

**ROLE OF THE DEPARTMENT OF COMMERCE IN
FEDERAL STATISTICAL GATHERING, ANALYSIS
AND DISSEMINATION, AND OPPORTUNITIES
FOR REFORM AND CONSOLIDATION**

HEARING

BEFORE THE

SUBCOMMITTEE ON OVERSIGHT OF
GOVERNMENT MANAGEMENT, RESTRUCTURING,
AND THE DISTRICT OF COLUMBIA

OF THE

COMMITTEE ON
GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

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OPPORTUNITIES FOR REFORM AND CON-
SOLIDATION**

WEDNESDAY, APRIL 9, 1997

U.S. SENATE,
OVERSIGHT OF GOVERNMENT MANAGEMENT, RESTRUCTURING,
AND THE DISTRICT OF COLUMBIA SUBCOMMITTEE,
OF THE COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, DC.

The Subcommittee met, pursuant to notice, at 1:45 p.m., in room SD-342, Dirksen Senate Office Building, Hon. Sam Brownback, Chairman of the Subcommittee, presiding.

Present: Senator Brownback.

OPENING STATEMENT OF SENATOR BROWNBACK

Senator BROWNBACK. This Subcommittee hearing of the Governmental Affairs Committee will be called to order.

We are holding our third in a series of hearings on the Department of Commerce, and this one in particular will look at the statistical gathering interest of the United States and our abilities in these area, or lack thereof, our lack of coordination. It has been interesting to me, in looking at this issue, that we have some 89 different organizations involved in statistics in the Federal Government, and yet with that and the amount of budget we spend, which I believe is about \$3 billion annually, we are ranked seventh amongst the leading industrialized countries for the quality of our statistics.

Well, that seems to me to be a bit odd, and we have in front of us in the first panel a couple of gentlemen who have been around this issue and who have either produced statistics or used statistics, either of which they are very knowledgeable about it. Let's just get started on this with the two of you gentlemen, looking at this area of the statistical functions of the Federal Government, what needs to be done differently. And we are trying to build a set amount of information as to what should be done differently in these areas. We have several panels today.

Senator Moynihan, thank you very much for joining us. I apologize for being late. We were in a major discussion on the chemical weapons convention, which is an issue of some important interest to a few, so I was following on that.

Thank you for joining us. Please feel free to illuminate us on what we should know about the statistical gathering from your background, either in the agency, in the entity, or in the U.S. Senate. The floor is yours.

**TESTIMONY OF HON. DANIEL PATRICK MOYNIHAN, A U.S.
SENATOR FROM THE STATE OF NEW YORK**

Senator MOYNIHAN. Thank you, Mr. Chairman. It is a special honor to appear here with my old White House colleague, Steve Horn. I can tell you it was a Republican White House, if that is of any reassurance.

Senator BROWNBACK. Those were the days.

Senator MOYNIHAN. And you will soon be hearing from Janet Norwood, who is a former Commissioner of Labor Statistics, and Vince Barabba, a very distinguished head of the Bureau of the Census.

I have a statement which I would like to place in the record.

Senator BROWNBACK. Without objection.

Senator MOYNIHAN. And to make a very brief statement, which I would hope you might Representative Horn just join in. I think this is—it would appear this is an idea whose time has come. In the last Congress, Senator Kerrey and I introduced—and we have done it once again—a proposal to set up a Federal commission to think about consolidating and rationalizing these agencies. Representative Horn put in a bill that would actually do so. I think you had the Census, the BLS—

Mr. HORN. And the Bureau of Economic Analysis.

Senator MOYNIHAN. And the Bureau of Economic Analysis, the three most important ones, into one institution. I gather that—and he can speak for himself—that Mr. Horn thinks that maybe we could get a commission to look at the whole subject first before deciding. The Heritage Foundation has come up with a proposal for a national statistical office.

There is a certain simple point here. We built statistics into our Constitution when we required a decennial census to apportion the House of Representatives. And so we have always had a powerful statistical basis in the Bureau of the Census—which I guess was started formally about 1860?

Mr. HORN. A little later.

Senator MOYNIHAN. And the Bureau of Labor Statistics about 1880?

Ms. NORWOOD. In 1884, and the Census was slightly after that.

Senator MOYNIHAN. The Census was slightly after. In 1884, the Bureau of Labor Statistics was established, and then as different departments of government are established, Mr. Chairman, almost invariably, if not from the outset, sooner or later they get their own statistical agency. And I have had my share in that wrongdoing. In the Intermodal Surface Transportation Efficiency Act of 1991, we created a Bureau of Statistics in the Department of Transportation, which needs data, but it does not need necessarily its own. And that is what other countries are finding.

In Canada, almost by a historical accident, they have had one agency, Statistics Canada, since 1923. They found themselves—in the First World War, their status as a country was indeterminate

with regard to Great Britain, but Great Britain would ask them how much can you do in the way of munitions and what can you send us in the way of wheat and how many troops do you think you can provide. And the answer was nobody in Ottawa knew. So they created a central agency, and it has been that way since, and very effective, partly because it gives the head of that agency—the chief statistician of the dominion—is on equal status with the other senior civil servants in the other departments of government.

I just learned from Janet Norwood that the British, who have had a system not unlike ours, are beginning to bring it together. They are taking it sort of one step at a time, but there is now in the United Kingdom a national statistical service, and with more merging yet to come.

The need in our case is twofold. One is that the mathematics of statistics gathering—index number theory—continues to advance. We surprise ourselves perhaps to learn how recent some of these advances in theory are. For example, the first unemployment rate published by the Department of Labor using current monthly survey methodology was 1948. We had to learn sampling, the kind of sampling that every member, in the White House does every night to find out what people think about the chemical treaty. They did not know how to do that. It was learned in the 1930's and gradually brought in. We used to take the unemployment rate in the census by the process of counting everybody and seeing how many were unemployed. We took it in April of 1930 and then April of 1940, and there was no depression. It just never appears.

I was once, in the Kennedy administration, I was Assistant Secretary of Labor with a nominal responsibility for the BLS. I can tell you that when the unemployment rate would come out people were fascinated with it because it was still new. And immediately it would be an issue of controversy. It is too high, said the Chamber of Commerce; too low, said the AFL-CIO. So we would have our meeting—but gradually over 30 years I think that number has achieved an acceptance that is rarely questioned.

On the other hand, you can see recently how much controversy and doubt is raised over the issue of how we adjust various benefits for the cost-of-living changes, and, indeed, we have indexed the Internal Revenue Code as well. All of which argues that, you know, let's take a look at this. And the view that it ought to have come about is very widespread, and I would like just to close my remarks by asking that you place in the record a copy of a letter from what I believe is every living former Chairman of the Council of Economic Advisers, a letter sent to me and Senator Kerrey just last year, saying—we write to support the basic objectives and approach of your bill to establish the commission to study the Federal statistical system.

[The letter follows:]

LETTER TO SENATORS MOYNIHAN AND KERREY FROM FORMER
CHAIRMEN OF THE COUNCIL OF ECONOMIC ADVISERS

September 23, 1996

The Hon. Daniel P. Moynihan
The Hon. J. Robert Kerrey
U.S. Senate
Washington, DC

DEAR SENATORS MOYNIHAN AND KERREY: All of us are former Chairmen of the Council of Economic Advisers. We write to support the basic objectives and approach of your Bill to establish the Commission to Study the Federal Statistical System.

The United States possesses a first-class statistical system. All of us have in the past relied heavily upon the availability of reasonably accurate and timely Federal statistics on the national economy. Similarly, our professional training leads us to recognize how important a good system of statistical information is for the efficient operations of our complex private economy. But we are also painfully aware that important problems of bureaucratic organization and methodology need to be examined and dealt with if the Federal statistical system is to continue to meet essential public and private needs.

All of us have particular reason to remember the problems which periodically arise under the current system of widely scattered responsibilities. Instead of reflecting a balance among the relative priorities of one statistical collection effort against others, statistical priorities are set in a system within which individual Cabinet secretaries recommend budgetary tradeoffs between their own substantive programs and the statistical operations which their departments, sometimes by historical accident, are responsible for collecting. Moreover, long range planning of improvements in the Federal statistical system to meet the changing nature and needs of the economy is hard to organize in the present framework. The Office of Management and Budget and the Council of Economic Advisers put a lot of effort into trying to coordinate the system, often with success, but often swimming upstream against the system.

We are also aware, as of course are you, of a number of longstanding substantive and methodological difficulties with which the current system is grappling. These include the increasing importance in the national economy of the service sector, whose output and productivity are especially hard to measure, and the pervasive effect both on measures of national output and income and on the Federal budget of the accuracy (or inaccuracy) with which our measures of prices capture changes in the quality of the goods and services we buy.

Without at all prejudging the appropriate measures to deal with these difficult problems, we believe that a thoroughgoing review by a highly qualified and bipartisan Commission as provided in your Bill has great promise of showing the way to major improvements.

Sincerely,

PROFESSOR MICHAEL J. BOSKIN,
Stanford University

DR. MARTIN FELDSTEIN,
National Bureau of Economic Research

ALAN GREENSPAN

PROFESSOR PAUL W. MCCrackEN,
University of Michigan

RAYMOND J. SAULNIER

CHARLES L. SCHULTZE,
The Brookings Institution

BERYL W. SPRINKEL

HERBERT STEIN,
American Enterprise Institute

PROFESSOR MURRAY WEIDENBAUM,
Center for the Study of American Business

Senator MOYNIHAN. It is signed by Michael Boskin, Martin Feldstein, Alan Greenspan, Paul McCracken, Raymond Saulnier, Charles Schultze, Beryl Sprinkel, Herbert Stein, and Murray Weidenbaum. I do not want to add an ideological tint to this because there is none, but I do somewhat regret to say that of all those illustrious names, only one of them is a Democrat. [Laughter]

But this is the view of the persons who had to advise the President under the legislation, the Employment Act of 1946, have had to advise the President about the state of the economy, the utilization of resources including manpower, and are the people who use data in the White House. They find they have to get it from too many places, and often it is simply inconsistent and sometimes incompatible, and so good management and good government suggest we would take a look at our present arrangements.

I thank you, sir.

[The prepared statement of Senator Moynihan follows:]

PREPARED STATEMENT BY SENATOR MOYNIHAN

Mr. Chairman: Statistics are part of our constitutional arrangement, which provides for a decennial census that, among other purposes, is the basis for apportionment of membership in the House of Representatives. Article I, Section I provides that:

. . . enumeration shall be made within three Years after the first meeting of the Congress of the United States, and within every subsequent Term of ten Years, in such Manner as they shall by Law direct.

President Kennedy once said:

Democracy is a difficult kind of government. It requires the highest qualities of self-discipline, restraint, a willingness to make commitments and sacrifices for the general interest, and also it requires knowledge.

That knowledge often comes from accurate statistics. You cannot begin to solve a problem until you can measure it.

As you know, Senator Bob Kerrey and I have introduced S. 144, a bill to establish a commission to study our Federal statistical system. The Commission would consist of 13 Presidential and Congressional appointees with expertise in fields such as actuarial science, finance, and economics. Its members would conduct a thorough review of the U.S. statistical system and issue a report including recommendations on whether statistical agencies should be consolidated.

We, of course, have an example of a consolidated statistical agency just across our northern border. Statistics Canada, the most centralized statistical agency among OECD countries, was established in November, 1918 as a reaction to a familiar problem. At that time, the Canadian Minister of Industry was trying to obtain an estimate of the manpower resources that Canada could commit to the war effort. And he got widely different estimates from statistical agencies scattered throughout the government. Consolidation seemed the way to solve this problem, and so it happened—as it can in a parliamentary government—rather quickly just as World War I ended.

A member of my staff has just returned from a working meeting in Ottawa with the Assistant Chief Statistician responsible for Business and Trade Statistics, including price statistics. We learned that Statistics Canada is doing quite well. Decisions with respect to the allocation of resources among statistical functions are made at the highest levels of government, since the Chief Statistician of Statistics Canada holds a position equivalent to Deputy Cabinet Minister. He communicates directly with Deputy Ministers in other Cabinet Departments. In contrast, in the United States, statistical agencies are buried several levels below the Cabinet Secretaries, so it is difficult for the heads of these statistical agencies to bring issues to the attention of high-ranking Administration officials and Congress.

Our bill, S. 144, would require the Commission to focus particularly on the agencies that produce data as their primary product—agencies such as the Bureau of Economic Analysis (BEA) and the Bureau of Labor Statistics (BLS).

I have here a letter from nine former Chairmen of the Council of Economic Advisers (CEA) endorsing this legislation—virtually every living chair of the CEA. While

acknowledging that the United States “possesses a first-class statistical system,” these former Chairmen wrote:

Without at all prejudging the appropriate measures to deal with these difficult problems, we believe that a thoroughgoing review by a highly qualified and bipartisan Commission as provided in your Bill has great promise of showing the way to major improvements.

The letter is signed by Michael J. Boskin, Martin Feldstein, Alan Greenspan, Paul W. McCracken, Raymond J. Saulnier, Charles L. Schultze, Beryl W. Sprinkel, Herbert Stein, and Murray Weidenbaum. I ask that the full text of this letter be printed in the record.

It happens that this Senator’s association with the statistical system in the Executive Branch began over three decades ago. I was Assistant Secretary of Labor for Policy Planning and Research in the administration of President Kennedy. This was a new position in which I was nominally responsible for, among other things, the Bureau of Labor Statistics. The then-Commissioner of the BLS, Ewan Clague, could not have been more friendly and supportive. And so were the statisticians, who undertook to teach me to the extent I was teachable. And so it was that I came to have some familiarity with the field.

In 1961 we received a report on “The Price Statistics of the Federal Government” from a committee led by George J. Stigler, who later won a Nobel prize in economics. The Committee stressed the importance of accurate and timely statistics, noting that:

The periodic revision of price indexes, and the almost continuous alterations in details of their calculation, are essential if the indexes are to serve their primary function of measuring the average movements of prices.

More recently, in December of 1996, the Final Report of the Advisory Commission To Study the Consumer Price Index (The Boskin Commission) also addressed itself to the effectiveness of Federal statistical programs. Although the Boskin Commission focused primarily on the extent to which changes in the CPI overstate inflation, the Commission also recommended that:

Congress should enact the legislation necessary for the Department of Commerce and Labor to share information in the interest of improving accuracy and timeliness of economic statistics and to reduce the resources consumed in their development and production.

There is some momentum for a more centralized statistical system, as you will shortly hear from your other witnesses. I would like to commend Rep. Steve Horn on the bill he introduced in the 104th Congress, H.R. 2521, which would establish a Federal Statistical Service by merging the Bureau of the Census, the BLS, and the BEA.

Janet L. Norwood, former Commissioner of the BLS, wrote in her book *Organizing to Count*:

The U.S. system has neither the advantages that come from centralization nor the efficiency that comes from strong coordination in decentralization. As presently organized, therefore, the country’s statistical system will be hard pressed to meet the demands of a technologically advanced, increasingly internationalized world in which the demand for objective data of high quality is steadily rising.

And in a recent report on *Balancing America’s Budget*, the Heritage Foundation recommends merging nine core statistical programs into a single, independent Bureau of National Statistics (BNS) headed by a Chief Statistician and modeled after the Canadian system.

While I share many of the objectives of those who want to move quickly, I believe we must approach this subject somewhat more cautiously than some have suggested. Issues such as privacy must be carefully evaluated by a Commission. For example, earlier this week, reports in the media indicated that it may be possible to gain unauthorized access to confidential Social Security Personal Earnings and Benefits Estimate Statements (PEBES) via the Internet. Along with Finance Chairman Roth and others, I sent a letter this morning to the Social Security Administration requesting that these statements via the Internet be suspended until the Social Security Administration is able to convene and receive recommendations from an independent panel of computer and privacy experts on what additional safeguards are needed to protect the confidentiality of Social Security records.

In an era in which people are fascinated by technology, but are not always aware of its consequences, it is important that a Commission take a comprehensive look

at how our statistical infrastructure protects the privacy of individuals and their personal records.

Our bill is only a first step, but an essential one. The Commission will provide Congress with a blueprint for reform. It will be up to us to finally take action after nearly a century of inattention to this very important issue.

Senator BROWNBACK. Thank you, sir, Senator Moynihan, whom I have followed for a long period of time and respect deeply your opinions, and I have quoted you often over the years as well, when you were with Republicans or Democrats, either way. I very much appreciate your being here, and we will look forward to a discussion.

Congressman Horn has joined us. He has a bill, and what I want to get to eventually is a discussion between the two of you of an approach to take now, whether it should be a commission or a bill arrangement. I want to make sure we get to that. Congressman Horn, thank you for coming across the Hill, and the floor is yours.

TESTIMONY OF HON. STEPHEN HORN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. HORN. Well, thank you very much. It is a great pleasure and delight to be with Senator Moynihan, who certainly has influenced all of us on many aspects of public policy.

Let me just say I agree with the commission approach. Perhaps we both came out of the academic background and we found it is better to try and get a consensus by getting all the different views around the table and then pass legislation based on that. So I do not have any problem with the commission route.

What got me into the issue was in my role as chairman of the Subcommittee on Government Management, Information, and Technology of the House Committee on Government Reform and Oversight. I took a look at this, and have a strong belief that in the organization of the government, the controversial issues should be in Cabinet Departments. That is why we pay Cabinet officers and Presidents of the United States. Hopefully, the non-controversial issues—and I realize the Consumer Price Index is very controversial would be handled appropriately. My own experience was not as lofty a position in the Department of Labor as my colleague here in the Senate, I was assistant to the Secretary of Labor under President Eisenhower, James P. Mitchell. And I know from that experience that we had high respect and never interfered with the Bureau of Labor Statistics within the Department.

I feel very strongly that both the Census and the Bureau of Labor of Statistics—less I know about the Bureau of Economic Analysis—deserve the credibility of what I would call an independent agency. The National Science Foundation gets along quite well as an independent agency. It goes on about its business. To my knowledge, there has never really been a scandal involving the National Science Foundation. And we ought to get those agencies that need the credibility and should not be mixed up even by innuendo in partisan politics, we need to let those agencies function on their own in an independent agency status.

So I am looking at, suggesting here as I did last year, a Federal statistical service. Former Commissioner Norwood was of great help as a principal witness, and I am glad to see that she is one of your principal witnesses. But I think we are not talking about

merging all statistical services. I think there are certain advantages to incrementalism and not having everything come out of one service. For example, Agriculture will have some of its own statistics. Any Cabinet Department has some of this. And OMB, the Office of Management and Budget, is there to supervise the degree to which you will burden the taxpayers and others with this or that survey.

But there are historically two agencies—Census and BLS—that are looked to not simply by the Department in which they happen to be located, but they are looked to by millions to affect various decisions. Not only legislators at the local, State, and national level, but corporations, labor unions, non-profits, all of those groups rely on the data that is reflected in the 10-year census, as well as in the monthly series in the case of BLS or the half-year series. We look to those for credibility, and my feeling is get them out of the Cabinet Departments where, even if the critic is mistaken, they would seem to be under political influence. And that is what has motivated me here, not to get everybody in one tent, but to get the two major ones plus the Bureau of Economic Analysis in one tent and have it assured that there is no political intrusion. We could have a professional advisory committee which could be, for terms certain, made up of leading statisticians. You could analyze that by category, and they serve between administrations and give policy guidance if needed to the director involved. That is just the way I would come at this, having looked at the successes or non-successes in government over the years.

So I would like, Mr. Chairman, to file the statement which gets into detail really on the bill, but I just wanted you to know where I am coming from in terms of suggesting this.

[The prepared statement of Mr. Horn follows:]

PREPARED STATEMENT OF REPRESENTATIVE HORN

During the last Congress, I introduced two pieces of legislation relating to Government statistics.

The first, the Statistical Consolidation Act of 1995 (H.R. 2521), would have consolidated the three primary economic statistics agencies of the Federal Government—the Bureau of the Census, the Bureau of Labor Statistics and the Bureau of Economic Analysis—into a new, independent Federal Statistical Service. The second, H.R. 3924, would have permitted data sharing among eight government statistical agencies.

The economic statistics gathered and analyzed by the Federal Government are integral to public and private decision making. The financial markets rise and fall based on the data provided by these agencies; Federal aid is determined and distributed using this information. Businesses make a variety of decisions with reference to these statistics, ranging from the development of new products to the opening and closing of factories. Although sound statistics and analysis do not automatically produce sound public policy, they do provide a necessary foundation from which to identify problems, to evaluate options, and to monitor results.

Historically, most Federal statistical programs were established to serve the information needs of the particular department or agency in which they were based. However, the increasingly interconnected nature of major economic and social issues far exceeds the bounds of any single agency's work program. The information needs of Congress and the President transcend the data and statistics compiled by any single statistical agency.

A new Federal Statistical Service would streamline and improve the production of key economic data. The three principal economic statistical agencies affected by this legislation cannot continue to operate in isolation.

Additionally, the independence of the consolidated Federal Statistical Service will ensure freedom from partisan influences. I cannot emphasize strongly enough the

need to protect the integrity of the data during the collection and interpretation stages of the process.

The Director of the Census and the Commissioner of Labor Statistics must demonstrate an absolute commitment to the integrity of their statistics and be willing to take decisive action if he or she believes the statistics are not being protected from external political pressures.

Confidentiality issues in statistical policy are also vitally important. More uniform confidentiality standards could permit the sharing of data for statistical purposes with Federal and State agencies. This would be integral to the success of the consolidation.

As for those concerned that in the current atmosphere of reducing government's size and cost, we anticipate that the creation of a consolidated Federal statistics agency would result in significant savings through the streamlining of personnel and field and procurement offices. Further savings will be achieved from the consolidation of population list management operations.

The other bill I introduced in the 104th Congress, H.R. 2521, would have taken existing resources and reallocated them to meet future statistical needs while also improving the accuracy of existing statistical measures.

The time has long since passed to bridge the schism between the responsibilities given the statistical agencies and their capabilities. Consolidation is a long awaited and logical extension of the decades old collaborative relationship between these three agencies.

Before introducing new legislation in the 105th Congress, I look forward to working with interested legislators, such as Chairman Brownback and Senator Moynihan, to develop bi-partisan legislation that could be introduced simultaneously in both bodies. Working together, we can develop legislation along these lines with important provisions that have been recommended again and again by those most familiar with government statistics.

Senator BROWNBACk. Good. I appreciate that.

A bit of discussion here. Senator Moynihan, you believe that the approach we should go is the commission route. That is the way to get everybody headed the same way at roughly the same time.

Senator MOYNIHAN. Yes, sir, and I think Chairman Horn is of the same view, and the former heads of the Council of Economic Advisers say, yes, it is time to take a look at this.

I would make the point, if I may, that we must not think of statistics as a sort of given thing, as something you know how to do and that is it. It is evolving all the time. An example, if I may, I was once Director of the Joint Center for Urban Studies at MIT and Harvard, and in the mid-1960s we held a conference down here with Census on what do you do about the undercount. And it was a very elegant arrangement. We had an academic—for each topic, a paper was prepared by an academic and a counterpart in the Bureau of the Census. And it was agreed that there was a very large undercount, that it was not evenly distributed. It was in central cities. It had racial components. It affected the distribution of seats in the House of Representatives.

But they also agreed there was not much you could do about it because, in theory, a sample would be better, but they did not know that much about sampling.

Thirty years go by, Mr. Chairman, and the Bureau of the Census now says, yes, we are ready, we can sample. But that is a learning process, and I think an independent agency might encourage that kind of creativity in a way that does not necessarily happen when you are way down at the bottom of an agency that has political activity going on all the time and the Secretary is not thinking about you. He is thinking about that other Secretary or what the Vice President says and what Chairman Brownback thinks.

Senator BROWNBACk. Let me ask you, would either or both of you be willing to hazard your opinion on what a consolidated agency or independent entity should look like, or at a minimum, which of the current functions it should contain?

Mr. HORN. Well, I suspect some economies could be made in a merger between what Census does and what BLS does. But I would think that is the kind of thing that might well come out before a commission where you have the chance and the time it takes to get into the—

Senator MOYNIHAN. And the Bureau of Economic Analysis.

Mr. HORN. Right. And see if there is a way you can do a certain series where all three of those agencies contribute something to the series. What I am trying to do is get strong professional guidance throughout the profession, be it the American Statistical Association, American Economics Association. From all of these I would put representation on an advisory board.

I have had the experience of doing that when the late Robert Cutack and I drafted the legislation for the National Institute of Corrections, which was Chief Justice Burger's idea. We needed to do something about the States and localities. Well, we put together an agency within Justice that has a professional board that actually recommends the director to the Attorney General, and what we did was establish various categories of representation. That has worked well, so I am used to a system like that where you have got a strong advisory board; they make their recommendations to the director, and if there is a vacancy there, they make the recommendations to the Attorney General about who should be the director. It has worked well for over 20 years. I am sort of thinking of that in this type of a consolidation.

Senator BROWNBACk. You are saying, Senator Moynihan, at a minimum you would look at Census, BLS, BEA, as being a consolidated—at least a core of that that you would be pulling these together.

Senator MOYNIHAN. That I think, sir, is your basic economic data system. Now, you know, the FBI crime statistics are going to be over there whether we like it or not because it is the FBI. But your economic data, population data, resource data would come together, as Chairman Horn proposed last year. That need not be the only way to do it, but certainly it would be one of the first things you would look at.

Senator BROWNBACk. OK. I have to admit, too, to my participation in this game previously when I was Secretary of Agriculture of Kansas. We had an arm that was counting different statistical items which the Federal Government was counting as well. Would you bring in something like that or not? You know, it is a very costly operation overall. I do not know what it is in USDA's budget, but it is a substantial dollar investment that is put in there.

You mentioned, Senator Moynihan, if I could, that you think maybe this is an idea whose time has finally come. The fortune of a good staff, they have looked into some of the background of this, of which I am sure you are familiar as well. Seventeen years ago, Senator Ribicoff introduced the Statistical Policy Act. Even before that, the now-defunct Bureau of Efficiency in 1922 issued a report

urging centralization of Federal Government statistical agencies. There have been other initiatives.

Why now do you think we could pull this together and actually move it forward and get something constructive done, when obviously this has been identified at different times over history as being an area of some problem for us, or if not problem, at least an area where gained efficiencies should be able to take place? Why could we get it done now?

Senator MOYNIHAN. May I say I had some involvement with Senator Ribicoff's proposal. Why now? I will tell you why now. Because a bunch of crazy Republicans have taken over Congress and they think it is time to change some things.

Senator BROWNBACK. Good enough for me. [Laughter]

Mr. HORN. I might add, instead of saying why, why not, I guess is where I am coming from on this.

Senator BROWNBACK. I guess I am asking for the detractors. Where are we going to get into the fights before you start into that?

Senator MOYNIHAN. You have touched the BLS, and you have touched the AFL-CIO. You have touched the Bureau of Economic Analysis. You have touched the Chamber of Commerce.

Mr. HORN. And we want to touch them all.

Senator MOYNIHAN. All at once. Or I think they will get you one more time.

Mr. HORN. I think the Senator is absolutely correct on that. That commission will smoke out where people are on these various areas in public, and I think that is important. I think we should be concerned about what the ultimate end of the public is as a whole as we try to legislate for America as a whole, not just the specific interest groups. But as the Senator says, every group in this town has their little bureau, and often, I remember when I went to the Department of Labor, it was filled with retirees from certain special interests. And I am sure the Senator ran into that in his role as Assistant Secretary.

So I just think if we start, I think we could do this in a year between the commission and the idea of moving ahead on legislation, or do it during this Congress.

Senator BROWNBACK. And that is a reasonable time frame, you think as well, Senator Moynihan?

Senator MOYNIHAN. That would be my judgment.

Senator BROWNBACK. Good. Gentlemen, thank you very much. I look forward to working with both of you as we push this on forward and catch some of those sacred cows. Thank you very much.

The next panel will consist of Janet Norwood, who served as Commissioner of the Bureau of Labor Statistics from 1979 to 1991, is now a senior fellow at the Urban Institute; and Vince Barabba—I hope I said that correctly.

Mr. BARABBA. You did, sir.

Senator BROWNBACK. Good—twice Director of the Census Bureau, past president of the American Statistical Association, currently general manager of General Motors Corporate Strategy and Knowledge Development.

Both of you have a distinguished past and current occupations as well and, I am sure, distinguished futures. I look forward to your

presentations and your thoughts. We can do this just as the last panel if you desire, or if you do want to read your statement in the record, we can do that as well. I think you can gather what I am after is what sort of proposals can we move forward on and in what sort of time frames, bottom line, for me and for this Subcommittee.

Ms. Norwood, if you would like to take the podium or the mike first, we would love to hear from you.

Ms. NORWOOD. Mr. Chairman, since Vince Barabba has a plane to catch, perhaps we might start with him.

Senator BROWNBAC. In the interest of reverse chivalry, Mr. Barabba, please.

Thank you for joining us.

**TESTIMONY OF VINCENT P. BARABBA, GENERAL MOTORS
CORPORATE STRATEGY AND KNOWLEDGE DEPARTMENT**

Mr. BARABBA. You should be aware that you have two people in front of you who have served in statistical agencies under the directorship of two different political parties, and I think that—

Ms. NORWOOD. That is, both Republicans and Democrats, each of us have served.

Senator BROWNBAC. Good.

Mr. BARABBA. And so I think it is clear that we sit here without any political point of view in mind.

I will just submit my testimony. I would say that Senator Moynihan and Congressman Horn did a very good job of articulating what I had in mind, and I learned a long time ago not to try to enhance what Senator Moynihan has said.

But let me address your question of "Why now?" One of the reasons of why now is that it is no longer a question of whether our society is changed. It is a question of the extent to which it has changed. And it is no longer a question of whether we are able to predict what that change is. It is clear that we are not capable of predicting what the future will be.

We could spend a lot of time trying to do it, but what we find out is the more we make assumptions, underlying assumptions about what our forecast is, the less likely you are to be correct because we are not very good at being correct about these assumptions because society is changing so fast.

So it becomes quite necessary to move from a predict-and-prepare mentality—that is, I can anticipate what the world is going to be like for some period of time, therefore I will prepare a set of actions—to much more of a sense-and-respond mentality, which says I have got to be prepared and I have to be sufficiently capable of adapting to changes that I did not expect.

That is no longer a question. Industry is coming to recognize that. I am not sure that government has, but the traditional ways of doing business just do not hold anymore. So that is another reason to change because the current statistical system was designed around a predict-and-prepare mentality. And I do not think we can handle that anymore.

The other point I think I could make is, having had the experience of working in both a large government agency and a reasonably large company, the problems are fundamentally the same. Up until recently, inside of General Motors you would find yourself

dealing with the different units of the company, virtually being silos of intense competence, but not willing to share that competence across the activities, and that poses a problem for a customer because a customer looks at the whole, not at any one of the entities. And if you come together in front of the customer and you are not consistent, you find yourself in trouble, as we did just recently.

It has taken a fundamental change of how we understand customers and how we have to look across our activities to put us in the position where we have improved our situation from the situation we found ourselves in in the late 1980's. We had to make some really hard choices inside the company, and we actually had to change how we gathered information and consolidated the activity. But there is a trade-off there. You do not want to consolidate information gathering so that it becomes an entity in itself and it collects what it wants to collect. You have to design a balance so that those who use the information are in a position to affect the relevancy of what is collected.

The other aspect of it is that those who are responsible for the collection have to be responsive to the issue of relevancy, but then they have to have in place a set of procedures, agreed to by all involved, that this is how we will collect the information and this is how we will present it.

I would say that the difference between the public and the private on this issue is not very great. In fact, there are more similarities between big agencies and big companies than there is between public and private.

The third point I would make is relative to the commission, which I would support, because there is a lot of sorting out to do before you would move forward at any level of consolidation. Based primarily on the comments I just made, the worst thing to do is to take a set of agencies that were designed for one era and mush them together without understanding what their new assignment is. So the notion of a commission to really sort out the needs of society, not just the needs of government, to design a system based on those needs would be very important.

This issue of finding out where the barriers generated by the vested interests becomes a really important item, and so the make-up of the commission I think has to be really carefully thought through, because I think you want the people with specific interests involved, but you want them to show up at the meeting with the interests of society at the forefront, not the interests of their vested interest group.

I think I could stop there, Mr. Chairman, and let Janet go ahead.
[The prepared statement of Mr. Barabba follows:]

PREPARED STATEMENT OF VINCENT P. BARABBA

Let me, at the outset, suggest that determining whether the Census Bureau be housed in the Department of Commerce or elsewhere, although an important topic, will not, by itself, significantly improve the role or performance of the Census Bureau in particular, nor Federal statistics in general. The issue is far more complex, and so this afternoon I will attempt to provide a framework for addressing both the challenges faced by the Census Bureau and those faced by Federal statistics overall.

More specifically, I suggest the development of a broader information system (not necessarily a large central organization) within which the agencies of the Federal

Government can adequately meet the ever-changing information needs of our society.

As currently operated, few statistical agencies are either equipped or authorized to help determine what society needs to know to meaningfully improve our well being. Doing so would require a cross-societal discussion process, which our current system does not support. An ideal process would allow interaction between those who determine what citizens need to know and those who collect the data. These parties would be encouraged to discuss all aspects of the information, including its form, accuracy and cost (both time and money), and would go far toward ensuring that the right information was collected, and was then used as effectively as possible.

This issue is important for at least two reasons:

1. It is no longer sufficient to address the issues of society from the perspective of limited purpose functional organizations (i.e., labor, commerce, health, education, etc.).
2. A government that merely “predicts and prepares” is no longer viable. Our society faces an increasing rate of change and increasing complexity, and therefore requires a government with the ability to “sense and respond” in an iterative, interactive learning process.

For the duration of my testimony, I will elaborate on these two points.

A Systemic Approach

First, it is no longer sufficient to address the issues of society from the perspective of limited purpose functional organizations (i.e., labor, commerce, health, education, etc.).

Each of us sees the world through a unique set of lenses, determined by our personal experiences, our responsibilities and our singular interests. As a result, none of us sees reality in its entirety. This is sometimes referred to as the silo or smoke-stack problem—a problem of particularism versus globalism.

In any large organization, individuals have particular tasks and responsibilities, which tend to be organized into narrow, vertically structured functions. Those who manage the business, on the other hand, have broader interests, as well as more general tasks and responsibilities.

I have encountered this problem throughout my career in both the public and private sector. Interestingly, my first encounter with the silo problem occurred during my senior year as an undergraduate student. One of my professors had developed a business simulation in which students were organized into teams that competed in making and selling a product. One year, instead of assigning students to a particular team at random, the professor organized the students according to major. This led to strikingly different outcomes.

The marketing majors spent most of their time and money on sales and promotion. They acquired an impressive share of the total market, but at high cost, and were bankrupt before the game ended. The accounting majors aimed at maximizing profits by minimizing investments in products and promotion. With no new products and only meager promotion of existing ones, the eyeshade brigade lost market share and slipped by degrees into bankruptcy.

At the other extreme, the production majors spent all their money on product development and manufacturing processes. They ended up with great products at the right prices, but with no money to tell customers about them, they too went out of business.

To the consternation of all concerned, the personnel majors won. The marketing majors ran out of money, the accountants ran out of products, and the production majors ran out of customers. The personnel types occupied themselves with endless changes to the organization chart. Having spent no money, they simply ran out of time and won the game by default.

Unfortunately, a similar scenario plays itself out in our government as well. Our functional policy makers often fail to bring together diverse government departments to address the cross-functional requirements of society. More often than not, information acquired by different departments falls into functional information depositories, where the data does little to improve government’s understanding of the constituencies it serves. Department A knows what it knows; Department B knows what it knows, and so forth. By themselves, the isolated bits of information are less useful than they might be if combined with information from other sources and placed in the context of a decision making process.

But working cross-functionally is not the answer on its own either. In addition to tapping into cross-functional networks, a new system should also include methods

for accessing deeper knowledge within the individual functions. *A strong statistics system must support both.*

One of Federal statistics most knowledgeable observers and constructive critics, James Bonnen, pointed out the need to organize statistics around knowledge needs, rather than points of data collection during a debate over whether the Census of Agriculture should be collected at the Census Bureau or the Department of Agriculture. While almost everyone else focused on who should collect the information, Jim reminded the group of how the data would be used. He pointed out that society needed to understand the specifics of each aspect of the system, as well as the interactions of the entire system—a system that started in the farmer's field and ended on the consumer's dinner table.

This meant we needed to integrate the data and information collected from numerous sources, ranging from the input supplies (seed, fertilizer, machinery, etc.) to agricultural production, commodity assembly, processing, manufacturing, wholesaling, retailing, transportation and eventual consumer consumption.

With that system view in mind, Jim suggested that the Census Bureau commit resources to identifying and integrating the various food sector statistics scattered throughout several economic censuses and surveys, then relate those statistics to the agricultural census. In essence, Jim knew it would be best to align our statistical practices around the user's needs and not around the existing organization structure.

This is not only a government problem. Many large organizations—both public and private—have failed in similar ways. The communities or markets of interest they wish to serve have changed, while the organizations themselves have remained much as they were at the turn of the century. Many public and private enterprises remain relics of the industrial age and a long-vanished society in which governments and companies offered services or products to customers and constituents who bought or accepted what they were offered. If government and corporate leaders do not drive the necessary changes, their enterprises, like endangered species, will be replaced by better, more adaptive competitors.

Faced with an uncertain future, we require structures and processes that can adapt quickly and flexibly to change, because while we can guarantee that change will occur, we can not predict what such changes will actually look like. Creating such structure and processes demands a systemic approach—an approach that takes its cues from the realm of systems thinking.

Russell Ackoff describes a system as “any entity, conceptual or physical, which consists of interdependent parts.” At the same time, “a system is a whole that cannot be divided into independent parts.”¹ Each element of the organization must rely on and interact with the rest if the organization as a whole if it hopes to succeed. *Today, problems are best solved not by breaking them into functional bits, but by carrying them into the next larger system and solving them through integrative mechanisms.*

Systems thinking allows us to see the structure that underlies complex situations, while still seeing the whole. It provides a framework for seeking interrelationships rather than things, as well as a framework for seeking patterns of change rather than static snapshots. In essence, it encourages us to create a whole whose value is greater than the sum of its parts.

Currently, the totality of Federal statistics is *not* more valuable to society than the sum of its parts. I make this assertion recognizing that each agency individually makes valuable contributions, but as a statistical system designed to contribute to a broader system of democratic governance, the current combination of functionally aligned statistical agencies falls considerably short of its potential value. By looking at the problem from a systems thinking framework, the solution clearly does not lie in fixing any one or some combination of the parts (i.e., the statistical agencies). *The solution lies in fixing the way the agencies interact—not only among themselves but also with those for whom they provide information.*

Solving the problem, of course, has become more difficult in that the combination of parts is increasing. For example, just the transfer of responsibility for many social programs from the Federal Government to the states and localities has dramatically increased the number of customers served by Federal statistical agencies. Yet, with some notable exceptions, the attention of many Federal statistical agencies is directed to the needs of Federal functional departments within which they are located.

The problem presented by this lack of a systemic approach was aptly described by a participant in a conference I attended in 1991, at which we discussed the barriers to making more data readily available for use by State and local agency staff.

¹Russell L. Ackoff, *The Democratic Corporation: A Radical Prescription for Recreating Corporate America and Rediscovering Success* (New York: Oxford University Press, 1994), 21.

As my colleague observed, "It's nobody's job to see that data are integrated across programmatic areas, that standards are established, or that needed data are collected and made available."

Moving Toward Sense-and-Respond

My second point builds on the first, and requires that we acknowledge the changes in society overall, and act on what that means for government in particular. A government that merely "predicts and prepares" is no longer viable. Our society faces an increasing rate of change and increasing complexity, and therefore requires a government with the ability to "sense and respond" in an iterative, interactive learning process.

Peter Drucker recognized this fact nearly ten years ago. In 1988, Drucker observed the following:

"We are entering a third period of change: a shift from the command-and-control organization, the organization of departments and divisions, to the information-based organization, the organization of knowledge specialists But the job of actually building the information-based organization is still ahead of us—it is the managerial challenge of the future."²

Drucker has also pointed out that knowledge must serve a purpose to have real value. The power of knowledge lies in its role as a basis for action. For the public or private enterprise, knowledge must serve as a basis for decision making and the allocation of resources that follow from those decisions.

While it may seem painfully obvious that using knowledge effectively makes sense, organizations consistently create barriers to doing just that. Key among these self-imposed barriers is the intervention of "vested interests" and "information handlers."

Vested Interests

To remain relevant and useful, the information produced by Federal statistical agencies depends on linkage and communication between data providers and data users—those who produce information and those who make laws and policies. Most data providers understand the importance of this linkage, but generally prefer arm's-length transactions with policy makers and political officials, in order to guard against the manipulation of data collection, production and dissemination. There is some historic evidence for their concerns; nevertheless, closer encounters must occur.

To ensure society's investment in relevant knowledge creation stays relevant to national goals and needs, the data provider communities require the user communities provide a clear statement on overall, societal information needs. To ensure all this is accomplished efficiently, someone must coordinate efforts and make sure that only the minimum allocation of resources (time, money and respondent burden) are expended to gather all that is needed.

Without such a systemic approach, the budgeting process will be increasingly dominated by special interests. This will occur due to the nature of the budget process and the multiple client users of statistical agencies. The individual agencies, in budget terms, link to their departments first, then OMB, and then the congressional appropriation cycle. If the budget process is neglected or becomes too decentralized, attempts to allocate the limited statistical resources of government to needed activities that cross departmental boundaries, at the expense of department budgets, will face the difficult political reality of what is sometimes referred to as the "iron triangle"—the affected departments, special interest groups associated with those departments, and related congressional committees.

Information Handlers

"Information handlers," those competent department employees who collect, package and interpret information and construct databases, also intervene between data collection and its useful application. Typically, these individuals are attached to specific functional areas and operate on behalf of their respective functions. They transmit information within the function's hierarchy, offer advice, and act as keepers of the function's accumulated data, information and knowledge. These information handlers are often individuals who, by virtue of long tenure, have a unique grasp of the information used by others within their functional area.

Information handlers, no matter what their titles, have one thing in common: their position and status in the organization is closely bound up with the control

²Peter F. Drucker, "The Coming of the New Organization," *Harvard Business Review*, 66, no. 1 January-February 1988: 53.

of information. Information and its methods of acquisition are the coin of their realm, and they guard it carefully. This is neither unnatural nor entirely bad. The most adept information handlers are generally those who recognize the dangers of allowing people who lack training in research methodologies to get involved with data collection, because these individuals often draw inferences that cannot be supported by the statistical requirements of professional research.

In this context, information handlers are justifiably concerned that “insights” be objectively and genuinely determined. They are aware that information gained from listening can influence decisions involving large sums of money and other resources. As a result, information handlers prefer to be the singular channel for listening, the intermediary between the outer environment and the many individuals in their function who have an interest in probing that environment.

But information handlers can create problems within their own functions when they become more focused on the methods of analysis than the use of analysis. The consequence of this behavior is described by Russell Ackoff in a recent interview regarding operations research (OR) and management science (MS) specialists.

He points out that although OR and MS “started out as the application of science to the problems of managers of large-scale operations,” eventually “the researchers became enamored of the techniques, which eventually became ends in themselves, taking the focus off management and its problems.”

The role of information handlers was most appropriate during the Industrial Age when we viewed the enterprise as a simple machine of interrelated and replaceable parts. Its limitations are more obvious today, particularly as we require greater cross-functional activities to address the problems facing us from a total systems perspective. Since most information handlers are bound to particular functions of the enterprise, they inadvertently maintain barriers to cross-functional information sharing. Their higher order mission has been to collect, order and analyze information for the particular uses of their parent functions, not to make it available or meaningful to others outside their domain. There is also evidence that simply being part of a function skews listening toward those things the function is keen to hear.

Potential Solutions

As external pressures force us to move from the familiar “predict and prepare” mentality, and toward a “sense-and-respond” capability, we need to design a Federal information system that is positioned and empowered to do several things. It must:

1. Balance needs of society from a total system perspective with the natural desire to create narrow departmental specific budgets, championed by vested interests.
2. Be motivated by an incentive system that rewards functional statistical agencies and the users of their information for focusing their attention on the requirements of the total system, even at the expense of functional interests.

How does this relate to the concern of this Committee regarding the location of the Census Bureau? The Census Bureau, as currently constituted and perceived by most observers of Federal statistics, is a general purpose statistical agency—often referred to as “the fact finder for the nation.” This designation has occurred mostly by practice, because of the central and integrative role of the decennial and economic censuses, and not by organizational design.

If we are to achieve the advantages of a truly Federal statistical *system* that also serves the needs of local governments, there is no question the Census Bureau must be an integral part of that system. If that direction is taken, as others have clearly stated, the Bureau of the Census will require a broader perspective on the needs of our society than is found in any current department of government. The same could be said for the Bureau of Labor Statistics, Bureau of Economic Analysis and other major departmental statistical agencies.

The Census Bureau, in this case, must be empowered to anticipate the needs of local as well as Federal Government. Using methods as simple as geocoding, we could then use local administrative records regarding specific populations in tandem with Census Bureau small area data to study, in a more consistent and inexpensive manner, any number of local public policy, business and health issues.

As I was preparing this statement, it occurred to me I would be participating in yet another plea to Congress to address this issue during the 20th century. Throughout this century—a century of incredible change—we have not been able to fundamentally change our approach to measuring and understanding ourselves, although endless reports and time have been expended to try to get us to do the job better. Given that continued change is inevitable, I believe we will change. The

question is whether that change will be designed in anticipation of future needs, or forced on us as we react to breakdowns in our system.

As the century comes to a close, several valuable suggestions have been presented: the well-reasoned and thoughtful account by my colleague Janet Norwood published in *Organizing to Count*; H.R. 2521, submitted by Congressman Horn; and the comprehensive review, *Improving the Federal Statistical System: Issues and Options* prepared in 1981 by the President's Reorganization Project for the Federal Statistical System.

A skeptic reviewing this material would conclude that "never has so much been said and so little done." As a practical optimist, however, my hope is that the needs of society have reached a point where something must be done. Past experience has shown that our elected and appointed officials, when confronted by a pressing need such as this, are capable of coming together to solve the problem.

I am convinced that the pressing need for a reform of how our statistical agencies are coordinated is about to burst upon us because of the complex problems we are facing—problems that require more relevant, accurate, timely, integrated, easy to understand and cost effective information than our current approach to information gathering is capable of achieving.

In commenting on the inability of the government to coordinate the Federal statistical agencies, Jim Bonnen referenced the sage comments of Sir Claus Moser, at that time the distinguished director of the Statistical Service of the United Kingdom.

Sir Claus Moser once observed to a conference that "statisticians must suffer disasters as a hazard of their profession. But, they should never allow disgraces to occur." He paused at the puzzled expressions of his audience and added "You know what a disgrace is? . . . It is a disaster that is allowed to continue." We now have such a disgrace.

Mr. Chairman, you and your congressional colleagues have the opportunity and responsibility to keep this disaster from becoming a disgrace. The solutions, painful as they might be to some of us, are available and clearly conceived.

From personal experience, I can attest to both the pain and the benefits of taking the type of action necessary to avoid a disgrace. In the early 90s General Motors found itself in very difficult circumstances. Our Chairman, Jack Smith, faced the daunting task of returning the company to profitability after years of disasters that brought the company to the brink of bankruptcy.

Among the steps he took was one similar to what I am suggesting today. In June 1994, he announced the formation of the Strategic Decision Center (now called Corporate Strategy and Knowledge Development) to support management in the integration of market and business knowledge, the management of information systems, and the development of a global direction on core business and strategic intent. He directed the center to create a knowledge-sharing network that would support GM's efforts to meet several goals:

1. Better align strategic and operational business plans.
2. Improve management's understanding of complexity, uncertainty and opportunity in the market.
3. Determine the required resources for knowledge development and clarify roles and responsibilities.
4. Effectively capture ideas for innovative products and services.
5. Develop organizational learning as a system.

This direction led to the consolidation and coordination of the market research function throughout the entire corporation. Today, our market research budgeting process, the manner in which we determine our information needs, and the manner in which they are incorporated into our decision making process all contribute to our understanding of General Motors as a system within the context of the environment in which we do business—on a global basis. I believe my colleagues within GM, including some of those who had their roles and positions within their functions severely altered, would agree that GM is better off today as a result.

Mr. Chairman, I find it interesting that I am at this hearing offering advice to the government, based on my experience, much of which was gained as an employee of the General Motors Corporation. I say that somewhat concerned that many people familiar with the often repeated quotation: "What's good for General Motors is good for the country," might be so bothered by the statement that they would ignore the transferability of the GM experience to the situation at hand. After reviewing the events leading up to the reported quotation, however, I believe a little historical clarification would be of value.

During his Senate confirmation hearing to become Secretary of Defense, former GM President, Charles E. Wilson, was asked, "If a situation did arise where you had to make a decision which was extremely adverse to the interests of your stock and General Motors Corporation . . . in the interest of the United States Government, could you make that decision?" Wilson replied, "Yes, sir; I could. I cannot conceive of [a conflict] because for years I thought what was good for our country was good for GM and vice versa."³

It is unfortunate that the news reports of his testimony interpreted the "vice versa" to mean "What's good for the GM is good for the country" and published only this interpretation as a direct quote. Other accounts attribute Mr. Wilson confiding to GM's general counsel that what he had meant by his "vice versa" was "and what is bad for the country is bad for GM."⁴

Mr. Chairman, If you and your congressional colleagues and the Executive Branch can find a way to bring together the appropriate Federal Government statistical agencies into a system designed to provide the information that Federal and State governments need to make appropriate policy and legislative decisions, I can say without hesitation that what is good for our country will also be good for all elements of our society—including businesses such as General Motors. I also contend that taking no action and allowing the current disaster to turn into a disgrace would harm all elements of our society.

Let's optimistically hope that at the beginning of the 21st century we will be celebrating, among other things, the establishment of a Federal Statistical System that better serves the needs of our society as we move into the uncertainty and opportunity of the next century.

Senator BROWNBACK. Because he has a plane, will you mind if I quiz Mr. Barabba just a couple of times?

Ms. NORWOOD. Yes, go right ahead.

Senator BROWNBACK. Why are our numbers not considered that good by consumers of statistical data when they compare us to other industrialized countries?

Mr. BARABBA. I am not familiar with who made that evaluation, but it kind of startled me. I do not know who said that, but in some areas I cannot imagine that anybody would be doing it any better—in some areas. In some areas, we are not quite good. Maybe Janet has more—I have been out of the business for a while on the government side, so maybe Janet could respond.

Ms. NORWOOD. I think that summation was done by looking at the number of times there were revisions, particularly in the national accounts. And the number of times that there are revisions is not a demonstration of the quality of the data. It is a question of how frequently, how quickly you get data out. In this country, because of the uses of data, there has been a push to get data out very quickly with incomplete information available to people with the understanding they would be revised when more complete data became available. And the article which ranked countries found that agencies which delayed putting data out, of course, revised them less frequently.

Generally I think people recognize that data produced by the statistical agencies of this country, particularly the most important ones, are really still, compared to those of other countries, quite good. The issue is not whether the quality of our data are adequate now. The issue is where we are going to go in the future as the world becomes more complex and, more importantly, where other countries are supporting statistical infrastructure, making it more efficient, and paying a great deal more attention to it. The Euro-

³U.S. Senate Nomination Hearing, Charles E. Wilson, January 15, 1953 Washington, D.C. GPO: 1953.

⁴See Robert A. Nitschke, *The General Motors Legal Staff 1920-1947* (Detroit, Mich. 1989) p. 41.

pean Community, for example, is integrating data across the European Union, and other countries are moving to improve their data systems at a much greater rate than we are in this country.

Mr. BARABBA. I would just add to that, at General Motors we have businesses across the globe, and the information we get from the U.S. Federal Statistical System, and even some of the States, is as good as anything we see anyplace else we go.

Senator BROWNBACK. Good. Mr. Barabba, you have been past president of the American Statistical Association. Would that group generally support a consolidation of some of these functions? Or can you speak with any sort of certainty—

Mr. BARABBA. Janet also was a president of this association. She can probably add to this. But I would be surprised—well, first of all, I have never found anything upon which the American Statistical Association had unanimous agreement.

Senator BROWNBACK. I am not asking unanimous agreement. If we could get 50 percent plus 1, we will—

Mr. BARABBA. You would find a lot of support within the ASA for this kind of activity, but there would be some people who would be concerned because consolidation to them means too much central control. And this is an issue, I think, that both Senator Moynihan and Congressman Horn referenced the issue and that Janet also alluded to it. This is not just the statistical activity. This is an activity that is generating information in a form that policymakers can make use of. And some statisticians—not all, but some statisticians really focus on the statistic, sometimes at the expense of its use. So though I would certainly think it would be important to have the support of the American Statistical Association as well as the American Demographics and American Economics Association, those also are vested interests. So I would not let that be the sole guidance of the direction of this commission.

Senator BROWNBACK. Ms. Norwood, on that question?

Ms. NORWOOD. I think I will leave it at that.

Senator BROWNBACK. OK.

Mr. BARABBA. She will let me deal with our colleagues now that I said it. [Laughter]

Ms. NORWOOD. I would say that I think there are many forces and many different ideas within the statistical community, as there are in the economics community, and in some of the population and social data groups. But everybody wants better data. Everybody wants data that are more relevant, and I think those issues could be worked out.

Senator BROWNBACK. Mr. Barabba, one final question before I let you catch your plane. You heard Senator Moynihan talk about at least consolidating the economic population and resource gathering devices and dissemination groups. Would you generally agree with that point of view, or do you not want to be heard yet on where you would pull things together?

Mr. BARABBA. I would think that—and I agree with what Janet expressed in her book. I think that is a very good start. I think there are some very, what we would refer to in private enterprise as some low-hanging fruit out there that we could really pick off and take advantage of. But how you go about doing that requires a lot of very interesting, thoughtful thinking because there may be

other agencies that should be incorporated into that as well, and so you would have to think about that a lot. But my biggest concern would be not focusing on the organization structure, but focusing on what we expect the outcome of this consolidation to be, and that requires a pretty good understanding and agreement that the role of these agencies would be to provide information about the system of government and the system of society, and not just functional information that allows one part of it to get better information than another part.

Senator BROWNBACk. I am gathering from your statement earlier you are saying it is not enough just to put these together for cost efficiencies and to gather the same sort of data and disseminate it. We need to step to the next wave of statistical type of information that can be more usable in looking forward rather than just historical. Do I understand that point of view?

Mr. BARABBA. Absolutely. If I could draw a comparison on the private side, if, say, in a company that produces vehicles one hand of the company would say we are going to make a claim that we are going to satisfy you no matter what it takes, and then another part of the company says we want to reduce costs and let's say service is part of cost. So you make a claim that we will satisfy you, no matter what. A person purchases the vehicle. Something goes wrong. They bring it in, and they say I am not satisfied. The person who did not make the claim but who is held accountable for reducing the cost says, "But we do not fix that." At that point two independent people, both meeting the requirements of their superiors in their functional area, are doing their job, but the customer is not satisfied.

If you took someone on welfare and the same kind of situation, and then you asked them about their needs for health, education, and other services, they would say, gee, I find agencies out there asking me to do different things, some of which are contradictory.

Now, if the information design is on the old system, then you are going to create strong functional silos of information rather than an information system that lets you address the needs of that person who needs help.

Senator BROWNBACk. That is a good way to put it. Thank you very much for joining us. If you have further statements—

Mr. BARABBA. I have some more time. I will just stay until the end of Janet's presentation, if it is OK with you, Mr. Chairman.

Senator BROWNBACk. That would be fine by me.

Ms. Norwood, we look forward to your presentation. You have the floor.

TESTIMONY OF JANET NORWOOD, SENIOR FELLOW, THE URBAN INSTITUTE

Ms. NORWOOD. Thank you, Mr. Chairman. You have my testimony. Let me just summarize a few points.

First of all, I think we would all agree—and both Congressman Horn and Senator Moynihan made the important point, which is we need professionalism, we need objectivity, we need freedom from political control. As we meet today, there are a number of controversial issues. Certainly you are aware, I know, of the most important ones. One is the decennial census and the use of sampling.

There are a number of critical issues involved in that, and there are several studies by the Committee on National Statistics. I am a member of that committee, and I served on one of those panels, and I also served on a so-called blue-ribbon panel of the American Statistical Association, which decided that sampling was indeed, as Senator Moynihan said, a useful tool for the census as well as for other products.

The Consumer Price Index is an issue as well, which we have been hearing a great deal about. Part of the problem, I think, is that the American public is not very understanding or very knowledgeable about statistics, in part because of the separation and the compartmentalization of these agencies. They do not understand why the Census Bureau cannot count. It seems very clear that it ought to be able to count. Why is it, therefore, that we undercount? They do not understand the difference between a cost-of-living index and a price index, and they do not see what all this controversy is about. Too many of the people in the country, sometimes even public officials in the Executive Branch and the Congress, tend to use data and look at data in ways that suggest that if they want them to go up and they do, they are good. If they want them to go down and they go down, they are good. So it depends. You cannot please everybody. I learned that a long time ago. People who pay always wanted the index to go down, and people who received payments always wanted the index to go up.

We have problems of that sort, and I think that suggests that it is useful to have a place in the sun, to have an agency that has respect, that is professional and objective, that can pull together the kinds of issues that need development.

I have looked at this a great deal. I was Commissioner of Labor Statistics for 13.5 years, and while I was there, I thought a great deal about whether the Bureau was better off in the Labor Department or whether it should be elsewhere. I had mixed feelings about that, mainly because I wanted to be certain that the data that we produce are relevant to policy issues.

Since that time, I have had a chance to look at the rest of the system and recognize that most of the other agencies have very little relationship to the departments in which they are located—very little relationship, that is, in terms of the data needs of those programs. They are not sufficiently high in the structure to be able to know what the programs are or what the program needs should be.

In my view, a statistical system should be able to define the problems, not to develop policy solutions but to identify the issues which need policy direction—or policy solutions. And to do that, we need to have a system that is large enough and strong enough to use state-of-the-art techniques, to have the professional respect that is needed in this country, to have the opportunity to educate people on these needs, but also, I think, a system which can be related to policy needs.

Last year, I was at a European conference on statistics in Bologna, Italy, and I had the opportunity to spend some time with the head of the new British Statistical Service. One of the issues that we discussed over dinner was how the British were trying to look at just that issue, could some of their people sit at and work with

the Department of Labor and with the other Ministries and still be a part of the central statistical organization.

I think all that needs to be worked out. It is for that reason that we should not move so rapidly that we ignore the needs that exist. I do believe that it is time for us to move. I believe that it is time for us to move toward a gradual integration.

Why did I pick out Census, BLS, and BEA? For several reasons, one being that if you tried to move the entire system together, it would fall of its own weight. It would be so enormous an instrument, so large a group in government, that I think it would not work very well.

Second, I do not think we should underestimate the stakeholders involved. I have dealt with many of them. I think that the Senator and the Congressman suggested that a commission might help to develop public support. That is certainly probably a very good idea.

The Bureau of Economic Analysis is frequently not discussed very much at all, and yet when you think about it, it is one of the smallest agencies of all, but it is one with probably the most difficult job to do and the broadest job to do. It has to measure the entire economy, and in order to that, it has got to rely on data that are produced in other agencies. And it is for that reason that it seemed to me that if we are going to move toward a gradual centralization, we ought to bring those three agencies together.

I would also argue, as I testified before Congressman Horn on his bill, that the new agency must really be responsible for statistical quality standards, for definitional standards, for representing the system abroad. And that means that much of the work that is done very well by the small group under the chief statistician at OMB would have to be moved with it.

I should say, Mr. Chairman, that no organizational change will solve the particular problems of the Census. Changing the location of the Census Bureau is not going to solve the problem of the undercount or how we deal with it. Changing the locus of BLS is not going to affect what is done on the CPI. In fact, if we move very rapidly without thinking through what we do, we could derail some of the work that is going on in those two agencies to improve the data system, and I think we should be very careful about that.

In this country, we have a habit of looking at something, dealing with it by jumping into it, and sometimes that is a very good thing. In this case, my fear is that we may reorganize the statistical system because of a desire to do some other kind of reorganizational structuring in some other agency, or even worse, because we believe that the way to do this is to reduce budget. We want only to get a lot of money out of this.

I would argue that we can have savings in the long run, but that it will take many years to work them out rather carefully. I have some ideas about how that can be done, but it is not going to happen overnight. It is not going to happen in the first few years because a great deal of research needs to be done.

So all in all, I believe that the time has come for us to move toward a gradual organizational change. We should be careful how we do it. And we should make sure that we examine all facets of it.

[The prepared statement of Ms. Norwood follows:]

PREPARED STATEMENT OF JANET L. NORWOOD

(Any opinions expressed herein are solely the author's and should not be attributed to the Urban Institute, its officers or funders.)

Mr. Chairman and Members of the Subcommittee: I appreciate this opportunity to comment on the state of our Federal statistical system and on methods to improve it. As you know, I spent much of my professional life at the Bureau of Labor Statistics. I served three terms as Commissioner with appointments from both Democratic and Republican Presidents. I have worked closely with all of the Federal statistical agencies, and I know the importance of their work.

I approach these issues with several strong convictions. First, I am convinced that the effective operation of democracy requires that our citizens have access to an accurate and objective data base of the highest possible quality, one that is clearly relevant to the policy issues that confront them. Second, those responsible for producing the nation's statistical data base must be professionally competent and completely free from political interference. They must work in an open environment in which all methodological changes are fully explained and freely discussed. Third, an effective statistical system must be grounded in an institutional and legal framework which provides the authority and public credibility to permit the setting of priorities, the protection of confidentiality, and the flexibility to conduct research for improvement. And, finally, our statistical series must be based on sound concepts, tested methods, and state-of-the art statistical techniques.

The Current Environment for Statistics

The data produced by government statistical agencies affect many critical policy decisions, and it is important that they be produced efficiently, accurately, and objectively. In recent months, programs of the two largest, general purpose statistical agencies in the system—the Bureau of the Census (Census) and the Bureau of Labor Statistics (BLS)—have been the subject of controversy in the Congress and the press. While public discussion of statistical issues is always useful, the current criticism of the Consumer Price Index and of the planning for the 2000 Census demonstrates the difficulties government agencies face when they produce statistics which affect the lives and incomes of a large part of our population. People do not understand differences in concept—between a cost-of-living index and a price index—and they become impatient with a Census Bureau which finds it hard to count all of the people in the country with complete accuracy. These criticisms are symptomatic of the challenges that face all of the official statistical agencies. This is a time when we must reinforce the objectivity and the professionalism of the agencies as we support their search for new survey and compilation methods. But it is also a time when we must find ways to improve their credibility with the public and their operational efficiency.

We live in a period of great change, when survey operations are becoming increasingly more complex. The environment in which Federal data producers operate today is very different from the past, in part because our citizens have begun a fundamental rethinking of the role of government in our society and the need for information for decision-making. The policy implications of statistical information have become more significant even as statistical agencies have found it more and more difficult to introduce state-of-the-art techniques to ensure the quality and relevance of the data they compile. And yet, the need to seize the opportunity for use of new statistical techniques and technological innovation has never been greater. The use of federally produced data by both the private and the public sectors has increased exponentially; they drive many public policy decisions and they affect family life. Our statistical data have become increasingly complex, much harder to collect, and much more expensive than in the past. Even more difficult is the need to keep up with a world which is constantly in a state of change. The Administration, the Congress, and the public all play an oversight role, but the risk is that those responsible for public policy may insist on techniques which produce data that are higher or lower—depending on their policy views—rather than those which will provide the best estimates of that which we are trying to measure.

Statistical Agencies in the Department of Commerce

As this hearing takes place, the Bureau of the Census is hard at work planning and testing methods to improve the 2000 Census of the population. A number of Congressional committees have been reviewing this work, and several panels of the National Academy of Science's Committee on National Statistics have been advising the Bureau. I am a member of the Committee and served on one of those panels. I also was a member of the American Statistical Association's Census 2000 Blue

Ribbon Panel which pointed out that sampling “. . . can be an appropriate part of the methodology for conducting censuses.” (ASA 1996). Like all previous Censuses, the 2000 Census will incorporate new, more modern collection techniques and may, therefore, provoke considerable public debate.

The other statistical agency in the Department of Commerce, the Bureau of Economic Analysis (BEA), one of the smallest agencies in the Federal system, has perhaps the largest and most difficult job of all—compilation of the national accounts. Since our Gross Domestic Product must be built up from data produced by a large number of agencies, BEA must, of necessity, rely on data produced by many of the other parts of the Federal statistical system.

Current Statistical System

The two agencies in the Commerce Department are part of a decentralized system consisting of more than 11 separate agencies located in 9 different executive government departments; and some 70 other agencies of the government produce statistical output as a part of their programmatic responsibilities. We have a statistical system that is more decentralized than that of any other large country. Moreover, the group at OMB which coordinates the system is one of the smallest in the world.

In recent months, Katherine Wallman, OMB's Chief Statistician, has been successful in spearheading completion of a new North American industrial classification system, and in sponsoring monthly meetings of the statistical agency heads. OMB has also developed a legislative initiative to standardize confidentiality and to permit the exchange of data for statistical purposes among the major Federal statistical agencies. Passage of that legislation would help considerably to strengthen the system. In addition, the OMB Director has requested development of a statistical budget so that resources devoted to statistics can be looked at across the entire system.

The Statistical System Problem

In spite of this progress, however, we must ask whether the current structure of our Federal statistical system is efficient enough to provide the kind of information base needed for the social and economic challenges of a democracy. Will our present system, as currently organized, be able to develop the kind of integrated data base required to solve the complex, multifaceted policy issues we face? When we compare our Federal statistical system to those of other countries, we find that our system, although much larger in size and scope, nevertheless, has more problems in operational efficiency and in public trust than they do. Our system is one that seems disjointed, with multiple data bases and little integration. Although we continue to produce data of relatively high quality, the risk is that statistical information will suffer as agency heads try to deal with the demands of their parent departments in a period of serious budget constraint.

Why do we have these problems? Is it because the environment in which the data producers operate has changed so dramatically? Or are there problems inherent in the system itself which need repair? I believe that both of these forces are at work. They must be addressed if we are to succeed in the development of the objective system of information that is so crucial to democracy in our country.

A Fresh Look at the Problem

It is time for us to take a fresh look at the organization of our Federal statistical system. We have multiple statistical agency heads with no one having sufficient authority, resources, power, and public prestige to make the entire statistical system function as efficiently as it should. Those heading statistical groups at OMB and other Cabinet agencies are dedicated and competent, but they work in a variety of different situations and at different levels within their own departments. Several of our laws, especially individual agency confidentiality legislation, make it difficult to engage in cooperative research and to benefit from economies of scale. We have insufficient long-range planning and budgeting of data products and of data production.

The system is too slow to adjust data to changing economic and social conditions, in part because investment in data is generated only when the statistics reflect deteriorating conditions; once improvement occurs, the public's interest in the production of data of high quality tends to disappear. And there is insufficient investment in coordination in a system that is heavily decentralized. Data priorities are all too often determined almost entirely among programs within each sponsoring agency instead of across the statistical system itself. This compartmentalization continues into the Congress as statistical activities are spread among a large number of different Congressional committees.

None of these conditions is new. The Pratt Commission was the first to study the need for statistics in 1844. In the century and a half since then, we have had some 15 more committees or commissions to study the nation's statistical system. Al-

though each commission differed in emphasis, every one of them struggled with the same critical questions: centralization vs. decentralization, location and power of the coordination authority, protection of confidentiality and reduction of respondent burden, as well as with problems of information dissemination and data integration. Unfortunately, the interest which generated appointment of each commission was generally short-lived. By the time the reports were issued, the commission was forgotten, and there was no sustained interest to bring about change. Thus, in spite of a long series of studies, the Federal statistical system remains relatively unchanged either because of a lack of popular support for statistics, because of bureaucratic inertia, or because of the unwillingness to upset stake-holders with a particular interest in retaining the status quo.

Steps Toward Centralization

The United States has neither the benefits that come from strong centralization of a statistical system nor the efficiencies that come with strong and effective coordination of a decentralized system. Our existing system will find it increasingly difficult to meet the demands for data from an increasingly technologically advanced and globalized world. We should move carefully and gradually toward greater centralization of the system. In a recent book, *Organizing to Count: Change in the Federal Statistical System* (Norwood 1995), I have outlined a plan for a new statistical agency that would house the two large multi-purpose statistical agencies—the Bureau of the Census and the Bureau of Labor Statistics—as well as two smaller groups—the Bureau of Economic Analysis and OMB's Statistical Policy Branch. This new agency would collect, compile, analyze, and disseminate statistical information and, at the same time, set quality and classification standards and provide oversight over statistical work done elsewhere in the government. Census and BLS would make up the core of the new agency, an arrangement that would permit development of a comprehensive effort to evaluate existing data sets and engage in research for efficient survey design aimed at the elimination of duplication and overlap. This work must be done with great care because much of the data produced are among the most sensitive and critical of all the data produced by the government. A new confidentiality protection law would be part of the package creating the new agency, so that protection of data collected from respondents with a pledge of confidentiality would be uniform across the system. I have provided a more detailed explanation of the organization and functioning of this Central Statistical Board in my recent book. What I suggest is a first step toward the consolidation of the Federal statistical system into a coherent and efficient agency of our government. This is the route that the British have taken, and they have done it with great success. The National Statistical Service of the United Kingdom is by now a well-established group. It started with the coordinating authority and the national accounts, then added labor statistics, and then demographic and census operations. We can learn from their experience.

Conclusion

In conclusion, let me emphasize several important points. First, the recent criticisms of the plans for the 2000 Census and of the Consumer Price Index are useful issues for discussion but they must not be allowed to result in politicization of the process of compiling these important data programs. Second, the nation's statistical system needs to operate more efficiently and more effectively. Third, we must consider very carefully how any proposed changes would affect the data systems upon which the whole nation depends. Fast re-engineering of the nation's statistical system without sufficient research and thought, carried out simply as a by-product of other government reorganization or only as a means to reduce statistical budgets, will surely damage the quality and the relevance of many of our most important statistical series.

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Senator BROWNBACk. Thank you, Ms. Norwood, for your presentation, and your testimony. Your background speaks volumes about your ability to articulate and speak with knowledge on these issues.

Let me ask you something about the speed of change, because both of you, as I gather, endorse change, endorse substantial change. Don't let me misstate your positions.

Ms. NORWOOD. No. That is correct.

Mr. BARABBA. We agree.

Senator BROWNBACk. But you question how fast we move at this. It has been my observation, Mr. Barabba, that your statement about big government and big business being pretty similar is pretty accurate. Both move as big entities and frequently move slowly. But when big business went through most of its reorganization in this country, it moved quite rapidly in moving forward under the theory, at least from folks I have talked to, that if you move slowly you are going to get stopped because of either the inertia of the bureaucracies or the special interest groups that support the current operation. The key was to move wisely but rapidly. What do you think about that in this setting here? Because it does bear upon how you go at this reorganization.

Mr. BARABBA. If you put wisely before rapidly, I would agree with that. Take, for example, all the movement that was made on—the buzz word—re-engineering and reinventions of companies. Most of those activities by any analysis says that most of the endeavors did not achieve what they set out to do and because everybody wanted to make a fast decision.

The thing that we have found is that it is not how fast you make the decision to do something, it is how fast you implement it. And I think what we are saying in this case is that we would be able to implement significant change if, in fact, we spent a little time making sure what we wanted that change to accomplish. It would be—and I know in our own case, in our own company, we for a long time made very fast decisions. But then as soon as you found out the ramifications, after a little bit of analysis and attempt at implementation, you went back to the decision time after time and that kept delaying the implementation even longer.

Our experience has been is if we walk a little bit, we find out we can run a lot faster.

Senator BROWNBACk. Ms. Norwood, what about the idea that you can do this within a time frame, if you establish a commission, it reports out, and you could actually implement or pass implementation legislation this Congress if we move forward expeditiously, as Senator Moynihan was suggesting in the earlier panel? Is that too fast?

Ms. NORWOOD. I think it would depend on what the commission came up with, obviously. I would not want to prejudge that. It might not be too fast. But I think we should be clear about the complexity of the task. It is not just a matter of taking a few agencies and saying we will pull you from here and from there and put you together. The question is how you put them together. The question is how you integrate programs. A great deal of work needs to be done looking at data integration.

There is another question, if I may say so with due deference, of the way in which the Congress is organized in order to provide oversight to statistical agencies. I once spent some time trying to count up the number of congressional committees with oversight over the Federal statistical system. And I will tell you that there are an enormous number of them, and each of them looks at a little piece of the system but not at the total system.

If we move toward an integration, even a gradual integration, of the statistical system, we have got to look at that. My experience has been that changing the Congress takes even more time than for the Congress to decide to change the Executive Branch.

So I think there are a lot of complex issues that we need to think about. If this is to be an independent agency, exactly how will it relate to the Congress? How will it relate to the Executive Branch? How will its budget and its personnel be handled? These are details, but they are very important details. And I would hope that a commission, if one were appointed, would have people who are knowledgeable enough to look at things of that sort.

Senator BROWNBACK. And you would support an independent agency, independent entity with a civil servant head? Or are you willing to make that type of statement?

Ms. NORWOOD. Yes, I would like to see someone with a long fixed term of office heading it who was qualified. I do not know what you mean by a civil servant. I was a civil servant, but I was a Presidential appointee with the consent of the Senate. I believe that this is an important enough position to be a Presidential appointment with the consent of the Senate.

Senator BROWNBACK. What I think most people look at is whether you have a long enough term and a qualification requirement. You mentioned how much of government looks at these statistics and depends upon actions based upon these and how much of the private side, markets are driven. I mean, my little neck of the woods that I know about, as far as the agricultural sector, you release those reports and the markets move.

Ms. NORWOOD. Yes, I know that.

Senator BROWNBACK. And my dad complained about it every time we put one out, saying, "I wish you guys would just quit putting out those dang numbers." Because he thought we were counting cattle by how many legs they had instead of how many head of cattle were there and driving his market down.

Ms. NORWOOD. Well, you know, I am currently serving on a board of a very large international bank, and I am chairing the board of directors committee on risk assessment. And what we are doing is essentially looking at data in order to determine the decisions that we make or that the bank officers make in their business judgments. So I recognize that this is certainly very multifaceted.

I think that we need to be careful, and that we let the improvement of the CPI and of the Census go along as planned. I would not want to see those derailed because suddenly we moved the agencies.

Second, it is fine to say these agencies should be put together, but how do you do that? Are you still going to have the Census Bureau out in Suitland and BLS over here just a few blocks away and

BEA somewhere else in the city? Or are you going to put them together? And how are you going to relate this agency to OMB and to the Congress?

Those are issues which really need some considerable thought. There is the GAO example of a 12- or 14-year term for the Comptroller General, and that is a semi-independent agency. There are other examples in government.

The important thing is that we need to move, I think with some deliberate speed, but I emphasize the word "deliberate," and with some wisdom and in a non-political manner.

Senator BROWNBACk. You remind me of the old Russian proverb: The slower I go, the further I get. I do not know that that applies to government. I am still mixed in my opinion on that. But thank you both very much. You have a tremendous amount of expertise and background and have obviously thought about this a great deal. If you have additional thoughts, either flying back or at another time, please let us know as we consider that in moving forward.

Thank you very much.

Ms. NORWOOD. Thank you.

Mr. BARABBA. Thank you.

Senator BROWNBACk. The next panel will be Maurine Haver, the past president of the National Association of Business Economists; Dr. Leonard Nakamura, Economic Adviser for Federal Reserve Bank of Philadelphia; and Nye Stevens, the Director of Federal Management and Workforce Issues, General Accounting Office.

I do not know if the three of you have discussed who should go first or if we have particular problems. If not, I am going to go with Ms. Haver first on the list, unless you all—does anybody have any scheduling difficulties? If not, then, Ms. Haver, the mike is yours.

TESTIMONY OF MAURINE A. HAVER, CHAIR, STATISTICS COMMITTEE, NATIONAL ASSOCIATION OF BUSINESS ECONOMISTS

Ms. HAVER. Thank you. I would like to have my written statement put in the record, and I will summarize some of my thoughts.

Senator BROWNBACk. Without objection.

Ms. HAVER. First of all, I am representing the National Association of Business Economists, and we have been supporting a single agency for at least 3 or 4 years now. We came to the recognition that we needed consolidation because we have realized that, despite the fact that the U.S. statistics really remain among the best in the world, we have been lacking the investment in our statistical infrastructure to keep our statistics up to date. And this is what Janet was alluding to when she talked about the European Community investing in their statistics. They now have industry statistics that actually represent the growth industries of today, whereas the United States is truly lacking detail in services and high-tech industries, the industries of the information age.

In fact, on some of the statistical tables that we look at, the most important item is the one listed as "all other." This, I think, is due in large part to the fact that our budgets have simply been growing at a rate that perhaps covers wages and rent escalations. But if you look at the past budget increases of BLS, BEA, and Census,

taking out for a moment the decennial census and periodic programs, they have been very flat for a number of years. And these have not allowed for the research and development that is sorely needed to expand the scope and to improve the quality of our statistics.

So as we look at it, we have to make the system as efficient as possible, and we feel that will be achieved through consolidation.

Now, we agree with both Senator Moynihan and Representative Horn that we should start with BLS, BEA, and Census. These are the core statistical, economic statistical functions. They also are general purpose agencies that do not have the strong special interest groups such as agriculture. I gave a talk on consolidation in Omaha, and I walked away from that talk realizing that we must start small if we are going to accomplish something. And I feel we can accomplish a great deal for those economic data that drive our financial markets, the data on which businesses make many decisions, if we restrict ourselves to these three agencies.

NABE sent a letter on February 24 to the President, to many of you on the Hill, stating our position and our recommendation. We recommend that the new agency be an independent one, that it report to the Office of the President, and that it be headed by a Statistician General who would serve for 7 years. We think it is very important to get the statistical agency outside of any of the Departments of Labor or Treasury or Commerce.

One of the problems in improving our system has been a problem of response rates from businesses and individuals. And certainly I think businesses are more concerned with confidentiality and the existence of statistical agencies in organizations that also have enforcement areas. Whereas if the statistical agency is separate, I think you would find in business a great willingness to provide the data.

Also, within a single agency, we would envision a single reporting form so that you would not often have to report the same data twice. Right now, because of the confidentiality between BLS, BEA, and Census, oftentimes they do not have the right to see the data that are collected perhaps by Census.

In a meeting at BLS recently, we learned HHS is starting a survey on health benefit costs of companies. Well, the BLS already goes to companies as part of their employment cost index program and requests information on health benefits. I think that consolidation could also mean much less respondent burden, and that would be important to our business members.

Finally, just one last point, and I believe it is a very important one. Consolidation without data sharing does not matter. If we do not have data sharing, there are really very few benefits to consolidation. Now, there is a bill proposed by the executive, I think, from OMB for data sharing among the statistical agencies BEA, BLS, and Census, and I believe the remaining 12 statistical agencies, and also with the Treasury. This is very, very important. And I know the response NABE got back from the White House about our proposal on consolidation was that data sharing would solve the problems that we have now.

We really feel data sharing is important. It is a first step, but data sharing is not going to realize all the efficiencies and all the advantages of one unified consolidated system.

Thank you.

[The prepared statement of Ms. Haver follows:]

PREPARED STATEMENT OF MAURINE A. HAVER

I am Maurine Haver. Today I am speaking in my capacity as the chair of the Statistics Committee of the National Association of Business Economists. (NABE).

Economic statistics are important to every American.

Statistics produced by our Federal statistical system are vital to the functioning of our market economy. Businesses make decisions about where to locate a plant, how much to produce and how much to pay their workers based on data provided by the Bureau of Labor Statistics (BLS), the Bureau of Economic Analysis (BEA) and the Bureau of the Census. Participants in financial markets make investment decisions which in turn affect interest rates, the stock market and the value of the dollar. These data also serve as critical inputs into the formulation of monetary, fiscal and trade policy. In short, the quality of our economic statistics impacts the lives of every American.

Is the present system producing what we need?

While U.S. economic statistics remain among the best in the world, lack of investment in our statistical infrastructure has left us with a system that does a better job of measuring the industrial economy of the past than the information economy of the present. Services and high tech industries are not well covered. The most important industry in some statistical tables is now the one labeled "all other". Budgets for statistical agencies barely cover mandated wage escalations. Funds for research and development are sorely needed to expand the scope and improve the quality of our statistics so they remain relevant in a rapidly changing economy.

The European Union is devoting considerable resources to the development of statistics for the 21st century. Its industry statistics have been reorganized to reflect new industries. U.S. agencies are only beginning a comparable effort. Adoption of the new system—the North American Industrial Classification System (NAICS)—is long overdue. Funding for the NAICS is provided for in the President's budget, but unfortunately these resources may not be adequate to develop comparable history for business analysis.

NABE members have been very concerned for many years about the quality and availability of economic data for business decisionmaking (see attached recent member survey results). But only one economic statistics program—the consumer price index—has received attention among Members of Congress. While measurement error in the CPI clearly impacts the Federal Government budget, mismeasurement of other important indicators can affect the actions of the Federal Reserve and businesses causing the economy to perform below potential. This underperformance also negatively impacts the Federal budget and the welfare of all Americans.

Some statistical programs have been terminated altogether. Many of these programs measured economic activity in local areas and were especially important to small and medium-size businesses without a national presence. Nonresidential building permits by State and locality were terminated by Census last year. Monthly retail sales by State and metro area were discontinued in January.

Other terminated programs were important for policymaking. For example, information on business spending for pollution abatement is no longer collected. If Congress considers any changes to clean air or water regulations in coming years, current data will not be available on business expenditures required to meet existing regulations.

NABE recommendations.

The time has come to organize our economic statistical system so it can operate as efficiently as possible and so that decisions affecting statistics are made within the context of the complete economic monitoring system.

NABE recommends that our major economic statistical agencies—BLS, BEA and Census—be consolidated into a high-level statistical office similar to those in other industrialized countries like Canada and the United Kingdom. This new agency should report to a Statistician General of the United States who would report to the President. The Statistician General would serve for seven years and be removable only for cause. He or she would have clout in the fight for resources and could re-

solve questions of statistical policy free of pressure from political and special interests. The Statistician General would be responsible for setting system standards and the consolidated agency could provide technical assistance to special interest statistical groups within other government agencies.

Statistical agency consolidation alone will not realize the efficiencies that must be achieved, and we would caution supporters consolidation not to expect immediate budget savings. Consolidation is important because it starts the process of functional integration and will bring decisions on program tradeoffs together so that more rational decisions are made.

Data sharing among these agencies is critical and would solve some of the problems that arise from our fragmented system. NABE strongly supports pending legislation which would provide for data sharing among statistical agencies and with the Treasury which is now often prohibited by law. However, we do not believe this legislation goes far enough. Consolidation is needed.

The business community and financial markets derive significant benefits from the collection and dissemination of economic data. Complaints of respondent burden are often misinterpreted. Many businesses are ready to provide data but object to rigid reporting requirements which preclude the submission of computer-generated reports. Some progress has been made in allowing for computer input but no single standard exists among the agencies. Duplication of requests due to confidentiality barriers which cause different agencies to request identical or similar data is another familiar complaint. We hope consolidation would free resources for the creation of one automated reporting standard which we believe would lower costs and improve response rates.

NABE recognizes the importance of balancing the Federal budget. Our members have consistently supported a balanced budget since we began policy surveys more than 20 years ago. However, we also recognize the costs of incomplete and inaccurate information which are well in excess of the combined budgets of our major statistical agencies (BLS, BEA, Census).

As Michael Boskin stated in a recent article in NABE's journal *Business Economics*, "Virtually every major private firm in the world is spending heavily on information technology—hardware, software, and human capital—and we should not expect better statistics from our government agencies without a corresponding investment.

Problems of data quality or lack of economic information pose heavy costs on our society. We must begin a renewed effort to improve our statistical system so it can provide us with the information we need to make appropriate decisions for the 21st century.

NABE ECONOMIC STATISTICS QUESTIONS

From the February 1997 NABE Outlook Survey (36 profession economic forecasters responding)

(A) Budget constraints have led to cutbacks in Federal statistical programs. Have these cutbacks impaired the availability and quality of information that you use in your work?

Yes 78% No 14% No Response 8%

As a general matter, are you satisfied with the scope and quality of measurement and reporting on the U.S. economy?

Yes 25% No 69% No Response 6%

(B) Should President Clinton create a blue-ribbon commission to review the content of economic indicators as well as the organization, management and funding of the agencies that assemble the data?

Yes 67% No 19% No Response 14%

(C) Would consolidation of Federal statistical activities into a new Central Statistical Office headed by a high-level, nonpartisan Chief Statistician of the United States help to improve the scope and quality of economic measurement and reporting in the U.S.?

Yes 67% No 17% No Response 16%

From the February 1997 Economic Policy Survey (228 business economists responding)

A. How adequate are the quality, timeliness, and coverage of current economic statistics produced by the Federal Government agencies for your needs as a busi-

ness economist? Please circle the appropriate number below where 5=very adequate and 1=not at all adequate.

5-5% 4-39% 3-35% 2-15% 1-4% No response 2%

B. Do you feel the quality of your analysis and decision-making is adversely affected by the lack of quality economic data from the Federal Government?

(a) no, the quality of my analysis and decision-making is *not* adversely affected by the lack of quality economic data 29%

(b) yes, the quality of my analysis and decision-making is *somewhat* adversely affected by the lack of quality economic data 62%

(c) yes, the quality of my analysis and decision-making is *very* adversely affected by the lack of quality economic data 9%

No response 10%

C. What Federal Government data series (e.g. GDP, retail sales, etc.) is the most important for you to have improved?

% of responses
 32% Inflation
 22% GDP
 10% Employment
 17% Regional data
 17% Productivity
 4% Service sector data
 14% Retail Sales
 14% Other

NABE MEMBERSHIP SURVEY FOR A STATISTICS ACTION PLAN—AUGUST 1995

A questionnaire on economic data quality and possible approaches to the improvement of government statistics was mailed to NABE members in late July. 394 questionnaire had been returned by the cutoff date of August 22. This was a 13% response rate for U.S. members. The tabulation below reflects these questionnaires. Over 400 questionnaires were received in total.

1. Which data are most important to you in your work?

45.9% U.S. Macro Indicators
 23.9% Regional
 13.2% Industry except Agriculture and Energy
 1.3% Agriculture
 14.1% Energy
 7.4% Demographic

2. How do you view the quality of data you ranked #1?

	Total	Macro	Regional	Industry	Agr	Energy	Demo-graphic
—for accuracy?							
Excellent	14.0	14.4	10.6	9.6	0.0	25.0	24.1
Good	44.2	46.4	40.4	38.5	20.0	56.3	55.2
Acceptable	33.0	33.7	34.0	38.5	80.0	18.8	17.2
Poor	7.4	5.0	12.8	9.6	0.0	0.0	3.4
—for timeliness?							
Excellent	11.9	19.3	2.1	9.6	20.0	12.5	6.9
Good	35.0	46.4	19.1	25.0	0.0	31.3	34.5
Acceptable	35.5	27.6	45.7	44.2	60.0	50.0	44.8
Poor	17.0	6.1	31.9	21.2	20.0	6.3	13.8
—for coverage?							
Excellent	15.0	16.0	9.6	5.8	0.0	25.0	17.2
Good	40.4	44.8	35.1	25.0	40.0	50.0	41.4
Acceptable	30.7	28.2	38.3	51.9	40.0	18.8	31.0
Poor	12.9	9.9	14.9	17.3	20.0	6.3	10.3

3. How do you view the trend?

	Total	Macro	Regional	Industry	Agr	Energy	Demo-graphic
—in accuracy?							
Improving	16.8	14.9	16.0	15.4	0.0	25.0	17.2
Stable	53.0	49.7	52.1	61.5	40.0	56.3	55.2
Deteriorating	28.4	34.8	27.7	23.1	60.0	18.8	24.1
—in timeliness?							
Improving	12.9	9.4	13.8	15.4	0.0	25.0	13.8
Stable	64.7	74.6	56.4	61.5	40.0	68.8	55.2
Deteriorating	20.6	14.9	25.5	23.1	60.0	6.3	27.6
—in coverage?							
Improving	14.0	8.8	12.8	11.5	0.0	31.3	10.3
Stable	55.3	56.4	61.7	55.8	20.0	62.5	62.1
Deteriorating	28.7	33.1	21.3	32.7	80.0	6.3	24.1

4a. Most important step to improve quality of government data:

	Rank 1	Rank 2
Create a single statistical agency	27.9	17.3
Eliminate obstacles to data sharing	24.6	28.2
Increase funding targeted for R&D and technology	20.8	12.7
Make surveys mandatory	9.4	9.6
Increase R&D with current budgets by eliminating programs	1.5	4.1

4b. Greatest obstacles to accurate and timely government data:

Budget cuts	70.1%
Lack of coordination among agencies	67.0%
Poor response rate on surveys	47.7%
Inability of agencies to share data due to confidentiality agreements	45.4%
Lack of R&D effort	38.1%

5a. Do you support the consolidation of the major 12 statistical agencies into one STAT-USA similar to Statistics Canada?

	Total	Academic	Government	Industry
Yes	59.1	50.0	54.4	62.2
No	12.9	9.4	16.2	11.7
Undecided	27.7	40.6	27.9	26.1

5b. If no or undecided, would you support consolidation of only BEA, BLS, Census and the Statistical Policy Office of OMB?

	Total	Academic	Government	Industry
Yes	22.3	31.3	19.1	22.3
No	5.6	0.0	5.9	4.9
Undecided	11.9	18.8	16.2	10.2

6. What would be the advantages of a single statistics agency?

- 75.1% data sharing could eliminate duplication of surveys
- 74.6% higher productivity—expertise would not be duplicated
- 65.5% ease of locating data
- 54.8% investment in technology could have higher payoffs
- 43.9% data gathering would be separate from regulation
- 38.6% unified budget could be reallocated based on priorities
- 34.8% would have more clout in budget negotiations

7. What would be the disadvantages of a single agency?

- 49.5% might be less responsive to user needs
- 45.4% priorities might not coincide with needs of business economists
- 45.4% easier to politicize data in a single agency
- 18.8% agency with all data would have too much power
- 11.7% data gathering should be in same agency as regulatory work
- 6.6% congressional committees would be less able to control allocation of resources

8. Would you be willing to pay higher user fees if the money collected could be applied directly to data improvement?

	Total	Academic	Government	Industry
Yes	75.1	90.6	69.1	75.6
No	16.8	3.1	13.2	19.8

9. Would your company agree to extend existing confidentiality agreements to all parts of a consolidated agency?

	Total	Academic	Government	Industry
Yes	32.0	18.8	30.9	34.3
No	4.6	0.0	8.8	4.2
Don't know	51.5	53.1	39.7	55.5

Senator BROWNBACK. Thank you, Ms. Haver, for your concise and very good comments.

Dr. Leonard Nakamura is the economic adviser for the Federal Reserve Bank of Philadelphia. We very much appreciate your joining us today, and the mike is yours.

TESTIMONY OF LEONARD I. NAKAMURA, ECONOMIC ADVISER, FEDERAL RESERVE BANK OF PHILADELPHIA

Mr. NAKAMURA. Thank you very much for the opportunity to testify. I have submitted a written statement and two articles on the quality of our economic measures. What I am about to say represents my own views and not those of the Federal Reserve System or the Federal Reserve Bank of Philadelphia.

In my testimony, I would like to make the following five major points: First is that the 1978 CPI methodology revision, the largest revision in the history of the CPI, now appears, with hindsight, to have worsened our measures of inflation rather than improved them. The consequence is that over the past 3 years the U.S. economy was probably growing twice as fast as our real GDP growth rate figures indicate. The U.S. inflation rate may well be zero rather than 2 to 3 percent.

One of my studies shows that the rate at which consumers have been changing their spending patterns away from necessities like food and towards luxuries imply that mismeasurement of inflation overall worsened by 2 percentage points beginning in the late 1970's. One of the implications of this is that it may well be the case that the productivity slowdown we have been worrying about for the past 20 years may be a statistical figment.

I present some details on the CPI for air fares, food at home, and medical care. I estimate that air fare inflation since 1978 has been overstated by nearly 6 percentage points a year; food at home inflation appears to have been overstated by 1.5 percentage points annually; and medical care inflation appears to have been overstated by 4 percentage points annually.

Known fixed statistical procedures cannot currently measure the inflation rate accurately. It will likely take a major ongoing economic research effort to ameliorate this problem.

Let me elaborate a little bit about the 1978 revision. The methodology that we used seemed sensible at the time. I myself was very active in measurement at that point. I was a member of the Rees—I was a consultant to the Rees Commission on productivity statistics, and I was among the many economists who, in effect, vetted the new BLS methodology. I thought it was a solid step in the right direction.

Well, we were wrong. The new methodology happens to lean on an economic principle called the law of one price, and the new methodology was implemented just as deregulation and computerization made changes in retailing that basically repealed the law of one price. And I will go into that more a little bit later.

Our current economic statistics do not give an accurate picture of what is happening in the U.S. economy, but this is not the fault of the agencies that collect and publish the statistics. It is primarily due to the extremely rapid rate of change of the economy itself to which we have already had allusions in this testimony.

One point that I would like to make is that it is sometimes argued that even if the data are biased by a large amount on a trend basis, they are accurate on a short-term basis. This may be so, but the little evidence that we do have is actually to the contrary. One of my exhibits shows the Bureau of Labor Statistics estimates on the year-to-year changes in the source of inflation bias that is easiest to measure, and in a number of years, the year-to-year inflation bias doubles or falls in half in a very striking way. So the year-to-year changes in CPI inflation may reflect changes in bias and may not reflect true changes in inflation.

I would like to give an example which I think is particularly striking, and the example is one of air traveling. In 1978, when our current methodology for the CPI was put in place, there was only one round-trip coach fare on most routes because fares were regulated by the Civil Aeronautics Board. Now, as we all know, dozens of different fares are available with a variety of restrictions on every route, and the fare structure changes by the minute.

Between 1978 and 1996, if we asked the question, What did passengers actually pay per mile to travel on airlines? that price per mile grew at a 2.7 percent annual rate. The CPI for air fares, however, grew at an 8.3 percent annual rate during that same period, a difference of 5.6 percentage points. Now, if we take that CPI and use it to deflate airline passenger revenues for that period, we find that the real output of airline passenger travel fell from 1978 to 1996. If, on the other hand, you look at the actual miles that passengers flew, passenger miles on airlines more than doubled, from 100 to over 240.

How can such a substantial gap have been sustained for so long? The reason is precisely this dispersion of fares. Full fare for unrestricted travel has risen very rapidly. It has risen at nearly a 9 percent annual rate. The CPI for air fares has basically tracked the full fare. However, the average restricted discount fare has increased at only 2 percent a year. As a result of the accumulation of those differences, the average unrestricted fare is now more than 3 times as great as the average restricted fare. You often hear about air travelers buying two round-trip restricted tickets instead of one restricted fare—in order to get around these restrictions, and you can see why. The unrestricted fares themselves cost three times as much.

Only 7 percent of passenger miles are flown at full fare. So almost all passengers are, in fact, flying at the restricted fares but we are tracking the full fare. Nevertheless, full fares account for 20 percent of passenger revenues because the gap between the prices is so large.

Now, you can argue and I believe that this constellation of fares is, in fact, highly efficient. In essence, airlines divide the customers into two broad groups: business travelers and vacation travelers. Business travelers care most about saving time. Their time is extremely valuable, and they want to have the maximum possible flights to a wide variety of destinations, and they are willing to pay more for that. Vacation travelers, on the other hand, care most about savings money and are often flexible about exactly when they fly. The airline accommodate both types of travelers efficiently, providing a multitude of flights for business travelers, filling the seats with vacation travelers. The typical restriction on a discount flight, the Saturday night overnight stay, which vacation travelers can usually easily accommodate, is used to separate the two.

It is the deregulation and computerization that made this possible, and those date from the late 1970's, precisely the time when we were instituting this new methodology.

Now, that proliferation of fares and restrictions is not without cost. It is highly efficient, but it also has costs. The costs are that consumers have to be careful shoppers; they have to plan their trips in advance; they have to guess when to lock in their fares. Changing plans becomes a lot more costly for them.

Now, there are ways to estimate the relative costs and benefits of the proliferation of fares, but that is not easy. It involves ongoing research.

Now, let me tell you very briefly what forces this upon us and why the CPI revision was wrong in the first place. Basically, the message is that our system was set up for catching the one price that we believed was the long-run competitive price for that good. And yet that long-run competitive price has disappeared.

In the late 19th century, when economics became a modern science, the principle on which that science was based was the law of one price. The law of one price basically says that in any market at one moment there cannot be two prices for the same kind of article. What that means for economists is that, as long as there is competition among suppliers, in the long run that unique price is a good measure of the resource cost for producing that good and service. Consumers for their part are only going to buy the good if the exchange of dollars for the good benefits them, which makes price a good measure of consumer utility, and that was the central synthesis of the laws of supply and demand which join in the law of one price.

When that law holds, we can use a cost-of-living index that reflects consumers' welfare to help us obtain real output measures for productivity growth because productivity growth is about resource costs, and consumers is about the utility and efficiency with which we use that. If that law of one price does not hold, that logic falls apart, and our statistics create the kind of problems that we see in the airline fares example, that a model of utility based on the law of one price says something like, well, if a full fare is 3 times as expensive as a restricted fare, then that must be 3 times as valuable for all users. That law, that falls apart.

Senator BROWNBACK. Mr. Nakamura, I want to make sure that you do focus on whether we should consolidate these entities. I appreciate the points you are making here because it is a good point

and it is one I was not familiar with. But do you see consolidation points, issues? Do you have trouble with doing that? I do not know if you have that in your written testimony as well, because I sure would like to make sure we do not get buzzed for a vote or anything before I get you to that point.

Mr. NAKAMURA. OK. The main thing that I have to say about this is that the known fixed statistical procedures cannot measure the inflation rate accurately. It is going to take a major ongoing research effort to solve this problem. I think that we can agree on research principles that will measure price reasonably, but in the rapidly changing economy in which we live, we will not be able to define fixed procedures that are going to accurately measure inflation.

The economics profession has been developing the necessary theoretical and statistical apparatus for measuring price in a rapidly changing world, and we have made tremendous strides. But we do not have the data, the funding, or the authority to use this knowledge to create useful statistics. And if we as a Nation are to agree on our inflation measures, we must figure out how to create an ongoing research effort in economic measuring.

[The prepared statement of Mr. Nakamura with attachments follow:]

PREPARED STATEMENT OF LEONARD NAKAMURA

(This testimony reflects the personal views of the author and not those of the Federal Reserve Bank of Philadelphia or of the Federal Reserve System.)

Contents:

- I. Introduction and overview
- II. More on the quality of price and output statistics: details on food and medical expenditures.
- III. The rate of change of consumer expenditures and its implications for growth mismeasurement: Engel's Law and estimates of real growth
- IV. Measuring of inflation and economic growth requires on-going research, not just a change in procedures. There is no quick fix.

Thank you very much for the opportunity to submit testimony. What I am about to say represents my own views and not those of the Federal Reserve System or the Federal Reserve Bank of Philadelphia.

In my testimony, I will make and support the following five major points.

1. The 1978 CPI methodology revision appears, with hindsight, to have worsened our measures of inflation rather than improved them.
2. Over the past 3 years, the U.S. economy may have been growing twice as fast as our real GDP growth rate figures indicate. The U.S. inflation rate may be zero, rather than 2 to 3 percent.
3. Known fixed statistical procedures cannot currently measure the inflation rate accurately; it will likely take a major on-going economics research effort to ameliorate this problem.
4. Details on the CPI for airfares, food at home, and medical care are presented. I estimate that airfare inflation since 1978 has been overstated by nearly 6 percent. Food-at-home inflation appears to have been overstated by 1½ percent. Medical care inflation appears to have been overstated by 4 percent.
5. The rate of change at which consumers have been changing their nominal spending patterns implies that mismeasurement of inflation overall worsened by 2 percentage points beginning in the 1970s.

I. Introduction and overview

A. *The 1978 CPI methodology revision appears, with hindsight, to have worsened our measures of inflation rather than improved them.* In 1978 the Bureau of Labor Statistics undertook the most fundamental revision to its methodology that has ever occurred. The methodology seemed sensible at the time; I myself was among the

many economists who vetted it and thought it was a solid step in the right direction. We were wrong. The new methodology was implemented just as deregulation and computerization began changes in retailing that made it inaccurate.

B. *Known fixed statistical procedures cannot currently measure the inflation rate accurately it will likely take a major on-going economics research effort to ameliorate this problem.* Our current economic statistics do not give an accurate picture of what is happening in the U.S. economy. But this is not the fault of the agencies that collect and publish the statistics. It is primarily due to the extremely rapid rate of change of the economy itself. A major research effort in economics may be necessary to ameliorate this problem.

Currently, measured inflation is approximately 2 to 3 percent. I argue that a much more reasonable estimate of the true inflation rate is zero and that the mismeasurement of inflation has been accelerating. This upward bias in inflation has downwardly biased our measures of growth and productivity.

I believe that over the past 3 years the U.S. economy has been growing perhaps 5 percent a year instead of 2 or 3 percent. When we look back on this period of time 10 or 15 years hence, we will likely acknowledge that this was a period of unprecedented change and growth for the U.S. economy.

Our current statistics say that the U.S. economy is growing unprecedentedly slowly; our statistics argue that there has been no technological progress, despite 20 years of computerization, automation, deregulation, tax cutting, and downsizing. Exhibit 1 presents data that say that the efficiency with which the U.S. economy uses its capital and labor rose roughly 1.7 percent a year from 1947 to 1978 and that since then there has been no gain in efficiency. Our current statistics say that the average U.S. worker has been losing ground since 1965 (Exhibit 2). Every time we compare our paychecks to the consumer price index, we think we are falling further behind.

It is sometimes argued that even if the data are biased, they are informative on a short-term basis. This may be so, but the little evidence we have is to the contrary. Exhibit 3 shows the BLS estimates of the easiest-to-measure source of inflation bias, the inflation bias that arises from not updating the weights of major product groups in our market basket. It accounts for one-fifth of the bias in the CPI according to the Boskin Commission, and less than one-tenth by my reckoning. Year-to-year changes in CPI inflation may reflect changes in bias as much as true changes in inflation.

An example: Air travel. In 1978, when our current methodology for the CPI was put in place, there was only one round-trip coach fare on most routes, as fares were regulated by the Civil Aeronautics Board. Now, as we all know, dozens of different fares are available with a variety of restrictions on every route, and the fare structure changes by the minute.

Between 1978 and 1996, the average price paid per mile by passengers grew at a 2.7 percent annual rate (Exhibit 4). The CPI-U for airfares grew at an 8.3 percent annual rate, a difference of 5.6 percentage points. If we use the CPI to deflate airline revenues from passenger travel, we find that "real" airline passenger travel output fell from 1978 to 1996. But, in fact, passenger miles on airlines more than doubled.

How can such a substantial gap have been sustained for so long? The reason is the dispersion of fares. Full fare for unrestricted travel has risen at nearly a 9 percent annual rate, and the CPI for airfares has basically tracked the full fare. The average restricted (discount) fare has increased at only 2 percent a year. The average domestic unrestricted fare is now 3.1 times as much as the average restricted fare. But only 7 percent of passenger miles are flown at full fare (full fares account for 20 percent of passenger revenues).

It can be argued that this constellation of fares is highly efficient. In essence, airlines have divided their customers into two broad groups: business travelers and vacation travelers. Business travelers, who care most about saving time, want to have the maximum possible flights to a wide variety of destinations. They are willing to pay more for this privilege. Vacation travelers, on the other hand, care most about saving money and are often flexible about exactly when they fly. The airlines accommodate both types of travelers, providing a multitude of flights for business travelers and filling the seats with vacation travelers. The typical restriction on discount flights—a Saturday overnight stay, which vacation travelers can often easily accommodate—is used to separate business travelers from vacation travelers. Note that deregulation and computerization has made this possible.

The proliferation of fares and restrictions also has many costs. Consumers have to be careful shoppers, planning their trips in advance and having to guess when to lock in a nonrefundable fare. Changing plans has become more costly. There are

ways to estimate the relative costs and benefits of the proliferation of fares, but they are not simple. One approach is to directly measure the cost of the restrictions to the flier. Another approach is time diary measures, which track shopping times (the amount of time consumers spend searching for the lowest fares) and compare them to estimated waiting times (the amount of time consumers save by having more flights available). A complementary approach is to measure the elasticities of demand for different types of travelers, which gives us estimates of the travelers' tradeoff between time and price. A third approach is to estimate the market structure of airline competition, to see where airlines have market power and where competition reigns. A fourth approach is to analyze and measure the role of the various contributors to airline output: airplane manufacturers, travel agents, airlines, airports. None of these approaches alone will do the job.

The law of one price. The proliferation of prices for air travel is the product of computerization—it also violates the most fundamental principle in economics, the law of one price. Jevons's law of one price is the principle that “in the same open market, at any one moment, there cannot be two prices for the same kind of article (Jevons, 1879)”.

As long as there is competition among suppliers, in the long run this unique price will reflect *the resource costs* of producing the good or service. Consumers, for their part, will only buy goods if the exchange of dollars for the good benefits them; this makes price a good measure of consumer utility. Thus the law of one price is that prices are a useful measure of resource costs and of utility. When the law holds, we can use a cost of living index (based on measuring consumer utility with prices) to deflate nominal output to obtain real output for productivity growth measures (productivity is our ability to reduce resource costs). If the law of one price does not hold this logic falls apart. In the absence of the law of one price, the meaning of prices is difficult to know without thorough study of supply and demand conditions and the exact nature of the price variations.

The phenomenon that we have been examining, the breakdown of the law of one price, appears throughout our economy. The computerization of transactions and recordkeeping has made it possible for managers to know the impact of price changes on profit in item-by-item detail, and has also made possible daily variation in prices. Meanwhile, we shoppers have all learned to be careful shoppers, and to shop at large malls, which are designed to help us compare as many goods as possible in the shortest period of time.

II. More on the quality of price measurement: details on food and medical expenditures. These two categories account for roughly one-fourth of consumer expenditures and one-sixth of the consumer price index.

A. *Food.* Among all consumer prices, economists are most experienced at collecting food prices. The following extended example shows that our measures of food prices (narrowly defined here as food purchased for consumption at home) went dramatically awry beginning in 1978.¹ The argument is a *reductio ad absurdum*: our official statistics imply that the real output of retail services at supermarkets fell dramatically, but direct measures of supermarket services rose substantially over this period.

1. The Bureau of Labor Statistics has been collecting monthly data on food prices since World War I, when the CPI, then called the cost of living index, was institutionalized. Prior to 1978, the prices collected were for the same goods and services across all the cities surveyed. Price inspectors throughout the country would collect prices for “milk, delivered, glass bottles,” or “bacon, first quality, hand sliced.” Uniformity poses some problems. Over long periods of time the quality of these goods might well vary, and indeed the products might well disappear altogether. Milk might be rich or watered or sour; first quality bacon in one city might be second quality in another. And delivered milk has become a rare commodity in most cities.

2. In 1978, when the new methodology came in, this uniform specification of products was replaced by decentralized specification of products. Price inspectors were asked to define detailed product specifications in the field. The price inspectors were given broad product definitions, such as flour and prepared flour mixes, and a store location based on a nationwide survey called the Consumer Point of Purchase Survey. For example, the Survey and the randomization process might result in the choice of the Acme supermarket at Germantown and Sedgwick in Philadelphia. Then the price inspector, with the help of store personnel, chooses several possible items, and randomly picks one, say, Betty Crocker Chocolate Fudge cake mix. For the next 5 years the item priced by the price inspector would be this particular item at this particular store (unless the store stopped carrying that item or closed).

¹ This is drawn from my papers, Nakamura (1997b).

3. The BLS also collects and publishes average price (AP) data on a selected group of foods. This is a separate series that prices products (such as flour; white, all-purpose) that are relatively broadly defined when compared to the very narrow product-store combinations used in the CPI. The AP series gives the average price for that product per pound. The prices are weighted by the relative sales of the outlets at which they are collected. The AP series is apparently piggybacked on the CPI data, in the sense that the basic data in the AP series are, to the extent possible, taken from the CPI collections.

The AP series, it should be pointed out, is essentially what economists have typically collected historically. The AP series (except for a break from 1978 to 1980) is available going back to 1890 for nine foods.

4. Before the introduction of random sampling by the price inspector in 1978, the CPI series and the AP series showed no systematic tendency to diverge. An economist at the BLS, Marshall Reinsdorf, published an article in 1993 that has been one of the seminal articles in the area of CPI price mismeasurement. He discovered that from 1980 to 1990, the CPI and AP series for comparable products diverge by roughly 2 percent a year, with the CPI series rising faster than the AP series. As can be seen in Exhibit 5, the divergence over a recent 6 year period is quite substantial for many of the products—and the divergence is almost universally in the same direction. And as seen in Exhibit 6, the roughly 2 percent a year divergence between the two series continues to January 1996.

5. In principle, there are two reasons the CPI and the AP series might diverge. One is that customers may be switching to lower quality goods within each product category. The other is that customers may be switching to less costly outlets for goods. And there is an additional technical reason: the method that the BLS used to reweigh goods when it updated its sample was biased in the absence of the law of one price. This so-called “formula bias,” which apparently accounted for 1/2 percentage point a year of the 2 percentage point annual divergence, was corrected in January 1995.

One possible reason for the CPI to rise more rapidly than average prices is if consumers were shifting to lower quality foods. We would have evidence of a switch to lower quality goods if the CPI rate of increase were mirrored by an increase in the PPI for comparable goods. It is not. The CPI series for food at home grows 1.4 percent faster from 1977 to 1992 than does the PPI series for consumer food (Exhibit 7).

6. Another possibility is that supermarkets’ retail services could be declining rapidly, if, for example, variety were decreasing or service personnel were declining or stores became more cramped. This is also not the case. There has been some switch to discount warehouse type stores, as shown in Exhibit 8, but the greater switch has been to the superstore format, in which the supermarket sells extensive additional lines of goods, such as drugs, and provides additional services, such as a deli counter, fresh fish, flowers, and even banking.

In this enlarged format, supermarkets are larger (Exhibit 9), stock more items (Exhibit 10), and have more employees (Exhibit 11). While some of the growth in number of products is due to a shift toward more drugs and other nonfood products, most of it appears to be due to an increase in variety of food products.

Consider the following. We can use the CPI for food commodities to deflate food store sales for 1992 to measure the real value of food products and retail services delivered to consumers. Similarly, we can use the PPI for finished consumer foods to deflate 1992 food store goods purchases to get a measure of the real value of products farms and manufacturers delivered to food stores. The difference should be real retail services added by the food stores: the economic contribution of supermarkets. This calculation is shown in Exhibit 12, when we use this so-called “double-deflation” methodology to estimate the real contribution of supermarket output. The implication of our official statistics is that food store output has been declining at a 7.7 percent annual rate. This is absurd, because as I have shown along a variety of dimensions, food store output has been increasing.

In short, the CPI attributes declining real output to a retail segment that by every conceivable measure has been rapidly providing an ever greater abundance of value added services. This unreasonable result is the outcome of the clash between the methodology put in place in 1978, and the fact that foods do not obey the law of one price in our current retail environment.

B. *Medical expenditures.* Between 1984 and 1994, measured per capita real expenditures on medical care rose at a 2.2 percent annual rate; real spending on drugs, a subcomponent, rose at a 2.3 percent annual rate. But most of the components of medical care are priced by inputs, such as office visits, procedures, and hospital room charges, rather than by outputs such as conditions treated successfully. Since 1974, the proportion of nominal expenditures on medical care in personal con-

sumption expenditures has more than doubled and medical expenditures now account for one dollar in six in consumer spending. Note that this figure includes health insurance benefits paid by corporations, and Medicare and Medicaid payments as well.

An argument can be made that the true rate of growth of real spending on the drug subcomponent was over 8 percent annually in the 1980s. This would include an adjustment of 3 percent to the inflation rate from late introduction of products into the survey (Berndt et al, 1993), a 2 percent adjustment from brand names and generics and conversions from prescription drugs to over-the-counter status (Fisher and Griliches, 1995, and Temin, 1992), and a 1 percent adjustment from uncaptured consumer surplus from the introduction of new varieties of drugs at prices substantially below reservation levels.

Since the value of medical care depends on the ability to treat, and treatment to a large extent consists of prescribing drugs and performing surgery, the real rate of increase in drug supply would be a useful proxy for treatment success. Thus the quality improvement in medical services might be usefully proxied by the growth of real expenditures on drugs.

Cutler (1995) has examined the growth of spending in medical services. In a detailed study of heart attack treatments from 1984 to 1991, he measures the inflation rate on a Paasche basis as 3.5 percent annually. During that time the GDP deflator rose at a 3.7 percent annual rate. By contrast, the PCE deflator for medical services rose at a 7.5 percent annual rate. This deflator prices inputs, such as the price of an hour of a surgeon's time, and not treatments. Even Cutler's measure does not impute any benefit for the improvement in techniques for treating heart attacks, particularly angioplasty as an alternative to bypass surgery. Cutler's measure does capture accurately the declining price of the angioplasty, which fell at a 2.3 percent annual rate. The difference between Cutler's heart attack price series and the PCE deflator is roughly 4 percentage points per year. This understates the quality improvement associated with hospital services, as it does not include any imputation for the availability of angioplasty or improvements in techniques in performing these operations. (Angioplasties are less expensive than bypasses, as well as being less invasive and therefore requiring less patient time for recovery.) Shapiro and Wilcox (1996) show similar price mismeasurements in an analysis of cataracts.

Cutler et al (1996) revisits these issues, and includes an analysis of ultimate benefits in terms of quality of life years (QOLY) saved. Taking a quite conservative measure of the value of a QOLY, \$20,000, they confirm that conventional measures understate the growth of value produced by at least 4 percentage points a year.

Changing medical technology includes improved diagnostic machinery (Trajtenberg, 1990) and surgery. The development of noninvasive or less invasive surgical procedures such as ultrasound treatment of kidney stones and arthroscopic surgery as well as improved understanding of the healing process has led to shorter hospital stays. As a consequence, the 6 percent annual rate of inflation in medical care could be entirely a result of mismeasurement of quality. Even with a conservative estimate of bias, the inflation rate of medical care services is likely being overstated by 4 percentage points.

III. The rate of change of consumer expenditures and its implications for growth mismeasurement: Engel's Law and estimates of real growth.² Here I argue that the rate of change of American spending suggests that growth is being undermeasured by two percentage points a year, compared to how growth was measured previously.

A systematic way of testing for the presence of economic growth is to examine the rate at which basic economic necessities, such as food and clothing and household operations, are shrinking as a proportion of total expenditures. The basic empirical principle in this regard is Engel's Law: As real income per person rises, the proportion spent on food declines. The eminent Harvard economist Hendrik Houthakker has said, "Of all empirical regularities observed in economic data, Engel's Law is probably the best established; indeed it holds not only in the cross-section data where it was first observed, but has often been confirmed in time-series analysis as well."³

Exhibit 13 illustrates the basic idea. Suppose at time 0 real income is 1000, of which 60 percent is spent on food and other necessities, while the other 40 percent is spent on luxuries. Now suppose that real income grew 20 percent, to 1,200. De-

²This is drawn from my papers, Nakamura (1997a, c.)

³Hendrik S. Houthakker, "Engel's Law," in John Eatwell, Murray Milgate, and Peter Newman, eds., *The New Palgrave: A Dictionary of Economics*. Volume 2 (Macmillan, 1987), pp. 143-44.

mand for food doesn't increase as much as demand for luxuries, so although food purchases increase, they shrink as a percent of expenditures. Suppose that real income grows another 20 percent. Food purchases continue to rise, but less rapidly than total income and spending. The share spent on food declines over time. Moreover, equal percent increases in real income lead to equal changes in the share of nominal expenditure on food and in the share of nominal expenditure on luxury: in both periods, each share changes 5 percentage points, food down and luxury up.

This formulation of Engel's Law is based on work by Angus Deaton and John Muellbauer.⁴ It implies that equal percent increases in real incomes per person should lead to equal percentage point changes in shares of expenditure.

How do we apply their formulation to U.S. data? From 1959 to 1974, according to the official statistics, real income per person grew 45 percent. In the longer period from 1974 to 1994, real income per person grew 39 percent. If these numbers are accurate, one would expect that the share of necessities in total expenditures should have shrunk by about the same amount in the two periods (or perhaps a bit less in the second period). In fact, the proportion of the average budget spent on food fell from 27.3 percent in 1959 to 23.1 percent in 1974, or 4.2 percentage points, but fell substantially more—7.1 percentage points—from 1974 to 1994 (Exhibit 14).

The proportion of household budgets spent on other necessities, such as clothing and home heating, also almost uniformly contracted by more in the period 1974 to 1994 than in the earlier period 1959 to 1974 (Exhibit 15). In contrast, the share spent on luxuries, such as medical care, personal business services, recreation, education, and foreign travel, generally rose more in the later period than in the earlier one.⁵ This faster shift away from necessities as a proportion of budgets in the second period suggests that real income per person grew more in the second period than in the first, not less as the official statistics say.

How much more? To answer this question, calculate the average absolute change in shares for all consumption categories over each period, that is, take the average without considering whether each change is up or down. In this way, a decline of 2 percent for a necessity like food and a rise of 2 percent for a luxury like travel both correspond to rising real income. The nine consumption categories in Exhibit 15 changed absolutely by 1.50 percentage points, on average, in the period 1959 to 1974, while they changed 2.88 percentage points, on average, from 1974 to 1994. If we use Deaton and Muellbauer's application of Engel's Law, the fact that the average shift in spending shares (away from necessities and toward luxuries) was almost twice as big in the second period as in the first—2.88 to 1.50 percentage points—implies that the true rise in real income in the second period was about twice as large as that in the first (so long as prices of luxuries did not rise at a substantially different rate than prices of necessities). If real income rose 45 percent from 1959 to 1974 as the official data show, the change in spending shares from 1974 to 1994 suggests that real income rose just over 100 percent during those 20 years, not 39 percent as reported in the official statistics.⁶ Over 1974 to 1994, this represents a per-person annual growth rate of 3.7 percent, not 1.7 percent—a difference of 2.0 percentage points per year.

Now let's reexamine the productivity slowdown that began around the mid-1970s. That slowdown is reflected in the official data in Exhibit 16 in that more real growth per person took place from 1959 to 1974 than in the longer period from 1974 to 1994. But the slowdown is not consistent with the changes in the consumption expenditure shares. The implication of the calculations reported above is that growth in real income per person was mismeasured by 2.0 percentage points annually from 1974 to 1994—slightly more than the measured slowdown in productivity growth in the official statistics of 1.7 percentage points annually. That is, it is pos-

⁴"An Almost-Ideal Demand System," *American Economic Review* 70 (June 1980), pp. 312-16. Their system formally says that holding relative prices constant, equal changes in the logarithm of real income lead to equal changes in shares in nominal expenditures. Here we discuss the system in terms of percent changes as we assume most readers are more familiar with that terminology.

⁵What is a necessity and what is a luxury is not always easy to determine. Food is the clearest example of a necessity. Goods and services whose consumption declines over long periods of time when incomes are rising are defined as necessities here; the consumption of luxuries rises over the same time periods.

⁶According to the Deaton and Muellbauer model, the ratio of the change in the log of real income between 1974 and 1994 to the change in the log of real income from 1959 to 1974 equals the ratio of the absolute change in expenditure shares between the periods 1959 to 1974 and 1974 to 1994. The change in the log of real income from 1959 to 1974 is 0.375. We multiply this by the ratio between the percent changes in shares, $0.375 \times (2.88/1.50) = 0.720$. The antilog of .720 is 2.05, suggesting that real per capita income in 1994 was 2.05 times real per capita income in 1974.

sible that the entire productivity slowdown of the past two decades revealed by the official statistics is the result of mismeasurement! Put another way, the shifts in composition of expenditures from 1959 to 1974 and from 1974 to 1994 are consistent with the view that productivity growth was the same in both periods. Households are spending in a pattern that is inconsistent with the official statistics on real output and price; that is, the average household has expanded the proportion of luxuries it buys as if its real income had doubled over the last 20 years, while the official data report that its real income rose by less than half.

IV. Measuring inflation and economic growth requires on-going research, not just a change in procedures. There is no quick fix.

A. *Why measuring inflation appears to be easy but is really quite difficult.* We live in a society that measures physical units with the accuracy of angstroms. Moreover, a manager in Omaha can know what we had for breakfast and what we paid for it. How could we not know what the inflation rate is?

At first glance, price appears to be as clear as day. The arithmetic problems we give first graders are about prices: if an apple costs ten cents, what do two apples cost? And we are all consumers, so each of us is an expert on price. In every shopping decision we make, we are using our knowledge of prices and inflation.

But as the airfare example shows, we have lost the simple connection between prices and products. In 1978 we all paid the same fare. Since then, the full fare has risen 8.8 percent a year, the CPI for airfares 8.3 percent, the average fare 2.7 percent, and discount fares 2 percent a year. Almost all the time we fly at the discount fare. Is the rate of inflation in airfares 9 percent, 8 percent, 3 percent or 2 percent?

We buy most goods on sale. We have all become careful shoppers. Markups and discounts have always been with us, but they have exploded since the computerization of retailing in the 1970s and early 1980s. In 1965, the average department store discount was 6 percent, almost unchanged from the 5 percent rate of 1955. But by 1986, large markdowns were endemic. A study by Peter Pashigian, a professor at the University of Chicago, of men's white dress shirts in 1986 revealed that *two-thirds* were sold at discount, with the average discount varying from 33 percent to 50 percent. In this environment, it becomes harder to know what the prices of products mean and to assess the rate of inflation.

B. *Measuring inflation requires ongoing research, not a fixed procedure.* The fundamental message of my testimony is simple: the ongoing measurement of inflation and growth is a research issue and not a procedural issue. In the economy in which we live, there is no fixed procedure that will accurately measure price forever. I believe that we can come to agree on a dynamic set of research principles that will measure price reasonably but for the foreseeable future we will not be able to define fixed procedures that will do so.

Ideally, the measurement of price would be accomplished by the economics profession as part of its regular research program. But measuring price is extremely expensive by academic standards.

The economics profession has been developing the theoretical and statistical apparatus for analyzing and measuring price, and has made tremendous strides. But the profession lacks the data, the funding, and the authority to use this knowledge to create useful statistics. If we as a nation are to agree on our inflation measures, we must figure out how to create an on-going research effort in economic measurement.

[Exhibits and two articles from Business Review follow:]

Exhibits

**U.S. Economics Statistics Appear to Indicate
No Technological Progress Since 1977**

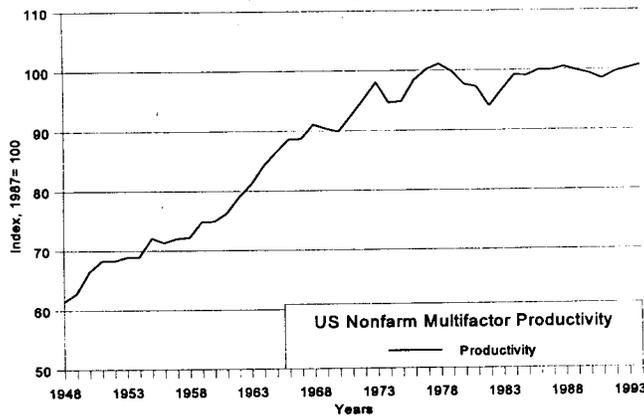


Exhibit 1. Postwar U.S. Nonfarm Business Multifactor Productivity, 1948-1994

Source: U.S. Bureau of Labor Statistics, Multifactor Productivity Trends, 1994

Hourly wage, in 1982 dollars

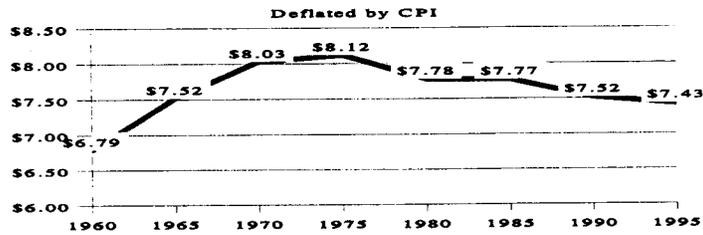


Exhibit 2

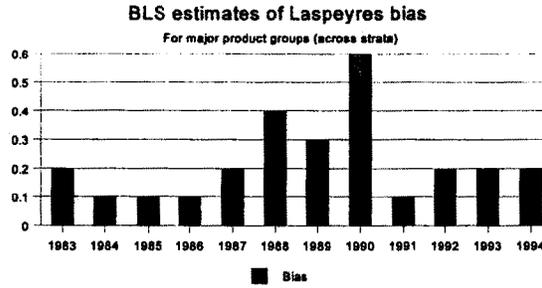


Exhibit 3

Exhibit 4. Airfares						
		1964	1978	1996	Annual growth, 1964-78	Annual growth, 1978-96
CPI, annual average	1982-84=100	23.7	45.5	192.5	4.8 %	8.3 %
yield, cents per passenger-mile	full fare			38.87	2.4 %	8.81 %
	average	6.12	8.50	13.67		2.67 %
	restricted			12.05		1.96 %

Sources: BLS and Air Transport Association.

Exhibit 5. Average Prices of Foods Consistently Rise Less than the Consumer Price Index for the Same Foods					
Selected Foods				Consumer Price Index	
Average Prices Per Pound, In Dollars					
Category	Jan 1989	Jan 1996	% increase	Category	Jan 1989 to Jan 1996 % increase
Flour, white, all purpose	\$0.23	\$0.26	14.9%	Flour and prepared flour mixes	27.7%
Ground chuck, 100% beef	\$1.81	\$1.80	-0.4%	Ground beef, excluding canned	7.9%
Bacon, sliced	\$1.81	\$2.14	18.5%	Bacon	33.9%
Chicken, fresh, whole	\$0.91	\$0.94	4.0%	Fresh whole chicken	9.4%
Eggs, grade A, large	\$0.94	\$1.15	22.7%	Eggs	30.1%
Apples	\$0.73	\$0.88	20.3%	Apples	39.4%
Oranges,navel	\$0.52	\$0.56	7.7%	Oranges, including tangerines	46.4%
Lettuce, iceberg	\$0.79	\$0.77	-3.1%	Lettuce	12.2%

Source: BLS CPI Detailed Report, January 1989 and 1996.

Exhibit 6. Average Prices compared to Consumer Price Index		
Weighted Average for Foods, Annual Average Rates		
First Month of Year		
	1980 to 1989 (Reinsdorf Study)	1989 to 1996 (Nakamura)
Average Prices, Selected Foods	2.1%	1.2%
CPI, Same Selected Foods	4.2%	3.3%
Difference	2.1%	2.1%

Source: Reinsdorf (1993) and Nakamura (1997b)

Exhibit 7. Comparison of CPI and PPI for foods				
	PPI, consumer foods 1977=100	CPI, food at home 1977 = 100	PPI, annual rate of growth from previous period	CPI, annual rate of growth from previous period
1959	47.4	46.7		
1977	100	100	4.2%	4.3%
1992	168	205	3.5%	4.9%

Exhibit 8. Grocery Supermarkets by type				
Percent of total	1980	1990	1993	1994
Conventional	73.1%	34.9%	28.0%	28.2%
Superstore	21.7%	47.6%	55.2%	56.6%
Warehouse	5.2%	17.6%	16.8%	15.2%
Total (billion \$)	\$157	\$260	\$281	\$289

Exhibit 9. Selling Floor Space (million sq ft)				
	1972	1977	1987	1992
Grocery	545.7	606.1	747.6	844.1

Exhibit 10. New Product Introductions and Number of Types of Items Stocked, Grocery Supermarkets				
Year	New Product Introductions	Items per store	Items stocked Ind	Items stocked Chains
1960		6000		
1964	1281	6900		
1970	1365	7800		
1975	1831			
1980	2689	9400		
1982			9339	11382
1983			9629	10883
1985	7330			
1990	13244	16500	11611	17901
1992	16790			
1993			15,751	20,299
1994		19,612	15,957	21,949

Exhibit 11. Employment in Grocery Store Retail Industry, thousands			
	1983	1993	% Change
Total	2234	2852	27.6
Exec and admin	175	122	-30.1
Sales	933	1243	33.2
Admin support	611	770	26
Service occup	185	315	69.6
Other	329	402	22.2

Exhibit 12. Measures of Output and Hours: Food Stores				
Annualized Growth Rates in Percent				
	BLS Hours	BLS Output	Double Deflation Output	Double Deflation Output with 3.5 % CPI inflation rate
1977-92	1.7 %	0.9%	-7.7 %	4.1 %

Source: BLS, Productivity Measures for Selected Industries and Government Services, July

1996, Bulletin 2480, and author's calculations.

Exhibit 13. Example of Engel's Law: As Real Incomes Rise, The Share Spent on Necessities Falls					
Deaton and Muellbauer's formulation: Equal percent changes in real incomes in two periods lead to equal percentage point changes in shares of expenditures of necessities and luxuries					
All data per person					
Year	Zero	Ten	Twenty	Change 0 to 10	Change 10 to 20
Spending on food and other necessities	600	825	1080		
Spending on luxuries	400	675	1080		
Nominal Expenditures	1000	1500	2160		
Spending on food and other necessities	60%	55%	50%	5%	5%
Spending on luxuries	40%	45%	50%	5%	5%
Nominal income	1000	1500	2160		
Prices	100	125	150		
Real income (dollars)	1000	1200	1440	20%	20%

Exhibit 14. Engel's Law Suggests Rapid Increase in Real Income since 1974:			
Nominal Spending on Food as Proportion of Total Personal Consumption Expenditures			
Declines Rapidly			
	1959	1974	1994
Food, Beverages, and Tobacco	27.3 %	23.1 %	16 %
Percentage point change from previous period		-4.2 %	-7.1 %

Source: Bureau of Economic Analysis, Survey of Current Business, January/February and August 1996.

Exhibit 15. Nominal Spending on Each Category as a Share of Total Spending (in percent)				Change in Spending Shares	
	1959	1974	1994	1959-74	1974-94
Total	100	100	100		
Food, Beverages and Tobacco	27.3	23.1	16	-4.2	-7.1
Clothing, Upkeep, and Personal Care	11.7	10.1	7.9	-1.6	-2.2
Housing	14.1	14.3	14.8	0.2	0.5
Household Furnishings, Fuel and Operation	14.1	13.2	11.1	-0.9	-2.1
Medical Care	6.4	10.0	17.5	3.6	7.5
Personal Business Services	4.3	4.9	7.6	0.6	2.7
Transportation	12.7	12.7	11.2	0	-1.5
Recreation	5.5	6.8	7.9	1.3	1.1
Education, Welfare, and Americans' Foreign Travel	3.8	4.9	6.1	1.1	1.2
Average Absolute Change in Shares of Consumption				1.5	2.88

Source: Bureau of Economic Analysis, *Survey of Current Business*, January/February and August 1996.

Exhibit 16. Real GDP per person growth, Chained 1992 \$, Compared to Engel Curve Changes			
	1959-74	1974-94, official measures	1974-94, as implied by Deaton and Muellbauer AIDS model
Average Absolute Changes in Shares	1.50	2.88	
Real GDP (1992) per person in logs	.375	.333	.720
Real GDP (1992) per person annual growth rate	2.5 %	1.7 %	3.7 %

Source: Bureau of Economic Analysis, *Survey of Current Business*, January/February and August 1996. Population data from Economic Report of the President, 1996.

Measuring Inflation In a High-Tech Age

*Leonard I. Nakamura**

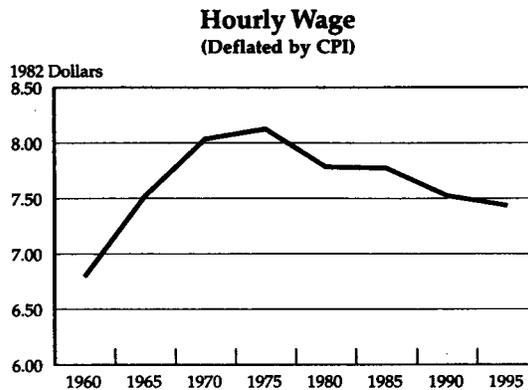
When Americans ask themselves former New York Mayor Edward Koch's favorite question "How'm I doing?" many of them may answer, "Not so hot." For when they look at their "real wages" corrected for inflation

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using the Consumer Price Index (CPI), it appears that many Americans are earning less than they were two decades ago (Figure 1). Is this really the case? Or is the CPI misleading as a standard for purchasing power?

I will argue that the answer to the second question is yes, which is disturbing for several reasons. What we normally mean by inflation is the loss of purchasing power of dollars. If the CPI is giving an upwardly biased view of inflation, then our inflation-adjusted measures of consumers' purchasing power and well-being will be too low. As we shall see, there is

FIGURE 1



The real wage rate of \$7.43 for 1995 equals the July 1995 actual measurement.

some evidence that the CPI has been upwardly biased more than 1 percent annually over the past 20 years. If the CPI is revised down 1 percent annually, the post-1975 decline in real wages disappears (Figure 2). Second, many economic payments—including major ones such as Social Security benefits and federal income taxes—are tied to the CPI to insulate them from inflation, but the CPI may be systematically distorting them. Some Social Security benefits may be too high by 20 percent, again using the 1 percent estimate.¹ Personal

¹It has been argued that the adjustment for the cost of living in Social Security benefits is inadequate because rapidly inflating medical costs are a larger part of expenses for the retired. However, as I argue below, rapid inflation in medical expenses appears to be, at least in part, an artifact of inadequate adjustment for the increased quality of medical care.

creasingly misleading to borrowers, lenders, and policymakers.

Why might the overstatement of inflation be worsening? Two complementary trends are at work. First, high-tech investment goods (such as computers and telecommunications equipment) are playing an increasing role in the economy and are rapidly increasing their ability to store, process, and transmit data, text,

²See Peterson, Congressional Budget Office, October 1994. Peterson's paper estimates that an increase of 0.1 percent in the CPI adds \$0.5 billion to the deficit, so a CPI that is 20 percent lower would mean roughly a \$100 billion lower annual deficit. To this must be added the cumulative effect of past overly large deficits on the total net interest paid, which would also lower the current deficit. However, the effect is actually somewhat less, since Congress has not always allowed the inflation adjustment to tax brackets to come into effect.

income tax brackets are also indexed to the CPI. If we extrapolate estimates from the Congressional Budget Office, between these and other corrections, it is quite possible that the budget deficit would be substantially smaller if the CPI had been correctly measured.²

Moreover, it is quite possible that the overstatement of inflation is worsening. If mismeasurement is accelerating, new dangers arise. Policymakers may have greater difficulty recognizing progress toward price stability. And the inflation-adjusted rate of interest—adjusted by the CPI—may be in-

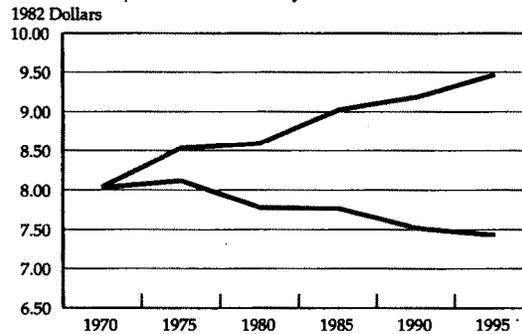
images, and sound. This progress has both direct and indirect impacts on high-tech consumption goods, such as home PCs and cars, and services, such as telecommunications, cable TV, and medical care. The CPI undermeasures these new products and services and their contributions to welfare. Second, improvements in consumption in the United States now increasingly take the form of greater variety and quality, rather than increases in quantity.³ New products and services (both high tech and low tech) are proliferating at an increasing rate. For example, half of all prescription drugs and one-third of breakfast cereals have been introduced in the last decade. Unfortunately, the CPI is not designed to capture changes in consumer welfare due to new goods and services.

The CPI measures the changing price of a fixed basket of goods. Currently, that basket is

³The *Economic Report of the President, February 1995*, puts it this way: "The output of the economy increasingly is shifting away from standardized commodities with easily definable characteristics that change little over time, towards goods and services for which issues of quality and even definition are of primary importance." See Leonard I. Nakamura, "Is U.S. Economic Performance Really That Bad?" Federal Reserve Bank of Philadelphia Working Paper No. 95-21 for evidence on the deceleration of physical output and consumption in the United States over the course of the 20th century.

FIGURE 2

Hourly Wage Adjusted for Lower Inflation (1%) (Deflated by CPI)



This graph is intended to show a reasonable minimum on the bias in the CPI, based on documentation to date. It is not intended to show the most likely amount of bias or the right amount of acceleration in bias. The top line represents the effects of lowering the inflation rate 1 percent. The last data entries, for 1995, reflect July 1995 data.

based on surveys of consumer purchases taken in the years 1982 to 1984, more than a decade ago. New goods and services are conceptually irrelevant, since the basket of goods whose prices are measured is held fixed. (In practice, the BLS cannot stick to the pure standard of a fixed basket of goods, because many of the goods and services available in 1982-84 have become obsolete and are no longer sold.⁴) If most of our economic progress is due to changes in the types of goods and services consumed, the CPI is not a good guide to how the cost of maintaining a certain standard of living is evolving. This is not the fault of the Bureau of Labor Statistics (BLS), which is responsible for

⁴As we shall see below, in practice the CPI does incorporate some new products, although it does not fully capture their benefits.

collecting the basic data for and calculating the CPI, but a problem created by the increasing divergence between the conceptual basis of the CPI and a true cost-of-living index.

These problems are not insuperable, but solving them may involve a change in our approach to the collection of statistics and in our use of economic theory to guide us in setting up the indexes. Ironically, the improvements in information processing and communications that are helping to make our current data-collection system outmoded could facilitate sharp improvements in price measurement.

DOES THE CPI MEASURE THE COST OF LIVING?

A true cost-of-living index answers the question: How much must I spend to maintain my standard of living? For example, if I must spend 5 percent more this year to give me the same enjoyment as last year, a true cost-of-living index would rise 5 percent. Such an index ought to take into consideration changing prices of one good relative to another and new goods and services that become available and how people benefit from these changes. These considerations are important because to take advantage of these changes as they occur, I will likely buy a different bundle of goods this year, even if I can still afford to buy what I bought last year.

Relative Changes in Price. Suppose I buy

only clothing and computer supplies. In 1994, I had \$200 to spend on articles of clothing priced at \$10 each or on computer supplies also \$10 each, and I bought 10 clothing items and 10 computer items. In 1995, I am earning 5 percent more, or \$210, and clothing increases in price to \$12 while computer supplies decrease to \$9. I could again buy 10 clothing items and 10 computer items, but I choose to buy seven clothing items and 14 computer items (Table 1).

My standard of living has improved: I could have bought exactly what I did last year, but I didn't. I prefer what I am buying this year, which I couldn't buy last year, so I am better off. A true cost-of-living index should help us measure, as precisely as possible, this improvement in the standard of living.

But the CPI, conceptually, doesn't do this. It takes the base-year bundle of goods (1994, in our example) and asks: How much does it cost to buy that same bundle this year? In our example, the base bundle costs \$200 in 1994 and \$210 in 1995, a 5 percent increase. So if we set the CPI equal to 100 in 1994, it would equal 105 in 1995 (Table 2). Since my income has risen 5 percent and the CPI has risen 5 percent, if I think of the CPI as a measure of the cost of living, my "real income" is unchanged. But as I've shown, I'm actually better off this year because I can buy a bundle of goods I prefer to the one I bought last year. If we compare the total purchases columns for 1995 in Tables 1

TABLE 1

Actual Purchases						
Item	1994			1995		
	Price	Quantity	Total	Price	Quantity	Total
Clothes	\$10	10	\$100	\$12	7	\$84
Computer	\$10	10	\$100	\$9	14	\$126
Total			\$200			\$210

and 2, we see the source of the difference: the CPI puts greater weight on clothes, the good whose quantity has fallen, relative to my actual current purchases.

A price index like the CPI that uses base-year weights (in our example, 1994) has a somewhat out-of-date comparison basket; a natural alternative would be to use an end-year weighted index (in our example, 1995).⁵ Using 1995 weights would result in giving greater weight to computer items whose price has fallen; buying 14 computer items and seven clothing items in 1994 would cost \$210, the same as in 1995, so an end-year index would show no price increase. However, it is difficult to do this in a timely fashion, 1995 quantity weights generally not being available until 1996.

An alternative is to set up a quantity index and derive an implicit price deflator. The Bureau of Economic Analysis (BEA) begins by constructing a measure of real personal consumption expenditures (PCE) by valuing current consumption at base-year prices. In our

⁵A base-year quantity weighted price index is called a Laspeyres index. An end-year quantity weighted price index is called a Paasche index.

example, that means measuring 1995 consumption (seven pieces of clothing and 14 computer items) at 1994 prices (\$10 for each). By this measure, this year's consumption has risen 5 percent, to \$210 (Table 3). This index of real purchases can be converted to an implicit price index by dividing the real purchases into nominal purchases: for 1994 this is $\$200/\$200 = 1$ and for 1995 this is $\$210/\$200 = 1.05$, so according to this implicit price deflator, the 1995 price level is unchanged from the 1994 level, just like the end-year index.⁶

In general, price indexes like the CPI (which compares today's cost of the *base year consumption bundle* to what it cost in the base year) will tend to understate improvements in welfare

⁶This is not a coincidence—an end-year quantity weighted price index is the same as the implicit price deflator for a base-year price weighted quantity index for the entire period between the base and end years, but not for intermediate years. For example, if the base year is 1994 and the end year is 1996, the 1996 end-year price index and the implicit price deflator whose base year is 1994 will agree on the overall inflation rate from 1994 to 1996, but not necessarily on the rates for each intermediate year 1994 to 1995 and 1995 to 1996. The implicit price index for the intermediate years does not have a clear interpretation, being a kind of odd residual, unlike the end-year price index.

TABLE 2

Consumer-Price-Index Method of Calculation

Item	1994			1995		
	Price	Quantity	Total	Price	1994 Quantity	Total
Clothes	\$10	10	\$100	\$12	10	\$120
Computer	\$10	10	\$100	\$9	10	\$90
Total			\$200			\$210
CPI	1994=100		100			105
Real Spending	deflated by CPI		\$200			\$200

TABLE 3

PCE and Implicit Price Deflator Method of Calculation						
1994				1995		
Item	Price	Quantity	Total Purchase	1994 Price	Quantity	Total Purchase
Clothes	\$10	10	\$100	\$10	7	\$70
Computer	\$10	10	\$100	\$10	14	\$140
Real Spending	in 1994 prices		\$200			\$210
Total Spending	in current year prices		\$200			\$210
Implicit price deflator			100			100

and overstate price increases, while price indexes like the implicit price deflator (which compares today's cost of *today's consumption bundle* to what it would have cost in the base year) will tend to exaggerate improvements in welfare and implicitly understate price increases.⁷ These effects increase as prices diverge further from those in the base year. So when there are divergent price trends, these effects accumulate over time until the base year is updated.

One quick fix for the problem, proposed early in this century by economist Irving Fisher, is to update every year and average the quantity-based index and the price-based index. Fisher's so-called Ideal Index multiplies the two indexes and then takes the square root. In our example, this would result in an inflation rate of 2.4 percent, about midway between the zero inflation of the BEA's method and the 5 percent inflation of the BLS's. The BEA has begun emphasizing Fisher Ideal price and out-

put indexes in its reporting of the U.S. Gross Domestic Product and its components (see *BEA's Chain-Weighted Price and Quantity Indexes*).⁸

How large is the impact of the relative price problem that we have described? It depends on the rate of divergence of relative prices of goods and the average interval between updating the market basket. Historical comparisons of a Fisher Ideal Index with the CPI provide a measure of the size of the upward bias in the CPI growth rate, and such studies broadly agree that the bias is about 0.2 percentage points annually.⁹

⁸For further discussion, see Robert Parker, "Preview of the Comprehensive Revision of the National Income and Product Accounts: BEA's New Featured Measures of Output and Prices," *Survey of Current Business*, August 1995; and Jack E. Triplett, "Economic Theory and BEA's Alternative Quantity and Price Indexes," *Survey of Current Business*, April 1992.

⁹Marilyn E. Manser and Richard J. McDonald, "An Analysis of Substitution Bias in Measuring Inflation, 1959-1985," *Econometrica*, 56, July 1988, pp. 908-30; and Ann M. Aizcorbe and Patrick C. Jackman, "The Commodity Sub-

⁷This holds for inflation after the base year; the base year is periodically updated.

The BEA's Chain-Weighted Price and Quantity Indexes

The Bureau of Economic Analysis, beginning at the end of 1995, will emphasize chain-weighted price and quantity indexes (Fisher Ideal indexes) in its monthly reports on the national income and product accounts, rather than the more familiar output measures based on 1987 prices. The result will be lower measured real output and higher prices compared with the 1987 price-weighted output and the implicit price deflator. The major reason for the reduction in estimated output is a reduced weight for computers, cut by more than half.

The BEA is entirely correct to make this change. The change makes more urgent, however, revisions to the fundamental price series to enable them to capture more of the consumer surplus lost using current measurement conventions. The BEA and the BLS (which has the primary responsibility for price measurement) are, of course, taking steps in this direction.* For example, the BLS is correcting the rotation bias in foods, where it appears to be most important, and it is improving its methodology for measuring prices of prescription drugs as well. But other steps will take longer to implement, particularly under the tightening budget constraints these agencies face. The net result is that, in the short run, measures of price and output may be further from, rather than closer to, reality.

*BEA, "Mid-Decade Strategic Review of BEA's Economic Accounts: An Update," *Survey of Current Business*, April 1995, pp. 48-56.

New Products in Old Price Indexes. The solution outlined above gets us only part of the way toward a true cost-of-living index because the price indexes typically ignore new goods, and when they do consider these goods, they do so too late. Suppose, continuing our earlier example, a new good, the CD ROM, appears in 1995 and costs \$10.50. I decide to buy two CD ROMs and therefore reduce my purchases of both clothing and computer supplies by one item each (Table 4). Now I am even better off because I prefer the CD ROMs to the articles they replaced.

Note that the new good would not affect the CPI. Since the CPI uses base year (1994) quantities of each item, and for CD ROMs that quantity is zero, the price of the new good is irrelevant, conceptually. But the BLS in practice must confront the problem, because goods

stitution Effect in CPI Data, 1982-1991," *Monthly Labor Review*. These studies cover a longer period and extend over periods where the base year has been changed. They average out the effects of the different base years that have been applied to achieve the long-run index.

in the base market basket sometimes disappear from the marketplace as they succumb to competition from newer products. Moreover, in constructing the PCE deflator or a true cost-of-living index, the BEA needs to construct a 1994 price for CD ROMs.

There are four basic ways to deal with this problem.

Ignore it. One could assume no change in price for the good. For many years, the BEA had no statistics on actual prices of mainframe computers and kept the computer price index at 1.¹⁰ Since the general price level was rising, this implied that mainframe computer prices were falling relative to the prices of other goods. However, there is no reason to believe that this method provides very accurate answers.

Alternatively, one could use changes in the prices of similar products to measure the price change for new goods, which may make some

¹⁰This period was before personal computers were an important share of computer sales.

TABLE 4

Actual Purchases—With New Good Added						
1994				1995		
Item	Price	Quantity	Total Purchase	Price	Quantity	Total Purchase
Clothes	\$10	10	\$100	\$12.00	6	\$72
Computer	\$10	10	\$100	\$9.00	13	\$117
CD ROM	?	0	\$0	\$10.50	2	\$21
Total Spending			\$200			\$210

sense if the products are moving similarly in price. However, this is probably not the case as the "similar" products are typically older products and may well be outmoded. Moreover, the very existence of the new products increases the standard of living by making possible a greater variety of purchases. So ignoring the problem is highly unsatisfactory.

Use sample rotation. A partial solution is to add new items to the price survey as they appear, for example, to begin collecting data on CD ROMs in 1995 and to lump them in with some pre-existing good. For example, CD ROMs could be considered computer supplies. To keep abreast of new products and stores, the BLS rotates the sample of goods and outlets whose prices it collects. It rotates 20 percent of the sample each year, but it takes two years after new items are identified before they are introduced into the surveys. As a result, the actual goods priced are, on average, about five years out of date.

Unfortunately, the BLS's sample rotation procedure itself biases the CPI upward. If an item is selling at a temporarily reduced price when the BLS rotates it into the sample, the quantity sold will be temporarily high, so the item will appear in the CPI basket of goods with a higher quantity weight than justified by its average sales. And items that are at a sale price when rotated into the sample show a

high rate of price increase as they return to a more normal price. So sample rotation gives a bigger weight to goods whose prices are likely to rise. This effect alone is estimated to have erroneously raised inflation between 0.2 and 0.3 percent annually over the 15 years since the BLS introduced sample rotation.¹¹ The BLS has recently taken steps to remove this bias from the foods category, where the effect has been quite pronounced.

Use product characteristics. When a variant replaces an existing product, if the value of the changes in the product can be given a price, then the new and old products can be compared. In the auto industry, for example, the *resource costs* to the manufacturer of optional equipment that has been made standard are used to compare new models with old ones. For example, if a new model has a driver's-side air bag as standard equipment and the old model did not, BLS deducts the wholesale cost of the bag, electronics, and installation, plus a standard markup, before it calculates how much the price of the new model differs from the old.

The hedonic method is a somewhat more

¹¹Brent R. Moulton, "Basic Components of the CPI: Estimation of Price Changes," *Monthly Labor Review*, December 1993, pp. 13-24.

theoretically satisfying statistical technique that values changes in goods by the implicit *retail price* of the changed characteristic. This method uses statistical regressions to estimate how much consumers pay for each of a product's specific characteristics or parts (like an air bag), controlling for other characteristics.¹² In the computer industry, at least in the 1980s when the BEA introduced this technique, the most important characteristics of computers were processing speed and memory size. So a computer with twice as much processing speed and twice as much memory was considered to be twice as much computer. Since the processing speed of different computers and their memory sizes could be calculated, at least for some given benchmark set of tasks, then even though whole new generations of computers appeared, their prices could be compared.¹³

¹²See Jack E. Triplett, "The Economic Interpretation of Hedonic Methods," *Survey of Current Business*, January 1986, pp. 36-40.

¹³Product characteristic adjustments are used for housing and new autos, two areas in which quality improvements are sometimes thought to be overstated rather than understated. But this doesn't mean that the CPI is overstating quality as a whole, since the upward biases produced by sample rotation and relative price changes are much larger than the downward biases in the measurement of housing and auto prices. Between 1983 and 1988, the BLS failed to adequately correct for the aging of housing units. This resulted in a downward bias of roughly 0.1 percent annually and was eliminated in 1988. See William C. Randolph, "Housing Depreciation and Aging Bias in the Consumer Price Index," *Journal of Business and Economic Statistics*, July 1988. The other widely cited indication of downward bias is the correction for environmental controls in new cars. However, this effect has been estimated to be less than 0.05 percent per year. See John F. Peterson, "Is the Growth of the CPI a Biased Measure of Changes in Cost of Living?" Congressional Budget Office paper, 1994. Thus, over the past 10 or 15 years, the average effect of these overstatements of quality must be less than 0.1 percent annually. The well-documented errors of underestimation of quality due to sample rotation bias and relative price bias are roughly five times as large.

Hedonic methods help to capture the resource cost, including the cost of the sales effort, of new characteristics of products. But they do not fully capture the benefits that accrue to consumers from the introduction of new goods.

Estimate consumer surplus. When a new product is introduced, consumers receive a welfare gain (called "consumer surplus"), which is the difference between what they would be willing to pay for the product and what they actually have to pay. In our example, suppose that I would have been willing to pay \$35 to buy the two CD ROMs, but I only had to pay \$21.00. To be explicit, suppose I would be willing to pay \$20 for one CD ROM, \$15 for a second one, and \$10 for a third. At a price of \$10.50 each, I will buy two, and the welfare gain I will receive is the same one I would have got if the price had fallen from \$17.50 to \$10.50.

Note that a product need not be wholly new to provide surplus. Consider the opening of a discount clothing store near my home. Again using the example, suppose the price of clothing has gone up from \$10 to \$12 at the store I patronized in 1994, but the discounter sells the same items for \$10, so I decide to purchase the clothes from the discounter. If I am just as happy to shop at the discounter as to go to the old store, my price of clothes has not risen. The arrival of the discounter gives me "surplus" compared with shopping at the old store—I would be willing to pay up to \$12 for clothes and would still switch to the discounter, but I pay only \$10.

The assumption implicitly made in the CPI and in the PCE deflator in this example and others is that there is no consumer surplus from the introduction of the new product. Under this assumption, there is no measurement problem. The arrival of a new product, such as a CD ROM, makes no difference to my welfare. In the discounter example, the discounter's clothes are considered new clothes

items, different from the old store's. There is no consumer surplus from the arrival of the discounter—it is assumed that any consumer surplus I would have gained is eaten up in the switch (the old retailer's friendliness and service that have been lost are equal to the full difference in price).

An alternative assumption is that shifts in consumer demand in response to changes in price are informative about the amount of consumer surplus consumers receive. If, when the CD ROM is introduced, consumers purchase them in large amounts and their purchases thereafter are relatively insensitive to price increases, that is an indication that had the CD ROMs been available earlier, consumers would have been willing to pay more than required. In other words, consumers are receiving a substantial consumer surplus. If consumers switch to discount outlets in large numbers and are relatively insensitive to price swings at the new outlets, they are receiving a substantial consumer surplus. To measure the price sensitivity of consumers requires statistical analysis and extensive data. This is the textbook problem of estimating the consumer's demand curve.

One such study has been conducted for pharmaceuticals. After Eli Lilly's drug Keflex lost patent protection in 1987, generic versions became available at roughly half the price of the brand-name product. Eli Lilly did not cut the price of Keflex but, indeed, raised it 24 percent over the next three years. Meanwhile, the price for the generic drug fell 30 percent, and generics garnered 83 percent of the market measured in doses. Until recently, in such instances, the BLS treated the generic drug as a separate product that was worth only half as much as the brand-name product (the relative price of the generic at introduction) and would have likely recorded a rising price index for this drug. But many purchasers are probably indifferent to the brand name and would have experienced a pure price decline when the

generic became available. A study by Franklin Fisher and Zvi Griliches argues that the most reasonable measure of the consumer surplus realized by purchasers who switched would lead to a price index that declines 48 percent, compared with the BLS approach, which would show a price increase of 14 percent. This is a 19 percent annual rate difference over the 45 months covered in the study.¹⁴ In January 1995, the BLS changed its procedure to reflect a price decline when a therapeutically equivalent generic version of a drug replaces a brand-name patent drug. This change should substantially reduce this problem of pricing drugs.

Although there is some arbitrariness to estimates of the value of consumer surplus from the introduction of new goods and services, they are surely an improvement over assuming that new product introductions result in no consumer surplus.¹⁵ Moreover, private data companies, as well as many retailers, regularly

¹⁴Franklin M. Fisher and Zvi Griliches, "Aggregate Price Indices, New Goods, and Generics," *Quarterly Journal of Economics* 110, February 1995, pp. 229-44. They make the assumption that consumers vary in their relative valuations of the generic product, but that those who switch are evenly spread over the spectrum of possible types—from those for whom the entire difference in price is surplus, to those who receive no surplus. This and other studies on prescription drugs have been done at the wholesale level where the data are relatively easy to come by. In summarizing them, F.M. Scherer has estimated conservatively that the BLS's treatment of the introduction of generics implies an upward bias of 1.2 percent a year in the Producer Price Index for prescription drugs. F.M. Scherer, *Journal of Economic Perspectives* 7, Summer 1993, pp. 97-115.

¹⁵When goods and services and outlets disappear from the marketplace, consumer surplus is lost. But, in general, this consumer surplus is likely to be small compared with the consumer surplus of new product introductions because consumers will not choose to switch from high consumer-surplus goods to low ones, and because suppliers of high consumer-surplus goods can raise their prices and still retain demand, and so are unlikely to go out of business.

collect the data necessary for these estimates. A study by Jerry Hausman examines ready-to-eat breakfast cereals, specifically Apple-Cinnamon Cheerios, using supermarket data.¹⁶ Hausman found that accounting for new cereal introductions, as measured in a true cost-of-living index, might have reduced the CPI for ready-to-eat breakfast cereals by 20 percent over the 10-year period 1980 to 1990, or about 2 percent a year.¹⁷

IMPROVEMENTS IN QUALITY PLAY IMPORTANT ROLE IN ECONOMY

What is driving these rapid product and service innovations? Dramatic improvements in high-tech investment goods are an important force in the availability of new goods and services. Investment in high-tech goods accounts for more than 4 percent of the economic output of the United States. For many of these goods, substantial price *deflation* is normal. For example, between 1951, when the first computer was designed, and 1984 the cost of computers—adjusting for changes in quality—fell an estimated 1000-fold.¹⁸ Since 1984 computer prices have continued to fall dramatically. Large price declines appear in other recent high-tech investment goods, such as telecommunications equipment and medical equipment. While there have always been some goods whose prices are declining, the declines haven't been as large. In the early part of this century and over roughly the same period as that for computers, the price of automobiles

declined substantially, but only about tenfold.¹⁹

High-tech investment goods are primarily purchased by businesses rather than consumers; their effect on consumer prices is indirect and often is not captured statistically. For example, buying automatic teller machines may improve banking services, but the impact is difficult to measure and, in practice, is not captured. Similarly, as new medical equipment is introduced, its effect on the quality of diagnosis and treatment is typically not included in the pricing of medical services.

High-Tech Entertainment Goods and Personal Computers. As measured in the CPI, PC prices fell about 10 percent in 1994, about the same rate of decline for the whole period 1987 to 1994. This appears to underestimate the rate of decline: computer magazine advertisements show a much sharper rate of decline: approximately 24 percent over the course of 1994.²⁰ A recent study by Ernst Berndt and Zvi Griliches shows a decline of 30 percent annually for 1982-88.²¹ The likely reason for this discrepancy is that the CPI tends to underestimate the price decline for personal computers because the sample being surveyed is too old.²²

¹⁹Daniel M. G. Raff and Manuel Trajtenberg, "Quality-Adjusted Prices for the American Automobile Industry: 1906-1940," NBER Working Paper 5035, February 1995.

²⁰I collected data from advertisements of Dell and Gateway, the two largest mail-order PC firms. Price level data indicate a decline of \$570 on an average price of \$2380, or almost 24 percent. Complete data for the study can be found on the Federal Reserve Bank of Philadelphia Internet site at <http://libertynet.org/~fedresrv/fedpage.html>.

²¹Ernst Berndt and Zvi Griliches, "Price Indexes for Microcomputers: An Exploratory Study," in Murray F. Foss, Marilyn E. Manser, and Allan H. Young, eds., *Price Measurements and Their Uses*, NBER Studies in Income and Wealth No. 57 (University of Chicago, 1993).

²²The introduction of the P6 Intel processor in 1995 marks the sixth generation of PC microprocessors since the

¹⁶Jerry A. Hausman, "Valuation of New Goods Under Perfect and Imperfect Competition," NBER Working Paper 4970, December 1994.

¹⁷This measure depends on an assumption of a "representative consumer," i.e., that all consumers are alike.

¹⁸Robert J. Gordon, "The Postwar Evolution of Computer Prices," in Dale G. Jorgenson and Ralph Laundau, eds., *Technology and Capital Formation* (MIT, 1990).

Similar measurement problems exist for a broad spectrum of products that have electronic components embedded in them. A readily identifiable segment in personal consumption expenditures includes video and audio products, computing equipment, and musical instruments; this segment accounted for 1.6 percent of consumer purchases in 1994. Electronic parts play a large role in a wide variety of other consumer products. For example, the value of the electronic components of new cars is approximately the same as that of the steel in them—and improvements in the quality of these components are not well captured in the CPI for new cars.

Medical Goods and Services. The development of new drugs and diagnostic and treatment methods make medical care an area where quality change has been important. Studies of prescription drugs suggest that annual inflation in this product group may be overstated 6 or 7 percent because the BLS does not account for quality improvements. Although such drugs account for only about 1 percent of consumer expenditures, the net effect may be close to 0.1 percent on the overall index.²³ And these drugs are less than one-fifth of the portion of consumer expenditures accounted for by medical costs.

One interesting study of CT scanners shows that the average price rose about 160 percent between 1973 and 1982. However, correcting for quality, using characteristics like resolution and speed, produces a price *decline* of 72 percent. Finally, a third method that includes consumer surplus shows a 1000-fold price decrease!²⁴

first IBM PC in 1979, or a new generation every three years. It is obviously extremely difficult to keep up with this rate of product introduction using conventional methods of price data collection.

²³Zvi Griliches and Iain Cockburn, "Generic and New Goods in Pharmaceutical Price Indexes," Harvard Discussion Paper 1664, Cambridge, MA 1993.

Technological advance in medical care has been profound. Yet the benefits to the consumer of such advances are not included in our price statistics. Medical care is a large proportion of the consumer budget, accounting for roughly 7 percent of the CPI.²⁵ If we extrapolate the 6 percent quality improvement in drugs to all of medicine, this one source can reduce the inflation rate, as measured by the CPI, 0.4 percentage points annually.

HOW BAD ARE THESE PRICING PROBLEMS?

The best estimates for the impact of the first problem we discussed, relative price movements, show the CPI about 0.2 percent too high annually. The upward bias from sample rotation has been reliably estimated at 0.2 to 0.3 percentage points annually. For quality gains whose costs go unmeasured there is considerable uncertainty, but they are likely to account for more than half a percentage point.²⁶ Thus the CPI may well be overstated 1 percent annually even if we take no account of the consumer surplus associated with the introduction of new goods and services. Studies of CT scanners and of generic pharmaceuticals show that consumer surplus in high-tech goods may be very large. And Hausman's study of breakfast cereals suggests that non-high-tech goods may also have very substantial consumer surpluses.

²⁴Manuel Trajtenberg, *Economic Analysis of Product Innovation: The Case of CT Scanners* (Harvard, 1990).

²⁵It has been argued that its proportion of the consumer budget is actually twice as large because the 7 percent figure does not take into consideration government and corporate subsidies of these payments.

²⁶The extrapolations discussed in the text for medicine and high-tech consumer goods alone would amount to 0.6 percentage points annually on the CPI, and these goods account for less than one-twelfth of consumer expenditures.

HOW CAN WE DO BETTER?

Right now, most price data are obtained by sending BLS price collectors on their rounds of retail establishments to fill out pricing forms. This seems unnecessary. Improvements in computer and telecommunication facilities mean that many retailers, wholesalers, and manufacturers routinely capture detailed item-by-item transactions data as part of their billing systems. If the BLS could tap this information, collecting price data might be less expensive and more accurate than current methods. A pilot project to use scanner codes (universal product codes) as a basis for price-data collection is under way at the BLS.²⁷ Moreover, broad collection of data of this type would facilitate further studies on demand curves that could help measure the impact of increases in variety and quality on welfare.

Another question arises in regard to data collection: Should a private firm collect the data for and publish the Consumer Price Index? Having private firms collect price data might enhance efficiency, but there are a number of problems. One is that a private data collector might not be able to protect the privacy of voluntary data providers, and this might discourage such providers. Another problem is that the private data collector might be tempted to use the data for private gain. If the private data collector were to pick up indications that the price index was going to be

surprisingly high, it might be tempted to use this information to make speculative gains in interest rate markets. Thus, it would appear unlikely that purely private data collection would enhance price measurement.

Public-private cooperation would probably be essential to an improved effort to collect statistics. In the past, private corporations have been very useful to the BLS and the BEA in assisting them in improving statistics. For example, special arrangements with automobile manufacturers help provide more accurate statistics on new car and truck sales. And a team of economists from IBM was very helpful in setting up the hedonic price regressions for computers. Large firms may have the resources to assist in such an effort, and the incentive to do so, since sound government policy-making and improved public perceptions of economic reality are likely to be in their best interest.

CONCLUSION

U.S. economic performance is most probably better than has been reported in our official statistics. Documented biases and extrapolations from other studies suggest that the CPI may distort our picture of recent U.S. economic history. A true cost-of-living index would show prices rising more slowly than reported in the CPI; most likely, inflation would be at least one percentage point per year lower. Improving data collection and providing firmer economic foundations for the price measures themselves are important elements in improving economic decision-making and contracting in the United States.

²⁷Marshall Reinsdorf, "Constructing Basic Component Indexes for the U.S. CPI from Scanner Data: A Test Using Data on Coffee," U.S. Bureau of Labor Statistics, mimeo.

Is the U.S. Economy Really Growing Too Slowly? Maybe We're Measuring Growth Wrong

*Leonard Nakamura**

The central paradox of the American economy today is that we are apparently in an era of extremely rapid technological progress in which economic progress has slowed dramatically — and according to some measures stopped. In an article in the *Wall Street Journal* for June 8, 1995, G. Paschal Zachary quotes Robert M. White, head of the National Academy of Engineering: “The pace and intensity of technological advance are without historical precedent.” By contrast, government data say

that U.S. aggregate economic growth, after correcting for inflation, has been very slow for the past 20 years, compared with past trends. The apparent consequence is that measured economic rewards have stagnated. In particular, current measurements show real average hourly earnings are lower now than they were 20 years ago. While total real earnings per person (counting all residents of all ages) in the United States have increased, it is only because a larger proportion of us are working and because the quality of the workforce has increased: we are better educated and more experienced at our jobs. What these and other official statistics plainly assert is that changes in the tech-

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nology of production no longer lead to improvements in economic well-being.

An alternative view is that the statistics are wrong: the U.S. economy has been experiencing strong growth, but our official measures fail to reflect it. In an article in the November/December 1995 issue of the *Business Review*, I argued this *mismeasurement* view — our price statistics are biased upward, thereby artificially reducing measured U.S. growth.

The policy differences implied by the two alternative economic descriptions are profound. For better or worse, we live in a society in which national economic policy is both formulated and evaluated based on national statistics. Should we stress fairness and support for the unfortunate, or should we stress efficiency and incentives for savings and investment? Should we tax all incomes equally, or should the rich bear a disproportionate burden, even though this reduces their incentives to earn? A prerequisite for answering these kinds of questions is good data. If our economy is stagnating, generosity to those currently in unfortunate circumstances may be misplaced because it may make us less able to be generous in the future. On the other hand, if the economy is growing robustly, we may be able to afford more generous policies today.

In this article, we will explore how economic progress is measured and some policy implications that arise from alternative measures of our rate of growth.

ECONOMIC PROGRESS

What Is It, and How Do We Measure It? Economic progress is best defined as the ability to better meet our needs and desires by increasing the quantity and quality of goods and services at our command. Such progress comes from making better use of existing resources as well as using more resources. Ideally, we would like a measure of economic well-being that takes into account nonmarket activities such as child rearing and home health care. In practice, how-

ever, our statistics measure goods and services sold in the marketplace. Thus we measure economic progress by the growth in output of marketed goods and services, not growth in well-being.¹ The advantage in referring only to the marketplace is that we can quantify market activities by the prices paid for marketed goods and services (and as we shall see, even that is no easy task!). Accurate quantitative measurement, in turn, provides common facts about national problems, and such information is important to the success of our policies to overcome them.

For purposes of measurement, there is an important distinction between two kinds of economic progress: progress in our ability to make *existing* goods and services versus our ability to create *new goods and services* that satisfy old needs more efficiently. Economists have long expected existing goods and services to become less important over time because, as wealth rises, we are likely to demand more variety of and higher quality goods: as wealth rises, necessity shrinks in importance and luxury gains.²

In all previous eras, necessity was paramount. If we turn back the clock of Western

¹The market-based measures used in economic analysis, such as gross domestic product (GDP — the broadest measure of domestic output), thus clearly mismeasure growth in well-being. In general, market-based measures are upwardly biased measures of growth in well-being, as nonmarket activities such as child rearing and care for elderly relatives at home become market activities at daycare centers and nursing homes. In earlier times, these types of activities were provided within the household and extended family, not through paid market services, and so were not counted as part of GDP. Thus, even if the amount of these activities hasn't changed, measured GDP has grown, since these activities more frequently take place in the market and thus are counted as part of GDP. This makes the paradox of slow growth in recent years even more marked: GDP shows little growth even though it is intrinsically biased in favor of showing too much growth!

²See, for example, H.L. Wold, *Demand Analysis* (John Wiley, 1953).

economic development 400 years, for example, we find that in the Mediterranean world of the Renaissance, food was by far the dominant economic product, representing some four-fifths of all economic output. Of this, fully half was bread grains, primarily wheat.³ A Spanish or Italian worker might have labored 140 days in a normal year to earn the ton of wheat that meant subsistence for his family; famine was never far away. A drought that doubled the price of grain was ruinous, and such a drought typically recurred three to six times in a worker's average lifetime.

The contrast with the situation facing the American worker is substantial. Today, a ton of wheat costs less than \$150 wholesale.⁴ Even at the minimum wage of \$4.75 an hour this is but a week's work; at the average wage of \$12, it is under two days' work. Creating the raw materials necessary for caloric subsistence used to require the preponderance of the working year; now it is a trivial part.

Americans spend more on medicine than on food, beverages, and tobacco (a category that includes restaurants). And the food purchased for home consumption includes an increasing proportion of ready-to-eat or -drink products as the boundary between supermarkets and take-out restaurants disappears. Thus, without question, over these past 400 years, there has been spectacular advance in the standard of living enjoyed by the citizens of economically advanced Western nations like the United States.

A Slower Pace of Measured Growth. In the past 20 years, however, there has been a marked slowdown in measured U.S. economic growth. According to official statistics, real gross domestic product (GDP), a measure of total market-

place economic activity that includes government, business, and consumers, grew at an annual rate of 3.8 percent from 1959 to 1974. But its growth then slowed by one-third, to an annual rate of 2.7 percent, from 1974 to 1994. Population growth slowed too, from 1.3 percent annually to 1.0 percent annually. So on a per-person basis, real GDP slowed from 2.5 percent to 1.7 percent.

This slower pace of growth has been the subject of repeated analysis along the lines that Nobel Laureate Robert Solow advanced: analyzing the sources of growth by measuring the contributions of added capital, added labor, and improved technology. Solow's original work, published in 1957, covered the period 1909 to 1949.⁵ During that time, real output in the non-farm business sector (a convenient grouping that avoids the measurement problems of the agricultural and government sectors) grew at an annual rate of 2.9 percent.⁶ Of this rate, 1.1 percentage points were due to an increase in the total number of hours worked (a product, in turn, of more people working a shorter number of hours each year, with the increase in workers outweighing the shortening of the work year). Of the remaining 1.8 percentage points, Solow reckoned that one-fifth (0.4 percent annually) was due to an increase in capital per worker, that is, people having more equipment with which to do their work. The remaining four-fifths (1.4 percent annually) was due to an increase in technological progress, that is,

³Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Phillip II*, Vol. 1, Sian Reynolds, transl. (Harper and Row, 1972), pp. 418-61.

⁴The cash price of wheat in December 1996 was \$4 per bushel, or roughly \$135 a ton.

⁵Robert M. Solow, "Technical Change and the Aggregate Production Function," *Review of Economics and Statistics*, 39 (1957), pp. 312-20. The data on labor hours are from Solow's source, later published as John W. Kendrick, *Productivity Trends in the United States* (Princeton University Press, 1961).

⁶In agriculture, the difficulty is counting the hours of farm owners and their families. In the government sector the outputs — compulsory schooling, criminal justice — are hard to count because they are not priced in the marketplace.

having superior procedures and equipment with which to work. Subsequent work by Edward Denison of the Brookings Institution on the period 1929 to 1969 pushed up the annual contribution of technology to 1.7 percent.⁷ The clearcut evidence from these and other studies was that for most of the 20th century, most of American economic growth per person was due to improvements in our technology — *how* we worked — rather than to increases in hours worked or amount of capital per worker. Exactly how technological advance of this type occurs and to what extent the improvements in technology reside in organization of the workforce (working smarter) or equipment (smarter tools) have remained unclear. Indeed, technological advance came to be known as the “black box” of economic growth.⁸

When this same approach is applied to the period of the slowdown in growth that began in the 1970s, however, a new, startling conclusion emerges.⁹ The statistics show that the growth of labor and capital accounts for *all* of the increased growth beginning in the mid-1970s and that the contribution of technological advance to economic growth has disappeared! Figure 1 shows what is left over from output growth after accounting for increases in

capital and labor.¹⁰ From 1929 to 1974, our productivity advanced at an annual rate of 1.7 percent; afterwards, its growth was nearly zero.

The picture of slowdown in U.S. productivity growth in Figure 1 is at odds with the picture of intensive technological advance that appears in business and science publications. Let’s take just one example: electronics. Advances in integrated chips have made electronics ubiquitous in the United States. The number of computers in use today rivals the number of cars. And the United States is at the forefront of the design, manufacture, and utilization of integrated circuits.

Similarly, U.S. universities are at the forefront of practically every discipline, from neuroscience to materials science to computer science, from comparative literature to finance to cinema. And this expertise spills over to technology and engineering, as Intel and Microsoft, Merck and Goldman Sachs, Disney and McDonald’s continue to dominate world markets.

To try to reduce the dissonance between these two portraits of America, we can look at other aggregate evidence of American well-being. We have already discussed one candidate: the analysis of expenditure on necessities and luxuries.

MORE LUXURIES AND FEWER NECESSITIES: THE CHANGING COMPOSITION OF EXPENDITURES AS INCOMES RISE

A systematic way of testing for the presence of economic growth is to examine the rate at which basic economic necessities, such as food and clothing and household operations, are shrinking as a proportion of total expenditures.¹¹ The basic empirical principle in this regard is Engel’s Law: As real income per person

⁷Edward F. Denison, *Accounting for United States Economic Growth, 1929-1969* (Brookings Institution, 1974). The 1.7 percent figure represents Denison’s semiresidual, which includes both pure technological advance and economies of scale — productivity gains due to the increased scale of production. Here, I am lumping the two together. It is now generally recognized that technological advance and economies of scale are, in the long run, inseparable. Output per person grew 2.1 percent during this period.

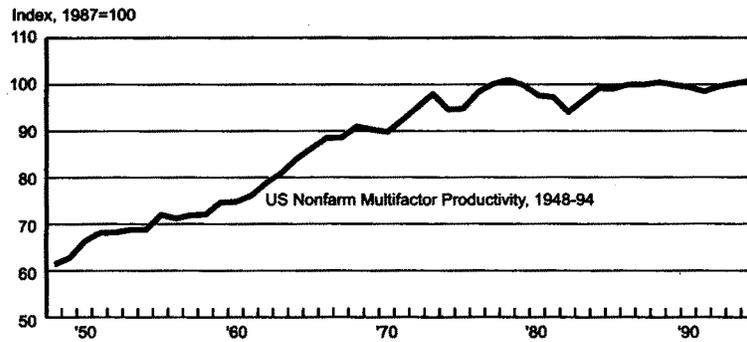
⁸See, for example, the preface to Nathan Rosenberg, *Inside the Black Box: Technology and Economics* (Cambridge University Press, 1982).

⁹Edward F. Denison, *Accounting for Slower Economic Growth: The United States in the 1970s* (Brookings Institution, 1979).

¹⁰Bureau of Labor Statistics, *Multifactor Productivity Trends, 1994*.

FIGURE 1

U.S. Economic Statistics Appear to Indicate No Technological Progress Since 1977



Source: U.S. Bureau of Labor Statistics, *Multifactor Productivity Trends, 1994*.

rises, the proportion spent on food declines. The eminent Harvard economist Hendrik Houthakker has said, "Of all empirical regularities observed in economic data, Engel's Law is probably the best established; indeed it holds not only in the cross-section data where it was first observed, but has often been confirmed in time-series analysis as well."¹²

¹¹This section is based on my paper, "Is U.S. Economic Performance Really That Bad?" Federal Reserve Bank of Philadelphia Working Paper 95-21/R, April 1996.

¹²Hendrik S. Houthakker, "Engel's Law," in John Eatwell, Murray Milgate, and Peter Newman, eds., *The New Palgrave: A Dictionary of Economics*. Volume 2 (Macmillan, 1987), pp.143-44.

Table 1 illustrates the basic idea. Suppose at time 0 real income is 1000, of which 60 percent is spent on food and other necessities, while the other 40 percent is spent on luxuries. Now suppose that real income grew 20 percent, to 1200. Demand for food doesn't increase as much as demand for luxuries, so although food purchases increase, they shrink as a percent of expenditures. Suppose that real income grows another 20 percent. Food purchases continue to rise, but less rapidly than total income and spending. The share spent on food declines over time. Moreover, equal percent increases in real income lead to equal changes in shares of nominal expenditure: in both periods, each share changes 5 percentage points.

This formulation of Engel's Law is based on

TABLE 1

**Example of Engel's Law:
As Real Incomes Rise, the Share Spent on Necessities Falls**

Year	Zero	Ten	Twenty	Change 0 to 10	Change 10 to 20
Spending on food and other necessities	600	825	1080		
Spending on luxuries	400	675	1080		
Nominal expenditures	1000	1500	2160		
Spending on food and other necessities	60%	55%	50%	5%	5%
Spending on luxuries	40%	45%	50%	5%	5%
Nominal income	1000	1500	2160		
Prices	100	125	150		
Real income (dollars)	1000	1200	1440	20%	20%

Note: Deaton and Muellbauer's formulation: Equal percent changes in real incomes in two periods lead to equal percentage point changes in shares of expenditures of necessities and luxuries. All data per person.

work by Angus Deaton and John Muellbauer.¹³ It implies that equal percent increases in real income per person should lead to equal percentage point changes in shares of expenditure.

How do we apply their formulation to U.S. data? From 1959 to 1974, according to the official statistics, real income per person grew 45 percent. In the longer period from 1974 to 1994, real income per person grew 39 percent. If these numbers are accurate, one would expect that the share of necessities in total expenditures should have shrunk by about the same amount in the two periods (or perhaps a bit less in the

second period). In fact, the proportion of the average budget spent on food fell from 27.3 percent in 1959 to 23.1 percent in 1974, or 4.2 percentage points, but fell substantially more — 7.1 percentage points — from 1974 to 1994.

The proportion of household budgets spent on other necessities, such as clothing and home heating, also almost uniformly contracted by more in the period 1974 to 1994 than in the earlier period 1959 to 1974 (Table 2). In contrast, the share spent on luxuries, such as medical care, personal business services, recreation, education, and foreign travel, generally rose more in the later period than in the earlier one.¹⁴ This

¹³"An Almost-Ideal Demand System," *American Economic Review* 70 (June 1980), pp. 312-16. Their system formally says that holding relative prices constant, equal changes in the logarithm of real income lead to equal changes in shares in nominal expenditures. Here we discuss the system in terms of percent changes as we assume most readers are more familiar with that terminology.

¹⁴What is a necessity and what is a luxury is not always easy to determine. Food is the clearest example of a necessity. Goods and services whose consumption declines over long periods of time when incomes are rising are defined as necessities here; the consumption of luxuries rises over the same time periods.

TABLE 2
Nominal Spending on Each Category

	Share of Total Spending (in percent)			Change in Spending Shares	
	1959	1974	1994	1959-74	1974-94
Total	100	100	100		
Food, Beverages and Tobacco	27.3	23.1	16	-4.2	-7.1
Clothing, Upkeep, and Personal Care	11.7	10.1	7.9	-1.6	-2.2
Housing	14.1	14.3	14.8	0.2	0.5
Household Furnishings, Fuel and Operation	14.1	13.2	11.1	-0.9	-2.1
Medical Care	6.4	10.0	17.5	3.6	7.5
Personal Business Services	4.3	4.9	7.6	0.6	2.7
Transportation	12.7	12.7	11.2	0	-1.5
Recreation	5.5	6.8	7.9	1.3	1.1
Education, Welfare, and Americans' Foreign Travel	3.8	4.9	6.1	1.1	1.2
Average Absolute Change in Shares of Consumption				1.5	2.88
Real GDP per Person, Official Measures, chained 1992 \$	\$12,494	\$18,178	\$25,352		

Source: Bureau of Economic Analysis, *Survey of Current Business*, January/February and August, 1996. Population data from *Economic Report of the President*, 1996, U.S. Government Printing Office.

faster shift away from necessities as a proportion of budgets in the second period suggests that real income per person grew more in the second period than in the first, not less as the official statistics say.

How much more? To answer this question, calculate the average absolute change in shares for all consumption categories over each period, that is, take the average without considering whether each change is up or down. In this way, a decline of 2 percent for a necessity like food and a rise of 2 percent for a luxury like travel both correspond to rising real income.

The nine consumption categories in Table 2 changed absolutely by 1.50 percentage points, on average, in the period 1959 to 1974, while they changed 2.88 percentage points, on average, from 1974 to 1994. If we use Deaton and Muellbauer's application of Engel's Law, the fact that the average shift in spending shares (away from necessities and toward luxuries) was almost twice as big in the second period as in the first — 2.88 to 1.50 percentage points — implies that the true rise in real income in the second period was about twice as large as that in the first (so long as prices of luxuries did not

rise at a substantially different rate than prices of necessities). If real income rose 45 percent from 1959 to 1974 as the official data show, the change in spending shares from 1974 to 1994 suggests that real income rose just over 100 percent during those 20 years, not 39 percent as reported in the official statistics.¹⁵ Over 1974 to 1994, this represents a per-person annual growth rate of 3.7 percent, not 1.7 percent — a difference of 2.0 percentage points per year.

Now let's reexamine the productivity slowdown that began around the mid-1970s. That slowdown is reflected in the official data in Table 2 in that more real growth per person took place from 1959 to 1974 than in the longer period from 1974 to 1994. But the slowdown is *not* consistent with the changes in the consumption expenditure shares. The implication of the calculations reported above is that growth in real income per person was mismeasured by 2.0 percentage points annually from 1974 to 1994 — slightly more than the measured slowdown in productivity growth in the official statistics of 1.7 percentage points annually. That is, it is possible that the entire productivity slowdown of the past two decades revealed by the official statistics is the result of mismeasurement! Put another way, the shifts in composition of expenditures from 1959 to 1974 and from 1974 to 1994 are consistent with the view that productivity growth was the same in both periods. Households are spending in a pattern that is inconsistent with the official statistics on real output and price; that is, the average household has expanded the proportion of luxuries it buys as if its real income had doubled over the last 20 years, while the offi-

cial data report that its real income rose by less than half.

INCREASING UNCERTAINTY IN OUTPUT MEASUREMENT IN THE AMERICAN ECONOMY

Is it really possible that growth could be mismeasured on this scale? Quantifying economic progress was easier in earlier periods in the industrial revolution. Mass production standardized many goods and thus made their output easier to measure. The more uniform quality of apples and wheat and cars and shoes made for standardized pricing and publication of wholesale and retail prices of these commodities. The most rapid progress took place in the production of goods whose increased quantities we were best able to measure.

Now, an increasing proportion of the economy is devoted to products whose real output we do not attempt to measure. As Zvi Griliches pointed out in his 1993 presidential address to the American Economic Association, the industrial composition of the economy has shifted to service activities that we are not well prepared to measure.¹⁶ And an increasing proportion of goods we do measure is changing more rapidly than in the past, adding to the measurement difficulties.

The clearest example lies in two major components of current consumption expenditures, medical care and personal business services, which are predominately measured by inputs rather than by outputs. Our official data estimate the output of doctors or insurance agents by the number of hours doctors and insurance agents work, rather than the success rate of treatment or number of insurance policies written.^{17,18} That is, our statistics assume produc-

¹⁵To see this, remember that the underlying arithmetic is being done in logs. The change in the log of real income from 1959 to 1974 is 0.375. We multiply this by the ratio between the percent changes, $0.375 \times (2.88/1.50) = 0.720$. The antilog of .720 is 2.05, suggesting that real per capita income in 1994 was 2.05 times real per capita income in 1974.

¹⁶Zvi Griliches, "Productivity, R&D, and the Data Constraint," *American Economic Review* 84 (March, 1994), pp. 1-23.

tivity growth in these areas is nonexistent. And these two categories of consumption alone have grown from about 11 percent of consumption expenses in 1959 to over 25 percent of consumption expenses in 1994, so the errors in measurement loom far larger.

IMPROVING U.S. ECONOMIC PERFORMANCE: A PROBLEM IN MEASUREMENT, DIAGNOSIS, AND PRESCRIPTION

We thus are confronted by two possibilities: One, our true economic performance has been quite good, but our measurement of that performance has been faulty. Two, our measures are right, and scientific and technological progress is not being translated into increased economic output. Is this difference important?

The data matter because political disagreements about what our problems are and how to fix them rest on statistics, as does our ability to evaluate the success or failure of our efforts to solve them. Programs that leave in their wake high inflation and low growth are clearly failures, while those that result in low inflation and high growth are successes. If the rate of increase in prices is overestimated, so that growth in output is understated, an economic policy that, in fact, has successfully generated high growth and low inflation will appear to

be a failure that has generated low growth and high inflation.

Here are some examples that show why knowing the correct measures of growth is critical to our understanding of the economy. Two other examples are discussed in *Output Mismeasurement in Health and Educational Services*.

Fostering Growth. If we accept the official data at face value and productivity is stagnating, future generations may be worse off. To be generous to those future generations, we may need to decrease constraints on economic growth and increase incentives to economic efficiency, even at the expense of equity in the present. Milton Friedman has argued that government regulations increased dramatically in the 1970s under Presidents Nixon and Carter, declined under President Reagan, and then rebounded to a new high under Presidents Bush and Clinton (Figure 2). If these regulations are associated with programs that have benefited the aged (for example, Medicare and Social Security) and the unfortunate (for example, the Americans with Disabilities Act and Medicaid) at the expense of economic efficiency, perhaps this generosity was misplaced, for, according to the official statistics, our ability to produce with fixed resources is on the verge of deterioration.

Another way to foster growth is to reduce government claims on resources, permitting greater private incentives. A sharp decline in government purchases and cutbacks in the federal safety net are already in progress.

On the other hand, if real output and inflation have been mismeasured, the apparent failure of current policies may be an artifact of bad statistics. Has free trade in the United States been costly? The apparent slow growth of the U.S. economy in the 1980s and 1990s has led some critics to argue that policies too generous to our trading partners have put us on a permanently slower growth path. But are we really on a slower growth path?

¹⁷Technically, the Bureau of Economic Analysis deflates the nominal revenues of these service providers by a weighted average of input prices. To the extent that any increase in productivity results in higher wages, it will not be measured as increased real output.

¹⁸The Bureau of Economic Analysis has recently changed the method it uses for deflating medical services. It now uses the Producer Price Index (PPI) for medical services, a series first collected in late 1992, to deflate that segment of personal consumption expenditures. This series measures the costs of treating a disease, a procedure that should be substantially closer to the right measure. However, this measure does not take into consideration improvements in quality of outcomes.

Output Mismeasurement in Health and Educational Services

Measurement problems also apply to policy issues within specific industries, such as health and education. Our efforts in these areas may suffer because we confuse inflation and technical progress.

Health Care in Crisis. We are experiencing a national crisis over health care expenses. This is no wonder: medical care now counts for one-sixth of our consumption. But because we do not measure the output of doctors, nurses, or pharmacists, but rather inputs, some people have the impression that medical providers are absorbing an increasing part of American income out of pure avarice. But what economic evidence there is suggests instead that medical costs are rising entirely because of technological advance — improvements in medical practices cause us to want to buy a lot more medical care.*

As surgery has become less invasive and recoveries more rapid and as the probability of success has risen, patients and doctors have chosen surgical intervention more often. Far more heart attack victims now choose to undergo bypasses and angioplasties because the survival rates are higher and recoveries quicker. Knee surgeries have proliferated as arthroscopic procedures have shortened recovery times to days rather than months. New, expensive drug combinations now offer hope to AIDS victims, when before their cases had been considered hopeless. Thus, the improvement in medical practices has widened demand and, in Cutler's analysis, is the main force that has driven the expansion of medical care.

The Rising Cost of College. A similar issue has been raised about education. Tuition costs at private colleges and universities, for example, have risen more rapidly than the price of medical care. Again, the increased value of the education is not being measured. Unquestionably, the totality of academic information has expanded substantially, as fundamental advances have been made in every physical and social science. As colleges and universities have more to teach, the value of education has risen. This value may be hard to measure precisely, but all available evidence suggests that the rate of return to a college education is increasing rather than falling.

Both of these cases are American success stories in which the producers are at the vanguard of worldwide scientific and technological achievement. But because our statistics treat these achievements as raising prices rather than increasing output, we risk mistaking our achievements and instead seek "reform" of health care and education.

*David Cutler, "Technology, Health Costs, and the NIH," Harvard, mimeo (September 1995).

To take another example, part of the sense of crisis about the U.S. economy is a fear that the Social Security system will be unable to support a rising burden of retirees. Part of this fear may be due to the fact that once a retiree enters the Social Security pool, payments rise with the Consumer Price Index. In theory, this permits retirees to keep up with inflation. But if the Consumer Price Index is overstated, as the

Boskin Commission has argued, retirees are enjoying rising real incomes. Indeed, average Social Security benefits have been rising faster than wages — virtually guaranteeing long-run instability.

Are We Saving and Investing Too Little? U.S. national income accounts are set up to measure investment in goods — plant and equipment — but not in information: research, edu-

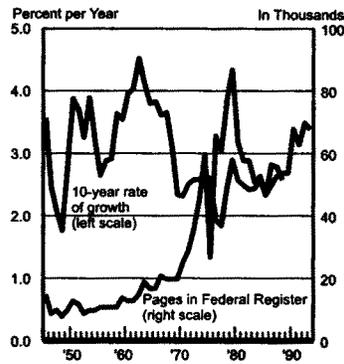
cation, computer software, data, and on-the-job experience. American investment in formal research and development efforts amounted to \$169 billion in 1994, and public and private expenditures on formal education (not counting the value of the time invested by students in acquiring education) were \$508 billion in 1994. These expenditures are roughly the same size as our investments in business structures (\$180 billion in 1994) and equipment (\$487 billion in 1994). Our gross investment rate is far larger than official data show if we consider these informational expenditures to be investments rather than costs of doing business (as our statistics currently treat research and development) or consumption expenditures (as they treat education).¹⁹ Moreover, at an individual level, categorizing our expenditures on education as investments rather than consumption would, by lowering measured consumption, boost savings rates as well, since savings is the difference between consumption and income. Measured personal savings in 1994 was less than \$200 billion, so that counting these additional investments in human capital as saving could make a substantial difference. Perhaps we are already saving and investing at unusually high rates! And fostering further saving and investment may not be so crucial after all.

This raises another paradox, however, because if we raise our estimates of capital stock, our estimates of total factor productivity would worsen. With more measured capital, the diagram in Figure 1 would show a clear long-term decline in our technological level. Only if real output growth is shown to be understated can we sensibly argue that investment is understated.

A more difficult, although related, problem

¹⁹In 1994, these information investments were about equal to investment in plant and equipment; in 1959, they were 78 percent as large as investment in plant and equipment and in 1974, 86 percent.

FIGURE 2
More Rules, Less Growth?



Note: Decadal rate of real growth of U.S. national income, and annual number of pages in Federal Register, 1946-93.

Source: Data courtesy of Milton Friedman. These data appeared in an article written by Dr. Friedman for the *Wall Street Journal*, August 1, 1995.

is the spreading inequality of incomes. In particular, college-educated workers are increasingly better paid than the less well educated.²⁰ This disparity is likely related to the rate of technological advance: those who have college educations are better equipped to learn the addi-

²⁰Lawrence F. Katz and Kevin M. Murphy investigate the changing supply and demand of college-educated workers in "Changes in Relative Wages, 1963-1987: Supply and Demand Factors," *Quarterly Journal of Economics* CVII February 1992, pp. 35-78. They find that demand for college-educated workers has been steadily rising, but supply has fluctuated, exceeding demand in the 1970s but falling behind in the 1980s.

tional skills necessary to keep up with a rapidly changing workplace. College graduates, for example, are far more likely than high school graduates to participate in continuing education courses in a given year (52 percent compared with 22 percent).²¹ Rapid technological advance and increased economic efficiency may directly exacerbate this inequality, for example, by increasing the return to education. Thus, reducing subsidies to students or spending on education may exacerbate future problems of inequality and deprive future generations rather than help them. It may also be inefficient to shift resources away from high-return investments in education to low-return investments in physical capital.

If we believe the economy is performing poorly, we may try to reduce educational subsidies because we believe that we cannot afford them. Doing so may reduce efficiency and equity if our belief is incorrect.

THE IMPORTANCE OF STATISTICAL INFORMATION

While the fact of statistical mismeasurement may be clear, estimates of the size of statistical mismeasurement differ widely. Estimating these statistics more precisely is crucial to our nation's ability to make effective policy. They

provide the yardsticks by which we measure our treatment of the poor, the rich, the elderly, the infirm, and students.

It is widely recognized that the official data underestimate growth and productivity.²² But the size of the error is unknown. We need further studies, detailed experimental series, and new means of collecting data to obtain better estimates of economic progress. The results of these studies would progressively be incorporated in our data series as the economy evolves.

To improve statistical measurements in the short run and possibly even in the long run, our statistical agencies would need more resources; the experimental collection of information aimed at improving our official statistics is expensive both in terms of economic expertise and electronic hardware and software. While it is true that electronics can improve the efficiency of data collection, the rapid rate of change in the economy means that properly collecting the data will become more and more difficult and will require increasing the amount of intellectual analysis that goes into data collection. But if our statistics are unable to keep up with new economic realities, it will be extremely difficult for government policies to be farsighted.

²¹Data are for 1990-91 and are taken from U.S. Bureau of the Census, *Statistical Abstract of the United States, 1995* (Berman, 1995), p. 194, which cites the U.S. National Center for Education Statistics, *Adult Education Profile for 1990-91*.

²²For example, W. Erwin Diewert, "Comment on CPI Biases," *Business Economics* (April 1996), and Matthew D. Shapiro and David W. Wilcox, "Causes and Consequences of Imperfections in the Consumer Price Index," NBER Working Paper No. 5590, May 1996.

Senator BROWNBACK. Good. And I do not mean to put you on the spot on anything at all, and if anybody is uncomfortable with any question, just say I am not interested or I do not feel like I can. But I do appreciate that comment and your thoughts.

Mr. Nye Stevens is the Director of Federal Management and Workforce Issues for the General Accounting Office. Mr. Stevens, thank you for joining us, and the mike is yours.

TESTIMONY OF L. NYE STEVENS, DIRECTOR, FEDERAL MANAGEMENT AND WORKFORCE ISSUES, GENERAL GOVERNMENT DIVISION, U.S. GENERAL ACCOUNTING OFFICE

Mr. STEVENS. Thank you, Mr. Chairman. I will give a very brief summary, if I may, and submit the statement for the record. It is based on a body of work that we have been doing on statistical issues in statistical agencies over the past 4 or 5 years, and the list of those products is at the end of my statement. We have applied those to four specific questions that you asked us in preparation for this hearing.

First, you asked for an assessment of the quality of statistical data that is produced by the agencies of the Federal statistical system, which is very extended. We believe that the Federal statistical agencies have done some things very well. In fact, we applied to the major agencies—BEA and Census and BLS among them—the principles for good professional standards by the National Academy of Sciences and found that generally they conform very well to those. The one area that raised some difficulty was that of data sharing, where there is a statutory restriction on them.

Nevertheless, it is also true that a number of studies of the Federal statistical system based on the assessments of government officials and users, like the two we have heard from today, do identify a number of concerns about the quality of statistical data. I think the view that Ms. Norwood and Mr. Barabba presented would have some people disagreeing with that in the statistical community. We note in particular that there are problems with the international transactions of the U.S. economy and the way they are measured. We would expect that probably there are criticisms in the area of investment and savings, and a number of other economic areas.

We are finding, as we get into how agencies are responding to the requirements of the Government Performance and Results Act, which was developed by this Committee, that the importance of data to measure the outcomes of their efforts is more important than ever. I should also point out that the economic statistics initiative, sometimes called the Boskin Initiative, identified 38 major problems with the collection and dissemination of statistics. We did a review of the implementation of those 4 years afterwards and found that only about half had had any implementation associated with them. The others still remained on the “to do” or “to be funded” block.

Finally, our current work on the decennial census reveals that there has been some deterioration in the quality of the data. There are many causes for that, of course, but we are worried enough to have put the conduct of the 2000 Census on GAO’s high-risk list just 6 weeks ago. So we do believe that there are major problems there.

You also asked us how the decentralized structure of the system affects these quality problems, and while our work does not really show the precise relationship between decentralization and quality, it does show that the decentralized nature of the system contributes largely to a number of other problems which may have quality implications, such as inefficiency, the lack of an ability to set priorities among the kinds of data that you collect, the burden of the collection on data providers and also the burden on users of having multiple resources for it, and restrictions on the exchange of data among statistical agencies. These all are contributors to quality problems and direct consequences of the decentralized nature of the system.

Some of the data quality problems that were identified by the Boskin Initiative, for example, have yet to be corrected because the corrective action involves steps by more than one agency, and in some cases we find that an agency would receive funding for its part of a corrective action and another agency involved in the same problem would not receive funding. The result was no real improvement in quality.

The lack of an effective mechanism for setting national priorities is also a problem. Each statistical agency has its own budget, its own trade-offs within the department where it finds itself. There is a similar dispersion of congressional attention to these agencies that results in an uneven quality of determination of what is most important. The burden on providers is another consequence, and this stems in large part, really, from the inability of statistical agencies to share data with one another because of legislated confidentiality restrictions.

You asked about the potential of consolidation to provide a more streamlined and effective system. Here we turned immediately to the Canadian system on which we have done a good deal of comparative work with our system. We did find a great deal more consolidation, and I would have to say a number of advantages from their consolidation that we do not have and that would potentially result in changes here. For example, the use of common data collection methods and development of more efficient survey designs, cost savings and reduced burden on data providers to be achieved through greater sharing of data, avoidance of duplication. I think Ms. Haver is certainly right, however, that if there were a consolidation that did not involve breaking down some of these barriers that now exist in data sharing, it would not do any good.

And then finally you asked whether the Census Bureau and the Bureau of Economic Analysis benefit from their present location within the Commerce Department. We have testified before the full Committee, in fact, on the legislation 2 years ago to dismantle the Commerce Department, and we described that Department then as essentially a holding company for a great many disparate programs, subject to almost constant organizational change over its 84-year history when it broke off from what was then the Department of Commerce and Labor. It has historically not been managed on the basis of any unifying mission or shared goals among its components. The components are overseen by a number of committees within Congress, none of which has jurisdiction over the entire Department.

I can say as an aside that, partly for that reason, GAO does not have a coherent overview of the Department as well because no committee in Congress has asked us to do a general management review there, for example.

It is also true that Commerce has decentralized its key administrative functions so that the major Commerce components have been granted the authority and the responsibility by Commerce for meeting most of their administrative requirements. They do this through a number of cross-servicing arrangements, but those are readily transferable. They get the money. They pay for services from Commerce, in some cases from other bureaus within Commerce. But they could also buy those from other agencies. The relative independence of the major components minimizes the disruption that would occur if one or more were broken off from Commerce, as has frequently happened in the past, and we note that neither the Census Bureau nor BEA is physically housed in the Commerce headquarters building.

We are not aware of any reasons that would prevent Census and BEA from performing their missions if they were not components of the Commerce Department. This is not, however, to say that the relationship is meaningless. It does have some implications. We, in fact, have, in our concern about the Census, called upon the administration to become more involved in the planning for the Census rather than leave it completely to the Bureau. Commerce officials have noted, for example, that the absence of regulatory programs in that Department is one positive argument for having it there, or at least the avoidance of some objections that might come from its being elsewhere.

It is also a fact that because Census and BEA are in Commerce they are competing for funding with functions as disparate as fisheries management and coastal zones, Weather Service, examination of patents and a whole host of unrelated functions, which have nothing to do with statistical data collection. But it is also true that another department would involve trade-offs, but just different kinds of trade-offs.

That is a brief summary of what we have done, Mr. Chairman, and I will respond to any questions you have.

[The prepared statement of Mr. Stevens follows:]

PREPARED STATEMENT OF L. NYE STEVENS

STATISTICAL AGENCIES: CONSOLIDATION AND QUALITY ISSUES

GAO's statement applies its considerable body of work on statistical issues to four questions the Subcommittee asked on data quality and the decentralized U.S. statistical system.

While the principal statistical agencies GAO has reviewed have generally adhered to applicable professional standards, there are reasons to be concerned about the quality of statistical data. Public and private sector experts have said that the current system needs a more coherent approach to measurement of investment, productivity, and services. Measurement problems, such as those concerning consumer prices, can affect budget and economic policymaking. GAO's work has also demonstrated a deterioration in the quality of the decennial census, which GAO designated as a high-risk area in February 1997.

Effects of the Decentralized Structure

Although GAO's work does not indicate the extent to which the decentralized structure is a major cause of the quality problems, it does show that the decen-

tralization contributes largely to other problems, such as inefficiency, the lack of national priorities for allocation of resources, burden on data users and providers, and restrictions on the exchange of data among statistical agencies. For example, in part because of the inability to share data, both Census and the Bureau of Labor Statistics have compiled and maintained their own lists of businesses.

Potential Effects of Consolidation

GAO has compared the dispersed U.S. system with Canada's centralized system. The head of Statistics Canada has a higher level position than that of the U.S. Chief Statistician, can set and change priorities and shift resources easily, has access to all of the government's administrative records, and can share survey data internally under strict and uniform privacy requirements. Potential disadvantages associated with consolidation would include possibly responsiveness to the needs of former parent departments and possible objections to the concentration of data in a single agency.

Benefits from Location in the Commerce Department

Commerce historically has not been managed on the basis of a unifying mission or shared goals and has decentralized its key administrative functions. While the Commerce relationship is not meaningless, GAO is not aware of any reasons that would prevent Census and the Bureau of Economic Analysis from performing their missions as part of another department

Mr. Chairman and Members of the Subcommittee: We are pleased to be here today to discuss the Federal statistical system. Over the years, we have developed a considerable body of work on statistical issues. The related products list that follows my statement contains our most recent products. As you requested, our testimony today brings this body of work to bear on four issues you asked us to address: (1) the quality of Federal statistics, (2) how the Federal statistical system's decentralized structure affects statistical quality, (3) whether consolidating the statistical functions currently housed in the Department of Commerce with those of other Federal agencies could provide a more streamlined and effective Federal statistical system, and (4) whether or not the Bureau of the Census and the Bureau of Economic Analysis benefit from being housed in the Department of Commerce.

Background

Statistical activities are dispersed throughout the Federal Government. The Office of Management and Budget (OMB) has identified 70 Federal agencies that each spend at least \$500,000 annually on statistical activities. Together, these agencies requested over \$2.75 billion for fiscal year 1997 for statistical activities. Of the 70 agencies, 11 are considered to be the principal statistical agencies because they collect, produce, and disseminate statistical information as their primary mission. These 11 agencies together spend approximately \$1.2 billion annually on statistical activities. Two Commerce agencies—the Bureau of the Census and the Bureau of Economic Analysis (BEA)—and the Department of Labor's Bureau of Labor Statistics (BLS) account for about \$825 million of this total.¹

The missions of the principal statistical agencies are to ensure that the statistical information they collect, produce, and disseminate is accurate, reliable, and free from political interference and impose the least possible burden on individuals, businesses, and others responding to requests for data. Most of the other agencies that produce and disseminate statistical data do so as an ancillary part of their missions.

Quality of Statistical Data

The principal statistical agencies have done many things well. For example, in August 1995, we reported that four statistical agencies we reviewed—Census, BEA, BLS, and the National Center for Health Statistics—generally adhered to applicable professional standards.² Nevertheless, a series of studies of the Federal statistical system, going back several decades, have identified concerns over the quality of statistical data. One of the concerns is that economic statistics have not kept pace with

¹The other eight principal statistical agencies are the National Center for Health Statistics (in the Department of Health and Human Services), Energy Information Administration (in the Department of Energy), National Agricultural Statistics Service and the Economic Research Service (both in the Department of Agriculture), Statistics of Income Division (in the Internal Revenue Service in the Department of the Treasury), Bureau of Justice Statistics (in the Department of Justice), the Bureau of Transportation Statistics (in the Department of Transportation), and the National Center for Education Statistics (in the Department of Education).

²*Statistical Agencies: Adherence to Guidelines and Coordination of Budgets* (GAO/GGD-95-65, Aug. 9, 1995).

changes in the economy. This has led some experts to question whether current statistics adequately reflect the importance of international transactions to the economy, or whether current productivity measures are adequate given the increase in importance of service industries. Experts who have worked in the Federal statistical system have also said that the current system needs to update its approach to measuring savings and investment. We are finding that agencies are devoting more attention than ever to the quality and coverage of statistical data series as they search for appropriate outcome-based performance measures in their efforts to comply with the Government Performance and Results Act that originated with this Committee.

In 1991, the Economic Statistics Initiative, which was led by Michael Boskin who chaired the Council of Economic Advisers under President Bush, made 38 recommendations to address well-known problems in economic statistics for which action was feasible in the near term. Among the recommended actions were (1) accelerating improvements in estimates of international trade in services, including financial services; (2) better measuring service sector production and prices; (3) separating quality and inflationary changes in prices; and (4) making it easier for statistical agencies to share data for statistical purposes. In reviewing the status of these recommendations, we found that only about half of the recommendations were funded and that the funding levels varied considerably among the different agencies producing economic statistics, thereby hampering improvement efforts.³

We reported in 1995 that measurement problems can affect budget and economic policymaking.⁴ In that report, we pointed out that many of the studies we reviewed indicated that technical problems associated with the development of the Consumer Price Index could cause it to overstate inflation. We also pointed out that measures of economic output and productivity failed to account for the increasing importance of the service sector to the nation's economy.

In February 1997, the Nation Association of Business Economists (NABE) reported that nearly 70 percent of its members who responded to its survey were dissatisfied with the scope and quality of economic data in the United States. NABE said that the current system does a better job of measuring manufacturing than it does of measuring services and the information technology aspects of the economy.

Our work has also demonstrated a deterioration in the quality of the decennial census, which provides a baseline for countless other statistical programs. The 1990 Census, though it was the most expensive in history, for the first time produced results that were less accurate than those of the preceding census.⁵ Almost 10 million persons were missed in that census, although the net effect of this was somewhat masked by the counting of about 6 million persons twice. These 16 million gross errors represent a minimum tally, since they do not include such errors as persons erroneously included or assigned to the wrong locations. In February 1997, we designated the 2000 Decennial Census as being at high risk of producing unsatisfactory results.⁶

How the Decentralized Structure of the Federal Statistical System Affects Statistical Quality

Over the years, a number of problems with the quality of statistical data have been associated with the organizational structure of the Federal statistical system. Although our work does not indicate the extent to which a decentralized structure is a major cause of the quality problems, it does indicate that not all of the quality problems that exist stem from the decentralized structure of the statistical system. For example, the deteriorating quality of decennial census data relates largely to limitations in the basic processes used to collect census data, not to the decentralized structure of the statistical system. On the other hand, our work as well as that of others has shown that the decentralized structure of the system contributes largely to other problems, such as inefficiency, the lack of national priorities for allocation of resources, burden on data users and providers, and restrictions on the exchange of data among statistical agencies.

Clearly, our decentralized statistical system has sometimes affected the quality of statistical data produced by the system. For example, in estimating the National Income and Product Accounts (NIPA), which includes the estimate of gross domestic product, BEA relies on data collected by other agencies. Frequently, those data are

³ *Economic Statistics: Status Report on the Initiative to Improve Economic Statistics* (GAO/GGD-95-98, July 7, 1995).

⁴ *Economic Statistics: Measurement Problems Can Affect the Budget and Economic Policy-making* (GAO/GGD-95-99, May 2, 1995).

⁵ *Decennial Census: 1990 Results Show Need for Fundamental Reform* (GAO/GGD-92-94, June 9, 1992).

⁶ *High-Risk Series* (GAO/HR-97-2, Feb. 1997).

collected for other purposes, and according to a BEA official, much of the data are not in the form that BEA needs to calculate NIPA. In some cases, gaps exist in the data, and these gaps, in turn, affect the NIPA estimates. As another example, some of the data quality problems that were identified by the Economic Statistics Initiative have yet to be corrected because the corrective action requires steps by more than one agency. In some cases, one agency received funding to correct its data problems, but another agency, which may contribute source data, did not get funds to address the issue.

Many experts have expressed concern about inefficiencies in the statistical system due to its decentralized structure. The experts often cite duplicative or overlapping data collection activities or system infrastructure, such as field structures; computer systems; or administrative, technical, and program personnel as sources of potential cost savings. Those who have studied the systems, however, often disagree on how much could be saved through consolidation. In this regard, we have noted that many agencies have used reimbursable agreements with other agencies, such as the Census Bureau, to handle their data collection activities, thereby avoiding having to establish and maintain their own systems and structure for these purposes.⁷ These types of arrangements would tend to limit the savings that could come from consolidation. Further, we are not aware of any savings estimates that have been verified by an independent party.

The lack of an effective mechanism for setting national priorities for the Federal statistical system has been another concern expressed over the years about the system's decentralized structure. Our work as well as work done by others has shown that the United States has lacked an effective apparatus for setting national priorities for use of the statistical agency resources. For example, in August 1995, we reported on limitations on OMB's ability to coordinate the budgets of statistical agencies.⁸ A number of factors contribute to the lack of clear national priorities for the U.S. statistical system. One of these factors is the nature of the budget formulation process, in which each statistical agency has its own budget which has been generally determined in the context of the competing needs and priorities of other components within its home agency or department, as opposed to the needs and priorities of the overall Federal statistical system. Another related factor is the dispersion of responsibility among multiple congressional committees and subcommittees for authorizing, funding, and overseeing the statistical agencies.

Another problem arising from decentralization is the increased burden on data providers as a result of duplicative data collection efforts. For example, Janet Norwood, a former Commissioner of Labor Statistics, has identified surveys that she believes could be consolidated. She believes that the consolidation of such surveys would reduce cost as well as burden to survey respondents while improving the possibility for integrating the data collected. At least to some extent, overlap in the types of information asked for in surveys has occurred because of the decentralized structure of the statistical system.

Another related factor that contributes to the overlap problem is the inability of statistical agencies to share data with one another because of legislated confidentiality restrictions. Federal statistical agencies generally operate under a number of laws, policies, or regulations that govern the collection, use, and confidentiality of the statistical information for which these agencies are responsible. Some of these laws, policies, and regulations apply only to a specific agency. The legal framework for the Federal statistical system also limits the extent of data sharing among agencies because statutes exist to protect the confidentiality of data providers and, in many instances, allow only the agency collecting the data to have access to them. For example, in part because of the inability to share data, both Census and BLS have compiled and maintained their own lists of businesses.

Potential of Consolidation to Provide a More Streamlined and Effective System

You asked whether consolidating the statistical functions currently housed in the Department of Commerce with those of other agencies could provide a more streamlined and effective Federal statistical system. To respond to your question, we drew on our work comparing the decentralized U.S. system with Canada's centralized system. The Canadian statistical system is often used as a reference point for considering proposed consolidations in the United States and is highly regarded in the international statistics community. However, there are some differences between the United States and Canada that need to be considered when making such a compari-

⁷ *Federal Statistics: Principal Statistical Agencies' Missions and Funding* (GAO/GGD-96-107, July 1, 1996).

⁸ *Statistical Agencies: Adherence to Guidelines and Coordination of Budgets* GAO/GGD-95-65, Aug. 9, 1995.

son. Also, there may be disadvantages associated with a consolidation, and there are alternative approaches to making the system more streamlined and effective.

A consolidated agency could help streamline and improve effectiveness in a number of ways. For example, better quality data could be achieved by bringing together the expertise needed to address important issues, such as the use of common data collection methods and more efficient survey designs, so that data that are produced are based on similar concepts, time periods, and classification structures. Cost savings and reduced burden on data providers may be achieved through a greater sharing of data and agency resources in a consolidated agency, thereby avoiding duplication and enabling greater integration. Consolidation could also resolve the issue of setting national priorities and achieving greater coordination for the system to the extent that a head of the proposed consolidated agency would be able to set priorities for the use of its funds and require its components to cooperate with one another.

Our August 1996 report comparing the Canadian statistical system with the U.S. system offers some insights on consolidation.⁹ While we did not evaluate the effectiveness of the Canadian system, we did identify several clear differences between the Canadian and U.S. systems in our review. The Canadian system is much more centralized, with Statistics Canada containing many of the activities currently divided among the principal U.S. statistical agencies and being responsible for the majority of the government's statistical information. The head of Statistics Canada has a higher level position than that of the U.S. Chief Statistician, has direct control over the agency's budget request, and can set and change priorities and shift resources easily. Statistics Canada also (1) has access to all of the government's administrative records, (2) can share survey and other data among its components and other government agencies and nongovernmental organizations, (3) has consolidated technical and administrative support functions, and (4) is subject to strict and uniform privacy requirements. According to Statistics Canada officials, these privacy requirements also help cure a high voluntary response rate to data collection efforts.

While Canada's centralized system may appear to offer several advantages over the U.S. system, several factors need to be considered as part of the comparison. Canada's parliamentary system of government may lead to a clearer definition of government policy and priorities and the ensuing needs for statistical information than our system, which institutionalizes tension between different branches of government. The United States is a much larger nation and has a larger and more complex economy than Canada. Also, the Canadian statistical system is much smaller than the U.S. system. For example, the fiscal year 1997 budget for Statistics Canada was about \$246 million (in U.S. dollars) compared with the nearly \$1.2 billion budget for the U.S. principal statistical agencies. Finally, the Canadian public has accepted that a government agency will have broad access to all government records for statistical purposes.

On the other hand, disadvantages may also be associated with a consolidation. For example, the consolidated agencies could be less responsive to the needs of their parent departments from which they came and their constituencies. Another potential disadvantage is the potential for abuse, such as breaches of confidentiality, that could occur when so much information about individuals and businesses is concentrated in one agency. Finally, some of the benefits expected from consolidation are unlikely to materialize unless the components of the consolidated statistical agency are authorized to share data and if legislative responsibility for the consolidated agency continues to be dispersed among multiple congressional committees. In addition, the extent to which benefits of a consolidation could be realized would depend on how comprehensive the consolidation is. If significant statistical activities remain outside the consolidated agency, some of the problems of inefficiency and priority setting in the statistical system could persist.

Given the potential drawbacks of consolidation, the Subcommittee may also want to consider alternative approaches for improving statistical data collection and analysis. One option would be to consider alternatives to the dominant paradigm of having Federal employees collect, analyze, and disseminate information through the use of appropriated funds. Alternatives might be privatizing at least some aspects of data collection, analysis, or dissemination; additional contracting out; or the imposition of user fees. We have not explored such alternatives for the Federal statistical system and are therefore not in a position to elaborate on them.

Concerning data sharing, one step could entail enacting legislation that allows statistical agencies to share data and information with appropriate safeguards to protect against breaches of confidentiality. Proposals to enable greater data sharing

⁹ *Statistical Agencies: A Comparison of the U.S. and Canadian Statistical Systems* (GAO/ GGD-96-142, Aug. 1, 1996).

among statistical agencies have been made in the past; both the Economic Statistics initiative under President Bush and the National Performance Review under President Clinton have recommended such actions. These proposals were not adopted, in part because of general concerns that greater data sharing might endanger the privacy of individuals. In 1996, OMB and the Department of the Treasury sent to Congress proposed legislation that would permit limited sharing of data among designated statistical agencies for statistical purposes subject to procedural safeguards contained in the proposals. Although Congress did not enact the legislative proposals, OMB officials have told us that the administration plans to submit these data sharing proposals in 1997. We as well as others who have studied or are knowledgeable about the Federal statistical system believe that the inability of statistical agencies to share data is one of the most significant issues facing the statistical system and one of the major factors affecting the quality of data, the efficiency of the system, and the amount of burden placed on those who provide information to the agencies. Since 1979, we have recommended changes to existing statutes that would enable statistical agencies to share data.¹⁰

Another approach to improve the current system would be to strengthen OMB's ability to set priorities for use of the agencies' funds and provide mechanisms that would enable agencies more easily to shift resources, including staff. The appropriations process constrains OMB's ability to independently make such resource shifts, and we, as well as others, have reported on limitations on OMB's ability to set priorities for allocation of funding among statistical agencies.¹¹ In recognition of this concern, OMB launched an initiative during preparation of the administration's fiscal year 1998 budget in which some priorities were set for statistical agency funding. The effect of OMB's efforts, however, will not be known until after Congress completes the appropriations process.

Greater coordination among statistical agencies is another way to improve their effectiveness and streamline operations. In this regard, it should be noted that some consolidation already has taken place and additional efforts are underway. For example, statistical agencies have already acted to reduce duplication and inefficiency by collection information for one another. An illustration of this is the decennial census long form questionnaire. Ten of the principal statistical agencies and many other Federal agencies use information collected through the form as source of data for their own statistical activities. We reported in July 1996 that if agencies had to collect or arrange for the collection of these data on their own the total cost would exceed the cost of having Census collect these data.¹²

OMB also has a number of coordinative efforts under way through the Inter-agency Statistical Policy Council, which OMB chairs. The council consists of the heads of the principal statistical agencies as well as representatives from the National Science Foundation and the Social Security Administration, and exists to foster greater coordination among statistical agencies. One such effort has been the development of the "one-stop shopping" service for users of Federal statistical data. This effort entails establishing an electronic link to all Federal statistical agencies through the Internet. OMB plans to have this service fully operational in 1997. With this system, a user should be able to go to one source that will identify the types of data available and will electronically link the user to the data maintained by the appropriate agency. Although OMB's coordination efforts appear promising, it is unclear at this point how effective they will be in resolving problems that result from the decentralized structure of the system.

Do the Census Bureau and the Bureau of Economic Analysis Benefit From Location in the Commerce Department?

In testimony before the full Governmental Affairs Committee on July 25, 1995,¹³ we described the Commerce Department as essentially a holding company for many disparate programs, and subject to almost constant organizational changes in its 84-year history. Because of the wide diversity of its functions, Commerce historically has not been managed on the basis of a unifying mission or shared goals. Its components are overseen and authorized by several committees in Congress, none of which has jurisdiction over the entire department. Within Commerce, Census and BEA to-

¹⁰ *After Six Years, Legal Obstacles Continue to Restrict Government Use of the Standard Statistical Establishment List* (GAO/GGD-79-17, May 25, 1979).

¹¹ *Statistical Agencies: Adherence to Guidelines and Coordination of Budgets* (GAO/GGD-95-65, Aug. 9, 1995).

¹² *Federal Statistics: Principal Statistical Agencies' Missions and Funding* (GAO/GGD-96-107, July 1, 1996).

¹³ *Government Reorganization: Observations on the Department of Commerce* (GAO/T-GGD/RCEC/AIMD-95-248, July 25, 1995).

gether account for less than 10.5 percent of departmental obligations and less than 20 percent of departmental staff.

Commerce has decentralized its key administrative functions. Major Commerce components—including the National Oceanic and Atmospheric Administration, the Patent and Trademark Office, and the Economics and Statistics Administration which comprises both Census and BEA—have been granted the authority and responsibility by Commerce for meeting most of their own administrative needs. Thus, Commerce headquarters provides some services but primarily sets policy and provides overall direction and oversight. In some cases, the major components pay for the services provided by headquarters through a working capital fund. Census and BEA receive their legal services this way, for instance. In addition, BEA purchases most of its administrative services from other components of Commerce through a series of cross-servicing arrangements. Commerce's decentralized approach to providing administrative services is a result of its response to significant budget reductions that occurred in the early 1980s. The relative independence of the major components minimizes the disruption that would occur if one or more were separated in a reorganization. Neither the Census Bureau nor BEA is physically housed in the Commerce headquarters building.

We are not aware of any reasons that would prevent Census and BEA from performing their missions if they were not components of the Commerce Department. This is not to say, however, that the Commerce relationship is meaningless. In fact, Commerce officials have argued that the absence of regulatory programs within the department has been a factor in preserving the reputation for independence of its two statistical agencies. Because they are located in Commerce, Census and BEA must compete for attention and resources with other functions of that department, functions as disparate as weather service modernization, fisheries preservation, technological innovation, and trade sponsorship.

The department's superior stature, resources, and access to the highest policy levels within the administration have at times been of value to Census and BEA; for example, our high-risk report on the 2000 Census recognized that the Bureau itself was not capable of securing all the stakeholder decisions it needs to proceed with plans, tests, and commitments, and that attention from the administration was needed. The value of attachment to a Cabinet-level department to promote an agency's interests at the highest policy-making levels is well established in organizational theory and practice. Statistics Canada, for example, takes pride in its independence but it is, nevertheless, a component of the Department of Industry Canada. Granting the value of departmental affiliation, it does not necessarily follow that the Commerce Department is the only organization to provide it.

Mr. Chairman, that concludes my prepared statement. I would be pleased to respond to questions on it or on aspects of our statistical policy work that I have not covered.

Senator BROWNBACK. Good. Thank you, Mr. Stevens. I appreciate that.

Ms. Haver and Mr. Stevens, you both agree in commenting that we need a common form for companies to fill out. That is at least a minimal, least burdensome way to go on this. Mr. Stevens, you talk about the Canadian system as having significant advantages. Now, you say that based upon studying the Canadian system?

Mr. STEVENS. Yes, we have done a report that compares it with our decentralized system. We spent a good deal of time in Canada and compared the funding mechanisms, their oversight, their confidentiality provisions, six or eight different facets.

Senator BROWNBACK. And you are confident of that system being better organized than the U.S. statistical gathering system?

Mr. STEVENS. Better organized, I would say yes. But we also noted there are a number of differences between Canada and the United States. We have a much more complex economy and statistical system. It is more expensive. And we have a different political structure that is probably not as comfortable with having large amounts of data and data collection capabilities in one centralized place. So there are some differences.

Senator BROWNBACk. But let me ask you about that last statement. Why shouldn't this political system be comfortable with having numbers in one place? If we are confident with the accuracy of the numbers, why would we be discomforted by them being at one place or many?

Mr. STEVENS. I do not have a reason for that. It is a matter of values, and I think that is a value that our political system has put up against the data collection system. The Internal Revenue Service, for example, has got an awful lot of good data, but there are a lot of suspicions about it among Americans as to what it does with it and what controls should be imposed upon it. It is not an area without controversy.

Senator BROWNBACk. So as a professional, you have no problem, and you would think if people look at this as professional, they would have no problem with consolidation of numbers coming from one point.

Mr. STEVENS. No, professionally, not at all, and the Canadians pull it off without any controversy at all, I believe.

Senator BROWNBACk. Ms. Haver, what about you? How do you look at that as a private professional?

Ms. HAVER. Well, actually, my company uses a great deal of Canadian data. We find their standards are very high, and essentially their programs are very impressive.

From the point of view of one place for our data, I think if that place is one that is not in an organization that has regulators, most companies would be much more comfortable with it than having it as it is right now in the Department of Labor, for example, with BLS. But I do not think the whole issue is as important as I hear government people telling me it is, very frankly.

Senator BROWNBACk. That BLS collects the numbers and also regulates?

Ms. HAVER. Well, BLS does not regulate. They—

Senator BROWNBACk. But I mean the Labor Department regulates.

Ms. HAVER. Right.

Senator BROWNBACk. Are companies deeply concerned about that?

Ms. HAVER. I personally—I run a company, and I am not concerned about that at all, and I think most—at least small businesses actually do not know the difference between BLS, Census, or BEA, very frankly.

Senator BROWNBACk. And they really do not care. It is just somebody hassling them for numbers. I mean, we used to have that problem when I ran the Agriculture Department on the State level. People are tired of giving you information all the time. They do not get much of anything out of it that they see specifically. I mean, they get the general number, but—

Ms. HAVER. Well, I think a lot of businesses use these numbers, and they are very valuable. But it is true the people that use them and the people that give them are often not one and the same.

I also believe—and this is just my ideal—that if we had a consolidated agency, we could start looking at all of these surveys we do of companies and figure out what we need. We could say to companies: Here it is, can you provide this and you program your com-

puters to produce this form, we are not going to change it for 5 years. Because once that is done and it just comes out of your system, it is not as troublesome as getting a form where you are supposed to write these things down. And companies still do get such forms.

Senator BROWNBACK. Good. I thank you all very much. Did anybody have anything else to add?

[No response.]

Thank you all very much. I appreciate this. If you have any additional thoughts, please feel free to send them on in to us.

Without further ado, we are adjourned.

[Whereupon, at 3:17 p.m., the Subcommittee was adjourned.]

