\*\*\*\*\*  
DIRECTORATE STAFF  
ASSIGNED: ASSIGNED:

ACTION STAFF  
REQUIRED: ACTION:

\*\*\*\*\*  
SENDER'S DUE DATE:  
OSTP DUE DATE: STAFF DUE DATE  
DATE COMPLETED: DATE COMPLETED/DEPT:

\*\*\*\*\*  
COPIES TO: INDUSTRIAL

\*\*\*\*\*  
WHITE HOUSE TRACKING #: CONTACT PERSON:  
PHONE: EXT:  
REMARKS:

OSTP RECEIVED: 09/25/92 DEPT RECEIVED:  
FILE: P-EOP-WHITE HOUSE MEMORANDUM

CENTRAL FILES:

## WHITE HOUSE STAFFING MEMORANDUM

DATE: 9/11/92 ACTION/CONCURRENCE/COMMENT DUE BY: ----

SUBJECT: CEA NUMBERS -- PRODUCER PRICE INDEXES FOR AUGUST, LABOR DEPARTMENT RELEASE

|                | ACTION                   | FYI                                 |             | ACTION                   | FYI                                 |
|----------------|--------------------------|-------------------------------------|-------------|--------------------------|-------------------------------------|
| VICE PRESIDENT | <input type="checkbox"/> | <input type="checkbox"/>            | MCBRIDE     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BAKER          | <input type="checkbox"/> | <input type="checkbox"/>            | MOORE       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| SCOWCROFT      | <input type="checkbox"/> | <input checked="" type="checkbox"/> | MULLINS     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DARMAN         | <input type="checkbox"/> | <input type="checkbox"/>            | PETERSMEYER | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BATES          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | PORTER      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BRADY          | <input type="checkbox"/> | <input type="checkbox"/>            | PROVOST     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BROMLEY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ROSS        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| CALIO          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SMITH       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DEMAREST       | <input type="checkbox"/> | <input checked="" type="checkbox"/> | TUTWILER    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| FITZWATER      | <input type="checkbox"/> | <input type="checkbox"/>            | ZOELICK     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| GRAY           | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HOLIDAY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HORNER         | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |

## REMARKS:

For your information.

## RESPONSE:

PHILLIP D. BRADY  
 Assistant to the President  
 and Staff Secretary  
 Ext. 2702





THE CHAIRMAN

EXECUTIVE OFFICE OF THE PRESIDENT

COUNCIL OF ECONOMIC ADVISERS

WASHINGTON, D.C. 20500

September 11, 1992

2 SEP 11 A 8:34

MEMORANDUM FOR WHITE HOUSE SENIOR STAFF

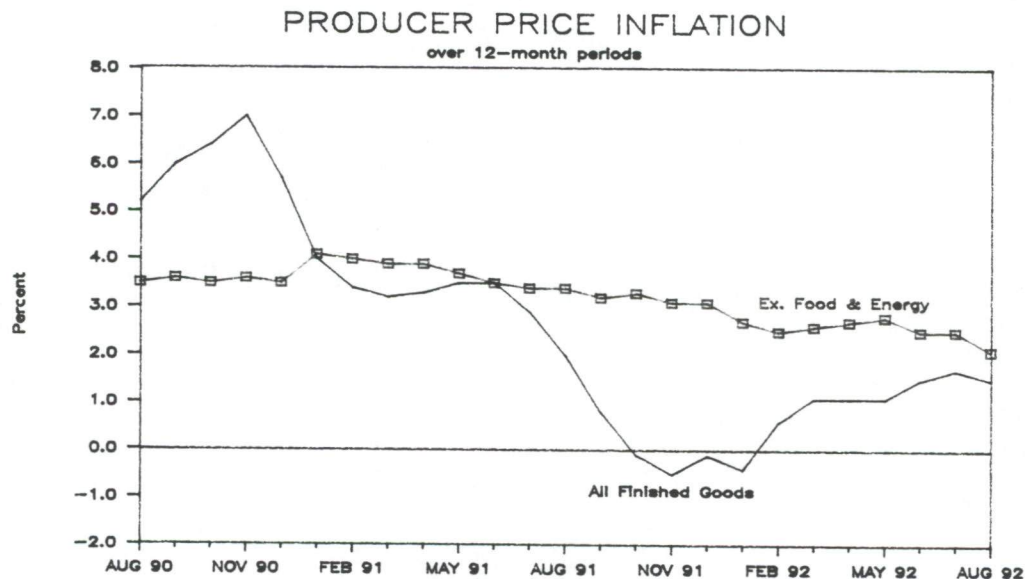
FROM: MICHAEL J. BOSKIN *mjb*

SUBJECT: Producer Price Indexes for August, Labor  
Department Release, This Morning, 8:30 a.m.

Producer prices for finished goods rose 0.1 percent in August after increasing 0.1 percent in July. Private analysts had expected an increase of 0.2 percent in August. Over the past 12 months, producer prices increased only 1.5 percent.

Prices of finished energy goods fell 0.1 percent in August, with gasoline prices falling 1.7 percent. Prices of finished foods increased 0.7 percent, due largely to an increase in prices of fresh fruits and vegetables. This is only the third increase in food prices in the past 16 months. Excluding food and energy items, producer prices fell 0.1 percent in August, bringing the increase over the past 12 months to 2.1 percent.

The graph below shows that producer price inflation flattened out recently after being on a mild upward trend for the first half of this year. Excluding food and energy items, producer price inflation has been on a downward trend for the past year and a half.



"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9202699  
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS  
\*\*\*\*\*

FROM: BRADY, PHILLIP D.: ASSISTANT TO THE PRESIDENT & STAFF SECRETARY

TO: DR. D.A. BROMLEY

DATE OF  
CORRESPONDENCE: 09/01/92

SUBJECT: CEA NUMBERS--JULY INDEX OF LEADING INDICATORS,  
COMMERCE DEPARTMENT RELEASE.

\*\*\*\*\*  
DIRECTORATE STAFF  
ASSIGNED: ASSIGNED:

ACTION STAFF  
REQUIRED: ACTION:

\*\*\*\*\*  
SENDER'S DUE DATE:  
OSTP DUE DATE: STAFF DUE DATE  
DATE COMPLETED: DATE COMPLETED/DEPT:

\*\*\*\*\*  
COPIES TO:  
INTERNATIONAL/POLICY

\*\*\*\*\*  
WHITE HOUSE TRACKING #: CONTACT PERSON:  
REMARKS: PHONE: EXT:

OSTP RECEIVED: 09/08/92 DEPT RECEIVED:  
FILE: P-WH STAFFING MEMO  
CENTRAL FILES:



# WHITE HOUSE STAFFING MEMORANDUM

DATE: 9/1/92 ACTION/CONCURRENCE/COMMENT DUE BY: -----  
SUBJECT: CEA NUMBERS -- JULY INDEX OF LEADING INDICATORS, COMMERCE DEPARTMENT RELEASE

|                | ACTION                              | FYI                                 |             | ACTION                   | FYI                                 |
|----------------|-------------------------------------|-------------------------------------|-------------|--------------------------|-------------------------------------|
| VICE PRESIDENT | <input type="checkbox"/>            | <input type="checkbox"/>            | MOORE       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BAKER          | <input type="checkbox"/>            | <input type="checkbox"/>            | MULLINS     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| SCOWCROFT      | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | PETERSMEYER | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DARMAN         | <input type="checkbox"/>            | <input type="checkbox"/>            | PORTER      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BRADY          | <input type="checkbox"/>            | <input type="checkbox"/>            | PROVOST     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BROMLEY        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | ROSS        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| CALIO          | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | SMITH       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DEMAREST       | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | TUTWILER    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| FITZWATER      | <input type="checkbox"/>            | <input type="checkbox"/>            | ZOELICK     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| GRAY           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HOLIDAY        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HORNER         | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| MCBRIDE        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |

REMARKS:

For your information.

RESPONSE:

PHILLIP D. BRADY  
Assistant to the President  
and Staff Secretary  
Ext. 2702



EXECUTIVE OFFICE OF THE PRESIDENT  
COUNCIL OF ECONOMIC ADVISERS  
WASHINGTON, D.C. 20500

THE CHAIRMAN

September 1, 1992

MEMORANDUM FOR WHITE HOUSE SENIOR STAFF

FROM: MICHAEL J. BOSKIN *MJB*  
SUBJECT: July Index of Leading Indicators, Commerce  
Department Release, This Morning, 8:30 a.m.

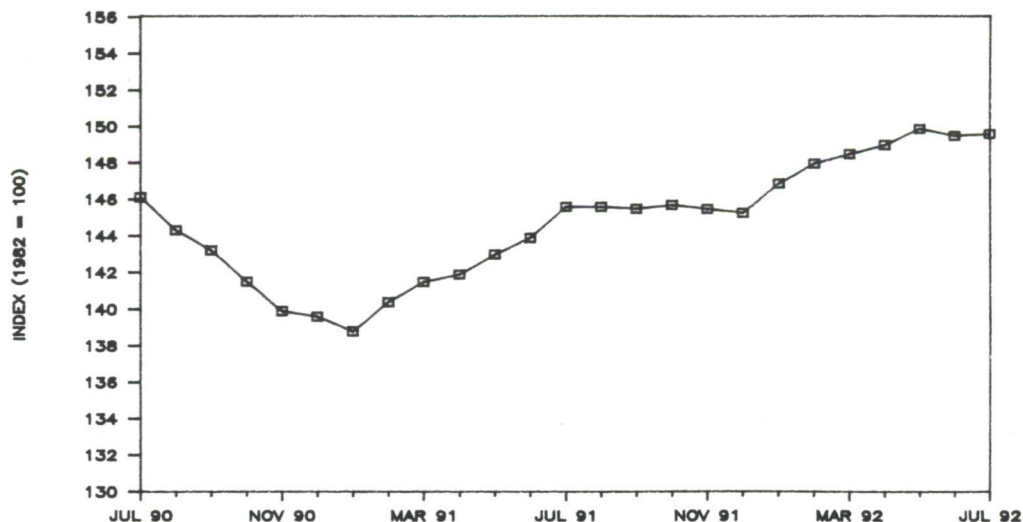
The index of leading indicators rose 0.1 percent in July, matching private analysts' expectations. The small increase followed a 0.3 percent decline in June.

In July, 5 of the 11 components contributed to the increase in the index. The largest contributions resulted from an increase in building permits and a decline in initial claims for unemployment insurance. Five of the 11 components had negative effects. The largest negative effects resulted from declines in unfilled orders for durable goods, sensitive materials prices, and consumer expectations.

The index of coincident indicators rose 0.2 percent in July--the largest increase since February. All of the available components--nonfarm payroll employment, personal income less transfers, and industrial production--made positive contributions to the index.

The graph below shows that the index of leading indicators has flattened out recently after increasing steadily for the first 5 months of this year. The gains earlier this year followed a flat period in the second half of last year.

LEADING ECONOMIC INDICATORS





**PLEASE NOTE EMBARGO RESTRICTIONS**

**ECONOMIC SNAPSHOT FOR THE WEEK OF AUGUST 31--SEPTEMBER 4**

**September 1, 1992**

The Department of Commerce reported today that the index of leading indicators--designed to show the likely future performance of the economy--rose slightly in July after falling in June. Private analysts had expected the small increase in July. The leading index has flattened out recently after increasing steadily for the first 5 months of this year.

Yesterday the Department of Commerce reported that sales of new single-family houses fell in July. The decline was a surprise, as private analysts had expected an increase. Despite the decline in July, sales of new houses have been on a slight upward trend over the past several months. The recent decline in mortgage rates and an increase in mortgage applications point to an increase in sales in coming months.

On Friday the Department of Labor will release data on the employment situation for August. Private analysts expect the unemployment rate to decline to 7.6 percent and nonfarm payroll employment to increase by 150,000.

**DATA RELEASED THIS WEEK:**

The index of leading indicators rose 0.1 percent in July, matching private analysts' expectations. The small increase followed a 0.3 percent decline in June. (Embargoed until 8:30 a.m., 9-1-92)

Sales of new single-family houses fell 2.6 percent in July to 563,000 units at an annual rate. Private analysts had expected a rate of sales of 588,000 in July.

**TO BE RELEASED THIS WEEK:**

**Release**

**Median Market Expectation**

Employment (August)  
(released 9-4-92)

Unemployment rate  
Nonfarm payroll jobs

7.6 percent  
+150,000

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9202717  
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS  
\*\*\*\*\*

FROM: BRADY, PHILLIP: ASSISTANT TO THE PRESIDENT & STAFF SECRETARY

TO: DR. D.A. BROMLEY

DATE OF  
CORRESPONDENCE: 09/03/92

SUBJECT: CEA NUMBERS--PRODUCTIVITY AND COSTS, SECOND QUARTER,  
LABOR DEPARTMENT RELEASE.

\*\*\*\*\*  
DIRECTORATE STAFF  
ASSIGNED: ASSIGNED:

ACTION STAFF  
REQUIRED: ACTION:

\*\*\*\*\*  
SENDER'S DUE DATE:  
OSTP DUE DATE: STAFF DUE DATE  
DATE COMPLETED: DATE COMPLETED/DEPT:

\*\*\*\*\*  
COPIES TO: D. Allan Bromley  
INDUSTRIAL  
Pierre Perrolle

\*\*\*\*\*  
WHITE HOUSE TRACKING #: CONTACT PERSON:  
REMARKS: PHONE: EXT:

OSTP RECEIVED: 09/08/92 DEPT RECEIVED:  
FILE: P-WH STAFFING MEMO  
CENTRAL FILES:



# WHITE HOUSE STAFFING MEMORANDUM

DATE: 9/3/92 ACTION/CONCURRENCE/COMMENT DUE BY: -----

SUBJECT: CEA NUMBERS -- PRODUCTIVITY AND COSTS, SECOND QUARTER, LABOR DEPARTMENT RELEASE

|                | ACTION                   | FYI                                 |             | ACTION                   | FYI                                 |
|----------------|--------------------------|-------------------------------------|-------------|--------------------------|-------------------------------------|
| VICE PRESIDENT | <input type="checkbox"/> | <input type="checkbox"/>            | MOORE       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BAKER          | <input type="checkbox"/> | <input type="checkbox"/>            | MULLINS     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| SCOWCROFT      | <input type="checkbox"/> | <input checked="" type="checkbox"/> | PETERSMEYER | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DARMAN         | <input type="checkbox"/> | <input type="checkbox"/>            | PORTER      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BRADY          | <input type="checkbox"/> | <input type="checkbox"/>            | PROVOST     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BROMLEY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ROSS        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| CALIO          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SMITH       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DEMAREST       | <input type="checkbox"/> | <input checked="" type="checkbox"/> | TUTWILER    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| FITZWATER      | <input type="checkbox"/> | <input type="checkbox"/>            | ZOELLICK    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| GRAY           | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HOLIDAY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HORNER         | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| MCBRIDE        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |

REMARKS:

For your information.

RESPONSE:

PHILLIP D. BRADY  
Assistant to the President  
and Staff Secretary  
Ext. 2702



EXECUTIVE OFFICE OF THE PRESIDENT

COUNCIL OF ECONOMIC ADVISERS

WASHINGTON, D.C. 20500

THE CHAIRMAN

September 3, 1992

MEMORANDUM FOR WHITE HOUSE SENIOR STAFF

FROM: MICHAEL J. BOSKIN *MJB*

SUBJECT: Productivity and Costs, Second Quarter, Labor Department Release, This Morning, 10:00 a.m.

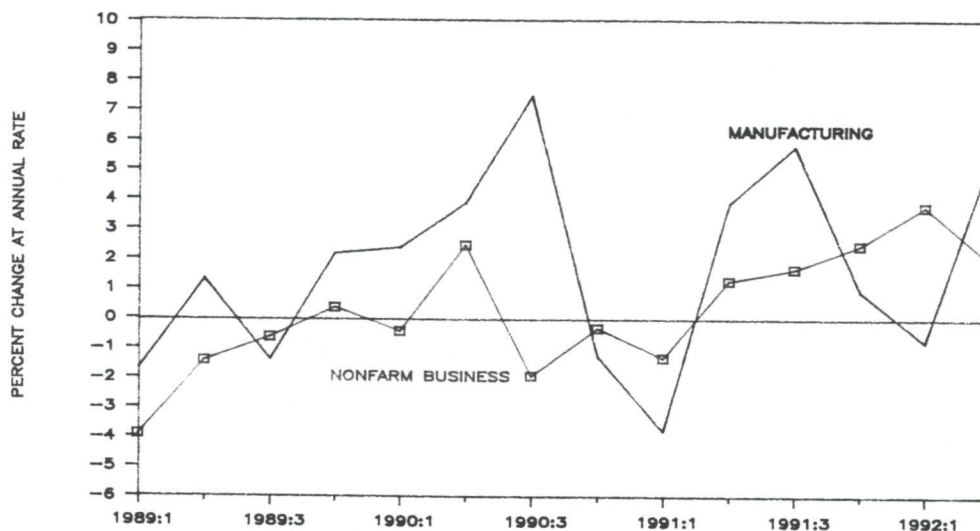
Productivity in the nonfarm business sector rose 2.0 percent at an annual rate in the second quarter, according to revised estimates. In the manufacturing sector, productivity surged at a 5.4 percent rate. The increases in productivity resulted almost entirely from increased output as hours worked were about unchanged.

In the second quarter, hourly compensation rose at an annual rate of 2.6 percent in the nonfarm business sector--the lowest rate of increase in 3 years. In the manufacturing sector, hourly compensation rose at an annual rate of 3.3 percent.

Over the past three quarters, unit labor costs--a measure of labor cost pressures on inflation--have increased on average by a slight 0.5 percent at an annual rate in the nonfarm business sector. The small increases in unit labor costs are a signal of continued low inflation.

The chart below shows that nonfarm business sector productivity has increased steadily for five consecutive quarters. Manufacturing productivity has been more volatile over the past five quarters, with two relatively flat quarters sandwiched between strong increases in the other three quarters.

CHANGES IN PRODUCTIVITY





PLEASE NOTE EMBARGO RESTRICTIONS

ECONOMIC SNAPSHOT FOR THE WEEK OF AUGUST 31--SEPTEMBER 4

September 3, 1992

The Department of Labor released revised estimates of productivity--output produced per hour worked--for the second quarter. The revised estimates show that productivity for nonfarm businesses increased for the fifth consecutive quarter. In manufacturing, productivity surged in the second quarter.

Earlier in the week, the Department of Commerce reported that the index of leading indicators--designed to show the likely future performance of the economy--rose slightly in July after falling in June. Private analysts had expected the small increase in July. The leading index has flattened out recently after increasing steadily for the first 5 months of this year. The Department of Commerce also reported that sales of new single-family houses fell in July. The decline was a surprise, as private analysts had expected an increase. Despite the decline in July, sales of new houses have been on a slight upward trend over the past several months. The recent decline in mortgage rates and an increase in mortgage applications point to an increase in sales in coming months.

On Friday the Department of Labor will release data on the employment situation for August. Private analysts expect the unemployment rate to decline to 7.6 percent and nonfarm payroll employment to increase by 150,000.

DATA RELEASED THIS WEEK:

Productivity in the nonfarm business sector rose 2.0 percent at an annual rate in the second quarter according to revised estimates. In the manufacturing sector, productivity surged at a 5.4 percent rate. The increases in productivity resulted almost entirely from increased output as hours worked were about unchanged. (Embargoed until 10:00 a.m., 9-3-92)

The index of leading indicators rose 0.1 percent in July, matching private analysts' expectations. The small increase followed a 0.3 percent decline in June.

Sales of new single-family houses fell 2.6 percent in July to 563,000 units at an annual rate. Private analysts had expected a rate of sales of 588,000 in July.

TO BE RELEASED THIS WEEK:

Release

Employment (August)  
(released 9-4-92)

Unemployment rate  
Nonfarm payroll jobs

Median Market Expectation

7.6 percent  
+150,000

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9202718  
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS  
\*\*\*\*\*

FROM: BRADY, PHILLIP: ASSISTANT TO THE PRESIDENT & STAFF SECRETARY

TO: DR. D.A. BROMLEY

DATE OF  
CORRESPONDENCE: 09/04/92

SUBJECT: CEA NUMBERS--EMPLOYMENT AND UNEMPLOYMENT IN AUGUST,  
LABOR DEPARTMENT RELEASE.

\*\*\*\*\*  
DIRECTORATE STAFF  
ASSIGNED: ASSIGNED:

ACTION STAFF  
REQUIRED: ACTION:

\*\*\*\*\*  
SENDER'S DUE DATE:  
OSTP DUE DATE: STAFF DUE DATE  
DATE COMPLETED: DATE COMPLETED/DEPT:

\*\*\*\*\*  
COPIES TO: D. Allan Bromley  
INTERNATIONAL/POLICY  
INDUSTRIAL

\*\*\*\*\*  
WHITE HOUSE TRACKING #: CONTACT PERSON:  
REMARKS: PHONE: EXT:

OSTP RECEIVED: 09/04/92 DEPT RECEIVED:  
FILE: P-WH STAFFING MEMO  
CENTRAL FILES:



# WHITE HOUSE STAFFING MEMORANDUM

DATE: 9/4/92 ACTION/CONCURRENCE/COMMENT DUE BY: ----

SUBJECT: CEA NUMBERS -- EMPLOYMENT AND UNEMPLOYMENT IN AUGUST, LABOR DEPARTMENT RELEASE

|                | ACTION                   | FYI                                 |             | ACTION                   | FYI                                 |
|----------------|--------------------------|-------------------------------------|-------------|--------------------------|-------------------------------------|
| VICE PRESIDENT | <input type="checkbox"/> | <input type="checkbox"/>            | MCBRIDE     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BAKER          | <input type="checkbox"/> | <input type="checkbox"/>            | MOORE       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| SCOWCROFT      | <input type="checkbox"/> | <input checked="" type="checkbox"/> | MULLINS     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DARMAN         | <input type="checkbox"/> | <input type="checkbox"/>            | PETERSMEYER | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BATES          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | PORTER      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BRADY          | <input type="checkbox"/> | <input type="checkbox"/>            | PROVOST     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BROMLEY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ROSS        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| CALIO          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SMITH       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DEMAREST       | <input type="checkbox"/> | <input checked="" type="checkbox"/> | TUTWILER    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| FITZWATER      | <input type="checkbox"/> | <input type="checkbox"/>            | ZOELLICK    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| GRAY           | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HOLIDAY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HORNER         | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |

REMARKS:

For your information.

RESPONSE:

PHILLIP D. BRADY  
Assistant to the President  
and Staff Secretary  
Ext. 2702



EXECUTIVE OFFICE OF THE PRESIDENT  
COUNCIL OF ECONOMIC ADVISERS  
WASHINGTON, D.C. 20500

THE CHAIRMAN

September 4, 1992

MEMORANDUM FOR WHITE HOUSE SENIOR STAFF

FROM: MICHAEL J. BOSKIN *mjb*  
SUBJECT: Employment and Unemployment in August, Labor  
Department Release, This Morning, 8:30 a.m.

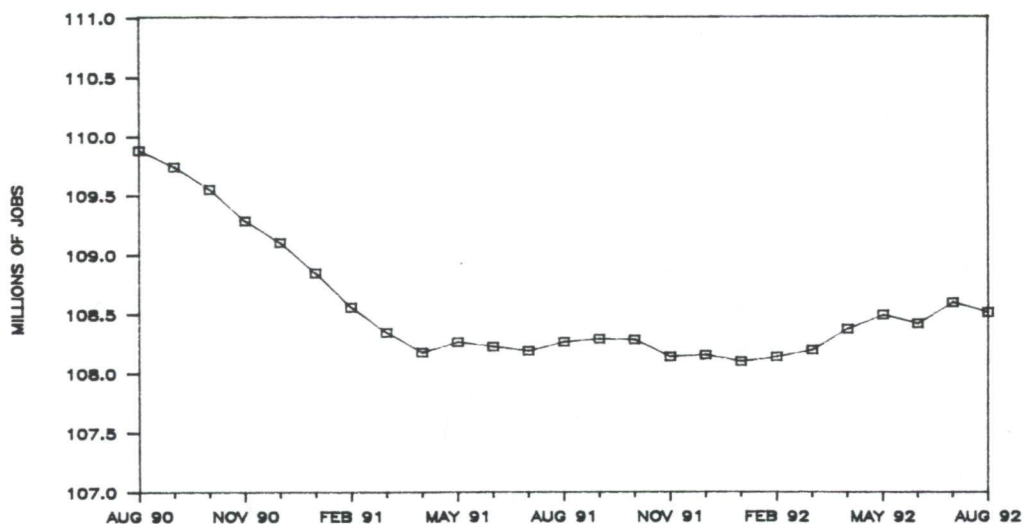
The civilian unemployment rate fell to 7.6 percent in August from 7.7 percent in July. The decline matched private analysts' expectations.

The number of nonfarm payroll jobs fell 83,000 in August. The decline in payroll jobs was a surprise as private analysts had expected an increase of 150,000. Goods-producing employment fell by 108,000, the 27th decline in the past 30 months. Service-producing employment rose by 25,000. However, the increase was more than accounted for by the summer-jobs-induced increase in government employment; employment in retail trade fell sharply.

Average weekly hours for private nonfarm production workers rose to 34.7 hours in August from 34.3 hours in July. Aggregate weekly hours also increased, indicating that those with jobs worked sufficiently longer workweeks to more than offset the decline in employment.

Average hourly earnings of production workers increased 0.7 percent in August, the largest increase since February 1990. The increases in hours and in hourly earnings point to a much-needed boost to income from wages and salaries.

NONFARM PAYROLL EMPLOYMENT





**PLEASE NOTE EMBARGO RESTRICTIONS**

**ECONOMIC SNAPSHOT FOR THE WEEK OF AUGUST 31--SEPTEMBER 4**

**September 4, 1992**

Today the Department of Labor reported that the unemployment rate fell to 7.6 percent in August from 7.7 percent in July. However, nonfarm payroll employment fell by 83,000 jobs--a surprise to private analysts, who had expected a gain of 150,000. On the plus side, aggregate weekly hours increased and average hourly earnings increased, indicating that income from wages and salaries received a much-needed boost. The data in the release confirm that the economy continues to experience sluggish growth with little improvement in labor markets.

Yesterday the Department of Labor released revised estimates of productivity for the second quarter. The revised estimates show that productivity for nonfarm businesses increased for the fifth consecutive quarter. In manufacturing, productivity surged in the second quarter. Earlier in the week, the Department of Commerce reported that the index of leading indicators--designed to show the likely future performance of the economy--rose slightly in July after falling in June. Private analysts had expected the small increase in July. The leading index has flattened out recently after increasing steadily for the first 5 months of this year. The Department of Commerce also reported that sales of new single-family houses fell in July. The decline was a surprise, as private analysts had expected an increase. Despite the decline in July, sales of new houses have been on a slight upward trend over the past several months. The recent decline in mortgage rates and an increase in mortgage applications point to an increase in sales in coming months.

**DATA RELEASED THIS WEEK:**

**The civilian unemployment rate fell to 7.6 percent in August from 7.7 percent in July.** The decline matched private analysts' expectations. The number of nonfarm payroll jobs fell 83,000 in August. The decline in payroll jobs was a surprise as private analysts had expected an increase of 150,000. **(Embargoed until 8:30 a.m., 9-4-92)**

**Productivity in the nonfarm business sector rose 2.0 percent at an annual rate in the second quarter according to revised estimates.** In the manufacturing sector, productivity surged at a 5.4 percent rate. The increases in productivity resulted almost entirely from increased output as hours worked were about unchanged.

**The index of leading indicators rose 0.1 percent in July, matching private analysts' expectations.** The small increase followed a 0.3 percent decline in June.

**Sales of new single-family houses fell 2.6 percent in July to 563,000 units at an annual rate.** Private analysts had expected a rate of sales of 588,000 in July.

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9202716  
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS  
\*\*\*\*\*

FROM: BRADY, PHILLIP D.: ASSISTANT TO THE PRESIDENT & STAFF SECRETARY

TO: DR. D.A. BROMLEY

DATE OF  
CORRESPONDENCE: 08/28/92

SUBJECT: CEA NUMBERS-- JULY PERSONAL INCOME AND OUTLAYS,  
COMMERCE DEPARTMENT RELEASE.

\*\*\*\*\*  
DIRECTORATE STAFF  
ASSIGNED: ASSIGNED:

ACTION STAFF  
REQUIRED: ACTION:

\*\*\*\*\*  
SENDER'S DUE DATE:  
OSTP DUE DATE: STAFF DUE DATE  
DATE COMPLETED: DATE COMPLETED/DEPT:

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COPIES TO: D. Allan Bromley  
INDUSTRIAL

\*\*\*\*\*  
WHITE HOUSE TRACKING #: CONTACT PERSON:  
REMARKS: PHONE: EXT:

OSTP RECEIVED: 08/30/92 DEPT RECEIVED:  
FILE: P-WH STAFFING MEMO  
CENTRAL FILES:



2716

Document No. \_\_\_\_\_

## WHITE HOUSE STAFFING MEMORANDUM

DATE: 8/28/92 ACTION/CONCURRENCE/COMMENT DUE BY: -----  
SUBJECT: CEA NUMBERS -- JULY PERSONAL INCOME AND OUTLAYS, COMMERCE DEPARTMENT RELEASE

|                | ACTION                   | FYI                                 |             | ACTION                   | FYI                                 |
|----------------|--------------------------|-------------------------------------|-------------|--------------------------|-------------------------------------|
| VICE PRESIDENT | <input type="checkbox"/> | <input type="checkbox"/>            | MOORE       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BAKER          | <input type="checkbox"/> | <input type="checkbox"/>            | MULLINS     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| SCOWCROFT      | <input type="checkbox"/> | <input checked="" type="checkbox"/> | PETERSMEYER | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DARMAN         | <input type="checkbox"/> | <input type="checkbox"/>            | PORTER      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BRADY          | <input type="checkbox"/> | <input type="checkbox"/>            | PROVOST     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BROMLEY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ROSS        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| CALIO          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SMITH       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DEMAREST       | <input type="checkbox"/> | <input checked="" type="checkbox"/> | TUTWILER    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| FITZWATER      | <input type="checkbox"/> | <input type="checkbox"/>            | ZOELLICK    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| GRAY           | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HOLIDAY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| HORNER         | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |
| MCBRIDE        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____       | <input type="checkbox"/> | <input type="checkbox"/>            |

REMARKS:

For your information.

RESPONSE:

PHILLIP D. BRADY  
Assistant to the President  
and Staff Secretary  
Ext. 2702



THE CHAIRMAN

# EXECUTIVE OFFICE OF THE PRESIDENT

COUNCIL OF ECONOMIC ADVISERS

WASHINGTON, D.C. 20500

August 28, 1992

## MEMORANDUM FOR WHITE HOUSE SENIOR STAFF

FROM: MICHAEL J. BOSKIN *mjb*

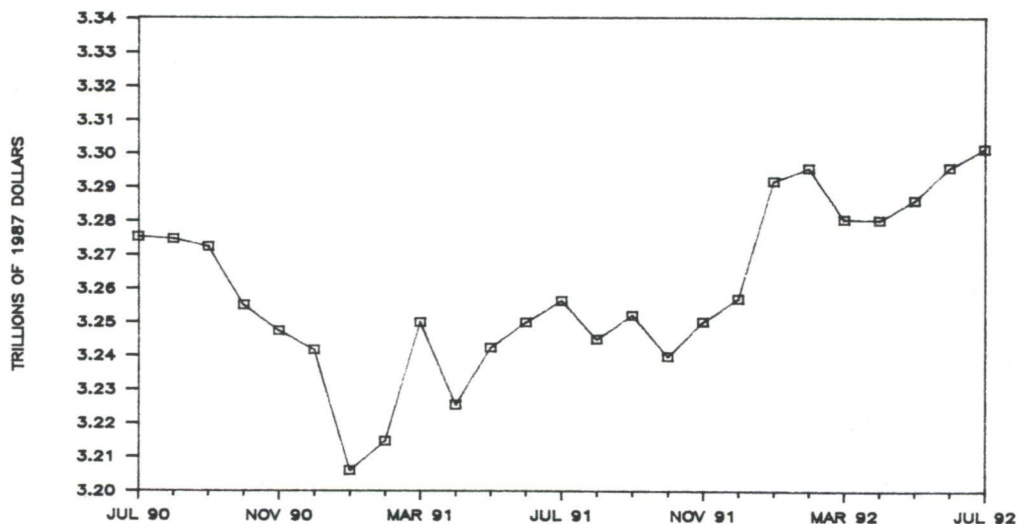
SUBJECT: July Personal Income and Outlays, Commerce  
Department Release, This Morning, 10:00 a.m.

Personal income increased 0.2 percent in July, the sixth consecutive monthly increase. Private analysts had expected a 0.3 percent increase in July. Real disposable personal income--income adjusted for inflation and taxes--increased 0.1 percent in July after being flat in June.

Consumer spending adjusted for inflation rose 0.2 percent in July, the third consecutive monthly increase. Spending increased for nondurable goods and services, but fell for durable goods. The decline in spending on durable goods was more than accounted for by decreased purchases of motor vehicles.

The graph below shows that real consumer spending has been on an upward trend in recent months following a weak period at the end of the first quarter. The recent gains in consumer spending indicate that the economy was growing at a moderate rate entering the third quarter.

REAL PERSONAL CONSUMPTION EXPENDITURES





**PLEASE NOTE EMBARGO RESTRICTIONS**

**ECONOMIC SNAPSHOT FOR THE WEEK OF AUGUST 24--28**

**August 28, 1992**

Today the Department of Commerce reported that personal income and spending increased in July. Consumer spending adjusted for inflation rose for the third consecutive month. The recent gains in consumer spending indicate that the economy was growing at a moderate rate entering the third quarter.

Yesterday the Department of Commerce released its (revised) preliminary estimates of GDP for the second quarter of this year. The estimates show that the economy grew at a 1.4 percent annual rate--the same rate as estimated in last month's advance release. Private analysts had expected a small upward revision. With the increase in the second quarter, real GDP has increased for five consecutive quarters, but at a slow and uneven pace. Separately, the Department of Labor reported that initial claims for unemployment insurance fell significantly, to their lowest level since October 1990. Earlier in the week the Department of Commerce reported that new orders for manufactured durable goods decreased 3.4 percent in July. New orders for transportation equipment fell sharply, more than accounting for the total decline. Most of the decline was for aircraft and parts. Shipments of durable goods fell slightly. Private analysts had expected a better report, with new orders rising. The decline in orders and shipments shows that the manufacturing sector continues to struggle.

**DATA RELEASED THIS WEEK:**

**Personal income increased 0.2 percent in July, the sixth consecutive monthly increase.** Real disposable personal income--income adjusted for inflation and taxes--increased 0.1 percent in July after being flat in June. Consumer spending adjusted for inflation rose 0.2 percent in July, the third consecutive monthly increase. **(Embargoed until 10:00 a.m., 8-28-92)**

**Real GDP rose 1.4 percent at an annual rate in the second quarter of 1992, according to revised estimates released by the Department of Commerce.** The estimate of real GDP growth was unchanged from last month's preliminary release. Private analysts had expected a small upward revision to a 1.6 percent rate of growth.

**Initial claims for unemployment insurance fell to 382,000 for the week ending August 15.**

**New orders for durable goods fell 3.4 percent in July, after increasing 2.8 percent in June.** The large decline in new orders in July is a surprise; private analysts had expected an increase of 0.5 percent.

"Document Control"

TYPE: INFORMATION DOCUMENT NUMBER: 9202738  
ORIGINATOR: 02 STATUS C DIRECTORATE STATUS  
\*\*\*\*\*

FROM: BRADY, PHILLIP: ASSISTANT TO THE PRESIDENT & STAFF SECRETARY

TO: DR. D.A. BROMLEY

DATE OF  
CORRESPONDENCE: 08/26/92

SUBJECT: CEA NUMBERS--ADVANCE DURABLE GOODS IN JULY, COMMERCE  
DEPARTMENT RELEASE.

\*\*\*\*\*  
DIRECTORATE STAFF  
ASSIGNED: ASSIGNED:

ACTION STAFF  
REQUIRED: ACTION:

\*\*\*\*\*  
SENDER'S DUE DATE:  
OSTP DUE DATE: STAFF DUE DATE  
DATE COMPLETED: DATE COMPLETED/DEPT:

\*\*\*\*\*  
COPIES TO: INDUSTRIAL  
D. Allan Bromley  
Pierre Perrolle

\*\*\*\*\*  
WHITE HOUSE TRACKING #: CONTACT PERSON:  
REMARKS: PHONE: EXT:

OSTP RECEIVED: 09/03/92 DEPT RECEIVED:  
FILE: P-WH STAFFING MEMO  
CENTRAL FILES:



WHITE HOUSE STAFFING MEMORANDUM

DATE: 8/26/92 ACTION/CONCURRENCE/COMMENT DUE BY: -----  
SUBJECT: CEA NUMBERS -- ADVANCE DURABLE GOODS IN JULY, COMMERCE DEPARTMENT RELEASE

|                | ACTION                   | FYI                                 |             | ACTION                   | FYI                                 |
|----------------|--------------------------|-------------------------------------|-------------|--------------------------|-------------------------------------|
| VICE PRESIDENT | <input type="checkbox"/> | <input type="checkbox"/>            | MOORE       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BAKER          | <input type="checkbox"/> | <input type="checkbox"/>            | MULLINS     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| SCOWCROFT      | <input type="checkbox"/> | <input checked="" type="checkbox"/> | PETERSMEYER | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DARMAN         | <input type="checkbox"/> | <input type="checkbox"/>            | PORTER      | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BRADY          | <input type="checkbox"/> | <input type="checkbox"/>            | PROVOST     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BROMLEY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> | ROSS        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| CALIO          | <input type="checkbox"/> | <input checked="" type="checkbox"/> | SMITH       | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| DEMAREST       | <input type="checkbox"/> | <input checked="" type="checkbox"/> | TUTWILER    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| FITZWATER      | <input type="checkbox"/> | <input type="checkbox"/>            | ZOELICK     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| GRAY           | <input type="checkbox"/> | <input checked="" type="checkbox"/> |             | <input type="checkbox"/> | <input type="checkbox"/>            |
| HOLIDAY        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |             | <input type="checkbox"/> | <input type="checkbox"/>            |
| HORNER         | <input type="checkbox"/> | <input checked="" type="checkbox"/> |             | <input type="checkbox"/> | <input type="checkbox"/>            |
| MCBRIDE        | <input type="checkbox"/> | <input checked="" type="checkbox"/> |             | <input type="checkbox"/> | <input type="checkbox"/>            |

REMARKS:  
  
For your information.

RESPONSE:

PHILLIP D. BRADY  
Assistant to the President  
and Staff Secretary  
Ext. 2702



THE CHAIRMAN

EXECUTIVE OFFICE OF THE PRESIDENT

COUNCIL OF ECONOMIC ADVISERS

WASHINGTON, D.C. 20500

August 26, 1992

2 AUG 26 A 8:52

MEMORANDUM FOR WHITE HOUSE SENIOR STAFF

FROM: MICHAEL J. BOSKIN *mjb*

SUBJECT: Advance Durable Goods in July, Commerce Department Release, This Morning, 8:30 a.m.

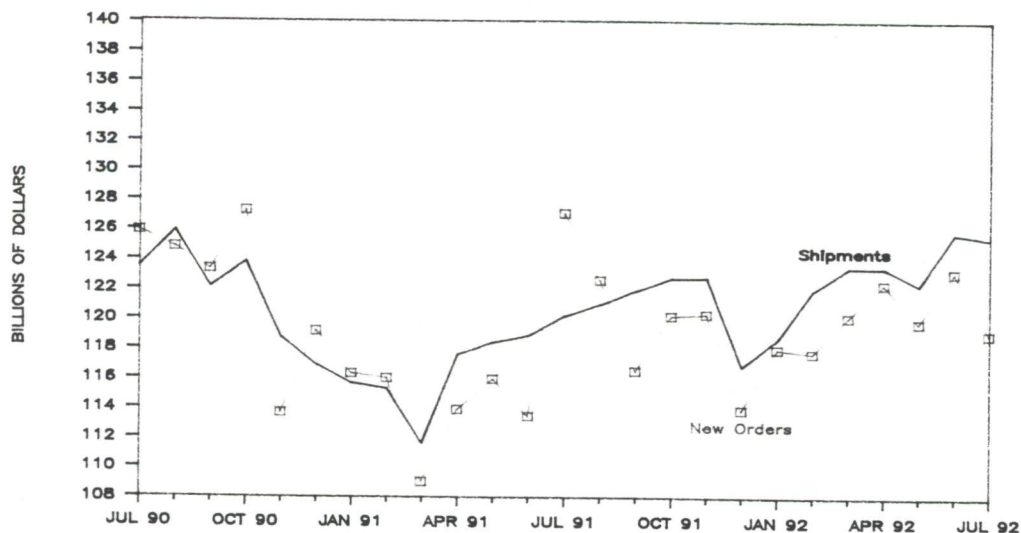
New orders for durable goods fell 3.4 percent in July, after increasing 2.8 percent in June. The large decline in new orders in July is a surprise; private analysts had expected an increase of 0.5 percent.

The decline in new orders for transportation equipment--at 15.2 percent--was particularly steep, and more than accounted for the total decline in new orders. New orders for defense capital goods also fell sharply, by 26.4 percent.

Shipments of durable goods fell a slight 0.3 percent in July, after increasing 2.9 percent in June. Shipments of nondefense capital goods--a key measure of durable equipment investment--fell 0.4 percent in July, after surging 7.3 percent in June.

The graph below shows that new orders for durable goods have been volatile over the past year and have shown no clear trend. Aside from a decline in December of last year, shipments generally have been increasing, establishing an upward trend from their recession low.

DURABLE GOODS ORDERS & SHIPMENTS





**PLEASE NOTE EMBARGO RESTRICTIONS**

**ECONOMIC SNAPSHOT FOR THE WEEK OF AUGUST 24--28**

**August 26, 1992**

The Department of Commerce reported today that new orders for manufactured durable goods decreased 3.4 percent in July. New orders for transportation equipment fell sharply, more than accounting for the total decline. Most of the decline was for aircraft and parts. Shipments of durable goods fell slightly. Private analysts had expected a better report, with new orders rising. The decline in orders and shipments shows that the manufacturing sector continues to struggle.

Tomorrow the Department of Commerce will release revised estimates of gross domestic product for the second quarter. Private analysts expect a slight upward revision from the advance estimate of real growth at a 1.4 percent annual rate. On Friday, the Department of Commerce will report on personal income and spending for July; private analysts expect that income and spending rose.

**DATA RELEASED THIS WEEK:**

**New orders for durable goods fell 3.4 percent in July, after increasing 2.8 percent in June.** The large decline in new orders in July is a surprise; private analysts had expected an increase of 0.5 percent. Shipments of durable goods fell a slight 0.3 percent in July, after increasing 2.9 percent in June. Shipments of nondefense capital goods--a key measure of durable equipment investment--fell 0.4 percent in July, after surging 7.3 percent in June. **(Embargoed until 8:30 a.m., 8-26-92)**

**TO BE RELEASED THIS WEEK:**

| <b><u>Release</u></b>                               | <b><u>Median Market Expectation</u></b> |
|-----------------------------------------------------|-----------------------------------------|
| 2nd Quarter GDP (preliminary)<br>(released 8-27-92) | 1.6 percent                             |
| Personal Income (July)<br>(released 8-28-92)        |                                         |
| Income                                              | 0.3 percent                             |
| Spending                                            | 0.4 percent                             |