

APPENDIX E: Periodical References

Kaminow, I. (1992), Statistical Stagnation, *Government Executive*, GE-24, July, pp.48-51.

Permission to reprint granted by Government Executive.

Leopold, G. (1992), U.S. Probe Targets Japanese Chip Imports, *Defense News*, DN-7, No. 49, December 7-13, pp. 34-36.

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Springfield, Virginia

Pollack, A. (1992), Japanese May Have Lead in Mega-megabit Chips, *The Denver Post*, December 10.

Statistical Stagnation

The government's economic statistics programs tell us more about watermelons than about semiconductors. The reasons: a devotion to agriculture at the expense of the modern economy, and an inability to drop outdated surveys.

BY IRA KAMINOW

When President Bush in January proposed a 20 percent increase in the budgets of federal statistical agencies for fiscal 1993, the news was welcomed by economists who had spent a decade lamenting the chopping of statistics programs.

But the increase, even if Congress grants it, will not bring rationality to an economic statistical system that tells us most about farms and least about the service industries that are at the core of today's economy. Such archaic priorities reflect an absence of leadership and direction, and the domination of politics and inertia. Statistics with strong political constituencies are collected for decades after they cease to be useful, while research on increasingly important developments waits in the wings for funding.

While the poor quality of economic statistics is often blamed on Reagan-era budget cuts, some experts say the problems in fact reflect longstanding systemic failures.

An Inaccurate Science

Ask a city boy where eggs come from, and he's likely to tell you the supermarket; ask a businessman where Gross Domestic Product figures come from, and he'll likely answer, *The Wall Street Journal*. The truth is that GDP figures, like other economic statis-

tics, are the work of a modest bureaucracy that faces a massive job measuring the complex and highly dynamic U.S. economy.

Agencies like the Bureau of Labor Statistics (BLS), the National Agricultural Statistical Service, and the Bureau of the Census gather millions of bits of information about the economy from consumers, workers and businesses. BLS calculates the unemployment rate by asking 60,000 households who has a job and who doesn't; it calculates the consumer price index by checking prices at 76,000 retail outlets and rental units; it surveys 340,000 employers to find out how much they are paying in wages and salaries.

Statistics are gathered from government records like tax returns, from direct field observations—the Department of Agriculture, for example, estimates national crop



RAY ORNER



RICHARD A. BLOOM

Output in the service sector is difficult to measure, says Michael Boskin, chairman of the Council of Economic Advisers.

yields by sampling individual farms—and, most importantly, through surveys. Hundreds and thousands of telephone, mail and in-person surveys inquire of workers, consumers, savers, farmers and businesses who is working and who is not; what businesses produce and how much people make; how many cars they own; how much they spend and how much they save.

In other words, collecting economic statistics is much like taking the population census. With this difference: The government lavishes more care, planning time and resources on the decennial population census than on any other statistical count. If, even with all these resources, the 1990 count was off by some five million people, it is beyond hope to expect complete accuracy in each of the thousands of economic statistics that are collected with far less preparation, with less care and with far fewer resources.

The safest thing that can be said about economic statistics is that they are, to one degree or another, wrong. And that's fine. Total accuracy is too expensive. Unfortunately, inaccuracy in government numbers too often goes beyond the acceptable. In May 1991, Gail Fosler, chief economist of the Conference Board, a New York-based business research group, told a House subcommittee that one federal survey was showing that sales of capital goods were running 15 percent behind a year earlier, while another indicated that sales were up by 5

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percent. At least part of the discrepancy, Fosler believes, was due to inaccurate or missed responses to the surveys.

Indeed, the quality and rate of responses to government surveys has been declining. The reasons can only be guessed: perhaps fatigue with filling out government forms, or a revolt against government intrusion, or an effort by businesses to cut costs.

The government could obtain more accurate information through more careful—and more expensive—surveys. For example, government data show that between 1965 and 1981, American men cut their time on the job by about 90 minutes a week, according to weekly summaries provided by the workers. A survey performed by the University of Michigan's Institute for Social Research, on the other hand, showed the reduction was more like a full eight hours. The difference was that the Michigan study asked respondents to keep *daily* diaries of how they spend their time, a measurement

**It is meaningless to use
numbers alone to compare
standards of living or
national output over time.**

more sensitive to the difference between scheduled hours and actual hours.

Slow growth in the productivity of American workers is a continuing national concern, but if Americans have actually reduced their hours on the job by more than we thought, part of our productivity problem will turn out to have been not inefficiency, but a statistical illusion.

The way official statistics are reported gives the impression that they are extremely accurate even though they are not. GDP is calculated to the nearest \$100 million, which is the rough equivalent of guessing your height to within the width of a single hair on your head. This would be a joke if it were not taken so seriously. An example came last year when the Commerce Department lowered its estimate of second-quarter 1991 growth in the Gross National Product (GNP), the statistical series that was replaced recently by the GDP estimates. After Commerce said the second quarter was characterized by "a small decline" rather than the "slow growth" reported earlier, *The Wall Street Journal* said that "the revision suggests that the recession didn't end in

the second quarter . . . and it may be continuing even now." The paper went on to credit the revision for igniting "a steady rally in the bond market." But the difference between the original GNP figure and the revised number was one one-thousandth of the nation's output, an amount that fits easily into the GNP's margin of error. It would be better and more honest if such statistics were published to the nearest \$10 billion. Similar adjustments should be made in all statistics.

Measuring Quality

Dr. Seuss's principle that "a person's a person no matter how tall; a person's a person no matter how small" is fine for the population count, but not for economic statistics where quality, as well as quantity, counts. Cars, cures, computers and symphonies are not all alike. Something crucial would be lost if automobile production statistics did not take into account improvements in pollution control, air conditioning, power steering and safety features.

Quality measurements are messy and imprecise. Statisticians can measure quantitative improvements like bigger houses or faster computers. But as goods change their very character it becomes more difficult to represent the improvements through one-dimensional, dollars-and-cents economic statistics. Eventually, products and services evolve so that they can no longer be meaningfully compared to earlier models or designs. What conceivable adjustment could make today's desktop personal computers comparable to the room-sized, vacuum-tube computers that required better air conditioning than the programmers who ran them?

Measuring quality advances is most difficult when it comes to services. In Senate testimony last year, Council of Economic Advisers chairman Michael Boskin summed it up this way: "In the service-producing sector, it is often difficult even to define a unit of output. For example, should the number of lines in a computer program be the standard unit of output?"

Like almost everyone else, Michael Darby, who served President Bush as Commerce undersecretary for economic affairs, claims that such definitional problems lead to understatement of the growth in American output. Darby asks, rhetorically, "whose services would you pay more for"—a doctor trained in the medical technology of 1950 or one trained in the technology of 1990? "The quality difference between the 1950 doctor and the 1990 doctor is not captured in our statistics," he says.

But the difficulties with measuring ser-



Definitional problems lead to an understatement of growth in American output, says former Commerce official Michael Darby.

vices should not be used as an excuse to neglect them. During the same hearings at which Boskin testified, Courtenay M. Slater, chief economist for the Department of Commerce from 1977 to 1981 and now a Washington consultant, pointed out that "measuring the real output even of traditional manufacturing industries is not always simple, but techniques for doing so are well developed... Doubtless the real output of financial institutions also can be measured, but to do so will require detailed study."

What Slater says about financial services is true also of other services. The Bureau of Labor Statistics recently completed a massive analysis of computers that for the first time allows a measure of the breathtaking technological advances. The same kinds of careful analysis for services would give us a vastly improved picture of the economy.

Not Just a Money Problem

Boskin's initiative to press in 1991 for a \$230 million increase spending on economic statistics over five years has wide support in the statistical community, and for good reason: It will provide modest spending increases in areas that are beyond a doubt in need of repair.

This year's federal budget boasts, for example, that in 1991 the government reinstated estimates of GNP broken down by industry that had been discontinued in 1989, and undertook to produce, for the first time, annual data on the \$200 billion communications industry. Boskin's program, the budget says, aims to recognize such trends as the shift from manufacturing to services and the growing importance of international markets. Among goals for 1992-93 is upgrading the federal statistical work force through establishment of a specialized graduate-level

program to teach survey skills.

The statistical agencies and consumers of their data welcome this renewed interest, yet the proposals for increased funding permit little more than triage among the government's statistical programs.

The problems with America's statistical system are deep and longstanding. The system drifts, with neither a clear mission nor firm leadership. Statistical resources are too often misdirected toward activities which enjoy the support of the administratively and politically powerful.

Hermann Habermann, chief statistician at OMB, has responsibility for "general policy guidance" to government statistical agencies. His office is as close as the government comes to having a coordinator of the federal statistical function. "Our [statistical] system is designed to collect information about an economy that was in place 30 years ago," Habermann wrote in a 1989 article.

In many ways the system is more like a century out of date. For example, the government recently improved statistics on U.S.-Canada trade by using Canadian data, a technique used by private-sector economist Matthew Simon back in 1960. U.S. authorities were aware of the underreporting of exports to Canada as early as 1867, according to professor Robert Lipsey of the City University of New York. "It took 120 years to solve this problem, which seems an unduly long time," he told a meeting of the American Economic Association.

Jack Triplett, chief economist of the Bureau of Economic Analysis (BEA), points out that even 50 years ago, the service sector employed half the workforce. Yet economists still complain that statistics for this sector are inferior to manufacturing statistics. At the other extreme, agriculture, which even 30 years ago accounted for only 5 percent of GNP, gets almost 27 percent of the statistics pie. The government collects far more detailed data about watermelons than about semiconductors.

No one has calculated exactly how much is spent on agricultural statistics. As a rough measure, the budgets of the Agriculture Department's Economic Research Service and National Agricultural Statistics Service totaled about \$120 million in 1990. This compares with Commerce's bureaus of Economic Analysis and the Census which together also spend about \$120 million on economic statistics. The difference is that Commerce is responsible for statistics in *all* sectors of the economy.

The heavy spending on farm statistics reflects the demands of America's agricultural policies. Farm programs require statistics to calculate support payments. But that is not the whole story. Much data is also collected for commodities not supported by farm pro-

grams. More than for any other sector, the government collects statistics not just *about* farmers, but *for* farmers. USDA publishes highly detailed data on plantings, production, inventory, demand and prices for scores of individual commodities, as well as general information on the business of farming: farm income, assets, credit and the like.

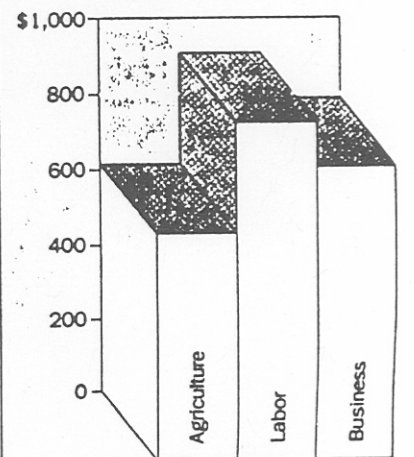
The first agricultural census was conducted 150 years ago. Since then, the government has grown accustomed to providing agricultural statistics, and farmers have grown to expect them. Farmers know how to exploit the political process to pressure the government to collect the statistics they want. Charles Caudill, administrator of the National Agricultural Statistical Service, notes, "When they want data we don't have, they go to Congress." Among the interest groups that have gone over Caudill's head to Congress are producers of mink, cattle, flowers and catfish, and cotton ginners.

Support for agricultural statistics is strong not only in Congress, but also among Agriculture Secretaries. They have been more committed to statistics than have the Secretaries of Commerce and Labor, who oversee statistics on the overall economy. Caudill says, "Support from the department has been critical to maintaining budgets."

Farmers aren't alone in pressing for sta-

TILTING TOWARD AGRICULTURE

Of the roughly \$2 billion per year that the government spends gathering statistics on all manner of subjects, about 30 percent is devoted to "economic" statistics on agriculture, labor and business. Though farms account for about 1.5 percent of economic activity in the United States, agriculture garnered 27 percent of the money spent on these three topics between fiscal 1986 and 1990. The chart below shows outlays for economic statistics over the five-year period, in millions of dollars.



Source: Office of Management and Budget

PHYLLIS MARINER

tistical programs, though they are particularly successful. Representatives of service industries have recently been lobbying for better data on their sectors of the economy, and with notable success. In its 1992 economic census, the Census Bureau will cover 98 percent of the economy, up from 75 percent in 1987. Most of the increase is due to the inclusion of service sectors like finance, insurance and real estate. Charles Waite, associate director for economic statistics at Census, says the Coalition of Service Industries deserves much credit for bringing about the broader coverage.

A Need for Trimming

This and other desirable expansions of statistics programs would be more affordable if outdated programs could be dropped. Indeed, agencies regularly review programs and conclude that some should be canceled, observes Katherine Wollman, executive director of the Council of Professional Associations on Federal Statistics and president of the American Statistical Association. Yet the agencies don't often press to cancel programs, Wollman says, because they know that "for any statistical program that exists, there is a user" who will lobby Congress to prevent cancellation. Agencies fear, moreover, that dropping programs from their budget requests will tempt Congress to reinstate the program but not the funding.

The BEA's Triplett denounced waste of statistical resources in a speech to a recent convention of the American Economic Association. "Marginal or counter-productive statistical activities may soldier on for decades," said Triplett, "sapping budgetary resources that could be used more productively, adding to respondents' burden, thus provoking resistance to new collection, and distorting statistical agency staffs' own perceptions of policy-related needs for economic data." Triplett blames failures not on Congress but on the agencies themselves. The problem, he says, is that many agency program managers and administrators follow current fads and politically popular agendas rather than responding to the economy's more fundamental data needs.

Triplett is by no means alone in his views. In a written comment in the *Journal of Economic and Social Measurement*, Fritz Scheuren of the IRS's Statistics of Income Division argues: "The federal statistical system can be out of touch with what may be fundamental in the long run, because of its connection to the political arena."

Triplett also argues that government statisticians can be indifferent to the needs of basic research. "Too frequently, statistical agency program managers and administrators are unfamiliar with economic policy analysis, and have neither the inclination nor

the ability to fathom data needs for basic economic research," he says.

The problem is mitigated by the use of government grants to private-sector institutions which then design surveys, with the help of government analysts, more suitable for research purposes. For example, the Bureau of Labor Statistics funds an annual survey of a fixed pool of 9,000 respondents. Researchers can follow their activities over time, tracking such qualities as wage levels and persistence of unemployment.

But economists and other professional data users do not always contribute to the solution either. They are too often cheerleaders for more government spending on statistics, too rarely reasoned advocates for cost-cutting and efficiency. Two members of the National Association of Business Economists' Committee on Statistics echoed this thought when they dissented from the majority view of a 1988 report. Jay Woodward of Bankers Trust Co. was concerned about the "impression left with the reader that we're just another special-interest group pleading for more federal spending to alleviate what we regard as a problem." Ed Fiedler of the Conference Board complained that the report "comes close to taking the attitude that the government's statistical programs are a failure for not providing all the high-quality, problem-free statistics that economists think might be useful."

Fiedler's criticism is particularly stinging for being aimed at economists, whose stock-in-trade is supposed to be weighing benefits—such as higher quality—against their costs. There have been only a few attempts—mostly among agricultural economists—to study the value of economic data and to compare the value of programs against their costs.

And these attempts have not been impressive. For example, Martin Fleming, chairman of the National Association of Business Economists' statistics committee in March 1991 attempted to show Congress's Joint Economic Committee "that significant problems can be attributed to [inferior] economic statistics." As evidence, he implied that the last recession might have been avoided if the Federal Reserve had gotten solid information on the economy more quickly than it did in 1989. Asked about this in an interview, Federal Reserve Board governor Wayne Angell said that the best monetary policy aims ahead of the target. It takes six months or a year for Federal Reserve policy to affect the economy, he noted, so when the Fed makes policy errors, it is because the future, not the past, is obscure.

To expand on Angell's point a bit, economic policy is made against the backdrop of great uncertainty about the future and about the workings of the economy. It is made in a



BRUCE REEDY

Less relevant statistical surveys often sap budgetary resources, argues Jack Triplett of the Bureau of Economic Analysis.

rough-and-tumble world of political compromise, which must balance pressures from competing interest groups. For most public policy makers, it is enough to have a general idea of the broad contours of the economy; excessive detail or precision is a waste.

The amount and kinds of information the government should collect, the appropriate level of detail and timeliness will vary from program to program. Policy makers, academics and private-sector businesses all have different requirements, and all can use economic statistics with different levels of payoff. Study of these issues can help establish a clear view of the needs and priorities of the whole system, which, as a 1989 Office of Technology Assessment report said, "is not now available from any source."

But a thoughtful, cost-conscious needs assessment is only a start. In a published reply to Triplett's criticism of statistical administrators, University of Michigan economics professor Thomas Juster said the system, not individuals, was to blame. The problems faced by statistical agencies are "generic to federal agencies generally, which at the policy level will always be more concerned with quick solutions to short-term problems rather than with laying the groundwork for better-formulated solutions to longer-term problems," Juster wrote.

The quality of economic statistics is lower because they are financed through the political system. This is one of the smaller costs of democracy. Those who want better statistics had better start to work within today's political realities, which include constraints on government spending. It is time to argue and vote not just for more spending, but for smarter spending, to devote as much attention to weeding out marginal programs as to supporting worthwhile additions. □

U.S. Probe Targets Japanese Chip Imports

By GEORGE LEOPOLD
Defense News Staff Writer

WASHINGTON — The results of an investigation of the security implications of Japan's importing of a key electronic component could help domestic producers gain a foothold in the multimillion-dollar defense market.

On Nov. 18, the Department of Commerce launched an investigation of the impact on U.S. national security of imports of ceramic chip packages, a market dominated by Japanese suppliers. Commerce Department officials said a decision is expected next summer.

The probe by the Commerce Department's Bureau of Export Administration was initiated in response to a petition by two U.S. producers, Coors Electronic Package Co., Chattanooga, Tenn., and Ceramics Process Systems Corp., Milford, Mass.

More than 90 percent of the ceramic

chip packages used by the U.S. military are supplied by Japanese manufacturers, U.S. and industry officials said.

The U.S. military's primary source of ceramic packages is Kyocera Corp., Kyoto, Japan, which has plants in Japan and San Diego. Other Japanese suppliers include NTK Ceramics and Narumi Ceramics.

The U.S. ceramic package makers filed a petition on Nov. 10 alleging that the U.S. military is dependent on foreign sources of ceramic packages used to mount and connect chips to other electronic components. They also asked that the Commerce Department take steps to adjust Japanese imports.

The department has 270 days to conduct its investigation to determine whether such a dependency exists and whether it adversely affects U.S. national security.

U.S. military specifications require

that manufacturers mount delicate computer chips used in weapons on ceramic packages to protect them from moisture and dust. The packages are used in virtually all modern U.S. weapons.

The Commerce investigation is being conducted under the national security provisions of the Trade Expansion Act of 1962. The law gives the president the authority to adjust imports if the investigation finds they are harming national security.

Remedies being sought by the U.S. companies in their petition include changes in federal acquisition regulations to stimulate the domestic industry and government assistance to U.S. firms trying to qualify as Pentagon suppliers.

"We're trying to ferret out through discussions with the government and industry . . . the kinds of remedies

See CERAMICS, Page 36

Inquiry Could Spur U.S. Chip Market

CERAMICS, From Page 34

that would be beneficial to everyone," Grover Coors, Coors Ceramics' vice president for national affairs, said in a Nov. 30 interview.

The military segment of the estimated \$1.2 billion global market for ceramic chip packages totals between \$250 million and \$400 million annually, according to U.S. industry estimates.

The Commerce Department investigation is the latest in a series of government studies examining growing U.S. dependence on foreign suppliers of critical electronic components. The Pentagon has identified ceramic materials, of which ceramic packages are a part, as a critical technology.

A Pentagon-sponsored study of U.S. dependence on foreign suppliers released in April 1991 found "exceptionally high U.S. dependence on foreign ceramic packaging." Among the U.S. weapon systems found to be almost totally dependent on foreign sources for packaging mate-

rials were the APG-66 and APG-68 fire control radars used in all U.S. and most foreign F-16 fighters.

The study, performed by the Institute for Defense Analyses, a government-sponsored think tank in Alexandria, Va., recommended that the Defense Advanced Research Projects Agency conduct research on advanced packaging materials, processes and manufacturing technologies to meet the military's most-stringent quality and reliability requirements.

Also, the study called on acquisition officials "to consider efforts to drive down . . . ceramic packaging costs for [weapon components] to help make U.S. products more competitive with offshore products."

If the investigation finds that reliance on Japanese packages is harming national security, U.S. suppliers could get government help in qualifying as domestic suppliers of ceramic packages. Remedies include changes to

U.S. acquisition regulations to stimulate domestic sources and Pentagon assistance to U.S. firms retooling their production lines to qualify as domestic suppliers.

A Commerce Department official said Dec. 1 that funding to help U.S. companies become qualified suppliers could come from a Defense Department manufacturing technology program. Technical assistance could come from the National Institute of Standards and Technology, a branch of the Department of Commerce that focuses on strengthening U.S. industrial competitiveness.

The Commerce investigation is the 11th in 12 years, and the department has yet to dismiss an industry petition filed under the national security provision of the 1962 trade law.

The decision to launch the investigation "doesn't telegraph any judgment about the case," cautioned the Commerce Department official.

Japanese may have early lead in mega-megabit chips

By Andrew Pollack
The New York Times

TOKYO — Four Japanese companies have separately produced the first prototypes of a memory chip that is likely to become the main means of storing information in computers around the turn of the century, one of the companies disclosed yesterday.

The silicon chip, known as a 256-megabit dynamic random access memory, or DRAM, can store 256 million bits of information, the equivalent of 10,000 or more pages of typed text. That is 64 times more capacity than that of the four-million-bit



chip now commonly used in computers.

Such a chip would probably be used in powerful hand-held computers and for storing sound and video images in computers and consumer electronics products like high-definition television sets.

The four companies, which worked independently, are: Fujitsu Ltd., Hitachi Ltd., NEC Corp., and Toshiba Corp. The descriptions of the prototypes provide a hint

that the Japanese companies will maintain their traditional dominance of the memory chip business.

But analysts said it was almost meaningless which company produced the first prototypes since the chips will not even begin to be sold in large volumes until about 1998. The industry must first proceed through the 16-megabit chip, which is just starting to appear on the market, and the future 64-megabit generation. Analysts also say that a few handcrafted prototypes, which are relatively easy to produce, often end up bearing little resemblance to the product that can be

manufactured by the millions.

"At this point in time, it doesn't really matter whether you're in the lead or not," said Peter G. Wolf, electronics analyst with Kidder, Peabody & Co. in Tokyo.

Toshiba, NEC and Hitachi, which are Japan's three largest chip producers, will announce their prototypes at the International Solid-State Circuits Conference, a technical meeting to be held in San Francisco in February. The conference prohibits companies from talking about their work before they present their papers. Fujitsu's paper was not accepted for the conference, so the company was free to de-

scribe its work first.

Japanese companies have long dominated the memory business, but have been receiving more of a challenge of late. Samsung, a South Korean company that often does not present papers at technical conferences, is considered to be roughly on a par with the Japanese. American companies like IBM and Texas Instruments Inc. also produce memory chips.

The circuits in the 256-megabit chips have features ranging from two-tenths of a micron in the case of Fujitsu to four-tenths of a micron in the case of Toshiba. A micron is one-millionth of a meter.

