NEXT

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The Presidential Statement reads: "The Commission will focus its attention on government and private sector actions, specifically:

- Identifying the problems and opportunities for the private sector to transform new knowledge and innovations into commercial products, services, and manufacturing processes.

- Recommending policy changes at all levels of government to improve the private sector's ability to compete in the international marketplace and to maintain and create opportunities for American workers."

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PRESIDENT'S COMMISSION ON INDUSTRIAL COMPETITIVENESS

The President's Commission on Industrial Competitiveness at its meeting of October 24, 1984 received this report and formally recommended:

That note be taken of the significant role that state/local governments and entrepreneurs are playing in improving the competitiveness of U.S. Industry in world markets and, with a framework to exchange innovative ideas, state governments should continue to exercise initiatives in this field. Also, where appropriate, federal policy dealing with competitiveness take note of this role by states and the entrepreneurial movement.

FOREWORD

Rapidly changing technologies and a loss in productivity growth are major causes for the acute international competition the United States faces today. As quickly as a given technology is developed and its consequent product marketed, a new more efficient technology is designed making the former obsolete—a business is less competitive and the nation's output suffers. In light of this changing environment, any response designed to improve U.S. competitiveness must be flexible and immediate. Two related and emerging movements in the U.S. indicate that such a response is in the making. States are developing their own innovative industrial strategies and entrepreneurial activity is rapidly expanding, both serving to foster adaptation to technological change in a timely manner.

These observations and the encouragement of a fellow Commissioner, Bruno Mauer, led me to propose to our Chairman John Young that our Commission spend more time studying these responses. As a result, the Task Force on State and Local Government Initiatives was established and, with the excellent staff support from the Commission, we set forth to examine more closely the new development activities at the State level and the recent surge in entrepreneurial activity. Here we provide you the result of our study on the entrepreneurial movement. Another study, "Innovations in Industrial Competitiveness at the State Level," is available under a separate cover.

The entrepreneur has long been part of the American economic scene. A surge in the entrepreneurial movement in the late nineteenth century is credited with making America a world industrial power. Statistics show that job creation in the past several decades has come from small business start-ups and expansion.

This report, in chronicling the causes and impact of current entrepreneurial activity, has drawn on several sources. We started with a conference I organized in Boston in July for an initial exploration into this area. Attended by nationally known experts in this field, the conferees provided testimony that was then synthesized and remarked upon by Dr. Ian MacMillan and his staff at the Center for Entrepreneurial Studies at New York University. They conducted further research into issues raised by conferees, and those findings are a major part of this report. As a third step, the report was offered for critiqués to Dr. Bruce Merrifield, Assistant Secretary of Commerce for Productivity, Technology, and Innovation, and a group of public and private sector experts assembled by him. Many of their observations and findings are also incorporated into this report. The conclusions stem from all three activities. We believe this report represents a major contribution to the understanding of the dynamics of the nation's economy.

I am most grateful to The Boston Company and its parent, Shearson Lehman/American Express Inc, for providing the facilities at which the conference convened. I am also grateful to the American Express Company for underwriting the preparation and printing of this document. And I thank Bruno Mauer for his scholarly contributions and his inimitable enthusiasm. Judith Ugelow, my assistant, and J.D. Young, the Deputy Director of the Commission, were invaluable in their rotating roles of coordinator, consultant, and editor. To all mentioned, and the unnamed others, I am indebted.

Edward V. Regan

December 1984

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ENTREPRENEURSHIP AND ITS IMPACT ON THE U.S. ECONOMY

INTRODUCTION: STRUCTURE AND PURPOSE OF THIS REPORT.

In this decade there has been a burst of entrepreneurial spirit in the U.S. A wave of new initiatives, new business, new opportunities, and resulting new jobs is surging through the economy, and firing the imagination of the nation. There is a question as to what can be done to maintain the momentum and the spirit of enthusiasm that the current entrepreneurial thrust has engendered, to ensure that its benefits continue to spread and uplift the entire U.S. community. In the spirit of exploring the issues, a publicly-held Special Conference was organized by Mr. Regan, and co-chaired by Mr. Regan and Mr. Mauer. The title of the conference was "Entrepreneurship and its Impact on the American Economy".

The purpose of the Conference was to invite experts in the field to raise issues, air concerns, and express viewpoints that related to the role of entrepreneurship in the U.S. The major focus was to be on high technology start-ups because it was felt that high technology businesses have greater impact on productivity and international competitiveness and were therefore more within the charter of the President's Commission. In the interest of spontaneity, this expert input was deliberately to be kept unstructured so that it could be used as a driver for subsequent systematic analyses of the major themes that emerged from the Conference. The results of these systematic analyses were then presented to a second group of experts—people already implementing much of what was discussed at the Conference, and whose input would shape the final recommendations of the report. The overall objective was to develop an agenda of specific areas that need attention if entrepreneurial activity and its benefits are to be sustained in the U.S. This document reports the results of the three step process.

Mr. Regan, in selecting the conference participants, took care to choose experts who represent a wide array of opinion, as can be seen from the following list of participants:

KARL H. VESPER is a Professor of Business Administration, of Mechanical Engineering and is Chairman of the Management and Organization Department at the University of Washington.

GEORGE GILDER is the author of numerous books about economic activity and growth.

MICHAEL A. CARPENTER is Vice President of Corporate Business Development and Planning at General Electric Corporation.

JOSEPH L. PARKINSON is founder and President of Micron Technology, Inc. Boise, Idaho, a manufacturer of Dynamic Random Access Memory computer chips.

CRAIG L. BURR is a General Partner at Burr, Egan, Deleage & Co. of Boston, one of the larger established venture capital firms in the country.

ROSABETH MOSS KANTER is Professor of Sociology and of Organization and Management in the School of Management at Yale University. She founded the international management consulting firm Goodmeasure Inc.

JACK KEMP is the Congressman to the House of Representatives from the 31st District in New York and has held this position since 1970. He is the Chairman of the House Republican Conference.

BRIAN TURNER is Director of Legislation and Economic Policy at the Industrial Union Department of the AFL-CIO.

HOWARD H. STEVENSON is the Sarofim-Rock Professor of Business Administration at the Harvard Business School.

HERBERT F. TRADER is Vice President of Urban and Rural Ventures for Control Data Corporation, and is responsible for that company's job creation service divisions.

Participants in the second round were from an equally broad spectrum of opinion, as can be seen from the following list of attendees:

BRUCE MERRIFIELD is Assistant Secretary of Commerce for Productivity, Technology and Innovation.

DONALD BEILMAN is President of the Microelectronics Center of North Carolina.

JACK WILLIAMS is Director of the Office of Productivity, Technology and Innovation at the Department of Commerce.

HENRY CHAUNCEY is President of the Science Park Development Corporation, Connecticut.

LISA BAKER represented the American Business Conference.

FRANK SWAIN is the Chief Counsel for Advocacy of the Small Business Administration.

JOHN K.L. THOMPSON is the President of Lumley Associates.

HUGH S. BRADY is the Director of the National Association of Manufacturers.

ED HODGINS represented the American Heritage Foundation.

This report is structured in such a way as to preserve the spontaneity of the participant's contributions by presenting key inputs to the Conference verbatim. However their discussions have been reordered around the three major themes that emerged from the Conference. After each discussion section has been presented, there follows the analysis and conclusions section that was precipitated by the discussion. This means that readers wishing to review the main conclusions of the report can skip directly to each analysis and conclusion section.

This report is organized around the following three themes.

1. ENTREPRENEURSHIP IN THE U.S. TODAY

a) What is the current prevalence of entrepreneurial effort, and what are the causes for this current prevalence?

b) To what extent is entrepreneurship uniquely a U.S. phenomonen compared to its major economic competitors?

c) What are the benefits and costs of entrepreneurship?

2. ENCOURAGING ENTREPRENEURSHIP IN LARGE FIRMS

What initiatives could be undertaken to encourage more entrepreneurial behavior in large corporations?

3. ENCOURAGING ENTREPRENEURIAL START-UPS

What initiatives could be undertaken to encourage independent and small company entrepreneurship?

CONFERENCE DISCUSSION: ENTREPRENEURSHIP IN THE U.S. TODAY

MR. GILDER: This is the most entrepreneurial economy of the post war era. Between the time of the capital gains tax cut of 1978 and today, the number of new business starts, for example, rose from 280,000 to 530,000 at an annual rate. This is seven times the rate of business starts of the 1950s and three times the rate of business starts of the early 1960s.

There has been a 60 percent rise in companies listed over the counter in the last four years and a 20 times rise in new public offerings to a level of 10.1 billion. Leading this investment surge was a surge in investments in producers' durable equipment, led by electronics. These capital investment figures leave out some of the most important capital—software—which has made it possible for the United States to regain the world lead in the application of high technology.

The venture capital market had an unprecedented explosion. Commitments to venture capital funds rose to a level of 4.1 billion in 1983.

The GAO recently did a study of 72 companies that were started with some $209 million of venture capital after the tax cut of 1978. GAO found that these 72 companies produced 350,000 new jobs directly, $450 million of new government revenue, and $900 million of exports. This only reflects direct and immediate effects of the new companies that have been launched as a result of this legislation.

MR. STEVENSON: Over the past 30 years, we've decided as a social policy that we need to create opportunities for a lot more people. As we have added perhaps twice as many people into the work force who need opportunity, we've had to find a way to create more opportunity for individuals without using the same amount of resources per unit of opportunity. I think this is where the demand for entrepreneurship comes in: one of the characteristics of entrepreneurs is their parsimonious use of resources; because they don't *have* resources, they get something done without them—they somehow find a way to stretch those existing resources better and further.

MS. KANTER: Where America competes well in world markets, it certainly isn't on the basis of cost, since our labor wage rates are too high and we're not going to reduce our standard of living and take on the lower-paying jobs around the world. Therefore it must be on the basis of better ideas. Where America still leads in world markets, it leads because of innovation. So the question is not how we create the availability of capital, but how we create the conditions in which people can act on their ideas.

MR. TURNER: It's my inevitable role as the unique representative for labor to ask some questions that might temper our enthusiasm for entrepreneurship.

Number one, very broadly, is it possible to over-invest in strategies for promoting entrepreneurship? As taxpayers, are we investing too much? It's important to note that in the tax rate cuts made on the capital gains side since 1978, the payback in each successive round seems to be getting smaller. By providing more and more tax incentives for new and existing business, are we not contributing to an undermining of needed public investments needed to build infrastructure?

Another way of coming at this question is: While the gains are positve, are our costs too high? The benefits from the capital gains tax cut go to people in the top ten percent of the income distribution. This is happening at a time when the middle tier of American society is in very tough shape. According to *Fortune* magazine, the middle tier of family incomes was 54 percent in 1970 but had fallen to 44 percent by the beginning of 1983—and this is already adjusted for the fact that lower real earnings had

brought more earners into the family. There was an increase at the top, but most of these people who left that middle segment has shifted *down* into lower-paying jobs.

Number two; it is essential for larger firms to be fully competitive internationally in the kinds of production that the small firm just can't do. Is there a danger that we are underestimating the potential of larger and medium-sized firms to engage effectively in innovative activities? Surely, we can avoid having to throw *all* of our hopes into the basket of the small garage start-ups—for all of their acknowledged virtues.

MR. CARPENTER: (In support), I would like to speak about the large corporation's role in entrepreneurship and how that relates to industrial competitiveness.

The first point is that many start-up operations are inappropriate for large corporations anyway. One reason is the nature of business that they are in. Seventy percent of venture capital investment was in computers, electronics and communications. These are *not* manufacturing industries, but rather businesses in which for two, three or four million dollars one can attain entry and carve out a niche. So, many start-up businesses are fundamentally unattractive to a large corporation because they have very low entry barriers, or their advantages are transient or short lived. (However, for those industries which *are* manufacturing industries, there is a need for entrepreneurship.)

The second point is that in 20 years the United States' economy has gone from being relatively independent of the world economy to having a great deal of dependence on it. Exports of manufactured goods have risen from 12 percent of production in 1960 to 25 percent in 1982. And imports in the same period have risen from 9 percent to 31 percent.

The economies of scale in manufacturing, research and development, and differential labor costs have driven us toward increased globalization of markets. And in the past 20 years of globalization, U.S. industry has lost out. We have lost world market share as many businesses conceded markets to foreign competition. The United States now has an advantage in technology in knowledge-intensive industries and agriculture but a disadvantage in mature and labor-intensive industries.

Asian companies have established themselves as particular effective worldwide competitors.

In high-technology industries, the historical stronghold of American industry, we are seeing an increase in competition, Japan is coming on strong—focusing R&D effort in a few selected high-tech industries. European governments are supporting high-technology industries as the only route to defending their markets and creating economic growth. So everyone is now in the same ball game.

Furthermore, in low-technology industries, we are going to see developing Asian countries at an advantage. Latin American nations will also seek to increase employment and balance their payments by exporting to the United States, which is one of the few markets available to them.

How does the large corporation fit in? Let me give you some data. The largest 15 companies in the United States account for over 20 percent of the total U.S. R&D and over 40 percent of private sector research and development. Using G.E. as an example, we have created three one-billion-dollar businesses internally in the last 15 years. Compare this to the total number of $1 billion corporations that have been created in the last ten years—only 21.

MS. KANTER: In Silicon Valley, we're beginning to discover some of the down side of entrepreneurship. One company, as recently as two years ago, had 80 percent of the market share of its product. It is now down to ten percent because there have been 75

start-ups in the last two years by managers who left that company to start their own. There is no way that the existing companies can possibly pay people as much as they think they're going to make if they start their own. (Unfortunately) there is also no way that more than a handful of those 75 start-ups will be here within a year or two.

We may seriously be diverting productive capacity by leading people to believe they can make more money by plunging out on their own rather than by contributing to existing businesses to help them get larger.

MR. VESPER: I'm not concerned about there being too much entrepreneurship or too many people taking a shot at it, because I haven't met many who are sorry they did, even when they failed. They learn by the process and many try again.

MS. KANTER: I want to comment on why I am so concerned about the failure rate. I have difficulty in fatalistically accepting a certain level of failure as inevitable. Why not try to capitalize on the experience to bear on all new enterprises, small and large, so that we do *not* have to accept a high failure rate as inevitable? Surely we can increase the percentages.

MR. TRADER: This has worked well at Control Data, where we encourage employees who want to start businesses to come and see us first. Nine out of ten of them never go beyond the discussion stage when you *really* discuss their business plans, because they realize the plans are not viable. They then become better employees, because they start paying more attention to their work and stop dreaming about the business.

There should be a wider availability of people who have experience in venturing to help potential entrepreneurs to think through whether they have a viable business idea.

MR. BURR: My basic belief is that to some extent the venture capital communtiy has acted as a catalyst for the entrepreneurial movement.

The recent increased availability of this capital stimulates the demand for this capital. The financial resources of the venture capital community do not escape the notice of entrepreneurs. In addition to reading computer printouts, they do read the newspapers and they see that there is capital available.

In the early 1970s they were afraid to leave the security of their jobs because their perception was that there was no money to start their business. They now realize there *is* capital start to start their business, and they're starting companies.

The venture capital industry is very sensitive to government regulations and policies. I believe strongly that the current availablility and growth in venture capital funds that we have result primarily from the decrease in the capital gains tax from 49 percent to 28 percent in 1978, and equally important, from the relaxed rules relating to pension fund investment. The pension funds are now contributing about 30 percent of the $4 billion that was raised last year.

MR. MAUER: What role does savings play in this entrepreneurial environment? Is it critical? Does most of it come out of savings or is most of it borrowed?

MR. PARKINSON: The vast majority of it comes out of savings, personal savings, and family savings—with the exception of some high-tech businesses, which have been able to borrow funds or obtain equity from venture capitalists (usually with significant dilution of equity of key employees).

MR. GILDER: Even high-technology companies start with disposable personal savings. Ninety percent of Silicon Valley start-ups are funded via personal savings.

ANALYSIS AND CONCLUSIONS: ENTREPRENEURSHIP IN U.S. TODAY

1. IS THERE A SIGNIFICANT LEVEL OF ENTREPRENEURIAL ACTIVITY AT PRESENT?

The underlying assumption of the Conferees was that there has been a significant increase in entrepreneurship recently—this we shall explore below.

There are several indicators that entrepreneurship reached unprecedented levels in 1983. These are: new business starts; venture capital underwritings; private placements; initial public offerings; and new companies trading in Over the Counter (OTC) stocks.

- "State of Small Business Report of 1984" (1) estimates 596,178 new business incorporations in 1983, the highest ever recorded, and up from 329,358 in 1973, a decade before. This indicates that more firms than ever before were initiated.
- Venture Economics (2), which focusses on venture capital activity, reports that the value of company underwritings of $5 million and under rose 700%, from an average of about $0.5 billion in the mid 1970's, to about $2.8 billion in 1983. Since 70% of venture capital is focussed on electronics and medical systems (3), this is a strong indication of entrepreneurial demand for capital for high technology businesses. It is also an indication that these high technology businesses are receiving significantly more capital support than in the 1970's.
- Securities Data Corporation reported that the number of private placement issues rose from 70 in 1981 to 115 in 1983, while initial public offerings rose from a low of 35 in 1976 to 282 in 1983. Although some of these data may apply to larger organizations, it is safe to assume that a significant proportion of these placements and offerings were for firms of relatively recent origin—a further indication of increased entrepreneurial activity in the last decade. This indicates a dramatic increase in the number of companies that have reached the stage of development where they need new equity from the financial markets.
- Finally, NASDAQ reports an increase in the number of companies trading in OTC stocks from 2475 in 1978 to 4109 in August 1984. A record 914 new companies registered in 1984 according to NASDAQ. This indicates a record number of companies had reached the stage of development where they were successful enough to seek, and secure, public support for their stocks.

We take the above data as sufficient evidence of significantly increased entrepreneurship in the U.S., as well as well as significant successes at every stage of a new firm's development. The underlying assumptions of the Conferees appears to be justified.

2. WHAT ARE THE CAUSES OF THIS INCREASED ENTREPRENEURSHIP?

In the Conference, there were several suggestions as to why the recent increase in entrepreneurial effort had taken place. For suggested causes of this significant increase in entrepreneurship, we draw on the commentaries of two recognized authors: Peter Drucker (4) and Karl Vesper (5). The causes are: availability of capital; well-developed capital and debt markets; the emergence of new knowledge, skills, and technologies; and supportive societal values and attitudes. Many others have been suggested, but these appear to be the most important in explaining the recent surge in entrepreneurial activity. Each will be discussed in turn.

Increased Venture Capital Availability

Record amounts of capital entered the venture capital market starting in 1980. According to *Venture Capital Journal* (6), the following capital was committed to professional venture capital firms.

Table 1: *VENTURE CAPITAL COMMITMENTS FROM MAJOR SOURCES (1981–1983)*

	Total capital committed, in millions of dollars		
	1981	*1982*	*1983*
Pension Funds	200	474	1070
Individuals and Families	201	290	707
Foreign	90	188	531
Corporations	142	175	415
Insurance Companies	132	200	410
Endowments and Foundations	102	96	267
Totals	867	1423	3400

It is important to see how different this is from the 1970's. Roubena Khoylian of Venture Economics provided the following table to indicate the inflow of new capital by year at 3-year intervals.

Table 2: *ANNUAL NEW CAPITAL INFLOWS TO VENTURE CAPITAL FUNDS*

	Net new capital, in millions of dollars
1969	171
1972	62
1975	10
1978	600
1981	1300
1983	4500*

*Sources other than the major ones reported in Table 1 were responsible for the difference between the 1983 figures in Tables 1 and 2.

In 1969 the long term gains tax rate was increased to 49 percent, while in 1978 it was rolled back to 28% again. Note the dramatic decrease in venture capital availability after the capital gains tax increase, and the significant resurgence of capital inflows after the 1978 roll back.

The flow of funds into the venture capital market has been ascribed partially to the reduction in capital gains tax and partially to the clarification of the ERISA "prudent person" rule in 1979. According to Greenwich Research Associates (7), the percentage of the 1003 pension funds in their sample that participated in venture capital activities increased from 5% in 1980 to 11% in 1983. The percentage of pension funds with assets greater than $500 million that participated in the venture capital market increased from 20% to 34% in the 1980-83 period, while those with assets between $200 and $500 million increased participation more than threefold, from 6% of firms to 15% in the same period.

There is a question of the extent to which these infusions of funds into the venture capital market truly reflect capital available for the entrepreneur. Arthur Lipper (8), the publisher of *Venture Magazine* points out that only about 1500 out of the 600,000 businesses created last year were funded by venture capitalists. On the positive side, from the point of view of the President's Commission, venture capitalists *are* inclined to invest in high potential, high technology firms (9) rather than the more general type of business.

However there remains the more serious problem that of the total funds disbursed in 1983 only 33% of the dollars were invested in "early stage" investments, as Table 3 indicates (10).

Table 3: *EARLY STAGE INVESTMENTS AS A PERCENTAGE OF TOTAL 1983 VENTURE CAPITAL INVESTMENTS.*

Seed capital for concept proving:	3%
Start-up capital for product development and initial marketing:	11%
First stage financing to initiate manufacturing and sales:	19%

In other words, only one third of the funds available go to supporting the "acts of entrepreneurship" that lead to the actual start-up of a company, the balance of funds going to support already existing concerns in one way or another.

The reasons for this are related to the risk/return preferences of investors. Investors, even venture capital investors, expect to reap rewards from their investments that are commensurate with risk. They compete with other investors for those entrepreneurial deals that offer the greatest reward to risk profile. Clearly, early stage investments are much riskier than investments in subsequent stages, where the company is already established, and may even have significant tangible assets. Therefore it is not surprising that the lion's share of venture capital funds are directed to the later stage investments that have greatest expected returns.

However, the recent influx of funds to the venture capital market has increased the competition for a relatively fixed supply of ventures. This can be expected to drive up the "price" for ventures, lowering the expected returns, and causing the venture capital market to accept more deals at the riskier, early stages. This appears to have happened. According to Bygrave, Timmons and Fast (9), since 1981 there have been significant increases in early stage investments in high technology ventures, and according to *Wall Street Journal* (11), "crowding out" has occurred for the later stage financing of young firms, driving investors into those less attractive ventures in the early stage. However, Table 3 indicates that while the influx of funds has been beneficial for start-up and first stage financing, there is *still* very little capital that is being committed to *seed* investments, namely investments which are needed for concept-proving. Clearly the risk/reward profile for such seed investments is still unattractive to most investors.

In summary, there is ample evidence that there has been a dramatic increase in the availability of funding, particularly for high technology ventures, but this additional funding appears not to have significantly increased the amount of seed capital deployed to ventures.

Capital Markets

There is no question that one of the unique features of the United States is its relatively well-developed financial markets for start-ups and small companies. As evidence that this is an important characteristic, one need only look at the struggles of other countries to replicate the system: France (*Business Week*, 12) has attempted to set up a market for small company equities; Holland (*Business Week*, 13) has created a 57% government-owned Venture Capital Fund; Germany and Sweden *(Fortune, 14)* were reported to be struggling to manage state-initiated venture capital agencies. In 1982, Japan's MITI made a *second* attempt to open up the venture capital market (*Business Week*, 15). In many of these reports, the U.S. venture capital markets and small stock markets are cited by foreign governments as critically important to the infrastructure needed for entrepreneurship—providing a vehicle for raising funds for entrepreneurship that is more efficient than in any other country.

Mauer (16) suggests that the financial infrastructure of the U.S. supports entrepreneurship in ways that extend well beyond the venture capital market itself. He suggests that the U.S. banking system is unique because of the large number of small banks. There is one bank for every 16,000 in the population (Syron, 17) compared to one bank for every one and a half million in the U.K. The great majority of the more than 14,000 banks in the U.S. tend to be small—and small banks do business with small business—providing a relatively accessible source of (albeit secured) credit to the entrepreneur seeking loans needed to cover critical start-up costs. Data from the studies of Bruno and Tyebjee (18) support this argument. Thus the small entrepreneur in the U.S. has significantly better access to debt as well as equity.

It was with the impact of recent infusion of funds that several Conferees raised a concern. Their concern may well be justified for there is some evidence that the infusion, though very welcome, may have overloaded the existing market. Remember that this huge infusion of capital, in the eyes of the venture community, is a drop in the bucket in the eyes of the $750 billion pension funds who, according to Thomas Murphy *(Forbes,* 19), "want to find out if venture capital investing can be scaled up to absorb really large amounts of capital."

The movement of unprecedented amounts of funding from the pension funds and foreign sources spurred the creation of dozens of new venture capital firms and partnerships and radically changed the structure of the deals that were being made (*Forbes,* 20). As we argued above, because of the increased supply of funds, venture capitalists are investing in riskier ventures than in the past. They now also get less equity in the venture than they have in the past. The obvious implications are that their economic performance will not match that of the past, and so we can expect to see more failures of their investments than in the past.

There are also indications that the supply of trained and experienced venture capitalists is becoming overextended, reducing the ability of the firm to monitor the ventures in which they invest. Late in 1983, *Wall Street Journal* (21) reported that venture capital firms were having difficulty with high turnover as experienced managers left the firms to strike out on their own. This problem was anticipated in 1982 by the General Accounting Office (GAO) (22) who pointed out that the U.S. would experience a problem with the supply of venture capital managers.

In summary, the U.S. has a capital infrastructure to provide debt and equity for start-ups which is the envy of the world. However, the recent major infusions of venture capital may have temporarily overstrained industry capacity. There is a possibility that this could lead to a significant number of failures as many of the less advisable investments founder. Since pension fund money is involved, such failures could precipitate pressure by interest groups to regulate the venture capital market. Intervention should be avoided at all costs—the evidence of most foreign governments' ineffectiveness when intervening in the venture capital arena should be sufficient to indicate that government interference is counterproductive.

Emergence of New Knowledge, Skills, and Technologies

A third factor which spurs entrepreneurship is the host of opportunities created by the emergence of new knowledge and its associated technologies (Drucker, 4). Arnold Cooper at Purdue University suggests that these fertile technologies are ripe for exploitation because easily segmented areas, many with low entry barriers, develop so rapidly that opportunities abound. Hambrick and MacMillan (23) found evidence that even for mature industries, new product developments were significantly easier to accomplish in markets where technological opportunities abound.

This has been a significant factor in the last decade—as Thomas Murphy (*Forbes*, 19) put it: "A dozen years ago (opportunities to invest) were in a narrow spectrum of solid state devices, minicomputers, medical devices etc. Now whole new high tech industries are emerging, such as applied genetics and robotics. And some of the older ones are still high growth: CAD/CAM (Computer Assisted Design/Computer Assisted Manufacturing), computer software, microcomputers, instrumentation, office automation."

The fundamental problem is that radically new industrial breakthroughs occur only after a long period of painful accumulation of new knowledge (Foster, 24). Merrifield (25) of U.S. Department of Commerce has suggested a model which clearly lays out the dimensions of the problem. This is presented as Figure 1, and depicts the process of conversion of ideas into commercially feasible ventures. The three main stages of this process are invention, translation of the invention into a manufacturing system, and finally commercialization. The entire process is seldom completed in less than 10 years, and 90% of the effort is expended in that part of the process starting from proving the technological feasibility through to completion of the pilot plant. The greatest problem lies in the area Merrifield calls the "GAP" in Figure 1, and represents a gap in funds available, and a gap in management and administration skills to manage the movement of an innovative idea through to initial commercialization.

As a result of this gap, enormous quantities of new opportunities remain unexploited, according to Merrifield. The U.S. government and universities spend about $10 billion per year generating new knowledge which then rarely moves into further stages. In fact, in the case of advanced ceramics, it was the Japanese who took current U.S. knowledge and moved it to commercial feasibility.

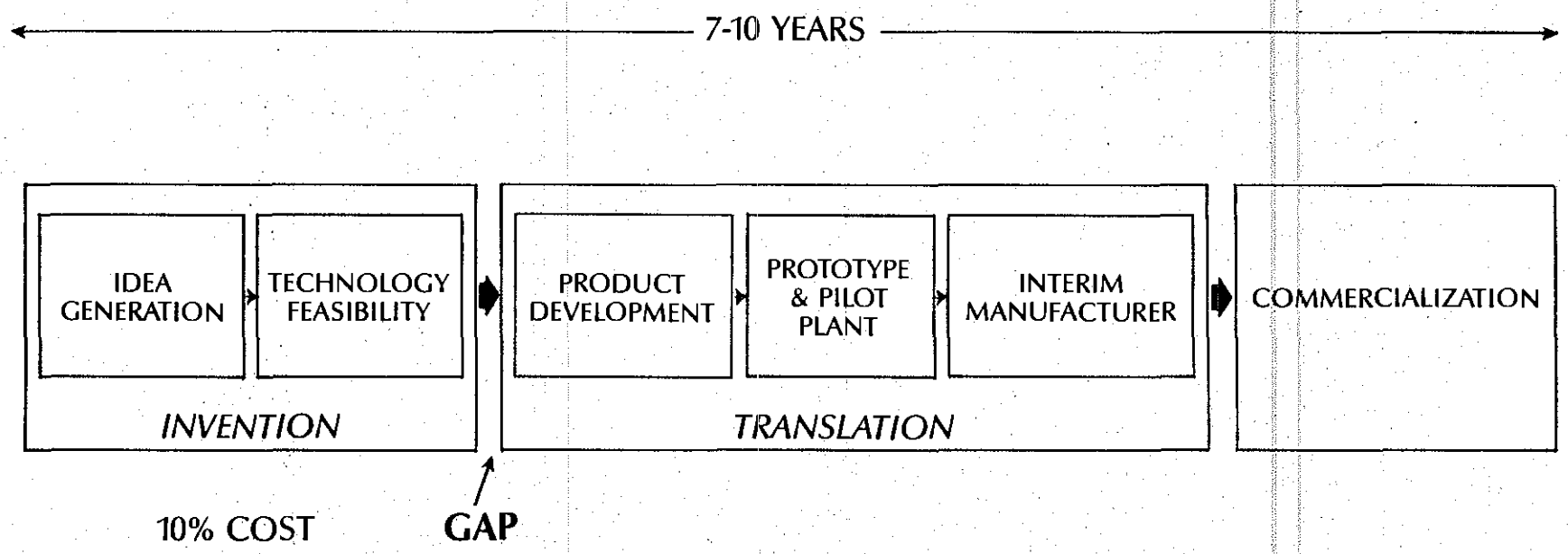
Entrepreneurs in the U.S. are given little in the way of assistance in their struggle to move the innovative idea across this gap. They are expected to take all the risks, and currently there is little in the way of incentives for investors to invest funds in the long and painful process of proving technical feasibility, and not much more in the way of incentives for developing the product and creating the prototype. As we shall see below, society as a whole benefits significantly from the efforts of successful entrepreneurs, so there is a serious challenge—society should help *share* in the risks the entrepreneur takes by creating systems to support the entrepreneur in this process.

In this regard, the role of incubator organizations and communities—firms and groups of firms and institutions that spin off generation after generation of new firms— cannot be ignored (Cooper, 26). Once the critical mass of talent, venture capital, and supporting supplier and distributor infrastructure are in place around some emerging new knowledge base, whole industries take off. The ability of the U.S. to do this has been to the despair of the Europeans who, because they cannot create these nurturing communities, have decided that to protect themselves they will have to use joint venturing to source their technology from Japan and the U.S. (*Wall Street Journal*, 27). We regard the need to create and support such incubator communities as critical.

There is one additional factor in the U.S. today that will rapidly be emulated by foreign competitors, but in which there is still a significant competitive edge, and that is in "knowledge-processing". The availability of high quality information from multiple sources—government, scientific and commercial—is unequalled in the world, and access to it by the personal computer and communication networks ensures that a huge mass of latent opportunities are accessible to, and processable by, the aspiring entrepreneurs (Mauer, 16).

In summary, the recent explosion of knowledge in several areas has led to new technologies which in turn has created many opportunities for entrepreneurial attack. The major problem is that there is a need to accelerate the movement of opportunities across the gap between idea generation and the pilot plant development, where the entrepreneur must take all the risk with few resources. In the recommendations below, we suggest the creation of investment incentives and incubator organizations to help the entrepreneur bridge this gap.

FIGURE 1: THE TOTAL INNOVATION PROCESS



AVERAGE YIELD: 1 SUCCESS IN 20

Source: Merrifield, U.S. Department of Commerce

Societal Attitudes to Entrepreneurship

The Economist (28), citing the Office of Technology Assessment, attributes the U.S. lead in biotechnology to availability of funds, a benign regulatory regime, strength in basic science, and entrepreneurial spirit. Conferees raised an issue regarding this last factor—what causes the spirit?

Traditionally, and especially in the past century, the U.S. has revered the entrepreneur more than other countries. To cite Mauer (16): "For whatever reason, entrepreneurial endeavor in our society is considered an honorable and even prestigious pursuit." Such societal approval is critical—providing both motivation and public support.

In the forefront of those currently providing support and approval are the media, particularly the press. Conferees agreed that the media have played a powerful and constructive role by extensively reporting the renewed entrepreneurial spirit in this country. Major articles in the *New York Times* (30) discuss the "pioneer spirit" of today's entrepreneurs and go on to describe the benefits to society of such activity, particularly job creation (*Wall Street Journal*, 31 and *New York Times*, 32). Magazines like *Forbes*, *Fortune*, and *Business Week* have introduced special columns on venturing; and new magazines, like *INC.*, *Venture*, and *Black Enterprise*, which focus specifically on the start-up and small growing business, have built up enviable circulation rates. Such publications help uplift the image of the entrepreneur and of fast-growing companies and the contribution that they make to society.

Coupled with the increased publicity is a less obvious, but equally significant phenomenon, and that is a significant shift in the value structure of the work population. For more than a decade, the firm of Yankelowitz, Skelly and White have been systematically monitoring worker attitudes via their Signal program. In that period there has been a significant growth in a particular type of worker—what they call the "fulfillment seekers". These are the people described by Naisbitt in *"Megatrends"* (33). At a median age of 31, they are amongst the best educated (over 70% have at least attended college), are generally in multi-earner households (if married), and at least 1 in 3 is in the professions or management. It is the key social values of this group that is of interest—according to the research, the fulfillment seekers demand that their work be challenging, interesting, and that they be continually learning something new. They have a real need to be creative. They thrive in dynamic situations in which they can rise to their full potential. Yankelowitz, Skelly and White find that fully one half are currently not satisfied with themselves and their progress in achieving their aspirations. Furthermore, they are prepared to trade off earnings in order to do so. And they comprise *at least one fifth* of the work force today. It is not surprising that these skilled professional young people are breaking away in droves to start their own firms.

As Mauer points out, other value changes are also helping. Two-income families mean the consequences of entrepreneurial failures are somewhat buffered. The trend towards later marriages enhances the ability to postpone the cost of childrearing and accumulate capital needed for start-ups. (Mauer, 16).

In summary, the U.S. has nurtured a huge pool of talented young people with precisely the values that would cause them to seek to strike out on their own at a time when there is great publicity around the phenomenon of entrepreneurship.

This concludes the discussion on the causes of the current entrepreneurial surge in the U.S. The following appear to be contributors: increased availability of venture capital, in a relatively efficient financial market for new firms; accompanied by an explosion of opportunities stemming from new knowledge and new technologies; and capitalized on by a group of "fulfillment seekers" who have the maturity and the skills to pursue a societally approved entrepreneurial career.

TO WHAT EXTENT IS ENTREPRENEURSHIP UNIQUELY A U.S. PHENOMENON?

Conferees suggested that the phenomenon we are experiencing is uniquely American. The discussion below explores the validity of this assertion.

According to Zenas Block of New York University, there are three factors that inhibit entrepreneurship in the societies of our major international competitors. First, the major economic competitors of the U.S. have significant cultural barriers that discourage entrepreneurship. Second, the financial infrastructure of these competitors mitigates against adequate capital support. Third is sheer lack of venture capitalist expertise—this is so significant that it has even been suggested that U.S. venture capitalist expertise might be exported much like U.S. management expertise was exported in the 1960's (*Forbes*, 34).

What is particularly encouraging is that to change each of these factors will require the substantial and sustained attention of any foreign government that attempts to reverse the position, so that if the U.S. has significant advantages emanating from its special entrepreneurial capability, these advantages are likely to be sustained. Below we discuss the evidence of the relative disadvantages of major foreign competitors in attempting to replicate the current entrepreneurial thrust of the U.S.

Japan

Japan, which has proven particularly effective in competing against large U.S. companies, has severe cultural constraints. For example, *Washington Post* (35) reports the following comment of a veteran MITI offical: "Being an entrepreneur in Japan must become more respected, as in America....." The fact is that enterpreneurs in Japan go against the grain of the society—to cite Boyer in *Fortune* (36): "Everything in Japan—its religions, its culture, its social structure—mitigates against individual action". Thus the most common word for entrepreneur in Japanese, *datsusara* means "salary man who has broken loose". This is not to say that highly successful entrepreneurs do not emerge, but these "rebels" then have great difficulty in attracting top talent who still favor employment in the traditional companies. Boyer says that even the entrepreneurs themselves are subtly influenced by this societal attitude—they are very reluctant to "head hunt" in other firms for this desperately needed talent.

The second major disadvantage is that the Japanese entrepreneur faces a financial infrastructure that is geared towards the large firm. As we mentioned before, *Business Week* (15) reported a *second* attempt in 10 years by MITI to create a venture industry. In addition, the Japanese stock markets cannot cater to start-up companies. So even after they start up successfully, new firms are often short of equity. Most firms are started with the savings of the entrepreneur, friends, and relations (as in the U.S.), but subsequent needs for funding receive scant attention from the big banks and finance companies. This is crippling.

This does not mean that the Japanese will remain disadvantaged. As *The Economist* (37) suggests, what Japan says it wants to do, it will do, and reports that MITI has determined that the creation of an "entrepreneur-friendly" venture capital market is important and is now being given priority. In addition to this, there are a number of U.S. venture capital firms which have set up in Japan. These firms bring much of the experience and financial resources needed to support Japanese entrepreneurship. (*Fortune*, 38).

Europe

Unlike Japan with its strong group norms, Europe's cultural barriers tend to stem from a strong socialism, which manifests itself in the form of government intervention. This creates institutional barriers which discourage entrepreneurship: high taxes, punishing employment regulations and labor laws, and a morass of protective tariffs all mitigate against successful start-ups. Stanley Pratt (publisher of *Venture Capital Journal*) suggests that many firms that *could* get larger do not because the owners shun involvement with the government bureaucracy (*Forbes*, 39).

There are also some cultural barriers: West Germans, who save 15% of their income, are traditionally risk shy and stay away from stocks, preferring fixed interest bonds (*New York Times*, 40). Since the German terms for venture capital— "Riskokapital" (risk capital) or "Wagnisfinanziering" (risk financing)—stress risk, it is not surprising that the public markets for venture capital are very thin. In Europe, it is also socially unacceptable to start something new and go broke (*Wall Street Journal*, 41). Leslie Wayne (*New York Times*, 32) points out that Europeans are not as willing as Americans to change location or even occupations as the economy demands. This reluctance to change or move is reinforced by socialist policy—housing is so subsidized that it is impossible to find, if a worker tries to move to a new location.

There are also serious infrastructure problems in Europe. Domestic markets are small (*Wall Street Journal*, 41), so it is necessary to go overseas almost immediately. The pools of venture capital are small and staffed with inexperienced managers—often the only experienced managers have been trained in the U.S. (*Fortune*, 14). Often the government has had to contribute funds to the venture capital pools. As we reported above, this has happened in Holland (*Business Week*, 13); and Sweden and Germany whose funds then had "to work with the albatross of government money around their necks" (*Fortune*, 14). The funding problem has been so severe that in 1983 one German company was acquired by its U.S. subsidiary so as to raise equity in the U.S. venture capital market. (*New York Times*, 42).

Public markets for new company stocks are totally inadequate: only recently has the U.K. (*Fortune*, 14) and France (*Business Week*, 12) created the equivalent of the OTC market. Without markets to sell the stocks of successful start-up companies, seed capital tied up in these companies cannot be released and recycled to newer ventures.

Lack of funds in Europe has been further aggravated because significant amounts of foreign funds have been invested in U.S.-based venture capital funds to avoid the interference of socialist governments. (*Business Week*, 43).

As in Japan, a final barrier for new firms is a lack of experienced managers who are prepared to join the firm once it gets started (*Wall Street Journal*, 44).

In summary, there appears to be significant obstacles to *rapid* spread of entrepreneurship in the economies of our major foreign competitors. This does not mean that the U.S. has a permanent edge, since Europe and particularly Japan are paying serious attention to the issue, but we do have a current edge that can be used to our advantage so long as we do not do something that destroys the current momentum.

So far the arguments indicate that there is a spate of entrepreneurship in the U.S., and that it will be difficult for foreign competitors to follow suit on the scale that the U.S. is capable of accomplishing. The next question looks at whether it is worth encouraging entrepreneurship.

BENEFITS AND COSTS OF ENTREPRENEURSHIP

There was extensive discussion in the Conference of the benefits of entrepreneurship, plus some concern expressed about the costs.

The benefits of entrepreneurship are particularly well expounded by Vesper (5) in his study "*Entrepreneurship and National Policy*". These are: significant new job creation; innovation and enhanced industrial productivity; enhanced international competition; revenues for government; and greater opportunity for the pursuit of happiness. Below we discuss evidence indicating where such benefits are actually being achieved.

Job Creation

The classic study of the impact of job creation was done by Birch (45) in 1979 in which he estimated that better than 80% of new job creation in the North Eastern United States, in the period 1969-1976, was via small firms. Birch used Dun and Bradstreet data. A much more recent study by Birley (46) using unemployment ES 202 records indicates that the findings of the Birch study may be conservative—that in fact new firm creation may be responsible for an even larger percentage of net increases in employment. What is equally significant from a policy point of view is her corroboration that the failure rate of new firms is highest in the early years of their existence. As did several Conferees, she suggests that a great number of jobs can be saved by focussing efforts on improving the ability of small firms to survive. Birley goes as far as to say that this is likely to be much more productive than attempts to save large, obsolete companies.

This new study, coupled with a study by Teitz, Glasmeier and Svesson (47), corroborates for the Midwest and West Coast the same type of findings that Birch found. There is little point in arguing about the specific percentages—the evidence is ample that new firms are generators of a significant proportion of net new jobs. A recent *New York Times* article (30) shows that while smaller companies increased their employment from 63 to 74 million in the period 1976-1982, the largest 1000 companies reduced total employment by about one million jobs in the same period.

Of further interest is the composition of this increased employment by new firms. The *New York Times* article mentions that women are starting businesses at a faster rate than men, growing 10 percent between 1980 and 1982 compared with 1 percent for men. *Wall Street Journal* (48) reports that many black managers, frustrated by their slow progress in larger corporations, are moving into their own businesses: between 1973 and 1983, black self-employed rose 51% compared to 29% for whites.

Of final interest is the issue of whether high technology businesses create a significant number of jobs. Vesper in his 1983 studies cautions against being "swept away by the impression of the job-generating performance of the top few most spectacular companies", pointing out that the INC 100 added only 54,000 jobs in five years. According to Peter Drucker (49), most of the 30 million jobs created in 1965-84 have been in the low technology and service sectors of the economy. The implications are that serious attention should still be given to businesses which do *not* have the glamor of high technology—they may not increase international competitiveness, but directly they do enhance national productivity by providing employment opportunities for people who might otherwise be unemployed.

On the other hand, the capacity of high technology companies to spawn employment should also not be underestimated. Merrifield (U.S. Department of Commerce, 25) estimates that for every high technology job there is a demand created for five to fifteen low technology jobs—in the areas of maintenance, construction, marketing, distribution, financial services, or communication services.

In summary—in the past decade entrepreneurship has created a significant percentage of net new jobs in the U.S. Many of these jobs come from low, rather than high-tech business creation, but there is also the fact that every high technology job creates many other jobs. What seems to happen is that entrepreneurship creates *both* types of jobs, while entrepreneurship in the high technology area has a particular tendency to spur on additional entrepreneurial effort—a single high technology enterprise can act as a breeder reactor for many other high technology firms. Finally it appears that the entrepreneurial spirit does not discriminate—significantly larger proportions of blacks and women are choosing self-employment than are white males.

Innovation and National Productivity

There is ample evidence that high technology firms spawn innovation and enhance productivity. According to *Venture Capital Journal* (50), venture capital firms invested in many ventures to enhance productivity (see Table 4).

Table 4. *PRODUCTIVITY ENHANCING INVESTMENTS BY VENTURE CAPITALISTS*

	Percentage number of companies financed in 1983	
Computer Hardware	28%	
Software & Systems	12%	
Industrial Automation	3%	
Commercial Communications	3%	
Telephone & Data Communication	9%	
*Sub-Total: Productivity Enhancing***		55%
Industrial Products & Machinery	3%	
Other Electronics	10%	
Medical/Health Care	11%	
*Sub-Total: Possibly Productivity Enhancing***		24%

**The categories "Productivity Enhancing" and "Possibly Productivity Enhancing" are ours, not those of *Venture Capital Journal*.

While there is no readily accessible data to directly demonstrate the effect, we can make some inferences about the impact on U.S. productivity by the entrepreneurs who are supported by these venture capitalists: well over half of the investments are in products and services that are likely to increase productivity. Roughly another quarter could possibly also enhance productivity. About 47 of the 1984 Venture Fast Track 100 (51) were producing productivity-enhancing products. According to the GAO study (22), over half of the investments historically made by venture capitalists have been directly related to productivity improvement. The GAO case analysis of a single, small CAD/CAM company dramatically describes the impact of their product on customer productivity—a French customer achieved a 7 to 1 increase in product design productivity, a large manufacturer saved 39 percent of its drafting and design support work, and a semi-conductor manufacturer was able to reduce its cost per function from one dollar to one tenth of a cent.

Merrifield (25) of the Department of Commerce describes the impact of high technology automation on a U.S. manufacturing company. On one production line, production was raised from 100 to 1000 units/day with rejection rates falling from 2 out of 10 to 1 out of a 100. Costs were cut 30% and prices reduced sufficiently to recapture *all* exports lost in recent years to foreign competitors.

Further evidence of the impact of new high technolgy businesses is reported by David Sanger (*New York Times*, 52)—software packages like Lotus are transforming small firms, allowing them to replan rapidly, to react faster to changes and opportunities, and to be more responsive to customer demands.

Though admitting that the data is limited to anecdotal evidence, Vesper (5) raises another issue relating to productivity—that new innovative firms tend to spur established firms to greater competition. Federal Express pushing the postal service into adding express mail; American House Calls and the legal firm Jacoby and Meyer forcing more quality or lower prices in professional services; new commuter airlines causing large airlines to reduce prices; Apple computer drawing IBM down into the small computer business are several of many cases where the entry of a brand new company caused a long established competitor to reduce prices, enhance services, or expand coverage of markets.

Though the evidence is less solid, we feel that there is an even subtler but equally inportant role that the entrepreneurs play. Large firms are often actually hampered in their attempts to innovate by pressure exerted from significant interest groups, who have a vested interest in the status quo. Examples are stockholders, unions, community groups, government, and special interest groups. The successful small start-up poses a significant and highly visible threat by its very success and provides the unequivocal evidence to management, and the various stakeholders, that change and enhancement of productivity are essential. Examples abound: in long distance telephone calls, photocopiers, airlines, trucking, and "fail safe" computers.

In summary, one of the major contributions of entrepreneurship is a tendency to enhance productivity in up to three ways—first by generation of productivity-saving products and services, second by forcing established competitors to enhance their competitiveness, and finally by demonstrating to vested interests that it is essential for the established firms to innovate.

Exports and International Trade

A third area of interest raised by the Conferees was international competitiveness. The U.S. balance of trade has been a major problem for some years now, so that the contribution of new businesses to export activity is of a special concern.

Unfortunately the data on exports by entrepreneurial firms are not easy to obtain. The GAO study (22) analyzed the exports of 72 companies which had been launched in 1970 to 1979 and had gone public in that time period. They estimated that by 1989 these companies would produce about $14 billion in export sales. These figures are not at all implausible, according to a McKinsey & Co. study (53) of the mid-sized U.S. firms. (These are firms with sales between $25 million and $1 billion, which is what most of the entrepreneurial firms that go public soon achieve). They found that such firms are able to consistently deliver 15 percent compounded annual growth. Comprising less than one percent of all businesses, these firms deliver 25 percent of all sales amd employ 19 percent of all private sector workers. Unfortunately McKinsey did not study the exports of these firms, though their findings do corroborate all the other GAO estimates.

As a check on the export capabilities of new high growth firms, MacMillan, Kobernick and Horvitz, of New York University Center for Entrepreneurial Studies, studied firms from the 1984 Venture Fast Track 100 and 1984 INC 100. Using data from the SEC library they calculated total export revenues reported by the top 75 firms which were less than 10 years old in the two lists. They estimated that these firms generated just over $800 million in export sales in 1983 alone, nearly all from the high technology businesses in the two lists. Clearly the total exports of *all* firms which were launched in the past decade must be considerably higher than this. And this is just the start—typically new companies start up by serving domestic markets first; export strength from start-ups takes some time to develop.

In summary, there is a little doubt that new businesses in the high technology area can contribute significantly to our long run export position.

Increased Government Revenues

The creation of new enterprises creates profits, after a neccessary gestation period. Taxes on such profits create a revenue stream for government which can be deployed to support important government programs. The GAO study (22) mentioned earlier suggested that the 72 companies in their study were capable of generating an accumulated $10 billion of government revenues by 1989.

To check this, the NYU Center for Entrepreneurial Studies analyzed SEC files to determine the total taxes paid by the top 75 companies *less than 10 years old* in the 1984 INC 100 and 1984 Venture Fast Track 100 list. In 1984 these 75 companies reported a total of $2.75 billion current and deferred taxes, of which an estimated 85% was federal and 15% state and local. This is only from the top 75 young companies in the U.S.—there is little doubt that the total tax revenue for all new business will be considerably higher.

Thus there is no question that successful entrepreneurial companies in the U.S. can generate significant tax revenues for the U.S. government.

As regards the other benefits of entrepreneurship discussed in the Conference, there is little conclusive evidence one way or another, though Hambrick and MacMillan (23) did find evidence that smaller market share firms are more efficient at converting R&D dollars into new products sales.

This concludes the discussion of the benefits of entrepreneurship. There appears to be little doubt that the nation benefits by the increase in jobs which accompany firm creation (particularly low tech); that there appears to be many benefits in terms of increasing productivity; that new firms create significant government revenues; and that our international competitiveness, as evidenced by export sales, has been already boosted by recent entrepreneurial efforts. We turn now to a brief discussion of the costs of entrepreneurship.

Costs of Entrepreneurship

In the Conference, several costs of entrepreneurship were suggested. The most important of these:

- the societal cost of failure of large numbers of new firms,
- the cost of losing talented workers from existing organizations, when they leave to start their own organizations,
- the cost in sacrified government programs as a result of additional cuts in tax revenues.

As far as the cost of failure is concerned, the magnitude of the problem needs to be scoped out first. The "State of Small Business" (1) cites a total of 31,334 failures and 58,898 bankruptcies in 1983. This is an order of magnitude lower than business formations, but does indicate a significant increase over previous years. It reflects the problem that participants in the Conference were anticipating—an increase in start-ups means that more failures will occur. The question is what the broad social cost of such failures will be.

The point was made in the Conference that, compared to the cost to society of a large firm's failure, the social cost of failure of a small firm is low—generally the loss is made of personal savings rather than the public's fund's, at least in the early, most vulnerable stages (Bruno and Tyebjee, 18). Futhermore, an important reason for failure of many entrepreneurial efforts has already been discussed. Often, failure occurs because the start-up forces the larger competitors to innovate in response, so even the start-up's demise serves a social purpose—the entire industry is forced to become more efficient. This historically happens to discount retailers, but is currently occurring to software houses and computer peripheral and computer component manufacturers.

Third, and very important, was the concern Conferees expressed with how society is going to react to this inevitable increase in absolute number of failures accompanying the recent vast increase in the numbers of start-ups. That this increase is occurring is borne out by the figures cited above for bankruptcies and business failures. As was suggested in the Conference, much could be done to use the knowledge and experience from the past to reduce the failure rate, if the right educational mechanisms are put in place.

Finally, it may be necessary for these failures to occur if the next generation of entrepreneurs is to be created. Tom Richman (54) reports the follow-up study of David Birch and a study by the Brookings Institute, which suggest that many successful high-tech ventures are created as spin-offs from ones which fail. It also appears from these studies that the entrepreneurs who fail do *not* return, chastened, to their original firms, but rather continue to try new businesses.

At this point in time, there is little hard evidence regarding the other costs raised in the Conference. There is no question that the loss of key staff from a growing firm to spin-offs can inhibit the firm's potential, and there is little doubt that loss of government tax revenue means that some government expenditures must be curtailed. What is needed is a program to gather and analyze data to address these questions.

In summary, the cost to society of failure of start-up firms is minimal compared to the benefits to society, but there is no conclusive evidence that the cost in lost personnel, or the cost in curtailed government revenues, exceeds the benefits derived from start-ups. However, our analysis indicates that significant tax revenue benefits are later derived from the new firms which are created.

CONCLUSION

We conclude from the above discussion that benefits of entrepreneurship outweigh the costs, and that the current wave of entrepreneurial activity will create enduring beneficial conditions which can not be easily matched by the major foreign competitors of the U.S.

The results of the Conference discussion on current entrepreneurship in the U.S., and the subsequent analyses which their discussion suggested, leads to several major implications for encouraging entrepreneurship in large firms and in small independent start-ups. These are discussed in the next two sections.

CONFERENCE DISCUSSION: ENCOURAGING ENTREPRENEURSHIP IN LARGE ORGANIZATIONS

MR. REGAN: The entrepreneurial movement in this country is bigger, more varied, and more dispersed than just two people leaving company X to mortgage their house and go off and make something. Clearly, the process is enormously complex and involves very large institutions in the process. Let us talk about this.

MR. CARPENTER: There is a close interrelation between large and small companies. They *depend* on one another. They have a lot to learn from one another, and they are very supportive of one another.

MS. KANTER: The entrepreneurial immigrants in Pittsburgh would not do very well if Gulf Oil goes under. The small businessperson is able to succeed in part because they sell to the large organizations. They're heavily dependent upon the success of the large enterprise.

MR. VESPER: I think that pressure from independent entrepreneurs forces large firms to be more entrepreneurial.

MS. KANTER: Let me focus on large businesses for a minute. There are some major problems that are standing in the way of an entrepreneurial revival in large firms. One is the diversion of funds into the merger/acquisition business: buying and selling productive capacity rather than creating it. Money is simply not available to create more potential inside the enterprise itself.

Another difficulty is the legal barriers placed on joint ventures, or loosely-knit ventures, particularly among companies in the same industry.

MR. TRADER: Let me agree that the federal government has got to address more directly ways of removing impediments to cooperation. Joanne McRae is the president of a small business group consisting of eight businesses that wanted to band together to do research, development, and production work with the federal government. It took the Attorney General and the head of the SBA to approve this, and it cost these eight little companies $250,000 to get together and do something that made so darn much sense.

MR. CARPENTER: I believe that the top companies in American industry are embarking on a major new experiment to test other ways of managing to maximize their competitiveness. The question I guess, is what can government—at the federal, state and local level—do to encourage and support worldwide competitiveness and entrepreneurism in businesses large *and* small.

At the federal level I agree that the most important thing is effective economic management, to provide a robust domestic economy. We're not only losing our share in world markets, we're finding international competitors gaining a share of domestic markets.

I believe, in the face of increasing globalization of business, the U.S. must resist the temptation to become protectionist—to protect old-line businesses which haven't really made an effort to get competitive in a world contest. I think government's responsibility is rather to support and smooth the inevitable transitions that must occur.

Since investment is the key to competitiveness, I think tax-stimulated R&D spending and investment are important.

Last, I think in many businesses we have to recognize that U.S. companies are competing not with foreign companies, they are competing with foreign co*untries*. We must strive for equity of treatment for U.S. firms in competition internationally.

At the state and local government levels, the contribution is less obvious, but I still think there are things that can be done. A technology-based economy depends on a superior educational infrastructure. To train engineers and scientists, state and local governments can do much to support initiatives such as state venture capital funds and regional export advisory assistance services and so on.

In the face of the increasingly tough economic environment that I described earlier, there are major changes in the way large U.S. corporations manage themselves. I would like to use General Electric as an example for my remarks because we are going through a transition which other leading companies are also experiencing.

At G.E. we have an unequivocal commitment to being the most competitive enterprise in the world. How do we intend to accomplish that objective? First, we are making massive financial commitments to our mature, strong businesses in order to ensure that they offer the lowest cost product of comparable value on the world market. This means large-scale automation and in some cases moving manufacturing processes offshore into low-labor-cost countries. Overall, we are focussing our resources on those businesses where we can be number one or two on a worldwide basis, not just in the United States.

Next, we are committing vast amounts of resources to develop new businesses. Our $2 billion in R&D will grow at 20 percent a year.

MR. PARKINSON: One of the benefits of the R&D tax credit was that it facilitated contributions by businesses to technical universities and technical education. It is absolutely critical to sustain these crucial seed institutions of human capital.

MR. STEVENSON: While the bigger enterprises may be able to sustain this type of research, the other question is whether they *do* it. I think that companies like G.E. and Bell Labs are really commendable, but there are many other big companies where we have not seen the same kind of long-term commitment to research. And yet as we look forward, many of the things that are going to make us adequate competitors require huge conglomerations of people and technology.

MR. GILDER: I think it's important that big companies do sustain a lot of crucial and absolutely indispensable research and development.

The question is whether these companies are spending their money efficiently compared to the small companies.

MR. TURNER: But isn't there a difference in the kind of research? For instance, IBM worked on very low-temperature semiconductors. No small start-up firm could contemplate undertaking that research. Isn't a start-up company going to be concentrating on a next step where you can really see the result a lot better than in more wide-ranging and more basic research done by a very large firm?

Let me mention *the* resource—the single most important resource in American innovation: competitiveness and economic strength. That is the intelligence of the American worker in the workplace. We need to to find ways to provide greater employment and economic security for workers so that the worker can feel that his or her best contributions in the workplace are to make that firm more competitive—not just to punch the clock and take home the salary, but to give intelligence and creativity.

The unions play an important role here. A problem is the individual's concern with the consequences of being more innovative and taking initiative. If the worker is afraid that making the process run better is going to result in guys down the line—maybe his cousin or maybe himself—losing their jobs as a result of greater productive efficiency, that's not going to work. You have to have a collective framework of security and a commitment not only of the workers to the firm but of the firm to the workers if that's going to play out.

MR. CARPENTER: I think you make an excellent point. I have an example in mind. We have a television plant down in Virginia operating without any quality control function at all, yet quality levels in the plant have increased by 50 percent over the last two years. Instead of a quality control department, there are screens telling everybody what is going on in terms of the current quality level in that plant. At any point in time any worker can stop the line.

I guess as a company we have learned a great deal in the last several years about how to work *with* our employees to respond to the competitive threat, and I think the more we've done that the more effective it's been.

MR. TURNER: I'd like to pick up on another aspect affecting workers. I'll couch this in terms of a study that I was recently reviewing from the National Academy of Sciences from last year on the competitive status of the American automobile industry. They found that of the $1500 or so gap that existed between U.S. small cars and Japanese small cars of comparable quality, the largest single factor in that gap—$1,000 or so—came from an excessively hierarchial management structure, oriented toward control and, in effect, containment of what workers were doing at each level down the structure.

We've heard that the characteristics of a new start-up firm include a more horizontal distribution of responsibility, easier vertical communication, smaller vertical gaps. Could you talk about that as a management objective in relation to processs innovation and entrepreneurship in a large firm?

MS. KANTER: I have been studying this. I found that the greatest impediment to entrepreneurship was the large organization itself—excessive specialization, dividing jobs into the smallest possible parts, separating production from execution.

In large corporations like General Electric, Hewlett-Packard, 3M and others—new models are evolving, focussing on how to maintain the entrepreneurial spirit despite large organization size. Jobs are being created in broader rather than narrower terms. There are internal venture capital pools that people can tap for new ideas. For example, 3M has a program called the "never-kill-an-idea" program in which anybody is entitled to spend ten percent of his time exploring the new. The organization structure is defined in flexible terms, so that new groupings can be set up as necessary in order to act on new ideas.

MR. CARPENTER: I think the reduction of structure is a major objective. We have seen a number of our businesses eliminate whole levels of management that were duplicative or unnecessary.

I would like to comment on the need to make management more willing and able to identify and take advantage of opportunities. We are trying to do just that in a number of ways, including greater differentiation in reward systems. We can't simulate the entrepreneur's reward of being the president of his own company, but we can reward people in a much greater fashion than has been done in the past.

Let me give you an example. We had a new venture that was involved in a new lamp business which failed after four or five years. Despite the failure, the management group of the business was rewarded with stock options and substantial financial rewards because they were judged to have done a good job in trying, but the times had changed and the original concept was not appropriate any longer. If we could do this with a failure, we can do a lot better in rewarding a success.

MR. TRADER: What we do as a company is to encourage people who have ideas to come to us and ask: "Is it a good idea?" And if it is a good idea and it makes sense in our business, we get a chance to invest in that business. Our position is: If they go across the river and let somebody else invest, we've lost access to that technology potential.

MS. KANTER: One of the interesting pieces of research I did was to prepare a list of about 50 companies with reputations for being the most progressive in America. I compared them with their counterparts and found that over a 20-year period, the ones that were progressive in their treatment and investments in people outperformed their counterparts in five economic areas. They simply spent more on people—training, compensation and benefits—they had better relationships with their unions.

Is it not possible that there is a government role in supporting human resource investments? We provide investment tax credits for capital investments, but we don't do anything for investments in those human resource programs that are critical in the success of companies that continue to be innovative.

ANALYSIS AND CONCLUSIONS: ENCOURAGING ENTREPRENEURSHIP IN LARGE ORGANIZATIONS

It is clear from the above discussion that one of the contributions of the Special Conference was to highlight the role of the large organization in the entrepreneurial surge of the early 1980's.

Critical interrelations between small and large firms

The Conference and subsequent analyses revealed that there is a critical interrelation between large corporations and independent start-ups.

The large corporation plays a significant role in fostering small entrepreneurs in two ways:

1. As pointed out by the Conferees, the high technology entrepreneur generally sells to large corporations rather than the public, particularly in the high-tech areas. MacMillan and Horvitz of NYU Center for Entrepreneurial Studies conducted a telephone survey of the top 20 high technology companies in the INC 100 and Venture Fast Track 100 which were less than ten years old—in this sample, 63% of the companies' revenues came from sales to established firms rather than sales to distributors marketing to the public. Thus the survival of the small firm is highly dependent on the success and support of large organizations.

2. Large companies are the fertile training ground for (especially technical) entrepreneurs, for it is in the large firms that they learn to apply their academic skills and gain experience before they go out on their own. Vesper (5) gives a graphic portrayal of the family tree of 35 firms that spun off from Fairchild between 1957 and 1970. Many other such geneologies are possible.

The small start-up firm also plays an important role for the large firms for three reasons:

1. The cost to society of the failure of a large firm is huge. So it is better for the small firm to test innovations in the market. These market "experiments" establish whether a particular innovation is viable at little cost to society since this cost is generally the personal savings of the entrepreneur. (Bruno and Tyebjee, 18). The large firm can observe these experiments and pursue the successful ones.

2. Large firms are hampered in their attempts to innovate by intervention from significant interest groups with vested interests in the status quo—examples of such interest groups are unions, communities, government agencies, and special interest groups. The successful small start-up, in posing a significant threat by its very success, provides glaring evidence to the corporation and to its constituencies when the change/ innovation is necessary. This paves the way for the corporation to make changes that would otherwise be vigorously and often effectively resisted.

3. As Bruno and Cooper (55) point out, a large proportion of high technology start-ups (about 30%) are eventually acquired by large firms, thus providing these large firms with opportunities for major new avenues of growth.

Need for internal corporate entrepreneurship

There is a real need for large corporations to foster entrepreneurship within their ranks. The Conference showed that this is possible and is being acccomplished today by those major corporations who are aggressively determined to maintain an internationally competitive position.

The strategy that is being pursued consists of:

a) Top management constantly communicating a serious commitment to competitiveness, by word and by deed.

b) Aggressive investments to achieve either the number one or the number two *global* position in mature markets—even if this involves major automation and/or offshore production to accomplish this position.

c) Major commitment of funds to developing new businesses.

d) Aggressive reductions in the management hierarchy, together with serious commitment to work *with* unions and the work force, so as to unleash the full initiative of the work force.

e) Frequent reviews with managers (who are expected to really "own" their businesses) either to seek new business opportunities or to seek radically new and innovative ways of conducting the existing businesses.

f) A radical revision of the reward system with the focus on performance. In other words, the company dispenses with automatic increases, whatever the performance, and rewards only significant performance.

Policy to encourage entrepreneurship in large firms

There is a major area that needs attention to foster entrepreneurship in large firms, and that is to *encourage basic and generic research*. There are certain research activities which require resources and patience beyond the capabilities of the small firm. This is for the type of basic and generic research (28) which requires considerable resources and long time periods before the technological breakthroughs, on which small firms can capitalize, takes place. In the long run interest of securing future technologies, it behooves the nation to seek creative ways of encouraging effective and efficient R&D spending by large firms or by consortia of large and small firms and universities.

CONFERENCE DISCUSSION: ENCOURAGING ENTREPRENEURIAL START-UPS

MR. KEMP: What can we do to make America competitive? What can we do to provide for an entrepreneurial climate? I think three things.

Number one. We need to reform the way we spend money in this country in the public sector. Prudence, responsibility, and saving tax dollars are important. See the correlation between growth in prudent nations and what's happened to some of our friends in Latin America. For example, put Brazil next to Japan.

Number two. There is a direct correlation between tax policies and growth. Nations which have tax codes that redistribute wealth are the nations that end up with shrinking wealth. The first goal of helping poor people is to expand the wealth of the nation. I suggest we lower our tax rates, effect a flattening of the tax code to bring the tax rate down to 25 or 30 percent, and build in a big, earned income tax credit for the working poor.

Number three. We need a credible, long term consistent monetary policy that will provide a guideline around which investors, savers, workers and consumers, borrowers, farmers, and third world countries can predict the value of the dollar over a given amount of time. A reform in monetary policy is an absolute must. I frankly think that solving this one issue alone will lead us into the next generation of industrial expansion.

MR. TURNER: I think that we have to look at the question of whether there is a positive role for government in stimulating a more efficient and dynamic economy that goes beyond providing lower tax rates and then getting government out of the way. Is there a role in R&D? Is there a role for government to bring together business and labor?

MR. GILDER: One thing we should be careful not to do is to have further complications in the tax code. In 1981, accelerated cost recovery created all sorts of new complexities, new tax shelter opportunities, and intricacies for middle management. That's why I think that what we want are across the board reductions that don't favor big companies against small.

Across-the-board policies have much better, broader, and more beneficial effects than targeting, even targeting the wonderful benefits of venture capital.

One of the problems with the capital gains tax cut was that when capital gains taxes were radically reduced, a big surge of commitments to venture capital resulted, which couldn't quite be managed as intelligently and efficiently by the venture movement as one might have hoped.

I don't think you should focus on capital gains. That's why I want to reduce tax rates on labor as well as on capital, and that's what Jack Kemp is stressing.

MR. KEMP: The question that keeps coming up about public policy is how you advocate policies that are not in the best interest of a certain class of people. The best way to do it is to advocate policies that are in the best interests of *all* the people. The rising tide lifts all boats. I don't think you should have policies directed to the entrepreneur. I don't think you ought to have policies directed at anyone, where an academic or a businessman or an agency of the federal government picks the winners. They can't do it.

MR. REGAN: Somehow the notion of managing *the process* seems interesting. And if so, how, and if not, why not? We are a government commission, after all, with some degree of stature. Perhaps we can have some influence over whether we should or should not manage the process.

MR. TRADER: I think it's fair to say that what's happened has happened rather haphazardly. You can only *dream* about what might happen if you had a specific process to encourage business formation and growth—a process that *has* to include access to seed capital. Let's recognize that as far as the individual starting is concerned, you're not going to come up with a process or a test that says, "You can be an entrepreneur and you can't be."

MR. PARKINSON: I don't think there's any way that anyone could manage a process of selecting entrepreneurs. But we c*an* manage policy to encourage people to come out of the crowd, and that's a worthwhile pursuit.

MR. TRADER: Yes, it helps a great deal if a community creates an environment to encourage the entrepreneurial movement. It's about time that the universities and colleges started talking about entrepreneurship as an *alternative*. The universities can begin teaching courses in entrepreneurship.

The same time that you're promoting entrepreneurship as an economic development activity or job creation activity, you can also focus on the problems of the people who have a hard time getting jobs.

Our experience at Control Data, going way back, is that people who have been disadvantaged and underprivileged make tremendous employees. You can address the inner cities. It's tragic that the enterprise zone legislation didn't get passed, because it works. I'm personally familiar with the enterprise zones in the U.K. I saw them start. And they've worked. One of the best examples is in the U.K., where British Steel was forced in a period of two or three years to make a reduction of 70,000 people. They just didn't stop there. They created what they call their "workshops." They gave space to their employees, to start their businesses at very reasonable rates. Today, there's about 30,000 people working directly because of those workshops.

If you buy the fact that entrepreneurism—small business formation and growth—is one approach to solving the economic problems of the country, then why don't we treat it in a managed—rather than haphazard—way to make it solve other problems. Get *big* businesses involved in nurturing small businesses.

This goes beyond individual entrepreneurship to trying to create jobs and economic well-being and opportunity. I'm talking about a job-creating network led by the private sector, in which all segments participate: the union, the churches, the not-for-profits, the community, and the government. I think there is evidence in this country and abroad that the *community-based approach* to job creation based on small business formation and growth does work.

If you had a managed process, which includes access to seed capital funds, and the involvement of the private sector in helping businesses get started and grow, it means that you're going to improve your success rate from 20 percent maybe to 50 to 70 percent, thus addressing the concerns we've heard earlier today.

What can the government do about it? Well, (state and local) pension funds could slide in two or three percent and you could instantly have a big seed capital fund in say, the state of New York. I'm not being facetious. In Minnesota, the Minnesota seed capital fund has pension fund investors—the teachers from the state.

MR. VESPER: It strikes me that out of the thousands of people who are currently being displaced there's going to be some small fraction who will take steps to start companies, and who are going to be successful. You can use that as a lever to inspire others in the same plight by letting them know about those who did it, and how they pulled it off.

There are people who just haven't thought about it as an option—by letting them see what others have done, you can multiply your effect of the accomplishments of a few.

MR. REGAN: Are there any other policies that would be successful? In general, I think we'd all agree that sound macroeconomic policies are the foundation of a good economy, but we are starting to hear something more than the traditional suggestions.

MR. VESPER: Just a thought on that. We're really exploring the notion of individuals being able to take more initiative. For instance, one aid to entrepreneurship in the country has been the emergence of magazines that make heroes out of entrepreneurs and let people see that it's an option. It's amazing how many people get to college without being aware that it's an option for them to take initiatives, to change or create something new—whether it's inside an organization or on their own independently.

Now schools make a big imprint on their pupils. Perhaps the educational system is one place where more attention could be given to the entrepreneurial option—as something people can become, and something they can do.

While we are on the issue of government initiatives, I'd like to comment on what appears to me to be the basic barriers that underlie *any* government action.

First, discontent is the parent of entrepreneurship. It is difficult for people in a political role to advocate discontent as a way of encouraging entrepreneurship, and yet that's what it takes in many cases. If you look at why many entrepreneurs did what they did, it was because they got fired, or they got mad at their boss or their idea was frustrated and it caused them to take initiative to do what they wanted on their own.

Second, and closely related, is the fact that entrepreneurship produces competition and nobody likes competition. Barbers and doctors and taxi drivers don't want competition—that's why we have licenses to keep people from competing with them. Industry doesn't want competition, that's why Japanese motor bikes carry a 45 percent import tariff. Unions don't want competition, and that's why trucking hasn't been deregulated more, and why the Davis-Bacon Act has been preserved.

Third, entrepreneurs, the people who start new businesses, are an invisible constituency; you don't know who they are until they actually create their business. How do you try to mobilize a constituency that sometimes doesn't even know it exists yet—because many of these people don't even *know* that they are going to start businesses.

Fourth, those who are most likely to start successful businesses are often capable and successful people. They are self-disciplined, so they have some savings to rely on while they are getting started. They are not the most needy. So, in a sense, you are advocating help for the nonneedy.

Fifth, entrepreneurship takes time. Silicon Valley and Route 128 did not begin five or six years ago, when they became famous. It took decades, and it also took World War II, which gave an enormous shot in the arm to both of those areas, to bring about what has taken place there. It takes a lot of time to build the resources and connections for banking, sales channels and other infrastructure. Unfortunately, the world of making legislation and policy runs on a short timetable where you have to get results quickly.

Sixth, more successes in entrepreneurship inevitably mean more failures. Where you get more entrepreneurial successes it's because there are more people trying. And a reasonable number of them are going to fail, and so you have to be able to tolerate some failure.

And finally, number seven and closely related to number six, is the fact that failure to produce entrepreneurial start-ups is not a clear and obvious failure. If you don't do it, nobody knows.

These are significant barriers that could stand in the way of enacting effective policies to encourage entrepreneurship. I think we have to recognize them so that we can work out ways to get around them.

MR. STEVENSON: The fact that entrepreneurship takes time is the most difficult factor to deal with. All of the evidence in entrepreneurship and new venture creation is that it takes five or seven years sometimes for cash flow to break even.

It seems to me that we have got to find a way to encourage longer-term thinking, but not only in the political environment, also in the financial community.

MR. BURR: I agree that it is important to focus on the longer-term. We have just finished raising our third fund, and we made the point over and over to the people who we were asking to entrust us with this capital, "Don't expect quick returns." And it is a five-to-seven-year time frame. Our partners contractually give us the capital for ten years. They can't get it back earlier—it's not a very liquid investment!

MR. STEVENSON: One thing that concerns me is that many of the firms which are now starting *are* going to fail. I doubt if we have a need for the hundred-and-something odd manufacturers of Winchester disk drives that have been formed in the last four years. What concerns me is how is the nation (and our national policies) going to deal with the inevitable failures. As we experience these failures, I'm very concerned that reaction to the current enthusiasms will dry up the market and so destroy the ability of the independent entrepreneurs to gain access to the kind of financial, human, and political support they need.

MR. VESPER: A last quick thought on things that government could do. William Proxmire has a golden fleece award, but he recently announced a flip side of that—some Air Force officer found something wrong with a G-suit connection hose, or something like that. When he looked into getting it fixed through channels he found that it would take like a couple of years, and hundreds of thousands of dollars, during which time his pilots would be at risk. So he went out and invested $1,000 of his *own* money to get some clips made to solve the problem. It was his *personal initiative* that got the problem solved. Perhaps we need more official recognition of individuals who have accomplished much with a *little personal initiative*.

MR. PARKINSON: While we are talking about what government should or should not do, I want to address how I think my company was able to succeed.

This is relevant to U.S. employment policies and regulations, how far the authorities should interfere in employment practices. We try to hire only the best. I think everybody does, but we really put the effort into it.

I personally still interview everyone we hire. I'm talking about line workers. That final interview occurs only after we've thoroughly reviewed their transcripts. What did they get in the field that we're trying to hire them for? Did they take challenging courses? Did they work part-time or full-time while they were going to school? Those are factors that we think are really important.

We then check with every prior employer, because interviewing has nothing to do with working: being charming in an interview doesn't help your work effort. We ask them, "Was this the best worker you ever hired?" And if he wasn't we don't hire him or her. It's that simple.

And I can say we don't discriminate. We're desperate for good help anywhere that we can get it. We have a woman who was making $1,000 a month, now a multimillionaire. Juan Benetez, who has got to be a shining example, was a Cuban refugee. I would say that a third of our people are minorities, and they are hired because they *want* to work.

We run 24 hours a day, seven days a week, all holidays, Christmas, New Years. There is no holiday—there is not a minute when the plant doesn't go full bore. I think we have the biggest output of any semiconductor small clean room in the United States, and part of the reason is running full bore around the clock, every minute.

Finally we *recruit*, instead of them coming to us. We really try to go out after who we think are the better engineers in this world.

We've never had a work stoppage, never even a hint of it. There have been no spinoffs. We've not lost one employee we wanted to keep.

And now the bad news. For every two we hire, we fire one. And that's a human trauma, and it probably goes counter to the concept of security. But, in fact, security is just anathema. In my mind it's an illusion.

People have *got* to be willing to work. If I were to recommend any change in the laws, it would be that it's all right to fire people. This may sound really simple, but it's getting harder every day. Title 7 and other laws create an atmosphere where the courts think there's something wrong with terminating a person. But if you've got a line and here's one guy working hard and here's another guy who's not, the first guy feels like there's something wrong with him to work hard while the other one isn't and they're getting paid the same. It creates a bad atmosphere. If people don't feel there is something that comes with working hard and putting out a good product then you can *never* create the esprit de corps and teamwork that is so essential to be competitive.

We're all in sympathy that there should be long-term security, and there should be protection against arbitrary management. But assuming you've got good management and they're acting in good faith, you've got to be able to weed out the bad workers.

ANALYSIS AND CONCLUSIONS: ENCOURAGING ENTREPRENEURIAL START-UPS

From the Conference discussion, there emerges several issues which affect our ability to foster more, and better, entrepreneurial undertakings. These are listed below. Those that are considered particularly important are discussed in depth.

Capital gains tax. In the above discussion, the high correlation between low capital gains tax and funds flow into the venture capital market could not go unnoticed. Should any pressure to increase the long run capital gains tax arise again, the U.S. should resist the temptation to do so. In fact, Vesper (5) goes so far as to suggest a tax moratorium on the first five years of profits made by any new business. This both encourages investment and reduces the cash outflow burden on growing young companies.

Regulation of the venture capital market. Several Conferees expressed concern that there could be a significant increase in venture failures in the next two years. If this occurs, considerable pressure may be brought to bear to regulate the venture capital market. This pressure should be resisted.

Barriers to co-operative R&D. Several Conferees objected to the legal barriers to cooperation for firms who wish to combine their R&D capabilities. These legal barriers should be removed. When eight small companies must spend $250,000 to get approval for joint R&D, the system is merely destroying initiative.

Official recognition of role models. Mauer (16) suggests that while culture is the area that can least be affected by public policy in the short term, much can be done to honor and publicly recognize those engaged in entrepreneurial activities. He makes the point that the Medal of Freedom is often given to political figures, entertainers, and sports stars but seldom to entrepreneurs. Much could be done at federal, state, and local levels to officially upgrade the image of the entrepreneur.

Availability of Official Statistics. As Vesper (5) has suggested in his previous report, there is a real need for more detailed official statistics on entrepreneurial activity in the U.S. This does not mean that one needs to create a new government department, but rather that resources be appropriated to ensure that such data is systematically collected and professionally processed. In this report, several cases were cited where official statistics were needed to fully explore our argument:

- We were unsure whether the current slow down in new business private placements and initial offerings was from cyclical effects or indicated a trend.
- We had to make estimates of the impact of entrepreneurship on productivity, tax revenues, job creation, and exports.
- We had to estimate the dependence of new, high technology firms on established businesses.

Such issues could be addressed much more accurately with a well-developed data base.

Enhance availability of seed capital via suitable incentives to investors.

The analyses that were conducted as a follow-up on the suggestions from the Conference, as well as the suggestions of those people currently involved in implementation of national policies, all suggest that there is a fundamental need to provide greater access to seed capital for entrepreneurs. Despite current record levels of funds in the venture capital market, only a small proportion of this capital goes into seed investments. The reasons for this are that there are currently inadequate incentives for investors or lenders to invest in such long term, risky ventures. As a result, today's entrepreneurs must use their own limited resources to carry their innovative ideas through to prototype development—this stage takes many years and consumes about 90% of the total effort of the entire innovation process. Thus the entrepreneur is obliged to bear the full risk of innovation. Yet the fact of the matter is that there are multiple benefits to society as a whole if the entrepreneur succeeds, particularly the high technology entrepreneur. Surely then it is incumbent on the society to share in the risk that the entrepreneur takes.

To this end we recommend the creation of incentives that further encourage investments in early stage ventures. While further investigations may be required to find out *which* incentives are best—whether special tax credits are needed to encourage investors to provide seed capital, or government guarantees are needed to encourage small banks to do so—the issue should be with how this should be done, *not* whether it should be done.

Conversion of innovative ideas to viable businesses via community-based initiatives

Provision of seed capital is not enough. There is ample evidence that the start-up business often suffers from a lack of managerial and administrative skills, and an adequate structure of supporting institutions and services. The result is that while the venture may be technically feasible, it founders for lack of this supportive infrastructure.

One of the major thrusts of the Conference was the suggestion that the most effective way of providing this support would be via community-based effort, supported by limited government funds and led by the private sector.

There are two components to such support. The first is the provision of the evaluative, managerial skills and technical skills to support the entrepreneur in the launch and early execution of the business. The second is the development of incubator environments in which the entrepreneur has access to necessary services at affordable costs.

Both components can be provided at a community level with a minimum of government intervention (other than initial injections of limited amounts of capital); can be driven by private sector initiatives; and can become self-funding.

a) *Provision of evaluative, managerial, and technical support*

The format for a community-based process has already been developed in partial form (Merrifield, 56). This is the Bi-national R&D Foundation (BiRD-F) Model. The BIRD-F model is based on a joint U.S./Israel program which has generated many successful projects in 4 years. By successful we mean the projects are already generating positive cash flow.

In this model, a relevant state, regional, or municipal agency is created with a limited budget ($5 million) and a charter to become self-funding within 10 years. Conceivably, large organizations in the region or community would contribute some of the initial funds needed to fund this activity. The agency's first role is to actively solicit and then screen business opportunities for commercial feasibility using something like the successful Constraint Analysis screening procedure currently used by the Department of Commerce in the BIRD-F model. Proposals which pass this screen are taken further—the local agency director seeks out large companies in the community whose skills complement those of the entrepreneur and invites them to join with community banks in funding the venture. Those firms, and banks that join, form an advisory group to provide managerial, technical, financial, and marketing skills needed by the entrepreneurs. A percentage of the funding needed is contributed by the agency, a percentage by the banks, a percentage by the large firm, and a percentage by the entrepreneur. If the venture fails, the project is written off. If the project succeeds, the agency recovers its investment and enjoys a subsequent royalty or dividend stream, which allows it to eventually become self-funding. If it does *not* become self-funding in the required time period, it is closed down.

This approach has an established record of success, engages the private sector in supporting the process both with funding and the necessary skills, minimizes government intervention and, after the start-up period, becomes self-funding.

b) *Creation of incubator organizations*

Also desirable is the establishment of incubator organizations to provide the supportive infrastructure that fledgling firms need. Incubators also become a focal center where entrepreneurs share technology and experience. We feel that such incubator centers should be driven by private sector initiatives, as is already being done by companies such as Technology Centers International, Inc., which now has centers in five metropolitan areas (57). In the full spirit of community-based, private sector-led initiatives, this firm is converting empty school buildings into incubator centers—thus creating new uses for community assets which are currently standing defunct. Each Technology Center is designed as a unit which houses about 50 embryonic businesses. The Center provides, for a reasonable rental, space and shared services such as reception, telephone answering, secretarial, communications, copy machines, computer services, transportation services, and conference rooms. The Center also provides advisors and a "champion" who represents the interests of the businesses to investors and clients. The Center derives its profits from three sources: from rentals, from capital appreciation of the building, and from an early window on investment opportunities.

In similar vein, Control Data Corporation has helped create twelve Business and Technology Centers, with a cumulative investment of close to $70 million. All these centers were created predominately with private sector funding.

If the private sector is prepared to create incubators, there is little need for government intervention. The major contributions that government can make are twofold: first to reduce local and state tax burdens on the Center and second, to ensure that the property is sold to the Center at a reasonable price, so that the Center can in turn charge reasonable rentals to its clients.

Programs of this nature should be implemented at the state level rather than federal level, since variants of the BIRD-F and Technology Center programs can be designed to suit the specific requirements of the particular state.

Promote supportive societal attitudes via the educational system

A recent study by Kent (58) identified a serious shortcoming in high school education—inadequate coverage in school curricula of the role of the entrepreneur in the U.S. economy. In his study, he found that little if any attention is given to the entrepreneur, so that high school students do not see entrepreneurship as an occupational option. State education systems could be encouraged to offer entrepreneurship as a serious and societally beneficial occupational option (for the long run, there are few self-employment opportunities direct out of high school). Educators at all levels should also be encouraged to include more material in school curricula that stresses the role of the entrepreneur in building our society and the contribution that entrepreneurship makes to the society.

A second major area for educational attack is in the area of educational programs to help entrepreneurs who have already started, or intend starting, new businesses. As Birley's study (46) re-affirmed, most deaths of new firms occur in the first two years after start-up. The equivalent of an agricultural extension program could do much to discourage start-ups doomed to failure, or aid start-up firms which get into trouble due to lack of skills in management. With relatively little effort, such community extension programs can do much to reduce the high attrition rate that firms experience in their first two years of existence.

This concludes the discussion of issues raised in the Conference, and by subsequent comment from the second group of experts. We now turn to the final section of the report which summarizes the entire report and makes recommendations regarding the fostering of entrepreneurship in the U.S.

CONCLUSIONS

The evidence presented in this report substantiates that society greatly benefits from entrepreneurial endeavors. High technology entrepreneurship creates significant new jobs; generates increased government revenues; enhances national productivity both by direct innovation and by forcing established firms to follow their lead; and contributes extensively to the balance of trade via exports of goods and services.

In addition, there are several ways in which entrepreneurial start-ups are of direct benefit to large businesses. First, by experimenting in the market place with new products and technologies, they demonstrate the feasibility of such innovations. Second, by their very success, they provide the large organization with the evidence it needs to convince powerful but reluctant stakeholders and interest groups that adoption of innovation is necessary. Third, the small high growth firm provides the large firm with access to new avenues of growth via acquisition of the small high growth firm.

Finally, this report showed that entrepreneurial activity can be sustained far more easily in the U.S. than in Europe or Japan, our major competitors in world trade. In Japan, entrepreneurship is inhibited by strong cultural norms that resist individualism. In Europe, entrepreneurship is inhibited by governments whose socialist policies are punitive to the independent entrepreneur. In both Europe and Japan, entrepreneurial expansion is inhibited by financial markets which do not provide ready access to capital for small entrepreneurs.

RECOMMENDATIONS

In the light of the above findings, we suggest that the entrepreneurial movement be supported in three major ways.

1. FOSTER POSITIVE SOCIETAL ATTITUDES TO ENTREPRENEURSHIP.

This can be done through the educational process, by increasing the image and stature of the entrepreneur in school curricula, as well as through more positive official recognition at state and local levels of the contribution of the entrepreneur.

2. INCREASE THE AVAILABILITY OF CAPITAL FOR START-UPS

This can be done by providing suitable tax and other incentives to private investors and financial institutions to support the riskier, early stage ventures, particularly seed ventures.

3. PROVIDE SUPPORT SERVICES FOR ENTREPRENEURS USING COMMUNITY-BASED, PRIVATE SECTOR-LED ORGANIZATIONS.

The objective of the actions recommended here is to provide entrepreneurs with the technology, software, management, and marketing skills that they need to successfully launch their businesses. Such support can be provided by community-based organizations, driven by private sector intitiatives. Training can be carried out by the business equivalent of local, agricultural extension programs; nurturing can be carried out by creating locally-based, profit-driven, incubator organizations; and evaluation and managerial support can be provided via self-funding agencies which promote collaboration between the venture and the local industry and banks. There is no need for extensive government investment or intervention, either at federal or the local level.

If these recommendations are implemented, there is every indication that the current entrepreneurial movement can be sustained at little cost, while the U.S. society accrues significant benefits.

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NEXT

September 24, 1987

FIRST TO FILE SYSTEM

Proposal:

When two or more inventors each apply for a patent for the same invention, the inventor first to apply would receive the patent. If an inventor is entitled to the right of priority or an earlier filing date, the right to a patent would be based on the earlier date. The first to file system would provide to earlier users or to those having made preparations for practice of the invention a personal right to use or continue using the invention where use or substantial preparation for use is undertaken before a patent application is filed by someone else. The prior user need not be the first inventor.

National or regional patent law would be applied in determining the filing date accorded to an application. A patent could be based on a regularly filed patent application or on the filing of a preliminary disclosure of the invention (internal priority document). If such a system requires the fulfilling of subsequent conditions for the preliminary disclosure document to receive a filing date, these conditions would, of course, have to be met.

Comments:

An appropriate court could decide the extent of the personal right available to a prior user to continue using the patented invention. The availability and extent of the personal right would take into account factors such as preparations and capital investments made, length of time the invention has been used and other equitable considerations. This personal right would be transferrable by license or assignment, but not expandable. It will be available whether or not the prior user applied for a patent for the invention.

ASSIGNEE FILING

Proposal:

The assignee of an invention would be authorized to apply for, receive and enforce a patent on his/her own behalf, but must identify the inventor(s) both in the application and in the patent, unless the inventor declines to be named in the patent or the published application.

The inventor would have to be named by the assignee within 16 months of the filing or priority date of the application. Inventorship could be corrected by the applicant at any time, however, so long as there is no deception involved in the original or corrected designation of the inventor.

Comments:

In the event the right to apply for a patent is challenged by another purported assignee or by an inventor, the matter would be turned over to an appropriate court or administrative body for resolution. Naming of the inventor within 16 months enables the name to be included in the published application.

GRACE PERIOD

Proposal:

A one-year grace period would be provided to patent applicants. A patent could not be invalidated on the basis of information from or activities by the inventor or person acting on the inventor's behalf, or by a third party who derived information about the invention from the inventor, within one year prior to the filing or, where applicable, priority date of the patent application for the invention.

Comments:

The grace period would be available regardless of the purpose of the act resulting in the disclosure; e.g., commercialization, technical or market demand testing, discussion at a scientific meeting, exhibition or disclosure to a prospective licensee.

SENIOR RIGHT
(SECRET PRIOR ART)

Proposal:

A published senior application would be prior art to any later-filed junior application in the same country. Its prior art effect for novelty purposes would date from its filing date, including any applicable priority date. The published application would have a prior art effect for all purposes from its publication date. The whole contents of the published senior application (except the Abstract) would be compared to the claims of the junior application in judging novelty or unobviousness. A published senior application would not be prior art to a junior application filed before publication of the senior application if both applications are commonly owned as of the date of filing of the junior application. Commonly owned copending applications would be subject to double patenting where identical inventions are claimed. Double patenting shall not apply, however, where one invention is obviously different from the other.

Comments:

This "senior right" provision is closely related to other provisions, such as (1) a first to file system; (2) benefit of a priority date to establish the effective date of a published patent application as prior art; (3) assignee filing; and (4) publication of a application a short time after filing (e.g. about 18 months). The senior right provision provides for "secret prior art" against other parties for novelty purposes but not for obviousness purposes. A published international application designating a particular country under the PCT would be a reference as of the filing date of the international application, whether or not the national fee for entering the national stage has been paid to that country.

An applicant's own published application would be prior art against his/her own junior application only if filed more than one year following publication of the senior application. Accordingly, the EPO concept of "selbstkollision" (self-collision) would not be adopted. This protects the rights of an applicant to obtain patent protection for plural inventions resulting from group research, which may not patentably distinguish over each other but are patentable when measured against the work of another.

OBJECTIVE TEST FOR NONOBVIOUSNESS

Proposal:

The following factual inquiries would constitute the objective test for unobviousness: determining the scope and content of the prior art; ascertaining the differences between the prior art and the claims; and judging unobviousness by comparing these differences to the level of ordinary skill in the pertinent art. Additional considerations, such as commercial success, long felt but unsolved needs, failure of others, would have relevancy as indicia of obviousness or nonobviousness and might be utilized to give light to the circumstances surrounding the origin of the subject matter. The subject matter would be viewed as a whole as of the time of filing.

CLAIMS AND CLAIM INTERPRETATION

Proposal:

The patent specification must conclude with one or more claims which particularly point out and distinctly claim the subject matter which applicant regards as the invention.

An applicant must define the invention in claims clearly stating the invention's scope in terms of its structural elements or steps. Structural elements, devices and processing steps may be defined in terms of the functions they perform. Infringement would occur only when the accused invention includes every element or step of the claim for which infringement is alleged, or their equivalent.

A patent could include any number of independent and dependent claims. Each claim of a patent would have a presumption of validity independent of the validity of other claims of the patent. Dependent or multiple dependent claims would be presumed valid even though dependent on an invalid claim.

A dependent claim which refers to more than one other claim ("multiple dependent claim") must refer to such other claims in the alternative only and must not serve as a basis for another multiple dependent claim.

Each claim in a patent would be interpreted for validity and the determination of infringement as broadly as possible, consistent with (1) the nature of the invention as explained in the patent specification and file history (including any narrowing of claim scope by the applicant in order to receive a patent); (2) common scientific knowledge in the related technical field as of the filing date of the application; and (3) the relevant prior art. Patented claims would be construed by an administrative or judi-

cial body, once a patent issues, in a light most favorable to the preservation of validity. When equitable to do so, a court will apply the doctrine of equivalents and find infringement even though the infringed claim must be enlarged beyond its literal language to read on the accused device. The claims would be construed in such a manner as to provide fair protection for the patentee and a reasonable degree of certainty for third parties. For examination purposes, claims would be read as broadly as their literal language permits.

Comments:

Peripheral claiming, by reciting the actual structural components of an invention, is the most precise way to define its scope. Central claiming, in which only the core or essence of the invention is described, usually in general or even conceptual terms, may leave the public and potential competitors confused as to exactly what has been patented and what limitations apply to enforcement of a patented claim.

A claim may include as an element a means plus a function where the means are well-known to persons in the relevant technical art. As examples, an ordinary amplifier (not the novel feature of the claim) may be described as a "means for amplifying an alternating current signal," or a chemical apparatus as a "means for centrifuging and precipitating chemical compound X." More than one "means" could be included in a claim.

When fairness requires, a claim will be interpreted in infringement cases to include obvious variations or modifications of the claimed invention which serve the same purpose and function in the same manner as the claimed part or step.

Under the doctrine of equivalents, an element is equivalent when it employs substantially the same means to achieve substantially the same results in substantially the same way as the claimed element.

An independent claim is one which does not refer to another claim. A dependent claim is one which refers back to and incorporates by reference all of the limitations of the claim from which it depends.

SCOPE OF PATENTABLE SUBJECT MATTER

Proposal:

Patent protection shall be available for all useful processes, machines, manufactures or compositions of matter, or improvements thereof, including, for example, pharmaceuticals, plants, plant parts (including genes), animals, foods and methods for creating or treating plants or animals.

Comments:

This proposal adopts the U.S. statutory language in regard to the kinds of inventions regarded as patentable subject matter. It is intended to be interpreted broadly, and to take into account all technical fields. Patents need not be available, however, for methods of doing business, computer programs per se, products of nature or atomic weapons. This proposal does not contemplate the patenting of humans.

PRODUCT PROTECTED BY PROCESS CLAIM

Proposal:

The importation into or the use or sale within a country of a product made by a process patented in that country would constitute infringement of the process patent.

The process patent owner would in infringement litigation be given a rebuttable presumption that a product that could be made by the patented process was actually made by it. The burden of overcoming this presumption (reversal of the burden of proof of infringement) would be placed on the alleged infringer.

NO DEFERRED EXAMINATION

Proposal:

Search of all applications should be completed as soon as possible after filing of the application. Examination of all applications must be completed promptly thereafter, in order to provide as early an identification of patent rights as possible. Appropriate time targets for completing examination procedures will be decided upon later.

Comments:

The deferral of examination creates situations where potential competitors of the applicant must guess at the future scope of patent claims. It is difficult or impossible for them to make sound business decisions until the deferred application is examined, which may not be for many years after commercial preparations should or may have begun. It is unfair to require them to request and pay for one or more examinations.

POST-GRANT REEXAMINATION

Proposal:

A patent would be subject to at least ex parte reexamination of its claims at any time during its term, on the basis of publications or patents provided to the examining office by any person. Offices would be free to make such proceedings inter partes or to permit post grant opposition proceedings on these or other grounds.

Patent claims could be cancelled or amended, but not be enlarged in scope during reexamination. No pre-grant opposition proceedings would be permitted so as not to delay commencement of the patent right.

NEW MATTER

Proposal:

No amendment shall introduce new matter into the specification, claims or drawings of a pending application. Claims containing new matter or depending upon the new matter for a supporting disclosure would be rejected and the new matter deleted.

Comments:

All amendments to the specification, claims and drawings filed after the filing date of the application must conform to one of them as it was at the time of filing the application. New matter involves a departure from or an addition to the original disclosure. New matter is not introduced by amendments that merely make explicit a disclosure that was implicit in the application as originally filed. If the amendment adds matter which is inherent in the application as filed, no new matter would be presented by the amendment. However, amendments to the specification that introduce new matter would include new comparative data and/or new examples.

DURATION OF PATENTS

Proposal:

A patent shall have a term of at least 20 years from the earliest domestic filing date to which the application is entitled. The term shall therefore be measured from any domestic filing date of an earlier internal filing document, continuation, continuation-in-part or divisional application.

Each office shall adopt procedures to extend patent rights for all or part of the term lost as a result of regulatory review or from imposing a secrecy requirement. Extension of the patent term would, in appropriate circumstances, cause its expiration more than 20 years after the earliest domestic filing date of the patent application to which it is entitled.

PUBLICATION OF PATENT APPLICATIONS

Proposal:

Each patent application would be published as soon as practicable after 18 months from its filing date, unless the applicant abandons the application and so notifies the appropriate office in sufficient time to prevent publication. The 18 months shall be measured from the filing date of an application or any applicable priority date.

Provisional rights to damages for infringement, based on the claims as published and subsequently allowed would be available, upon the issuance of a patent, for the time between publication and patent issuance. Claims may be broadened after publication, if the application is still pending.

Comments:

The file wrapper of any published application would be available to the public. Nevertheless, certain papers could be excluded from public inspection: documents concerned with the exclusion of members of an appeal tribunal; draft decisions and opinions; designations of the inventor if he/she renounces their inventorship; and any document that does not serve the purpose of informing the public about the application or the resulting patent.

If a divisional, continuation or continuation-in-part application is filed before publication of the parent application, the parent application could not be withdrawn for the purpose of preventing or delaying publication. For continuation and continuation-in-part applications, the filing date of the parent application would be used for calculating the 18-month period.

DESCRIPTION OF INVENTION IN THE PATENT

Proposal:

A patent specification must contain a written description of the invention and of the manner of making and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the invention without resort to undue experimentation. The best mode of practicing the invention known to the inventor at the time of filing the application could be required to be included therein.

REISSUE OF A PATENT

Proposal:

Each Office shall provide to a patent owner the opportunity to reissue a patent. No reissued patent shall be granted, however, enlarging the scope of the claims of the original patent unless applied for within two years from the grant of the original patent. Members of the public adversely affected by the grant of new claims in a reissue patent shall be entitled to intervening rights. These rights shall be determined by an appropriate court to protect investments made or business commenced before the grant of the reissue.

COMPULSORY LICENSES

Proposal:

A compulsory or non-voluntary license may only be given to address, only during its existence, a national emergency, or to secure compliance with, or remedy, an adjudicated violation of antitrust or restrictive business practice laws. Patents may also be non-voluntarily, non-exclusively licensed for governmental use. In the case of a license to address a national emergency or use by a government, the patent owner must receive adequate compensation commensurate with the market value of the license. A compulsory license must be non-exclusive.