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THE WHITE HOUSE

WASHINGTON

December 28, 1982

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Dear Mike:

The December 14 meeting of the National Productivity Advisory Committee made excellent progress in completing several recommendations in the areas the subcommittees had identified as most fruitful. A copy of the minutes of the meeting is enclosed for your information.

The 19 recommendations adopted at the December 14 meeting bring to 46 the total number of specific recommendations the Committee has submitted. This is a substantial accomplishment, and one that has helped the President tremendously in formulating policies for revitalizing productivity growth. Many of the Committee's recommendations have been embodied in legislation or implemented through administrative action. Others will become part of the Administration's policy initiatives for the coming year. After these new recommendations have been reviewed by the Cabinet Council on Economic Affairs and the President, we will provide you with a report on the status of all of the Committee's recommendations.

During lunch at the December 14 meeting, the Committee discussed the White House Conference on Productivity that it will be responsible for conducting in 1983. As the Committee decided, we will continue the four subcommittees that were established earlier this year and in addition create two new subcommittees--one dealing with government organization and operations and one dealing with ways in which private sector institutions can contribute to productivity growth. We would appreciate any ideas you have regarding additional issues that any of these subcommittees might consider.

I have appreciated very much the opportunity of working with you this past year. With best wishes for the New Year.

Warmest regards,

Roger

Roger B. Porter
Deputy Assistant to the President
for Policy Development

The Honorable Michael K. Deaver
Assistant to the President
and Deputy Chief of Staff
The White House
Washington, DC 20500

Enclosure

NATIONAL PRODUCTIVITY ADVISORY COMMITTEE

DECEMBER 14, 1982

10:00 A.M. - 2:00 P.M.

DEPARTMENT OF THE TREASURY

ROOM 4121

ATTENDEES: Messrs. Simon, Branscomb, Buoy, Dunlop, Garvin, Goldstein, Grayson, Hall, Kearns, Kingon, MacAvoy, Mettler, O'Donnell, Perkins, Schubert, Schurr, Seibert, Seidman, Smith, Webber; Ms. Spain; Messrs. Porter, Skancke, Li; government officials, members of the public and press.

The fourth meeting of the National Productivity Advisory Committee was convened by the Honorable William E. Simon, Chairman of the Committee, at 10:00 a.m. in Room 4121 of the Department of the Treasury.

Mr. Simon announced that during the lunch period the Committee would discuss the White House Conference on Productivity for which he and the National Productivity Advisory Committee had been given responsibility. While this is the last scheduled meeting of the National Productivity Advisory Committee, its members will form the nucleus of the White House Conference on Productivity. The Committee recommendations adopted today will be sent to the President through the Cabinet Council on Economic Affairs along with a summary of its previous recommendations. A copy will be sent to the members of the Committee.

I. Subcommittee on Capital Investment

Tax Reform to Increase Productivity. L. William Seidman, Chairman of the Subcommittee on Capital Investment, reported that the Subcommittee had examined long range tax reform possibilities for discussion at this meeting. Their statement included two central principals: first, the need to eliminate the double taxation of corporate dividends, and second, the importance of reducing marginal tax rates.

The Subcommittee noted that the Hall-Rabushka proposal has several major benefits: it is much more simple than the current system, it improves the fiscal control of the Federal Government, it makes compliance easier and less burdensome, and it can contribute to productivity growth. The Subcommittee

also noted certain concerns about this specific proposal: the treatment of undepreciated asset balances, the refundability of carry forwards, the impact of consumption taxes on government demand management objectives, the taxation of inheritances, the impact on charitable institutions, and the distributive effect on individual taxpayers.

Robert Hall observed that tax reform is a productivity issue and that the Hall-Rabushka proposal offers a sensible approach to it. Marginal tax rates have become excessively high, the Economic Recovery Tax Act of 1981 did not cut the 46 percent corporate rate and did not reduce the 50 percent maximum on unearned income.

Mr. Hall explained the rationale and elements of his proposal. Under the current tax system, proceeds from a good idea that results in a corporate enterprise will be taxed at the 46 percent rate in the corporation and then again at a 50 percent rate if the returns are paid to the innovator as dividends. As a result, more than 70 percent of the proceeds from this new idea may go to the government, and only 30 percent to the individual. Thus, the current tax structure provides incentives to seek less productive tax shelters. For productivity growth the disincentives must be reversed so individuals will pursue new ideas and create new businesses. A low marginal rate tax system would do this.

The Hall-Rabushka proposal would replace the current corporate and individual income tax with a uniform tax of 19 percent on all consumption. There would be no deductions other than a personal allowance. The system is progressive as a result of the personal allowance; the poor would pay no tax. Lower income groups would pay less tax as a proportion of income than would higher income groups. The personal allowance is important to obtaining progressivity while retaining the simplicity of a flat rate tax system.

All other income is taxed at the business level. By broadening the tax base, income is captured when it is generated, eliminating the leakages in the current tax system. By taxing income at the source, there is less opportunity for income to escape reporting or taxation. The business tax would be based on business gross sales, minus all allowable costs, minus purchases of plant and equipment. The remainder is taxable income. There is no deduction for interest expense, and there is no depreciation of assets. Income paid out to owners of the business is taxed in the business. Fringe benefits are taxed by making them nondeductible to business thereby eliminating the current distortion in the system for income-in-kind.

Mr. Hall noted that he and Mr. Rabushka have considered

several of the concerns of those who have reviewed their proposal. Many ask whether there is a fair distribution of benefits from such a proposal; is there too much of a break for high income groups? The personal allowance makes the system equitable for the poor and lower income groups, but there are distributive consequences especially for middle income groups. For some, the result of changing the penalty of success will mean lower income in the short run. There is a moderate gain by high income groups and a moderate loss by middle groups. At a $30,000 income level, the Hall-Rabushka proposal would reduce after tax income by five percent. At a $250,000 and above income there is a ten percent increase in after tax income. The productivity affect, however, dominates, and everyone comes out ahead in about one to four years. Although in the initial period middle income groups will pay more, in the longer run everyone is better off as the productivity results work through the system.

Mr. Simon stated that the distributive issue is really a social issue. We have proceeded on a belief that those who earn more should pay more. It is a presumption that always has been with us and will continue to be with us.

Mr. Hall continued to discuss the effect of his proposal on asset values. In housing, eliminating the deductibility of mortgage interest would have an impact on those who have invested with the expectation that their interest would be deductible. Although it might appear to increase the cost of housing, the net effect of the Hall-Rabushka proposal on housing, he claimed, is negligible. Interest payments no longer are deductible, but neither is there a charge for interest receipts. As a result, he estimated interest rates would come down at least three percentage points immediately. The new system would increase the resistance of borrowers to paying higher rates if they could no longer deduct the interest expense, and it would decrease the needs of lenders for higher rates to make up for that portion of their interest income that is taxable.

The Hall-Rabushka proposal does nothing with respect to loans already on the books. Mr. Seidman noted that the Subcommittee on Capital Investment felt there ought to be some transition rules such as not permiiting interest deductions on new mortgages but permitting interest deductions on existing mortgages. Corporations face the same issue and some special transition treatment is also appropriate.

With respect to the depreciation deductions, the Hall-Rabushka proposal would not allow deductions for asset depreciation. For undepreciated balances, some transition rule again might be necessary.

Mr. Seidman reiterated that this is a promising proposal requiring extensive study and debate. The Subcommittee feels that its goals are attractive but that the transition would inevitably be complicated. The Subcommittee requested that the full Committee approve the statement on "Tax Reform to Increase Productivity" contained in the briefing materials.

Recommendation

From the standpoint of improving productivity, there are several important reforms needed in the federal tax system. These include eliminating the double taxation of corporate income and substantially reducing marginal tax rates imposed on individuals so that lower tax rates are imposed on a broader concept of income. All income should be taxed just once at rates not exceeding some low fixed rate. Further, the tax system should provide a single comprehensive investment incentive in the form of immediate expensing of all investment expenditures. This incentive should replace the existing investment tax credit and depreciation provisions of the personal and corporate income taxes.

A detailed tax reform proposal that accomplishes these important goals has been made by Robert Hall and Alvin Rabushka of Stanford University. Under this proposal, all income would be taxed at the same low rate of 19 percent. By eliminating many deductions and other sources of leakage in the tax system, a lower rate of tax (19 percent in their estimate) would raise enough revenue to close the federal deficit by fiscal year 1985, assuming immediate enactment and no transition exceptions. The Hall-Rabushka plan replaces the corporate income tax and certain parts of the personal income tax with a comprehensive business withholding tax and so achieves a particularly simple and practical solution to the problem of eliminatng the double taxation of corporate income. Though the Committee does not endorse every feature of the Hall-Rabushka plan, and in particular would call for certain modifications to ease the transition to the new system, we feel that their plan is a most promising proposal to bring badly needed tax reform and merits extensive study and public debate.

Eliminating high tax rates on individuals and businsses is essential to restore adequate productivity growth. Faced with 46 percent tax rates on corporate income and up to 50 percent on individual income, and a combined tax rate on business and personal income that can be as high as 70 percent, prospective entrepreneurs divert their efforts into tax shelters instead of the creation of new businesses. Reducing high marginal tax rates and eliminating double taxation of corporate income are essential to stimulating productivity growth and should receive high priority in a

general program to spur productivity.

Mr. Simon expressed his conviction that any proposal must meet the criteria of simplicity and equity. Mr. Branscomb shared this concern about endorsing specific proposals. Mr. Dunlop asked whether the recommendation was to refer this to the White House Conference on Productivity. Mr. Simon explained that the mission of the National Productivity Advisory Committee is to make specific action proposals to the President and the Cabinet Council on Economic Affairs. Since the Committee was created there has been legislation creating a White House Conference but the Committee still has a job to do. While the Conference may discuss tax reform and productivity as one of its critical issues, the Committee still has the responsibility to recommend actions.

Mr. Seidman reiterated that his Subcommittee believes that the general principles of lower marginal tax rates and eliminating double taxation of corporate income and dividends are good for productivity, but more study regarding the best ways of achieving these objectives is needed. They are recommending that the Committee support the entire statement contained in the recommendation.

The Committee voted unanimously to approve this recommendation.

II. The Subcommittee on the Role of Government in the Economy

Reforming the Clean Air Act to Increase Manufacturing Productivity. Paul W. MacAvoy, Chairman of the Subcommittee on the Role of Government in the Economy, introduced the subcommittee's proposals for reforming the Clean Air Act to increase manufacturing productivity. He suggested that the administration of the Clean Air Act has seriously reduced productivity growth and will continue to do so unless the Environmental Protection Agency (EPA) adopts a more efficient approach to emissions reductions.

The Subcommittee is proposing to change the method of regulation gradually and to abandon equipment regulations because of their adverse effect on productivity growth in manufacturing. The recommendations were designed to improve productivity by eliminating the penalties of the current process on new plants which are subject to more stringent requirements and also by removing the impediments provided by equipment based standards.

The Subcommittee believes that the current pattern of regulation in the area is one of the most costly and least effective, and estimates that the productivity gains from

adopting these proposals will be great.

Recommendations

1. The Pollution Control System should be reformed to eliminate regulatory decision-making based on technological requirements, (BACT, RACT, LAER) and to end the discrimination against new plants inherent in the New Source Performance Standards.

2. The process of setting National Ambient Air Quality Standards (NAAQS) should be reviewed to determine if this complex process can be simplified and improved. Following this review, EPA should be required to simplify and then more closely set standards to time periods actually encountered in production and weather cycles.

3. The secondary NAAQS are required in most states by the end of 1985. These standards, centering on improving the "welfare" of the community, are supposed to be set without regard to cost effects. Congress should clarify the Clean Air Act to indicate that a cost analysis is permitted in the development of secondary standards.

4. The EPA's present reform initiative, its Emissions Trading Policy Statement of April 7, 1982, is an important step toward more flexible and efficient air pollution control, and should be endorsed by the Committee.

5. EPA should expand the present Trading Policy Statement into a full Transferable Discharge Permit (TDP) system for nitrous oxides (NOx) and volatile organic compounds (largely hydrocarbons). Eventually, the new TDP system must replace the equipment requirements now dominating regulation, and the Committee should endorse in principle the creation of market incentives for pollution control.

Part of these recommendations are directed towards slowing the standards setting process until it reaches equilibrium. The remainder focus on how to transform equipment based standards to point-source systems where a plant or a factory is responsible for controlling the volume of emissions in accordance with a pre-set level. This would be done over time to eliminate discrimination against new source performance standards. Mr. MacAvoy said that the new procedure will allow setting up a market for tradable permits with rights to buy and sell the right to emit. The fifth recommendation concerns expanding the present trading policy statement to set up a nationwide system for nitrous oxide and volatile organic compounds (largely hydrocarbons). Mr. MacAvoy said he did not believe that it is possible yet to have a trading system for sulphur oxide and particulate matters because these pollutants

do not spread evenly or rapidly.

The Subcommittee recommended considering these proposals as a package; as a statement for a new environmental regulatory system. The recommendations reflect the comments of members who provided their views at the November 3 meeting in New York.

In response to Mr. Schubert's question, Mr. MacAvoy explained that the substance of the December 9 memorandum is the same as the November 30 memorandum that was circulated to members earlier. The December 9 memorandum incorporates comments received from Mr. Garvin concerning the second and third recommendations on ambient air. It also expands discussion of Mr. Seidman's concern of short time periods over which emission standards must be met.

The Committee unanimously approved all five recommendations.

Well Pay. Mr. MacAvoy explained that his Subcommittee has not yet reviewed or approved the well pay proposals. The proposals are based on an assumption that if Federal employees are available to work in their jobs, they would be able to produce more. How much more work effort would be forthcoming is not known. Nor is the specific cost saving of not having to provide more or substitute employees known.

Mr. Garvin questioned why we had abandoned a system under which we pay for work and not for employee absence. Mr. Simon suggested that while that is an alternative, we are not likely to get rid of the current system. It has been built up over years as a result of various bargaining efforts. Mr. Branscomb concurred that this is an issue that must be treated carefully; it involves the contractual relationship between employees and employers. He asked whether statistics showed different patterns between men and women in use of sick leave. He suggested that women may need more sick leave from time to time, whereas men tend to be sick less often but for longer periods of time.

Mr. Weber indicated that the problem seems to be an abuse resulting from mixing annual and sick leave. Some companies use attendance bonus programs, some have identifiable personal leave balances, and others use administrative disciplinary considerations to eliminate abuse. He expressed concern about creating a sick leave program, making it an entitlement, and then paying employees not to use it.

Mr. Buoy stated he believed that it is a matter that should be left to collective bargaining. In addition, he does not like the negative approach where those who do not abuse their leave are penalized. In addition, he said that more data are needed.

Health Care Costs and Productivity. Mr. Dunlop pointed out that health care is an extremely complicated area, with a significant impact on the performance of the economic system. The share of expenditures on health care is growing rapidly and now is at 10 percent of GNP. The rising cost and enormous technological change going on in the health care industry further complicates its outlook for the future.

He stated that the Subcommittee has developed four recommendations where they believe there is an opportunity for genuine concensus.

Recommendations

1. Local and State Health Care Coalitions in varying configurations of hospitals, physicians, insurers, business, labor and other community groups or local or state governments, have been growing rapidly. There are approximately 120 such coalitions at varying stages of development. These coalitions have provided a useful forum in which to address health care costs and associated questions in the local setting. The best of them have been concerned with constraints on hospital beds, utilization review, outpatient and ambulatory care, review of benefit structures, etc., depending on the problems and opportunities of the community or state.

   At the present stage of national health care policy, Federal and state governments should encourage the development and operation of these health care coalitions, but should avoid any attempt to regulate, prescribe, or take over these private initiatives.

2. Antitrust. The government has a responsibility to assist in reducing the extent of uncertainty under the antitrust laws that may arise with respect to the activities of coalitions designed to constrain the increase in health care costs through sharing information on utilization, and programs to constrain expansion in beds where they are excessive. The government should work with the leaders of provider associations, insurers, and business and labor organizations to develop some general guidelines of acceptable activities to constrain costs.

3. Prospective Budgeting. There is a wide and growing consensus that cost reimbursement for institutional care should be replaced by prospective reimbursement, with the institutions sharing gains and losses from the prospective budget. The government should promptly adopt these procedures for medicare and encourage the general adoption of prospective budgeting.

It is likewise generally agreed that there are special problems that need attention in applying prospective budgeting to hospitals attached to medical centers on account of the costs of education of medical personnel and research, and to reflect other regional cost or patient mix or load differences.

4. Health Care Benefit Choice. It would be most helpful to have more experimentation in collective bargaining, and in management policies in the absence of organization, with devices to encourage choices among workers, and groups of workers, regarding health care benefits. (These arrangements are often called "cafeteria" plans and provide that workers receive directly funds not expended on health care.) There are complex issues of adverse selection and avoidance of basic health care needs that should be carefully addressed in any plan design. Legislation mandating specific details should be avoided.

Mr. Dunlop believes it is of vital importance to encourage health care coalitions so that they may develop appropriate responses to the reduction in growth and spending for health care. Coalitions are particularly useful for developing state and local initiatives.

With respect to prospective budgeting, the Congress has mandated the Department of Health and Human Services to produce by December 31 a system for prospective budgeting in certain health care expenditure categories. This is an area that offers great opportunity for cost and productivity savings.

The health care benefits choice recommendation suggests a kind of cafeteria arrangement, with some minimum level of benefits that may need to be prescribed beyond which employees would be able to select the health benefit program they prefer. To monitor any adverse selection problems, a follow up evaluation system is needed.

Mr. Hall asked about pending proposals to limit deductions of health care benefit payments to $150 per month. Mr. Porter indicated that this proposal was still under consideration within the Administration. Mr. Hall asked why they should not be included here. Mr. Dunlop responded that he would prefer to discuss the Subcommittee recommendations first and then consider others' proposals.

Mr. MacAvoy expressed reservations about the antitrust recommendation. He stated that where the activity of a coalition is designed to constrain health care fees, it is in violation of Section 1 of the Sherman Act. Mr. Dunlop disagreed with Mr. MacAvoy's interpretation of the law and suggested that there is a distinction between bargaining for

Hall and MacAvoy opposed the antitrust recommendation.

[The Committee recessed for lunch at 12:15 p.m. and reconvened at 1:00 a.m.]

Mr. Hall requested that the Committee also adopt a recommendation for limiting employer deductability of health plan contributions to not more than $150 per month. He believed that medical deductions should be treated like life insurance deductions by putting a cap on them. Unlimited contributions have contributed to excessive use of medical care.

Mr. Simon asked whether the Committee could judge an issue like this without adequate background information and analysis. The Committee decided not to vote on this issue at this time.

Employee-Management-Government Forums. Mr. Grayson introduced the Subcommittee's recommendation for developing a continuing dialogue between labor, management and government at all levels, including the national level, on productivity related issues. He noted that there was an important need to enhance cooperation and coordination on a large variety of issues. He noted that there were many different ways of structuring such arrangements and that the Subcommittee was not recommending any specific form. Rather, the Subcommittee was recommending the general concept.

Recommendation

> The Federal Government should examine alternatives for encouraging a continuing dialogue between labor, management, and government on issues related to productivity, product quality and quality of working life. National private sector labor-management forums should interface with government representatives in appropriate ways that do not conflict with Federal Advisory Committee Act provisions.

The Committee voted unanimously to approve this recommendation.

IV. Subcommittee on Research, Development, and Technological Innovation

Lewis M. Branscomb, Chairman of the Subcommittee on Research, Development, and Technological Innovation, reported that his Subcommittee had focused on four issues for the Committee's consideration.

National Medal for Productivity Achievement. The proposal for a National Productivity Medal was developed by Mr. Kearns. The objective of the proposal is not to promote R&D, but to reward all types of productivity efforts.

Recommendation

Create a National Medal for Productivity Achievement for the President to award annually in recognition of high levels of verifiable productivity achievement by organizations. The President should appoint a Commission for the National Medal for Productivity Achievement to develop the criteria and rules for awarding the medal and to govern the selection of the candidates.

Appoint a special task force of the National Productivity Advisory Committee to assist the Secretary of Commerce in developing a charter, objectives, award process, selection criteria, administrative procedures, etc., for the Medal.

The discussion revolved around two issues. First, Mr. Simon asked whether the Subcommittee was recommending giving more than one award each year. Mr. Kearns responded that they envisioned multiple awards of the medal in any one year.

Second, there was some interest about whether medals should be awarded to individuals, as well as organizations. Mr. MacAvoy expressed his concern about limiting the awards to companies and not also including individuals noting that individuals are eligible to receive the National Medal for Science. Mr. Branscomb observed that it is the combined contribution of a group or organization that leads to extraordinary productivity accomplishment. An outstanding entrepreneur, inventor, or invention all might be key elements in a group's productivity achievement, but they would not be sufficient conditions by themselves to merit the group award. In addition, there are other awards available for outstanding individual contributions such as the National Medal of Science or the National Technology Medal. Mr. Kearns added that the objective is to motivate whole organizations--management, workers, everyone--to strive for higher productivity.

The Committee unanimously approved the recommendations for a National Medal for Productivity Achievement.

Intellectual Property in Computer Software. The computer software field is one of the most rapidly growing, profitable and potentially significant contributors to productivity growth for U.S. products and industries. Property rights for computer software need to be secured to assure unimpeded development in this area. The recommendations prepared by Mr. Hall have been reviewed by the Subcommittee and by the Department of Commerce Patent and Trademark Office.

Great progress has been made in the area of software protection already, but there are elements of protection that

yet need to be assured. Accordingly, the Subcommittee has three recommendations:

Recommendations

1. Enact legislation to grant software authors protection under trade secret and copyright laws simultaneously.

2. Strengthen laws against piracy and counterfeiting of computer programs to include criminal penalties in the copyright laws.

3. Amend the copyright law to permit a software author to copyright a detailed description of the program as well as the program iteslf so that protection would extend to any program written by another author following the original author's description or program.

H.R. 6983 would permit that a copyright notice in a program would not constitute publication in a way that would prevent trade secret protection. It also would provide for confidential deposit of copywritten programs so that trade secrets are not revealed. Current copyright laws permit damage suits for infringement, but these are costly and time consuming. The potential for criminal penalties being imposed would strengthen the disincentives for infringement.

With respect to the third recommendation, the central issue is what constitutes intellectual property. Mr. Hall explained that a transposition of a music composition into a different key, for example, does not escape copyright protection. Similarly, line by line translation of a computer program from one language to another should not escape protection. The philosophy of copyright protection is tricky, however. Copyrights protect the form and not the expression. The Subcommittee believes that the expression of computer software also should be protected. This, however, would require further study and a legislative proposal.

Mr. Simon questioned why software could not be protected. The bulk is written by individual authors and contributes significantly to productivity. Mr. Perkins expressed his concern about the drawback to sharing. Mr. Hall explained that the objective is to provide strong incentives to create and to be able to disseminate. Authors should have strong rights and an incentive to distribute widely for profit. Additional copies and dissemination are relatively inexpensive once the product has been created.

Further discussion centered on two issues: would increasing the protection of software inhibit its dissemination, and exactly what property would be protected. First,

Mr. Hall explained that there is a tradeoff between protection of property rights and dissemination. Too much protection might impede dissemination, but without protection there would be little developed for dissemination.

Concerning what is protected, Mr. Goldstein asked about the similarities in something like a payroll system. Mr. Hall explained that while the very same language would not be permitted, i.e., it could not just be copied or translated, the copyright system does not control the "plot" in a novel and thus it would not control it in a software program.

Mr. Weber asked for evidence of the impact of the absence of protection on software development. The development and gains from software have been great. He questioned why further legislation is required if the market seems to be working. Mr. Hall indicated that much has been written because there is an established system of protection. Monopoly is not an issue here because the cost of reproduction is so low. Many areas, however, could be better supported by software than they are now. The need is to provide the maximum incentive for authors to develop.

Visicalc, for example, is protected in that it cannot be rewritten in another language and marketed as a new software system. It would not have been written without some form of protection, and without that protection this productivity tool would not be available. Mr. Branscomb added that his company spends $2 billion on development annually, one-half of which is spent on software. They could not afford to invest in software without some form of protection for it.

All members except Mr. Weber voted to approve this recommendation.

Engineering Education for Higher Productivity. Mr. Branscomb presented the Subcommittee's recommendation on engineering education for higher productivity. He pointed out that the Japanese do not out-innovate the United States, but they do out-manufacture us. American engineering schools must train engineers to design products for inexpensive, quality mass production.

Recommendation

> Federal science and engineering agencies should establish a program of matching grants to schools of engineering for expansion of research, instruction, instrumentation, and graduate fellowships in manufacturing engineering, engineering design, and related basic sciences for higher productivity. A program initiated in FY 84 should be funded for three years to a level of 500 graduate fellowships and

annual support for research in graduate training in these areas of $50 million. Universities and institutes of technology would be expected to match one-for-one these grants with funds from non-federal sources.

The Subcommittee believes that such a program would help remedy the imbalance in engineering training in the United States and would take advantage of the unique opportunity to establish a proper use of the tools of automated design and protection. A direct and long-term improvement in productivity would result.

The Subcommittee also believes that universities can find matching funds and that, in doing so, both the companies and the universities will profit from this new relationship.

In response to Mr. Grayson's question, Mr. Branscomb agreed that the purpose of the fellowship is not to focus only on the mechanical part of engineering research, but also to teach the social application and interface within industries and other sciences. Chemical engineering has been doing this for years. Mr. Garvin indicated that he could name other areas where this also has occurred, for example, in ceramics.

Manufacturing engineering degrees are offered by only six colleges in the United States. Mr. Weber cautioned that in some places a fair amount of effort is emerging in business schools too. Mr. Branscomb said that his Subcommittee recognizes the need for further work in business school applications to improving manufacturing, but the Subcommittee had limited its recommendation to an area where the Federal Government spends funds already, rather than expanding to include funds for business school curricula.

Mr. Weber also suggested that the support include "and related basic sciences". There has been a recent emergence of biological sciences and manufacturing. Mr. Branscomb supported the amendment. Mr. Kearns did also, but suggested the Committee give greater emphasis to engineering because other programs for basic sciences already exist.

The Committee unanimously approved this recommendation.

Cooperative Research and Development. The Subcommittee has also reviewed the issue of cooperative research and development, its contribution to productivity growth and the impact of federal policies on such efforts. A paper was distributed at the October 1 meeting discussing the issue of antitrust policy impediments and the effect of research tax incentives.

There has been much interest, however, in having the Committee help to foster a better environment for cooperative

research efforts. The Department of Justice attempted to clarify its guidelines in 1980 and has expressed its willingness to do so again if necessary. They have not had many applications and would appreciate any assistance that might be provided. The perception remains that there still is a problem. Neither the Subcommittee nor the Departments of Justice and Commerce are comfortable with the proposal for Justice issuing certificates of review to immunize ventures from antitrust liability.

Recommendation

The Administration should review the appropriateness of current antitrust law and practice in response to the new international environment. Representatives of government and industry should join together in identifying the need for clarification of the application of existing anti-trust policies. In addition, the Department of Justice should advise or expand its Business Review Procedures to provide an optional procedure for a continuing dialogue for individuals proposing specific industrial R&D cooperative ventures. This is especially relevant to ventures involving actual production of products in contrast to basic research only.

Mr. MacAvoy noted that the number of ventures coming under Justice Department aegis has been very small. He believes that cooperative limited partnerships are more effective. The Commerce Department believes that joint R&D partnerships will raise interest in cooperative R&D activities.

The Committee voted to approve this recommendation.

With respect to the effect of research tax incentives and limited research partnerships on cooperative R&D, the first signs of an effect from the R&D tax credit are starting to appear. Currently, the credit is biased against those who conduct R&D in preparation for starting a business. In addition, guidelines are not available on the extent to which limited research partnerships can utilize the credit. Moreover, it is not clear that the current credit provisions actually encourage addition R&D expenditures.

Recommendation

The Administration should develop and publicize tax guidelines concerning the use of Limited Research Partnerships for cooperative R&D purposes and establish a program to provide information to the private sector on the mechanisms for establishing legitimate limited research partnerhips.

Mr. Dunlop also expressed concern about the many industries where companies have had no history of research and development. In the men's clothing industry he was recently involved in a not-for-profit joint venture that through Draper Labs developed and patented a new way to sew. The number of mechanisms for initiating these efforts, however, is limited. Construction companies also do not do R&D. Many industries, in fact, obtain research and development only through their suppliers, and government ought to think of ways to get them interested in providing their own research.

Mr. Branscomb agreed that this is a real need. The incremental R&D tax credit, however, is a reward for those who are doing it anyway. He wondered whether a Commerce-Treasury project to develop a structure for the future would be appropriate. Mr. Simon said that this argument could be made for many others. Mr. Perkins asked whether, if industries will conduct research anyway, the Committee should be encouraging greater use of the tax benefit. Mr. Branscomb explained that the Subcommittee recommendation would be to make it work where it doesn't work now, and where it could provide a contribution. Mr. Kingon questioned whether the committee could appropriately endorse such a recommendation without reviewing its tax revenue consequences first.

Mr. Branscomb suggested that the recommendation could be modified to encourage Commerce and Treasury to evaluate the experience under the R&D Tax Credit with a view to developing proposals that would maximize private R&D investments likely to contribute to productivity improvement.

The Committee approved the recommendations as now worded.

V. Conclusion

Mr. Simon thanked the Committee members for all of their outstanding work in developing recommendations for the President and the Cabinet Council on Economic Affairs.

The Committee can look forward to working together again on the White House Conference on Productivity.

The meeting was adjourned at 2:00 p.m.

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Nominees: Douglas Fraser, President, United Auto Workers
Charles A. Bowsher, Comptroller General of the United States

THE WHITE HOUSE

WASHINGTON

June 9, 1982

Stanley
pls note

Dear Mike:

The executive order establishing the National Productivity Advisory Committee directs that it report to the President and the Secretary of the Treasury through the Cabinet Council on Economic Affairs. Last week, I had the pleasure of reporting the Committee's first ten recommendations covering the budget deficit, amendments to the Clean Air Act, financial institution reform, patent policy, and social security reform to the Cabinet Council. The minutes for the May 4 meeting are attached.

The Cabinet Council was extremely pleased with the Committee's recommendations and asked that they be shared with the relevant congressional committee chairmen and ranking members in the House and Senate. At the conclusion of the meeting, Secretary Regan made a special point of complimenting the Committee on its progress to date, and asked that I convey his sentiments to you.

Chairman Simon has signed and sent letters conveying the Committee's recommendations on the Clean Air Act, financial institution reform, and patent policy to key congressional leaders.

We have now established the dates for the Committee's next two meetings. We will meet on Friday, October 1, and on Tuesday December 14, at the Department of the Treasury in Washington, D.C. As in the past, our meetings will begin at 10:00 a.m. and conclude no later than 3:30 p.m. Lunch will be served to committee members.

I look forward to seeing you then.

Warmest regards,

Roger

Roger B. Porter
Executive Secretary
National Productivity Advisory Committee

The Honorable Michael K. Deaver
Assistant to the President and
Deputy Chief of Staff
The White House
Washington, DC 20500

MINUTES
NATIONAL PRODUCTIVITY ADVISORY COMMITTEE

May 4, 1982
1:15 p.m.
Room 4121, Department of the Treasury

Attendees: Chairman Simon, Gov. Alexander, Messrs. Branscomb, Buoy, Calhoon, Camicia, Dart, Dunlop, Feldstein, Goldstein, Grayson, Hall, Kingon, MacAvoy, MacNaughton, O'Neill, Parsky, Schubert, Schurr, Seibert, Seidman, Ms. Spain, Messrs. Porter, Anderson, and members of the public and press.

I. Report of the Subcommittees

The second meeting of the National Productivity Advisory Committee was devoted to action on the reports of each of the Committees' four subcommittees. The subcommittees, having met on their own since January 6 and during the morning of May 4, made a number of recommendations for the Committee's consideration. The Committee met with Secretary of the Treasury Regan during lunch.

II. The Subcommittee on Capital Investment

Martin Feldstein, chairman of the Subcommittee on Capital Investment, reported that his subcommittee had focused on identifying government policies that increase the total volume of capital and that cause the capital stock to be used more efficiently. The subcommittee made the following recommendations:

1. The federal budget deficit must be reduced significantly now.

2. The growth of social security retirement and survivor benefits should be slowed immediately by changing the indexing rule and further slowed for the longer term by changing the retirement age.

3. The individual income tax law should be modified to encourage more personal saving.

   a. The Individual Retirement Account (IRA) ceiling of $2,000 should be raised and indexed to keep pace with inflation.

   b. The All Savers Certificate should not be renewed.

   c. The distinction between short-term and long-term capital gains should be eliminated.

4. The tax rules should encourage the flow of savings into business investment. Although technical corrections may be appropriate, the accelerated cost recovery system rules enacted in 1981, including safe-harbor leasing, should be retained as enacted.

Discussion

In the discussion that followed the Committee agreed that the deficit must be reduced by cutting expenditures, and debated the merits of changes in the social security system and in the tax code to increase saving.

In discussing the social security-related recommendations, Mr. Schubert questioned whether the Committee's jurisdiction covered the issue. Mr. Simon responded that he felt it did, and encouraged the Committee not to avoid difficult issues such as social security. Mr. Dunlop questioned why the Committee felt obliged to consider the issue at this time as a matter of first priority, and suggested that the issue was inappropriate for a productivity committee. Mr. Schurr said that he did not favor raising the age at which full benefits would be received from 65 to 68. Mr. Buoy expressed his opposition to the proposals, as did Mr. Calhoon.

Mr. Grayson questioned whether the social security provisions of the subcommittee's report would be seen principally as measures to reduce the budget. Mr. Feldstein responded that the provisions would have that effect, but that they should not be seen in that light only. The provisions would also increase incentives for saving and thus would increase capital formation.

Mr. MacAvoy asked whether the provisions would affect the supply of labor. Mr. Feldstein responded that his subcommittee had not explicitly focused on labor market effects, but that the proposals were intended to be neutral with respect to the labor market. Mr. MacAvoy also suggested that the subcommittee consider reducing the level of benefits received by social security recipients who retire before age 65.

Mr. Dart stressed the need for action on these proposals and observed that the country had never in his lifetime faced a greater economic and financial challenge than it presently did.

On the various proposals to increase incentives for personal saving, Mr. Calhoon and Mr. Branscomb indicated their concern about indexing individual retirement accounts. Mr. Hall said that the proposals on IRAs illustrated why incremental tax reform was faulty, and why comprehensive reform of the system was needed. Individuals could borrow, use the money to take an IRA deduction and deduct the interest costs. Mr. Feldstein responded that the subcommittee's view was that indexing IRAs would provide significantly higher incentives to save, without great revenue loss to the Treasury. He said that eliminating the distinction between short-term and long-term capital gains may possibly increase tax revenues.

Decisions

1. By unanimous vote, the Committee decided to urge the President, the Secretary of the Treasury and the Cabinet Council on Economic Affairs to seek a reduction in the deficit by additional spending cuts.

2. By majority vote, the Committee decided to recommend indexing social security benefits to the rate of inflation over four percent, and extending the age at which individuals could receive full benefits from 65 years to 68 years. The majority recommended phasing in the extension in the retirement benefit age at a rate of 3 months a year. This would raise the age for full benefits to 68 years old in 12 years. The vote was 16 to 6 in favor.

   Those in Favor: Messrs. Simon, Branscomb, Camicia, Dart, Feldstein, Goldstein, Grayson, Hall, Kingon, MacAvoy, MacNaughton, O'Neill, Parsky, Seibert, Seidman, and Ms. Spain.

   Those Opposed: Messrs. Alexander, Buoy, Calhoon, Dunlop, Schurr, Schubert. (Although not present, Mr. Konyha subsequently requested that his opposition to this recommendation be duly recorded.)

3. By unanimous vote, the Committee decided to recommend that the ceiling on IRA's be raised and indexed to keep pace with inflation.

By majority vote, the Committee decided to recommend that the All Savers Certificate not be renewed. The vote was 21 in favor and one abstention. Gov. Alexander abstained.

By majority vote, the Committee decided to recommend that the distinction between short-term and long-term capital gains should be eliminated. The vote was 21 in favor and one abstention. Governor Alexander abstained.

4. By majority vote, the Committee decided to recommend that the ACRS rules enacted in 1981, including safe harbor leasing, should essentially be retained as enacted. The vote was 20 in favor and two abstentions. Mr. Branscomb and Mr. Calhoon abstained.

III. The Subcommittee on Research, Development and Technological Innovation

Lewis M. Branscomb, chairman of the Subcommittee on Research Development and Technological Innovation, reported that his subcommittee had discussed a range of issues involving research and development or technology policy in relation to productivity growth and that patent policy had emerged as the issue deserving the most immediate legislative attention. The subcommittee made the following recommendations:

1. The Patent and Trademark Office should be modernized. The Committee should endorse the principle of cost recovery through user fees as a means of funding this modernization. The Committee should endorse the user fee provisions in H.R.5602 and S.2211, or S.2326.

2. The incentives for research and innovation should be enhanced through patent term restoration. The Committee should endorse the Patent Term Restoration Act (S.255 and H.R.1937).

3. The commercialization of inventions from government contracts should be encouraged. The Committee should endorse S.1657 to establish a uniform patent policy that would permit all government contractors, except in narrowly defined areas, to retain commercial rights to their inventions, while protecting broad government license and "march-in" rights.

4. The arbitration of disputes about patent validity and infringement should be permitted. The administration should support legislation to permit patent dispute arbitration.

Discussion

At the request of Mr. Simon, Mr. Branscomb described the merits of each of the four proposals relating to patent policy.

Mr. Branscomb observed that the members of his subcommittee were also interested in the allocation of the government's research budget, and that they would work with the Office of Science and Technology Policy to determine if the Committee should make recommendations in this area.

Mr. Branscomb also noted the subcommittee's interest in the shortage of skilled workers and university faculty in various subfields of science and engineering, and indicated that the Committee could expect some specific recommendations in this area as well.

Finally, Mr. Branscomb called the Committee's attention to the work of the Commission on Precollege Education in Mathematics, Science and Technology recently established by the National Science Board, and urged support of the commission's efforts to improve the quality of high school mathematics and science instruction.

In response, Governor Alexander called the Committee's attention to a bill by Congressman Stark that would permit corporations to deduct from taxable income the costs of contributions of equipment to high schools, in much the same way that those costs are now deductible when gifts are made to universities. Governor Alexander urged the Committee to consider endorsing Congressman Stark's bill.

Mr. O'Neill suggested that the Committee's support for legislative initiatives be construed as support for the principles embodied in such legislation, and not a blanket endorsement of a particular piece of legislation.

Decisions

The Committee voted unanimously to recommend each of the suggestions relating to patent policy to the President, the Secretary of the Treasury and the Cabinet Council of Economic Affairs.

IV. The Subcommittee on Human Resources

John T. Dunlop, chairman of the Subcommittee on Human Resources, reported that his subcommittee had chosen to focus its efforts on three issues: reform of the unemployment insurance system, health care cost containment, and labor-management and quality of work committees. Mr. Dunlop emphasized that his subcommittee did not intend to present specific recommendations for approval at the present time, but rather to report on their deliberations and to seek the Committee's reaction.

Mr. Dunlop then called upon Mr. Schubert to report on the subcommittee's inquiry into the unemployment insurance system. Mr. Schubert's presentation focused on the need to restructure the nation's UI system in such a way as to provide more incentives for mobility and greater incentive for employers to provide training and retraining. The nation currently spends $23 billion for unemployment compensation, he said, and the subcommittee intends to provide specific recommendations in its next report on ways in which the system could be restructured.

Mr. Dunlop next called upon Mr. MacNaughton to report on the subcommittee's efforts in the area of health care cost containment. Mr. MacNaughton reviewed the nature of the problem and steps being taken to address the problem of escalating health delivery costs, and alluded to several proposals currently being discussed within the administration and on Capitol Hill for rectifying the problem. Specific proposals will be forthcoming from the subcommittee at the next full committee meeting, he promised.

In conclusion, Mr. Dunlop called upon Mr. Grayson, who reported that the subcommittee was also evaluating the efficacy of labor-management committees and quality of work life programs at various levels and that it was seeking to determine the proper role of the government in funding and facilitating such committees.

V. The Subcommittee on the Role of Government in the Economy

Paul W. MacAvoy reported that his subcommitte had focused its initial efforts on two important areas for regulatory reform — the Clean Air Act and financial institution reform. The subcommittee made the following recommendations:

1. The Committee should endorse the provisions of H.R.5252 that would amend the Clean Air Act to retain passenger car emissions standards at the 1980 levels.

2. The Committee should endorse the provisions of S.1720 that permit an expansion of thrift institution asset powers.

3. The Committee should recommend an acceleration in the phased elimination of Regulation Q.

Mr. MacAvoy also noted that the subcommittee had examined alternatives for increasing productivity and reducing absenteeism among federal employees through restructuring of sick leave. A variety of states, including Tennessee, currently offer employees such plans, known as "well pay." The subcommittee offered the following recommendation with regard to "well pay":

4. The Committee should request the Office of Personnel Management to provide further analysis of the "well pay" concept, especially with regard to the effect of such plans on the budget deficit and their impact on the accumulation of sick leave benefits.

Discussion

In the discussion that followed, Mr. MacAvoy described the merits of each of these proposals.

Mr. Hall urged that the Committee be clear that in supporting an acceleration in the phase-out of Regulation Q, it was recommending a major change. While not opposing the concept, Mr. Hall observed that an acceleration in the elimination of Regulation Q could precipitate a "blood bath." Mr. Simon stressed the magnitude of the costs of continuing Regulation Q and indicated that these costs are borne largely by the commercial banking system.

On the matter of "well pay" Governor Alexander reported that the program had worked very well in Tennessee, and recommended that the federal government investigate its possible adoption for federal employees, although he hastened to add that just because the program works well in Tennessee does not mean that it would be well suited for the federal government. Mr. Dunlop questioned whether or not the committee was inserting itself into a matter of contract negotiations between labor and management. Others agreed that the Committee should not get involved in the area of contract settlements, but urged that the Committee endorse further evaluation of the concept of "well pay" by the Office of Personnel Management.

Decisions

The Committee voted unanimously to recommend each of the recommendations of the Subcommittee on the Role of Government in the Economy to the President, the Secretary of the Treasury, and the Cabinet Council on Economic Affairs.

Roger B. Porter
Executive Secretary

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

COUNSELOR TO THE SECRETARY

June 4, 1982

MEMORANDUM FOR THE NATIONAL PRODUCTIVITY ADVISORY COMMITTEE

FROM: ROGER B. PORTER RBP

SUBJECT: Science and Engineering Education

Lewis Branscomb has asked that I distribute his remarks to the American Association of Engineering Societies on the subject of scientific and engineering education.

Enclosure

MEMO from Lewis M. Branscomb

TO Mr. Roger B. Porter DATE 5/20/82

Please distribute the attached AAES speech to the members of NPAC.

L. M. Branscomb

☐ REPLY ☐ INITIAL AND RETURN ☐ SEE ME

LEADING AMERICA BACK TO INDUSTRIAL LEADERSHIP

LEWIS M. BRANSCOMB
VICE PRESIDENT AND CHIEF SCIENTIST
INTERNATIONAL BUSINESS MACHINES CORPORATION
ARMONK, NEW YORK

AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES
ENGINEERING LEADERSHIP CONFERENCE

PORT ST. LUCIE, FLORIDA
MAY 6, 1982

Not since Sputnik in 1957 has the general public been so concerned about the quality of U.S. engineering and science.

One reason people know something about the so-called "crisis in engineering" is that the AAES and its member societies have worked hard to raise the awareness of press and public alike.

And I think one reason more people today care about the sufficiency of U.S. science and engineering is the realization that it has a lot to do with the standard of living of the American people.

For engineering skills determine not only our ability to translate scientific discoveries into commercial innovations, but -- to a major degree -- the productivity level of U.S. industry. And productivity, in turn, determines nothing less than the security of our nation and the real income of our people.

Improving productivity is the best, perhaps the only way, to control inflation while promoting growth in our economy. Competitiveness with the economies of other nations is the best measure of how well we are doing in this effort. And here, the data tell us we are not doing well at all.

"Physician, heal thyself"

Indeed, the engineering profession must bear part of the blame for the productivity slump this country is in; so, too must the scientists.

Since World War II, when scientists became quite good amateur engineers, the scientists have been telling the country what we ought to do about engineering. And the engineers have been telling the country what we ought to do for engineering.

Recently, engineers have been front and center in discussions of U.S. technological performance -- which is extremely welcome, since this is very poorly understood.

This national malady we face is serious, but by no means incurable. Stronger engineering capability -- more appropriate for all the nation's needs -- lies at the heart of strategies for that cure.

And having sounded the alarm, you in engineering society leadership must now take the next step -- a coordinated effort

to guide this nation in exploiting the great technological resources you represent.

The Conventional Description of the Problem

For this audience I do not need to paint a picture of the problem; let me do just a charcoal sketch of the landscape:

- A stagnant productivity trend in the face of rapid progress in competing nations abroad;
- Serious competitive challenges in one high-technology industry after another;
- A 20-percent decline in United States R&D as a fraction of GNP in the last decade;
- A 24-percent decline in fundamental research as a percentage of GNP in the last decade;
- An even steeper decline in industrial fundamental research as a percentage of sales in that decade;
- A decline in patent activity by U.S. inventors;
- A decline in the percentage of American citizens among engineering graduate students;
- A lower percentage of students taking engineering than in competing countries -- three times lower than in Japan, six times lower than Germany;
- A backlog estimated at two-to-four billion dollars to modernize the equipment in our universities' engineering and scientific departments -- equipment twice as old, on average, than similar equipment in industry;
- Faculty jobs going begging, companies searching for skills they cannot find -- even in a recession;

and,

- A deterioration in math and science education in our secondary schools that spells deep trouble for the future, even if we had no other problems.

This is what I would call the conventional description of the engineering and productivity crisis. My list is a mixture of shortfalls in economic performance and shortfalls in inputs. If the latter were remedied, I doubt that alone would solve the problems of productivity and competitiveness. We need a

clearer consensus on what the real problems are, and how to address them.

What can be done to turn around the trend of recent years? What should you urge our Government to do?

Management and the Strategic, Technological View

First of all, I believe that Commerce Secretary Malcolm Baldrige is right when he points the finger at America's business and labor managements for failure to take the long term, strategic view and for failure to manage our tremendous technological capabilities to full effect.

In this respect the Japanese performance is very impressive. For in Japan, industrial leaders are not alone in taking a long-term strategic technological position.

This commitment is shared among their bankers, suppliers, trading companies, educators, and government officials. They are all taking some very impressive risks, and the favorable outcomes they seek can in no way be assured or even quantitatively predicted. But they share a common goal and make serious commitments to each other.

That suggests to me that we cannot simply lay the blame on our nation's business executives for being insufficiently visionary.

Nor can any other single villain be pinned with the blame: Government for overregulating, labor for being too impatient or too reluctant to accept change, banks for being too conservative, business schools for being too theoretical, engineering schools for demotivating students from careers in manufacturing, universities for failing to build graduate computer science capability fast enough, school boards for allowing a deterioration in math and science instruction which is of potentially disastrous proportions. Yet all of these trends, taken together, spell trouble.

To improve productivity, the most important elements of economic strategy are inflation control and the encouragement of capital formation for investment in new technology. Many features of the new tax law have this purpose.

But financial investments are not the only part of our national investment strategy which is in serious shortfall. More important even than financial capital is human capital.

The country's concentration of public and political attention on the financial side is obscuring a shortfall in human

resource investments that are equally required for productivity growth over the long term.

I don't believe that the computer industry -- which creates tens of thousands of new jobs a year -- and whose products' potential for improving users' productivity grows by an astounding 25 percent a year -- is unique.

I suspect that the power of science and technology to suggest new ways of doing things, new materials from which to make things, and new ways to make smarter tools, has just begun to be explored in most industries. But to test that contention, public and private investments in research, engineering and education will have to be enhanced and focused.

During the coming months, the President's National Productivity Advisory Committee -- formed in November -- will be exploring many recommendations for action.

The committee is headed by former Treasury Secretary William E. Simon, to whom you should express any points of view you would like to put forward.

I'd like to share some of my own ideas with you today.

A Balanced R & D Strategy for the Federal Government

First priority would seem to be a Federal R & D investment strategy balanced between needs of defense and the civil economy.

The Federal government finances slightly less than half of all the R & D in the United States. About 60 percent of this is in Defense, about 40 percent in the "civil" agencies. These investments not only dominate the nation's research base but represent a large demand on technical manpower, a major source of support for postgraduate education, and a strong influence on both the nature of emerging technologies and the motivations of students and faculty.

OMB does its best to take these effects into account when budgeting the agencies, but there is no overall strategy aimed at balancing the research needs of Defense versus those of the economy as a whole; between research levels and postgraduate manpower requirements; or the skill needs of the military and their contractors versus the universities' for faculty, versus the private sector to improve productivity.

And this situation is especially unfortunate now, because the nation faces simultaneously, for the first time, a major defense build up, a squeeze on private sector R & D because of stagflation, a shortage of certain categories of engineers and

scientists, and the most acute budget stringency, on the civil side, in recent years. This stringency is likely to continue indefinitely.

To rebalance Federal R & D priorities, the Government should create a multi-year strategic research and development budget for its combined economic and security needs.

How Much is Enough?

But how do we set our goals? How much should the United States government be spending? On what priorities?

The answer to that, in my opinion, is: "enough to provide American institutions and individuals with the opportunity to achieve a leadership position in all important areas of science and engineering."

This is not to say that the United States should expect to be best in every field; that depends on the cleverness of our scientists and engineers and, indeed, on a good bit of luck. Nor am I suggesting that we spend so much as to overwhelm our competition in every area. Indeed, that has been the Soviet approach, and it doesn't work.

But even though we can't guarantee Americans will always be best, we shouldn't opt out of the race. And, whatever the total research budget, we must insure that the best ideas and the best people are supported, and the key capital investments are made.

Despite some growth in the Administration's 1983 research budget, the technical community continues to experience strains and concerns.

Competing countries, especially France and Japan, are expanding their research activities at a much more rapid rate than we. Their research priorities are much less distorted by government demand in the military and space fields and are strongly correlated with industrial policy and strategy.

We cannot duck the obligation to national security, but we should do a better job of getting as much synergy as possible out of defense and civil R & D objectives.

In choosing the balance among fields for investment, our Government should be guided not only by the intrinsic merits of the field as opportunities for rapid progress, but also by the field's economic potential.

This can be done by paying careful attention to those fields where industrial growth and job creation is most rapid (the

information industry, applied biology, and services, for example) and to those industries whose products and services give the greatest productivity leverage to others (instrumentation, specialty materials, engineering services, industrial processes, process control and automation, information systems and services).

It is startling how inelastic is the response of the Government's resource allocation mechanism to such criteria and to changing circumstances.

Judged by potential leverage on productivity growth and industrial competitiveness, the Government, as a whole, seriously underfunds a number of fields. Examples include polymers, instrumentation and metrology, materials characterization, computer science and electrical engineering, software engineering and information science, plant sciences, and so on.

Work in these useful fields need not take precedence over fundamental, exploratory work, but should have equal standing with it.

It was for this reason the National Science Board has muted the distinction between basic and applied research in NSF, for this distinction was used to undervalue useful science, to deny long-range exploratory work of its economic justification, and to obscure the fact that engineers contribute to the full spectrum of research, from short- to long-range objectives.

Next, I should touch briefly on a few technology matters that belong in the strategy. I will deal with each of these quite briefly.

Patent Policy

Patent reform is urgently needed. The Administration has already taken an important step -- the creation of a single Court of Appeals for the Federal Circuit to handle all patent appeals from both District Courts and the Patent Office.

Improving the Patent Office's own productivity is planned, but caught up in how much to finance it with user fee increases.

The Patent Term Restoration Act, S.255 and H.R.1937, would return to firms part of the lost years of patent coverage caused by delay in premarket clearance of proprietary products by Federal regulatory agencies.

Senate bill S.1657 would establish a uniform patent policy across all agencies and extend its coverage to all their contractors and grantees.

And new legislation is needed to give legal force to voluntary arbitration of patent disputes.

These proposals seem to me relatively noncontroversial and deserving of action. So, too, is reduction in the uncertainty that now surrounds patentability of chip layouts, and copyright and trade secret protection of software. Software engineers should join with the lawyers to find good solutions.

Cooperative Research

Cooperative R & D agreements among industries and with universities have much to commend them when the objectives are jointly defined. These have been encouraged by the Justice Department's guidance paper from the last Administration, and the Stephenson-Wydler Act, which calls for cooperative laboratories dealing with generic technology. Any impediments that remain should be reviewed and clarified.

The NSB soon will be submitting to the President, for transmission to the Congress, a report on university-industry research cooperation. There is a great deal of activity in this field, but most of it involves either very small firms nurtured by university research, or very large firms that do fundamental research in their own corporate research laboratories. The engineering community should help get attention focussed on the middle-sized firms, which have little connection to the universities today and could benefit primarily from cooperation in engineering.

Controls on Technical Information Flows

One potential impediment we must all take very seriously is the debate in Washington about the need for additional Government controls to keep our scientific and technical information from flowing to unfriendly nations.

The best solution is obviously to get ahead and stay ahead, in long-range research, industrial technology and military capability.

Each sector should take responsibility for managing its own information -- responsibly. We shouldn't confound their roles.

In my view, universities should not be asked to do either proprietary or classified work and should remain free and open. Companies and the Government should control that which must be controlled and not depend on universities to exercise control in their behalf.

Engineering Design and the Production Challenge

Faced with all these concerns and more, it is easy to forget that America's scientific base is still the strongest in the world, and we are still the most innovative society as well.

This innovation goes on every day, in firms large and small, and the health -- and ability to launch -- small, high technology companies is a critical part of maintaining this U.S. tradition.

Just as small U.S. enterprises have a good record for innovation, U.S. engineering schools do a good job of training students to work at the forefront of science and mathematics. And they have done almost as good a job of teaching engineers to be innovative in the research and development sense. But we don't do an adequate job of teaching engineers to design products for human users and for inexpensive, quality mass production.

It is in these areas of engineering in a production environment that the Japanese have shown up a lot of American companies.

So, I would suggest that the "engineering crisis" is really not a crisis so much as it is a turning point and an opportunity.

Our engineering schools and the engineering societies you represent are probably the only institutions in America through which a transformation can be achieved in this particular facet of our industrial performance.

Nothing less than rebuilding the image of the factory as an exciting and rewarding environment for high-technology engineering will do the job. If AAES could tackle this problem, it would go a long way to upgrade our manufacturing productivity, greatly expand the breadth of opportunity for young engineers, and attract new people to the profession.

And all you have to do is look at the way the Japanese use engineers -- the way they're motivated, and what they do in their companies -- to appreciate the change that is required.

There are, of course, numbers problems as well.

Shortages in Engineering Manpower

In the electronics and information industry, we see shortages of certain skills -- for example, in computer science, microelectronics, software and software engineering, as well as manufacturing engineering and certain materials specialties like polymers and ceramics.

There are three major supply constraints:

Demographics

Long-term, there is the falling college age population. Nothing can change these demographic facts; we are going to have to do a better job with less.

However, improving student retention rates could increase output substantially; only about a third of entering freshmen in engineering make it all the way. So, too, will giving more opportunity -- and, importantly, more motivation -- to young women and minorities to enter, graduate, and practice engineering.

Secondary Schools

Thus, we must worry about the deterioration of math and science instruction in our high schools. Far too many of them do not even offer the minimum training needed for technical career opportunities.

For example, only a third of our high school students take mathematics beyond the tenth grade. Only a third of our high schools require more than a single year of math or science for graduation. About a third do not offer enough math to qualify a student for admission to engineering without remedial training, and about one-third of the freshmen in engineering colleges must take remedial math.

Finally, over 90 percent of the states now report shortages of mathematics teachers at the secondary level, and about a third of secondary school science teachers did not major in science and are uncertified to teach it.

The National Science Board believes this to be a cause for very serious concern, particularly in light of the very rigorous training in math and science required of all students in Japan, Germany, Russia and other Eastern bloc countries.

To explore solutions, the Board last month established a new Commission on Precollege Education in Mathematics, Science and Technology.

The Commission includes Dr. Robert E. Larson, president of IEEE; Dr. Gerald D. Laubach, president of Pfizer, Inc.; Dr. George Burnet, Jr., chairman of nuclear engineering and coordinator of engineering education at Iowa State University, and General Lew Allen, Jr., chief of staff of the U.S. Air Force. Mr. William Coleman, Jr., and Dr. Cecily Selby are cochairmen.

Over the next 18 months, this Commission will define a national agenda for improving math and science education, including steps to be taken, assignment of responsibility, and a time table for accomplishment.

We expect this to be an action-oriented body, working in collaboration with the major scientific and engineering professional societies to mobilize the technical community at both the local and national levels. In other words, we will be applauding your work in this area, seeking to give it additional visibility, and looking to you for suggestions.

Faculty Shortages

The third, and even more immediate constraint on engineering manpower is shortages of faculty, deriving both from a decline in the number of doctoral candidates in engineering, and from the decreased attractiveness of a faculty career.

There are already some two thousand engineering faculty vacancies nationwide, and one result may be a chronic shortage of engineers for years to come. At least it is hard to prove there won't be.

The Numbers Game

Yet, I suggest it may not serve the best interest of the country's technical posture to put the principal emphasis on the numbers aspect of the problem. Because if, through a bad economy or some other cause, the shortage seems to go suddenly away -- the technical community's credibility once again will suffer a serious blow.

Not only that, but it is too easy to argue that if numbers are the problem, "market forces" will sooner or later redress the shortfall.

The real engineering manpower problem, in my opinion, is not numbers but quality and appropriateness of skills.

A highly talented, well-motivated graduate, trained in the most modern areas of engineering with the latest equipment, is much more valuable, and is productive sooner, than his fellow student from an overcrowded, understaffed, poorly equipped, out-of-date institution. You cannot equate their value by counting numbers.

Furthermore, as I suggested earlier, U.S. engineering education emphasizes preparation for careers in research and development and demotivates student interest in design for manufacturability, process technology, and design and production automation -- all vital areas to the achievement of high-quality, low-cost products.

Fortunately, computer technology is helping to change manufacturing's image on the campus. Computer-based production control systems, CAD-CAM and robotics are, in fact, the intellectual "carrots" that may draw more students into careers in production and in development for efficient, quality production.

But many of the students who want to go into these new fields also need financial help. The most important thing here is graduate fellowships, which the Science Board has set as its number one priority in the education field.

Likewise, universities which are scrambling to catch up -- to develop manufacturing engineering curricula and degree programs -- need all the help they can get with equipment, faculty, and money.

What Will It Cost?

How much will it take to give U.S. engineering education the "shot-in-the-arm" it needs? I don't know, but my guess is that it would take a quick investment of several hundred million dollars.

And where might that come from? Again, I don't know, but I observe that Presidential Science Advisor Dr. George Keyworth has asked his White House Science Council to undertake a review of the national laboratories. And if that source fails, it surely ought to be possible for the Government to convince itself that the sources of our engineering knowledge and skill are deserving of priority at least as high as a few tenths of one percent of the military budget.

How Can Industry Help?

Corporate contributions which amount to only 2.4 percent of university operating costs -- or about 10 percent of research costs -- are being stepped up, although industry dollars can

never replace Federal dollars lost to inflation or retrenchment.

But by being selective, companies can help a lot.

One bright spot is the collaborative research I mentioned earlier, in which companies share their problems and talent with universities, and help faculties and students get experience with the most interesting industrial problems. This is a promising area which can bring the real world of industry into academia, and the creativity of the university environment into industry.

These need not be major, long-term contracts, nor should they focus exclusively on specific, near-term problems. I would rather see companies fund many smaller efforts, and let the universities work on them rather freely, with the objective being new and non-proprietary knowledge -- not new products. Indeed, the direct contact and professional relationships that ensue between small groups of company and university scientists and engineers can be as valuable as the technical results.

Clearly, companies with both fundamental research and advanced development and manufacturing experience can find lots of ways to share it with universities.

IBM, for example, has long been a leading supporter, among corporations, of higher education. But we, too, have been exploring new ways to be helpful, such as equipment gifts and loans.

We don't talk much about it in public, but during 1981, for example, we supported science and engineering research in universities to the tune of over 150 projects at 66 institutions. Our current agreements of this type represent a total (multi-year) commitment of 15 million dollars.

And that's in addition to more than 17 million dollars given last year to educational institutions in the form of grants, 278 fellowships, and other forms of direct financial aid. Of that amount, more than nine million was earmarked for science and technology.

Nor does it include the 136 faculty members on sabbatical who worked last year in our Research Division alone, gaining experience with advanced facilities in an industrial setting. Or all the IBM scientists and engineers on loan to universities as visiting professors or teaching short courses.

Why should corporations like IBM help shoulder a national burden which has long been a state and institutional responsibility?

Because industry depends on universities, not only for graduates, but for knowledge.

And because, as one Cornell professor put it, "...college tuitions can't possibly go higher, or we'll have no students. Because the Federal government is going downhill to broke. And because our alumni, bless 'em, can't die fast enough to rescue us with bequests. Where else are we going to turn for survival money except to companies which can translate our brainpower into profits?"

It should be clear by now there are no neat solutions -- or quick Federal fixes, either -- to the engineering manpower and productivity problems.

Interestingly, however, we see some of the states taking initiatives -- such as new microelectronics centers at their universities -- which you might have expected, in an earlier time, would have been made at the Federal level.

Recently, Governor James B. Hunt of North Carolina said he believes that the center of gravity for technological innovation must shift from the Federal to the state governments.

Why? Number one reason, I think, is that it's more politically legitimate for a state to collaborate with industry in the quest to attract business. And, in this, the states use their greatest assets -- their universities -- and thus compete with each other. That's a powerful force.

One thing it says to me is, don't focus all of <u>your</u> efforts in Washington. Recognize that the state governments, once they get informed and interested, can be an important source of enhancement and encouragement, and even investment.

And so, for the pre-college problem as well as the engineering school problem, working at state level can be a very valuable thing, and I would encourage the associated engineering societies to begin organizing themselves to do that, state by state.

I could easily imagine, for example, a set of fifty state commissions on education, technology and development, in which local members of your engineering societies might find industry, community and political leaders who are willing to find out what's going on in other states and see what they could do to help.

In other words, don't stop monitoring and publicizing, but do start exploring avenues like the state governments (as well as the Federal government and industry) to convert awareness into action -- a concerned citizenry into an aroused one, which better understands the pragmatic solutions required.

Thank you, and now I'll be glad to try and answer any questions.

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THE WHITE HOUSE

WASHINGTON

May 10, 1982

MEMORANDUM FOR MICHAEL K. DEAVER

FROM: TOM SHULL

SUBJECT: Summary of National Productivity Advisory Committee Meeting Held on May 4, 1982.

After Mr. Simon opened the meeting, the sub-Committee on Capital Investments presented a summary of their recommendations: 1) the Federal budget deficit must be reduced significantly now; 2) growth of Social Security retirement and survivor benefits should be slowed immediately by changing the indexing rule and further slowed for the longer term by changing the retirement age; 3) individual income tax law should be modified to encourage more personal saving, and 4) tax rules should encourage the flow of savings into business investment. Several Committee members felt that a decision regarding social security should be held off until the Greenspan Commission has made its recommendations. The Committee voted unanimously in favor of recommendations 1 and 4. A majority agreed with recommendations 2 and 3.

The sub-Committee on Research, Development and Technological Innovation made recommendations regarding Patent Policy. Specifically, the sub-Committee endorsed: 1) the Patent Term Restoration Act, which restores to patent appplicants a part of their patent terms which would otherwise have been eroded by federal premarket regulatory review; 2) legislation to provide patent policy for government contracts; 3) legislation to provide user fees to fund modernization of the Patent and Trademark Office and, 4) legislation to permit arbitration of disputes about patent validity and infringement. The voting on these issues was unanimous.

The sub-Committee on Human Resources reported on three areas: 1) unemployment insurance; 2) health care costs, and 3) labor/ management committees. The Committee briefly discussed these topics.

The sub-Committee on the Role of Government made recommendations in the following areas: 1) health regulations; 2) regulation of financial institutions, and 3) quality of work of civil servants. The sub-Committee recommended to freeze the auto emmission standards of the Clean Air Act to the 1980 levels. The Committee also recommended to move rapidly to eliminate the ceiling on depository institutions and to remove limitations on the kinds of investments of various institutions. Finally, the Committee recommended that OPM investigate the potential for improving Federal employee productivity by reducing the incentive to use sick leave (currently 13 days per year). The Committee voted unanimously to support these recommendations.