S. HRG. 105–97

THE EMPLOYMENT SITUATION: MAY 1997 AND THE CONSUMER PRICE INDEX

HEARING

before the

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

ONE HUNDRED FIFTH CONGRESS

FIRST SESSION

June 6, 1997

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON: 1997

42-495 cc

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-055704-6

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[Created pursuant to Sec. 5(a) of Public Law 304, 79th Congress]

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THE EMPLOYMENT SITUATION: MAY 1997 AND THE CONSUMER PRICE INDEX

Friday, June 6, 1997

CONGRESS OF THE UNITED STATES,
JOINT ECONOMIC COMMITTEE,
WASHINGTON, D.C.

The Committee met, pursuant to notice, at 9:30 a.m., in Room 1334, Longworth House Office Building, the Honorable Jim Saxton, Chairman, of the Committee, presiding.

Present: Representatives Saxton, Stark, Hinchey, and Ewing.

Staff Present: Chris Frenze, Mary Hewitt, Juanita Morgan, Roni Singleton, Brenda Janowiak, Howard Rosen, and John Blair.

OPENING STATEMENT OF REPRESENTATIVE JIM SAXTON, CHAIRMAN

Representative Saxton. Good morning. Once again, it is a pleasure to welcome Commissioner Abraham before our first Friday meeting of the Joint Economic Committee.

Let me begin by thanking the Commissioner for the Bureau of Labor Statistics (BLS) study of the issues raised by the Boskin report, which is being released today. We appreciate very much the fact that you have done this and also in such a timely fashion, which obviously was of importance to us for legislative reasons.

As I have stated before, the Bureau of Labor Statistics is one of the finest statistical agencies in the world, and this study makes an important contribution to our understanding of the measurement issues related to the Consumer Price Index. In exploring these very difficult issues, the BLS study confirms the central role of quality change as it relates to this controversy, and we very much appreciate the insights provided to us by way of this study.

Employment data released today shows that the current business cycle upturn continues to generate job gains. According to the payroll

survey, 138,000 jobs were created in May and the April gain was revised upward to 323,000. Manufacturing continued to decline, and the household survey indicates that the employment rose by 255,000 last month.

The civilian unemployment rate, which had fallen to 4.9 percent in the previous month, stood at 4.8 percent in May, a slight decrease. The employment-population ratio, an important measure of the economy's ability to create sufficient jobs, climbed to 63.9 percent, a record high. The main soft spot is that other BLS data indicate that the earnings of middle-income Americans continue to stagnate.

The bottom line is that the sustained cyclical expansion continues to generate economic and employment growth. Let's give credit where credit is due: the workers, entrepreneurs, and farmers across the country whose efforts have expanded the economy, deserve a great deal of credit. To the extent that Federal policy has played a role, the anti-inflationary policies of the Federal Reserve have sustained the expansion by keeping inflation and interest rates low, laying a solid foundation for continued economic growth and lower unemployment rates. The notion that low inflation leads to high unemployment is contradicted by the experience of the last three decades.

In recent months, there has been much scrutiny of the labor market data for clues about the implications for future Fed policy. Our research here at the Joint Economic Committee indicates that while labor market data have important uses, they are not reliable guides of current or future inflation. The Joint Economic Committee research finds that price measures such as, the Consumer Price Index, and forward-looking indicators such as, commodity prices, the value of the dollar, and bond yields are more reliable indicators of inflation. According to these price measures, there is no real evidence that current or future inflation is a danger. The good news is that the economy is growing at a healthy pace, unemployment remains low, and inflation is in check.

Let me turn now to my friend, Mr. Stark, for any comments he may have.

[The prepared statement of Mr. Saxton appears in the Submissions for the Record.]

OPENING STATEMENT OF REPRESENTATIVE FORTNEY PETE STARK

Representative Stark. Thank you, Mr. Chairman.

I have been sitting here thinking, how we could take credit for the good news? I figured if I gave you credit for the good weather, you would give me and the Democrats credit for the good news.

Representative Saxton. Why not?

Representative Stark. I also join in welcoming Commissioner Abraham to these monthly sessions and complimenting her on the distinguished and professional way that she has dealt with the press and a variety of conflicting pressures on how we are going to change a whole lot of statistical studies, including my own. And I may get to that later, and just to welcome you back, I look forward to having you interpret for us and the country what the April figures mean.

Thank you very much.

Representative Saxton. Maurice?

OPENING STATEMENT OF REPRESENTATIVE MAURICE D. HINCHEY

Representative Hinchey. Thank you very much, Mr. Chairman. It is a pleasure to be with you again at these important meetings.

And, welcome, Commissioner, and your staff. Thank you for joining us, and we very much appreciate your bringing us up to date on a periodic basis like this on these very important figures.

We are, as the Chairman is, very heartened by the good news you have to impart to us this morning. It is quite clear that the unemployment rate continues to be low. It is lower even this month than last, and last month was the lowest, I think you told us, in almost 24 years. That is, of course, very, very good news.

We, of course, believe that a large part of the reason for this continuing low rate of unemployment that continues, in fact, to decline is due largely because of the fact that the Federal budget deficit has been brought substantially under control. Whereas the Federal budget deficit just four years ago or five years ago was about 5 percent of gross national

product, today the annual budget deficit is less than 1 percent of gross national product.

We attribute that, of course, largely to the budget resolution of 1993 which attacked the deficit very aggressively, and I think most objective observers understand and have pointed out that the decline of the deficit is largely due to that budget resolution of 1993, which had a healthy mix of increased taxes and lower spending and that resulted in the decline of the budget deficit, which we believe results in the good economic news we have been receiving over the course of these many months now.

Representative Hinchey. We also believe that the economic news could have been even better if the Federal Reserve had not raised interest rates so dramatically back in 1994. We paid very close attention to the Federal Reserve, and we are heartened that the Fed chose not to jack up interest rates at the recent meeting, and we are hopeful when they meet later this month, I believe, they will also be similarly constrained and will not move to increase interest rates. If they do so, that, we fear, will dampen the improvements that we continue to see in the unemployment rate and the economy generally.

So, Ms. Abraham, we are very grateful to you for bringing us up to date on these figures and we are happy to see you again.

Representative Saxton. Thank you very much.

Commissioner, why don't you proceed to outline the situation as you see it, with regard to employment numbers.

STATEMENT OF THE HONORABLE KATHARINE G. ABRAHAM, COMMISSIONER, BUREAU OF LABOR STATISTICS

ACCOMPANIED BY KENNETH V. DALTON, ASSOCIATE COMMISSIONER FOR PRICES AND LIVING CONDITIONS; AND PHIL RONES, ASSISTANT COMMISSIONER OF CURRENT EMPLOYMENT ANALYSIS

Ms. Abraham. Thank you, Mr. Chairman, Mr. Stark, Mr. Hinchey. I, as always, appreciate the opportunity to be here to comment on the labor market data we have to release.

Nonfarm payroll employment, as you noted, rose in May and the unemployment rate was about unchanged following a drop in April. At

4.8 percent, the jobless rate is half a percentage point lower than at the end of 1996. Payroll employment increased by 138,000 in May and has averaged 229,000 per month gains thus far this year.

Employment in the services industry rose by 125,000. Amusement and recreation services added 32,000 jobs after showing little change in the prior two months. Hotel employment increased by 13,000 following a gain of similar magnitude in April. Job growth also continued in health services, computer and data processing services, and engineering and management services. Help supply services, the largest component of which is temporary help agencies, lost jobs for a second month, with a combined loss over two months of 55,000.

In construction, employment rose by 23,000 in May following a decline in April. The uneven month-to-month construction movements this winter and spring have reflected the unusual weather conditions over the period. Taking a slightly longer term perspective, the number of construction jobs increased by 101,000 during the first five months of 1997, somewhat less than the gain for the same period in 1996.

In May, employment growth continued in trucking, air transportation, finance, real estate, and the durable goods component of wholesale trade. In retail trade, employment held steady following a substantial increase in April. The number of factory jobs was about unchanged for the second month in a row. Employment continued to increase in electronic components, industrial machinery, and aircraft manufacturing. These gains were offset by a continued decline in apparel and an over-the-month drop in food products manufacturing. Auto employment was down in May due to a strike. Manufacturing hours and overtime edged down in May, but at 42 and 4.8 hours, respectively, both measures remain near historically high levels.

Average hourly earnings increased four cents in May following a gain of one cent in April. Over the year, hourly earnings rose 3.8 percent. The over-the-year gains during the first five months of this year have been running higher than during the same period in 1996.

In accordance with standard practice, I might note, these payroll survey figures reflect the incorporation of our regularly scheduled annual benchmark adjustments. Each year we adjust our sample survey

estimates to the full universe counts of employment derived principally from State unemployment insurance tax records. The impact of the revisions on employment in the March 1996 reference month is a very small upward adjustment of 57,000.

Estimates of payroll employment for the post-benchmark period, April 1996 forward, also have been revised to incorporate the new benchmark levels as well as revised seasonal adjustment and bias factors. The net effects of these post-benchmark revisions also were small.

Turning to the data from our survey of households, the unemployment rate was 4.8 percent in April, a level last reached in 1973. Over the month, the jobless rate decreased for adult men. The rates for adults of both sexes have edged down in recent months. The number of those unemployed for 27 weeks or more also has trended downward since the beginning of the year. Since the end of 1995, employment, as measured by our household survey, has increased by 4.3 million.

Some analysts have wondered how such a substantial increase in employment could have occurred during a period when unemployment already was low. Even with the current high level of labor force participation, however, there are still more than 66 million people age 16 and older who are not working or actively seeking work. Although our household survey tries to measure whether these people want a job, changes in labor market conditions may cause people who previously had expressed no desire to work to seek employment or to take a job.

For example, a retired person might have no interest in finding a job until he or she notices a "help wanted" sign in a local store and realizes that conveniently located employment can be obtained. In other words, the size of the available labor force is not fixed but, rather, depends upon individual decisions based on personal and economic conditions that are constantly evolving.

To summarize, unemployment remained below 5 percent in May and payroll employment growth continued, although the increase for the month was smaller than the average thus far in 1997.

My colleagues and I, of course, will be happy to address any questions you might wish to raise.

[The prepared statement of Commissioner Abraham and accompanying press release appear in the Submissions for the Record.]

Representative Saxton. Thank you, Commissioner.

Mr. Stark, would you like to be the lead-off questioner, this morning?

Representative Stark. Mr. Chairman, I will be happy to.

Based on the data of this morning, Commissioner, can you provide some further background concerning the low unemployment rate and what might be the principal factors leading to it? Is it demographic factors? Cyclical? Long-term structural changes? Let me just start with a little more expansion, if you can, on the underlying causes for this.

Ms. Abraham. Well, it is hard for me, I guess, to speak to what the underlying causes of this low rate might be.

Representative Stark. You can tell me it is just a kind of a continuation of a trend.

Ms. Abraham. Okay. If you were making a comparison between the situation today and the situation in the late seventies, there are fewer young people in the labor force than there were as of the mid-1970s, and that might have contributed somewhat to unemployment generally today being lower than it would have been at that period. But as for the 4.8 percent this month, I don't have a good explanation to offer in terms of structural changes.

Do you have anything that you would add to that, Phil?

Mr. Rones. No.

Representative Stark. With the Chairman's indulgence, I want to touch on something that is not completely as relevant to the hearing, but I was going to ask you about some trends in part-time and temporary work and ask what has happened in that area, and I was going to ask you about firms having trouble getting new workers.

The Stark measure of that is, walking through the New Park Mall in Hayward, California, and Annapolis Mall and Pentagon City Mall and seeing how many "workers wanted" signs end up in The Gap or how many banners are in front of McDonald's is how I measure that, but I think you might have a more accurate measure, and the question of

whether you calculate unemployment rates according to occupations and skills.

I think what is behind all this is, we have been attempting to make changes, actually on a somewhat bipartisan basis, to a welfare-to-work law that was passed last year. There is some discussion about how many jobs are out there. This is where I would like to focus those other three questions.

How many jobs, or can we tell – get an approximation – how many jobs are available at the lowest end of the skill level or for completely unskilled workers, and I suppose that – I don't want to defame any of my constituents by suggesting that school crossing guards or flag people on construction are less skilled than perhaps other jobs, but can you help us in terms of what kind of information might be available? If we have one million people who have to go to work or lose their welfare benefits but we know that there is only a half a million jobs out there, we can identify the size of a problem we might be shifting to the states.

On the other hand, if there are two million jobs out there, then our efforts ought to be to train these people or find the help for the social workers to get the one million people face to face with the two million jobs.

But we are not sure of the size of our market, as it were, and I wonder if the Chairman will indulge that question: What help you could give us?

We were going to have an amendment that asked you to do that, and I was led to believe somebody felt that wouldn't be a good amendment because somebody felt it would be too expensive to get the details. Maybe you could enlighten me this morning.

Ms. Abraham. Maybe I could sort of try to address this in two ways. What we have information on is what has happened to employment in the past up to the present point in time. So we have information on the distribution of net additions to the stock of jobs by industry, net additions by occupation, and we have added jobs along the industry dimension, principally in service-producing industries rather than in manufacturing or construction, and I can provide you with

additional details on where that has occurred. I don't know that you really want me to go through and read this table to you.

Representative Stark. I just want to know what we can do in kind of a generic sense.

Ms. Abraham. All right. That is information we can provide. We have tables on where employment has been added, and although it is true that increasingly net additions to employment are in occupations that require relatively high levels of education, it also is true that the largest additions continue to be in occupations that don't require a lot of education. So we are shifting towards a more educated occupational distribution, if you will, but it remains true that we are adding more jobs that don't require a lot of education.

We have information on what is happened to part-time employment, information on what has happened to employment in help supply services, so we can give you that sort of thing. But that is all what the economy has been doing. I think that that would be illuminating.

What we don't have is information on the kinds of jobs that employers are trying to fill and on the success that they have been experiencing in doing that.

At several points of time in the past, the Bureau of Labor Statistics has been funded to collect information on job vacancies on a pilot basis. There was interest in this in the sixties, there was a pilot that was done in the seventies, there was a pilot that was done in the late 1980s, and the conclusion in each case is yes, it would be possible to collect information on job vacancies, but it is not something we have done on an ongoing basis, so we don't have that information to give you. Developing it would require starting a whole new data collection program.

I would add to that that I think the question that you are asking really gets beyond data and into a whole set of behavioral questions. Even if we had information on job vacancies, which I personally think would be useful and valuable, those data are not going to tell you how employers' hiring behavior is likely to change when the labor market conditions they face change. So it will tell you what positions they are recruiting to fill

now, not necessarily what positions they might be willing to try to fill if people to put in them were available.

Representative Stark. How about to this level? And I was just thinking, if we had broad categories of vacancies, service, part-time service jobs, which one might suspect are retail, warehouse, fast food, whatever, and one might suspect it is in that arena, and/or government, if you keep that as a statistic, because it may be that various government entities are going to have to provide these jobs as a work fare, sort of job of last resort. That is anticipated in the Act.

And it also might be that certain states are going to have more problems than others. We don't know that yet. In other words, it could be that New Jersey just doesn't have any job openings and Texas has a lot of them, or vice versa. That would be useful as we design how we are going to assist in implementing this new bill.

The governors are very interested in it, because they are flocking around us with more attention than I ever remember getting from governors in a long time, because they are going to be responsible for more of this, either our failure or indeed the solution.

We tried to quantify it, and perhaps even think about putting some money at your disposal to do this, but I would just ask, at a later date – I think you understand our interest in data – if you could anticipate for us – and I assure you that we would not ask you to do this without the necessary funding – an area that might be useful.

Now, I can remember President Reagan used to have the want ads in there when we would go to the White House, and he would say, look, I just read – I didn't have the temerity to suggest to the President that that wasn't a statistically very solid way for us to base legislation.

I would be much happier if you could tell us where, to the most limiting, whether you could tell us by state, MSAs would be even better, maybe it is just the broadest categories, and that would at least give us a sense of how we might proceed, or whether we have to make any changes. I will end at that. But it would be useful, I think, to all of us who have to wrestle with this. Everyone wants to resolve that. My Republican colleagues are as anxious to see, not only are the jobs

available, can we get people into them, but then we aren't sure about how many are out there, and debating about things we don't know is far less helpful.

So I will end there and ask you to submit to the Chairman a copy of areas where this might be helpful, and I appreciate the Chair's indulgence.

Ms. Abraham. Perhaps what I could do is have a paper prepared that summarizes what we know about the kinds of jobs that we have been adding, both looking across occupation and industry and, to the extent we have information, information by state, though that will be more limited, and then some comments about the sorts of things we don't know and what we would need to do to collect the data.

Representative Stark. That would be wonderful.

Thank you, Mr. Chairman.

Representative Saxton. Mr. Hinchey.

Representative Hinchey. Commissioner, I was struck by the figure of 66 million Americans above the age of 16 – more than 66 million who are not working or actively seeking work. I would assume that some portion of that would include full-time students and, of course, people who are retired.

Ms. Abraham. Right. Correct.

Representative Hinchey. Could we have a breakdown of that, please, as to what percentage or what number of that 66 million are full-time students and what percentage are retired people?

Ms. Abraham. That is something that we can easily provide you but not something I have with me.

Representative Hinchey. Yes, I didn't anticipate that you would, but I would appreciate just seeing that breakdown.

There was a story recently about employers paying bonuses, substantial bonuses, 30 percent or more, for new employees. And that indicates some shortages of particular areas of the work force, particular skills perhaps. Do you have any indication as to shortages in particular skills or difficulty that employers are having in hiring people in particular areas with particular expertise or particular education backgrounds?

Ms. Abraham. That, unfortunately, is not something we ask employers about directly. Again, if we were on an ongoing basis collecting information from them about job vacancies, we would, along with that, be getting information about kinds of jobs they were having trouble filling. But that is not something that we collect. I don't know if there is anything showing up in the geographic information on wage increases that would be illuminating. There is nothing that I recall having seen on that.

Mr. Rones. I think on this particular question, we are all doing analysis by anecdote. I think we see reports in the paper about particular firms. I have read where some temporary help firms have had a hard time at tracking people in this very tight job market. We see those "help wanted" signs out that say "help wanted," $7 for a job you know might have paid $5 or $6 in recent years.

So we have a feeling for these isolated shortages. It was very similar in the late eighties when the signs of that were obvious. But I agree with the Commissioner, we don't have a systematic way of measuring that.

Representative Hinchey. Do you have any information that would relate to unemployment levels in particular skilled areas, anything that discrete?

Ms. Abraham. We do have information on unemployment rates by occupation.

Do you have the current month's data?

Representative Hinchey. Not that you might give that to us now, but I think it would be interesting to see that, if you would kindly forward that information to us. To the extent that you have it, unemployment levels by occupation or skills would be interesting.

Ms. Abraham. Certainly. In broad terms, unemployment rates for managers and professionals, technical people, continue, as they always have been, to be lower than unemployment rates for production workers. But it would perhaps be useful to look at how that has been changing, and we will take a look at that and forward that information to you.

Representative Hinchey. Thank you very much.

I note also that the value of U.S. imports has almost doubled in the last decade. We are importing, by value, almost twice as much as we did just 10 years ago. This, of course, relates to the increased globalization of the economy and the fact that our economy has to be considered increasingly in the context of the overall world economy.

I am wondering if you have any information that would relate to the Consumer Price Index and how the CPI might be affected by this very substantial increase in the value of United States imports in recent years especially.

Ms. Abraham. It certainly seems reasonable to think that that might have had an effect. There was, I understand, at one point an effort made to trap in the CPI whether the particular items that we were pricing were imported or not, but that is difficult to do and I don't think we felt that we were doing that successfully. But that is not necessarily going to get at what you are interested in, since the prices of domestically produced products may be effected by importation as well.

So that is a long way of saying I don't think I have got good information on this. I would note that there was an article in yesterday's paper that addressed this issue. It cited some research by Joel Popkin, who is a well-regarded price researcher. I would be happy to obtain a copy of that, his study, and get that sent to you.

Representative Hinchey. Okay. Well, I think that this is something that we have to be increasingly aware of, because obviously this is having a major impact on our economy. I believe it is probably affecting the cost of things. The Consumer Price Index is probably affected, and therefore important decisions made by the Federal Reserve will also be affected by this, and it seems to me that this is a body of information that would be helpful to have in the compilation of important public policy decisions which will be made in the future.

Finally, Mr. Chairman, if I may, I note not in your testimony but elsewhere in the information that you provided us, Commissioner, that the unemployment rate in New York City is almost double the national average, and I am curious as to why that is occurring. I am wondering if you have any more discrete information on that, a breakdown perhaps by

occupation or by sex or by race or some other indications that may help to explain why New York City is experiencing an unemployment rate that is almost double the national average.

Ms. Abraham. We would have some of that information at least through calendar year 1996. I will get that for you as well. We used to produce estimates of unemployment and unemployment for New York City directly from our monthly household survey, and when we did that, we had more information on a current basis from the survey about what was going on in New York, but because of budget reductions and resulting cuts in sample size, we don't do that any longer. So I am afraid our information in that regard is somewhat less useful than it used to be.

Representative Hinchey. Well, maybe we would have to address that because it seems to me this is information that is important and would be helpful to have. In any case, thank you, Mr. Chairman.

Representative Saxton. Thank you.

Mr. Ewing.

OPENING STATEMENT OF REPRESENTATIVE THOMAS W. EWING

Representative Ewing. Thank you, Mr. Chairman and Commissioner.

When was the last time our unemployment rate was this low?

Ms. Abraham. Last time it was this low was in November of 1973.

Representative Ewing. So almost 25 years ago. Is the change in the unemployment rate between April and May statistically meaningful?

Ms. Abraham. No, it is not. Which is the reason for our very carefully chosen words in describing it. The change of one-tenth of a percentage point was not big enough to be statistically significant. The change between March and April was significant.

Representative Ewing. That would lead us to the conclusion that the unemployment is kind of flat.

Ms. Abraham. Well, with these data, because they do vary month to month, I think you have to take a little bit longer perspective. What is clear is if you look at what has happened since the end of last year, the

unemployment rate has fallen, and I think looking at it over a little longer time frame gives you more meaningful numbers.

Representative Ewing. Over the last 12 months, has the level of manufacturing employment increased or decreased?

Ms. Abraham. Over the last 12 months, just doing a straight comparison, employment in manufacturing is up a slight bit. It is up by 17,000 from where it was a year ago May.

Representative Ewing. In 1996, did we have a decline in manufacturing jobs?

Ms. Abraham. Yes. If you compare manufacturing employment in December of 1996 to where it was in December of 1995, it was down a little over 50,000.

Representative Ewing. Does your report explain or give factors as to why it might have been down in that year and now it is back up?

Ms. Abraham. The long-term trend, and when I say long-term, I am talking very long-term trend in manufacturing employment is that manufacturing employment has declined. We might be able to get some clues about what is going on by breaking it out industry-by-industry.

Representative Ewing. But you say the long-term trend is still downward in manufacturing jobs.

Ms. Abraham. Right. I am speaking over a very long period of time, the period over a number of years the tendency has been for manufacturing to fall. There was a period beginning in July of 1993 up to the spring of 1995 when we saw increases in manufacturing employment that partially reversed the larger decline that had occurred from 1989 through July of 1993. But then, over the course of late 1995 and early 1996, we then saw declines again.

Representative Hinchey. Your figures on unemployment are taken from those who are seeking employment? There is no measure in there. Is there a factor in there for those who may not be seeking employment?

Ms. Abraham. We publish a variety of measures. The official unemployment rate, the one that everybody focuses on, is, you are correct, calculated based on the number of people who tell us they have done something concrete to look for work within the last four weeks. But

we also collect other data on the number of people who say they would be interested in working, have actually done something to look for work within the last year, but for a variety of reasons didn't do any active searching during the last four weeks. And we publish alternative unemployment measures that factor those people in, and not surprisingly, if you add in those people and then you add in people who tell you that they are working part-time even though they would have preferred a full-time job, you get a larger fraction.

The alternative unemployment rate calculated including all of those folks is 8.5 percent on a not seasonally adjusted basis versus 4.7 percent on a not seasonally adjusted basis, calculated the way we ordinarily do. The thing about these unemployment rates, they are higher, including more people, they tend to move in tandem with the official rate. When the official rate goes down, they go down as well.

Representative Ewing. That was going to be my next question. So that rate would be at a fairly low level also because it moves in tandem with it.

Ms. Abraham. Yes. Because of some changes we made back in 1994 to the survey, we can't construct it on an exactly comparable basis, but it has come down over the last year as well.

Representative Ewing. Thank you, Mr. Chairman.

Representative Saxton. Thank you. I just have one question as a follow-up to Mr. Ewing. When Mr. Ewing asked if this month's change in the unemployment percentage rate was statistically significant you answered, no.

Ms. Abraham. Right.

Representative Saxton. I understand that. But it is significant in that it does verify, to some extent, the accuracy of the May figures; is that correct?

Ms. Abraham. The April figures, right. The fact that the rate didn't jump back up is telling you something.

Representative Saxton. In other words, this month's percentage of unemployment would tend to verify the accuracy, to some degree, of the April numbers.

Ms. Abraham. It is offering some confirmation that we really are seeing unemployment at a lower level than it had been.

Representative Saxton. Good. Let me turn to your report on the CPI, if I may. Near the end of your report there is a statement which I think moves to a kind of summary of all of the very interesting data that you have provided us, and your sentence says, "Unfortunately, the ongoing controversies surrounding cost of living measurement and more generally appropriate Federal indexation policy have led much of the public to conclude that the CPI is somehow broken."

Would you –

Ms. Abraham. May I ask what page you are on?

Representative Saxton. Twenty-eight. "Unfortunately, the ongoing controversies surrounding cost of living measurement and more generally appropriate Federal indexation policy have led much of the public to conclude that the CPI is somehow broken." Would you respond to that thought and tell us what it is that you think is broken, if there is anything broken?

Ms. Abraham. I guess we had at least a couple of things in mind in writing this. One thing has to do with the distinction between the Consumer Price Index and a cost of living measure. The Consumer Price Index, because it tracks a fixed basket of market goods and services, doesn't take account of substitutions that consumers may make when relative prices change. We have talked about this before. Suggesting that the CPI is broken because it doesn't do that when it has never been suggested that it did, I think it unfortunate in that it casts what I would consider to be unwarranted criticism of the BLS for not doing something that we had never said we were doing.

I think the other thought that I at least had in mind in saying this is that saying that the CPI is broken with respect to the treatment of quality change, new goods, and so on, sort of suggests that there is some way to fix it; that we might lead some people to think that it must be clear what we ought to do and we are just not doing it, and that, as we have discussed as well, is just not accurate. The economics profession doesn't have solutions to offer for addressing the very difficult measurement

issues that remain to be addressed, although we have, I think, made great progress.

Representative Saxton. Let me try to oversimplify this, if I may, and perhaps this is a way for the general public to look at it. If you and I decided we wanted to know what the temperature outside of this room was, it would be fairly simple for us to have a measure of temperature. We could walk over to the window together and we could see that the temperature is 79.3 degrees. If we had a thermometer that was broken down into tenths, we could both look at it and agree that the accurate temperature taken outside would be 79.3 degrees, if that is what it was, right?

Ms. Abraham. Right.

Representative Saxton. Consumer Price Index is not that simple, is it?

Ms. Abraham. It is much more complicated.

Representative Saxton. It is more complicated, taking into account different services, different products and different quality of service that is measured from time to time. All of those issues create difficulties in getting what the public would consider an accurate measurement; is that correct?

Ms. Abraham. Correct. And we can have procedures that are very well-designed that are state of the art in terms of measuring what we know how to measure, and there still can be questions that are raised. Can be and will be questions that are raised.

Representative Saxton. According to your report, when you talk about these difficulties, it is not the first time in the course of modern economics that people have talked about this different situation, in terms of measuring percentages of inflation or price stability. This is not the first time that we have seen intellectual people conclude that this is a difficult task which – and as you just suggested, perhaps we will never get to an accurate number. Is that correct? This is not the first time we have reached this conclusion.

Ms. Abraham. No. There have been various reports over the years that have examined, discussed the difficulties in addressing some of these

issues, particularly the issues related to quality change and the introduction of new products into the marketplace.

Representative Saxton. As a matter of fact, over half a century they had a discussion quite similar to this. As a matter of fact –

Mr. Stark. I was there.

Representative Saxton. Mr. Stark was there.

Ms. Abraham. We can go back even further. These issues came up in the context of a controversy that emerged during World War II.

Representative Saxton. And even in 1928 there was an intellectual by the name of Von Mises who concluded, that even the problem of weighting is, quote, "not capable of solution, and certainty in such a way as to be recognized by everyone as right."

Ms. Abraham. I think we might have resolved that particular issue subsequently. But, yes, I think that there is, at least among economists at this point agreement on the sort of measure that you would want to produce in terms of the weighting of the measure, if your objective is to produce a cost-of-living index. There are operational reasons that make it not possible for us to produce that at this time, but we have at least in principle resolved the weighting issue to the satisfaction of at least the economics profession though not perhaps to the satisfaction of everyone else.

Representative Saxton. Dr. Abraham, could you just take a minute to itemize several factors in the CPI that create this difficulty?

Ms. Abraham. Things that are particularly difficult for us to measure? Let me just give a couple of examples. One thing that ideally I think we want to measure would be the quality of the service associated with retail transactions. When you go into a store and buy something, you probably care not just about the item that you purchase and the price you pay, but also about other things such as the selection that was on the shelf when you went in, whether the item that you wanted was available, whether there were sales staff in the store who could give you information about the various products from which you were choosing.

We don't at this point attempt to measure those things and I think that doing so would be very difficult, though I think it would be important

to try to do that. So that is something we have begun doing research on, but I think is going to be very difficult for us.

A big area where we face enormous difficulties is in the medical care area. There have been important improvements in the quality of medical care over time along a variety of dimensions. Some of those I think we can hope to capture in our measurement processes. If there are procedures introduced that mean people have to spend less time in the hospital than they would previously, that is something we can measure and we have taken steps in that direction. But improvements in procedures that mean that people have a higher quality of life following the procedure would be very difficult for us to measure. So those are the kinds of things that I view as really most difficult.

Representative Saxton. In measuring the market basket, do you also take locality into consideration?

Ms. Abraham. Yes, in the sense that we do surveys in each of a whole set of geographic areas to find out what people are purchasing and our selection of specific items to price is also done geographically, so what we end up with is an index giving us a weighted average of the change of prices across this set of 80-plus geographic areas. I am not sure if that was the sense of your question.

Representative Ewing. Mr. Chairman, could I interrupt? How do you take into account the difference in rural areas over urban areas.

Ms. Abraham. Oh, that is a good question. We don't cover rural areas. The CPI is the CPI for all urban areas. Residents of urban areas are about 80 percent of the population, but we don't cover the remaining 20 percent.

Representative Ewing. Well, if you apply the urban CPI to the rural then, it could be a larger increase than would maybe be ordinary or necessary.

Ms. Abraham. It could be larger or smaller, and we don't know.

Representative Saxton. And likewise, Dr. Abraham, could the real CPI, if there is such a thing, for age groups differ? Could the cost-of-living for young people be at one level and the cost-of-living for older people be different?

Ms. Abraham. The change in the cost of living could be different for younger people than older people, and we don't have good information on that, or at this point I would say a good approach to developing information on that.

Representative Saxton. Now, Doctor, let me just conclude and then perhaps, Mr. Stark has some other questions. In your summary, in the report, you note that the BLS is intensely aware of the sensitive nature of the data it produces and of the critical need for this data to be as accurate as possible. It will continue to investigate the measurement issues that it, and others, have identified and will introduce corresponding improvements to the index as quickly as possible.

Now, over the last half a year or so, there have been suggestions by some, and considerations by some, that there ought to be a fix to this. One of the suggestions was that, I guess, we might legislate a fix. The Boskin Commission suggested that we ought to reduce the CPI by 1 percent. There was consideration given in this Institution to doing that legislatively, but we seem to have gotten past that.

At least we got through the adoption of a budget without the necessity of addressing that legislatively. The other suggestion that you make here in this statement that I just read, was that you think it is likely that improvements can be made from time to time to move forward that accuracy that we would like to see. At the same time, you also conclude, in other parts of the report, that we will likely never get to where we all can walk over to the window and say it is 79.3 degrees outside. Would you just comment on what you see, what kind of changes you will be making and how and where you think that might take us with regard to this issue of accuracy in measuring price stability?

Ms. Abraham. We have some things in the works and some other things that we will do if the budget proposal that we currently have pending before the Congress is funded this year and in future years. Those include efforts to do more in the way of making explicit adjustments for changes in the characteristics of items that might affect their value to consumers, making sure that new goods are brought into the

Index more promptly, updating our samples in rapidly changing market segments more frequently.

We have recently made some changes in the way we construct the medical care components of the Index which over time I believe will enable us to produce a better measure. So we are doing a variety of things. We have also taken steps to produce to a higher standard of reliability an alternative to the Consumer Price Index that would come out annually that does a better job of taking into account the substitution behavior we have talked about, though that could be produced only with a lag and would be a supplement to the CPI, rather than a replacement for it. So we are sort of adding to the stock of measures we produce that we hope will provide useful information to the Congress and others. So those are the sorts of thing we have in the works.

Representative Saxton. Well, Doctor, thank you very much. We appreciate your response in the form of this very thorough report. We appreciate it very much, and we equally appreciate the fact that you are pursuing an ongoing effort or efforts to make changes in the way we measure inflation. We appreciate your efforts along this line very much.

Mr. Stark, I believe, has indicated he would like to ask another question.

Representative Stark. I just wanted to follow up on the Chair's CPI issue. It has become a great political interest. And my guess is that as the CPI increases, which is what it has done pretty regularly, I don't know since when, I don't know that it has ever gone down. I don't think it could, but I don't know that. I am not even sure whether entropy can go down. But the IRS is the biggest loser because of the indexing of the Tax Code, I believe, and social security beneficiaries are probably the largest gainers.

Now, I guess in the aggregate, those are probably our biggest chunks. And without regard to where the partisan issues may fall on this, if the Chairman will indulge me as the chronologically senior member of this committee, but prior to 1970, we all used to vote on the COLA for social security beneficiaries, and I know that there is nobody at this table who back in the old days would want to vote against it.

Politically, we would not want to vote to not give the seniors an increase in their check. As a matter of fact, many of us liberals, we loved to write a letter to seniors and say we gave you this; they don't know who COLA is in my District. They may think he is a Republican. But I loved to go back and write a letter to my mother and whoever and say, look, I gave you this extra $10 a month. We finally took this animal called a CPI and I think all of us got something off our shoulders.

I am not sure if we won or lost politically, but I do know we have looked occasionally at getting rid of the indexing of brackets, because I don't think anybody in this room, even the brilliant economists at the table, could tell me the change in the brackets last year for their particular income bracket. We look at the table in the back and I will bet you, 90 percent of our taxpayers don't even know that those things change every year. But if we didn't give that bracket change every year, I think we are talking about a 30 billion over five years budget savings.

Now you get into all this, and I guess what I am suggesting is whether the Commission would say, the technical part of what I am saying or the political part of what I am saying is we don't ever want to get to the place where we are making that decision, because I think we would have more trouble than we do now. I think the Chair may be sympathetic to that, for which I applaud him.

I am perfectly willing to have the discussion and assist the Commissioner in getting the more accurate, none of us want to waste the taxpayer's money, but I hope we don't come back to having to make political decisions. It may be in some danger of being on automatic pilot and I look at our automatic pilots out there and say, thanks, you have taken some of the politics out of it for us and probably does a better job. And I thank the Chair for his encouraging the Commissioner to get our help however we can to make their job more accurate, but I leave it in their hands. I applaud the Chair for that.

Representative Saxton. I thank the gentleman for that. Mr. Hinchey.

Representative Hinchey. Just further on the subject, the CPI seems to be kind of organic in that the items it is measuring are always changing

and therefore is has to change. But I notice in your testimony you feel that it is not broken, and I think we tend to agree with you.

The changes that you are trying to make, and if I interpret your testimony correctly, you are attempting to refine your approach to the CPI to make it, in fact, more accurate than it presently is and to examine more aspects of the economy to reach that greater accuracy; is that correct?

Ms. Abraham. I think it is a very good measure now. We can always work on – I like your word, "refining" it.

Representative Hinchey. Let me just ask you one final question, if I may. You observe in your testimony that hourly wages in May went up four cents. That figure, of course, is presented in nominal terms, and I am curious, if you look at that in terms of inflation-adjusted numbers and what the increase in wages would be in the context of the present, albeit very low, rate of inflation.

Ms. Abraham. We don't yet have the inflation figure for May, but just looking year over year, the year-over-year nominal increase in average hourly earnings was 3.8 percent. The increase year over year in the CPI through April was 2.5 percent. So that would be using the CPI as the deflator, about a 1.3 percent increase in wages.

Representative Hinchey. So, in fact, the increase, if you took inflation into consideration, that four cent an hour increase would be considerably less.

Ms. Abraham. That is true.

Representative Hinchey. About half of that.

Ms. Abraham. Yes. Month to month, those numbers jump around, but the same point would hold if you look at year over year.

Representative Hinchey. Thank you very much, Commissioner. Thank you, Mr. Chairman.

Representative Saxton. Thank you, Mr. Hinchey. Commissioner, I have no further questions at this point. I would just like to emphasize how much I know Mr. Stark, Mr. Hinchey, Mr. Ewing and I appreciate the fact that BLS has come forth in a timely fashion with this study, and it will be extremely helpful in helping other Members of Congress who perhaps haven't identified the CPI problem as important as you and I

believe it is. Obviously, as we move forward with our policy decisions, the information that you provide will be extremely useful.

Thank you very much for being here today and we will look forward to seeing you. I believe the first Friday of July is over our fourth of July break, and so we will look forward to seeing you probably in August.

Ms. Abraham. Thank you, Mr. Chairman.

Representative Saxton. Thank you.

[Whereupon, at 10:35 a.m., the Committee was adjourned.]

SUBMISSIONS FOR THE RECORD

PREPARED STATEMENT OF REPRESENTATIVE JIM SAXTON, CHAIRMAN

Once again, it is a pleasure to welcome Commissioner Abraham before the Joint Economic Committee. I would also like to thank the Bureau of Labor Statistics (BLS) for the study of the issues raised by the Boskin Commission Report that is being released today. As I have said before, the BLS is one of the finest statistical agencies in the world, and this BLS study makes an important contribution to our understanding of the measurement issues related to the Consumer Price Index (CPI). In exploring these difficult issues, the BLS study confirms the central role of quality change in the whole controversy.

The employment data released today shows that the current business cycle upturn continues to generate job gains. According to the payroll survey, 138,000 jobs were created in May, and the April gain was revised upward to 323,000. Manufacturing employment declined. The household survey indicates that employment rose by 255,000 last month.

The civilian unemployment rate, which had fallen to 4.9 percent in the previous month, stood at 4.8 percent in May. The employment-population ratio, an important measure of the economy's ability to create enough jobs, climbed to 63.9 percent, a record high. The main soft spot is that other BLS data indicate that the earnings of middle income Americans continue to stagnate.

The bottom line is that the sustained cyclical expansion continues to generate economic and employment growth. Let's give credit where credit is due: to the workers, entrepreneurs and farmers across this country whose efforts have expanded the economy. To the extent Federal policy has played a role, the anti-inflationary policies of the Federal Reserve have sustained this expansion by keeping inflation and interest rates low, laying a solid foundation for continued economic growth and

lower unemployment rates. The notion that low inflation leads to high unemployment is contradicted by the experience of the last three decades.

In recent months there has been much scrutiny of labor market data for clues about the implications for future Federal Reserve policy. Our research here at the Joint Economic Committee (JEC) indicates that while labor market data have important uses, they are not reliable guides of current or future inflation. This JEC research finds that price measures such as the CPI and forward-looking indicators such as commodity prices, the value of the dollar, and bond yields are more reliable indicators of inflation. According to these price measures, there is no real evidence that current or future inflation is a danger. The good news is that the economy is growing at a healthy pace, unemployment remains low, and inflation is flagging.

PREPARED STATEMENT OF COMMISSIONER KATHARINE G. ABRAHAM

Mr. Chairman and Members of the Committee:

I appreciate this opportunity to comment on the labor market data released this morning.

Nonfarm payroll employment rose in May, and the unemployment rate was about unchanged following a drop in April. At 4.8 percent, the jobless rate is half a percentage point lower than at the end of 1996. Payroll employment increased by 138,000 in May and has averaged 229,000 per month thus far this year.

Employment in the services industry rose by 125,000. Amusement and recreation services added 32,000 jobs, after showing little change in the prior two months. Hotel employment increased by 13,000 following a gain of similar magnitude in April. Job growth also continued in health services, computer and data processing services, and engineering and management services. Help supply services lost jobs for the second straight month, with a combined loss of over the two months of 55,000.

In construction, employment rose by 23,000 in May, following a decline in April. The uneven month-to-month movements in construction employment this winter and spring have reflected the unusual weather conditions over the period. Taking a slightly longer-term perspective, the number of construction jobs increased by 101,000 during the first five months of 1997, somewhat less than the gain for the same period in 1996.

In May, employment growth continued in trucking, air transportation, finance, real estate, and the durable goods component of wholesale trade. In retail trade, employment held steady following a substantial increase in April.

The number of factory jobs was about unchanged for the second month in a row. Employment continued to increase in electronic components, industrial machinery, and aircraft manufacturing; these gains, however, were offset by continued declines in apparel and an over-the-month drop in food products manufacturing. Auto manufacturing employment was down in May due to a strike. Manufacturing hours and

overtime edged down in May, but at 42.0 and 4.8 hours, respectively, both measures remain near historically high levels.

Average hourly earnings increased four cents in May following a gain of one cent in April. Over the year, hourly earnings rose 3.8 percent. The over-the-year gains during the first five months of this year have been running higher than during the same period in 1996.

In accordance with standard practice, these payroll survey figures reflect the incorporation of our regularly scheduled annual benchmark adjustments. Each year, we adjust our sample-based survey estimates to full universe counts of employment, derived principally from the administrative records of the state unemployment insurance tax system. There is no benchmark source for the hours and earnings data, but these series may be affected by the benchmark process because of changes in the industry employment weights and the introduction of new seasonal factors.

The impact of the revisions on employment in the March 1996 reference month is a very small upward adjustment of 57,000, or less than one-tenth of one percent of the total nonfarm employment level. Estimates of payroll employment for the post-benchmark period, April 1996 forward, also have been revised to incorporate the new benchmark levels as well as revised seasonal adjustment and bias factors; the net effects of these post-benchmark revisions also were small.

Turning to the data from our survey of households, the unemployment rate was 4.8 percent in May, a level last reached in 1973. Over the month, the jobless rate decreased for adult men; the rates for adults of both sexes have edged down in recent months. The number of long-term unemployed-those unemployed for 27 weeks or more–also has trended downward since the beginning of the year.

Since the end of 1995, employment as measured by our household survey has increased by 4.3 million (after adjusting for the change in population controls made in January of this year). Some analysts have wondered how such a substantial increase in employment could have occurred during a period when unemployment already was low. Even with the current high level of labor force participation, however, there are more than 66 million people aged 16 or older who are not working or

actively seeking work. Although our household survey tries to measure whether these persons not in the labor force want a job, changes in labor market conditions may cause people who previously had expressed no desire to work to seek employment or to take a job. For example, a retired person may have no interest in finding a job until he or she sees a help wanted sign in a local store and realizes that conveniently located employment can be readily obtained. In other words, the size of the available labor force is not fixed, but rather depends upon individual decisions based on personal and economic conditions that are constantly changing.

To summarize, unemployment remained below five percent in May, and payroll employment growth continued, although the increase for the month was smaller than the average thus far in 1997.

My colleagues and I now would be glad to respond to your questions.

News United States Department of Labor

Bureau of Labor Statistics Washington, D.C. 20212

Internet address: http://stats.bls.gov:80/newsrels.htm
Technical information: USDL 97-186
Household data: (202) 606-6378
Establishment data: 606-6555
Media contact: 606-5902

Transmission of material in this release is embargoed until 8:30 A.M. (EDT), Friday, June 6, 1997.

THE EMPLOYMENT SITUATION: MAY 1997

Nonfarm payroll employment rose in May, and unemployment was about unchanged after falling in April, the Bureau of Labor Statistics of the U.S. Department of Labor reported today. The number of payroll jobs rose by 138,000 in May, following an increase of 323,000 in April (as revised). The May gain was below the average monthly increase so far this year. The nation's jobless rate, 4.8 percent in May, has fallen by half a percentage point since the end of last year.

Chart 1. Unemployment rate, seasonally adjusted, June 1994 - May 1997

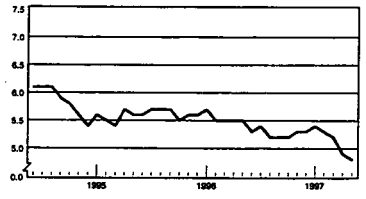
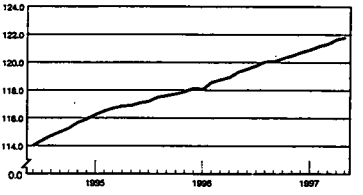


Chart 2. Nonfarm payroll employment, seasonally adjusted, June 1994 - May 1997



Unemployment (Household Survey Data)

Both the number of unemployed persons, 6.5 million, and the unemployment rate, 4.8 percent, were little changed in May. The jobless rate had declined by 0.3 percentage point in April. Among the major demographic groups, the rate for adult men dropped by 0.4 percentage point in May to 3.8 percent, while the rates for adult women (4.5 percent), teenagers (15.6 percent), whites (4.0 percent), blacks (10.3 percent), and Hispanics (7.4 percent) were essentially unchanged. (See tables A-1 and A-2.)

The establishment data in this release have been revised as a result of the annual benchmarking process and the updating of seasonal adjustment factors. More information on the revisions is contained in the note beginning on page 5.

Beginning this month, a convenient method of obtaining historical data for both the household and establishment series contained in this release are available through the BLS Internet site. This feature can be accessed at the end of the Employment Situation news release.

Table A. Major indicators of labor market activity, seasonally adjusted
(Numbers in thousands)

Category	Quarterly averages		Monthly data			Apr.-May change
	1996	1997[1]	1997[1]			
	IV	I	Mar.	Apr.	May	
HOUSEHOLD DATA	Labor force status					
Civilian labor force	134,830	135,934	136,319	136,098	136,173	75
Employment	127,705	128,728	129,175	129,384	129,639	255
Unemployment	7,124	7,206	7,144	6,714	6,534	-180
Not in labor force	66,627	66,462	66,194	66,577	66,659	82
	Unemployment rates					
All workers	5.3	5.3	5.2	4.9	4.8	-0.1
Adult men	4.4	4.5	4.4	4.2	3.8	-.4
Adult women	4.8	4.7	4.7	4.4	4.5	.1
Teenagers	16.6	17.0	16.4	15.4	15.6	.2
White	4.6	4.5	4.5	4.2	4.0	-.2
Black	10.6	10.9	10.7	9.8	10.3	.5
Hispanic origin	8.0	8.3	8.6	8.1	7.4	-.7
ESTABLISHMENT DATA[2]	Employment					
Nonfarm employment	120,452	121,138	121,344	p121,667	p121,805	p138
Goods-producing[3]	24,509	24,635	24,670	p24,663	p24,683	p20
Construction	5,494	5,585	5,609	p5,599	p5,622	p23
Manufacturing	18,444	18,476	18,489	p18,491	p18,486	p-5
Service-producing[3]	95,943	96,504	96,674	p97,004	p97,122	p118
Retail trade	21,850	21,928	21,945	p22,036	p22,032	p-4
Services	34,800	35,086	35,176	p35,322	p35,447	p125
Government	19,499	19,540	19,545	p19,578	p19,550	p-28
	Hours of work[4]					
Total private	34.5	34.7	34.8	p34.5	p34.5	p.0
Manufacturing	41.8	41.9	42.1	p42.1	p42.0	p-0.1
Overtime	4.6	4.8	4.9	p4.9	p4.8	p-.1
	Earnings[4]					
Average hourly earnings, total private	$11.97	$12.10	$12.14	p$12.15	p$12.19	p$0.04
Average weekly earnings, total private	413.48	419.36	422.47	p419.18	p420.56	p1.38

[1] Beginning in January 1997, household data reflect revised population controls used in the survey.
[2] Establishment data have been revised to reflect March 1996 benchmarks, updated seasonal adjustment procedures, and recomputed seasonal adjustment factors.
[3] Includes other industries, not shown separately.
[4] Data relate to private production or nonsupervisory workers.
p=preliminary.

Total Employment and the Labor Force (Household Survey Data)

Total employment was little changed in May but has shown strong growth so far this year. The proportion of the population with jobs (the employment-population ratio) was 63.9 percent, a record high, and was up by 0.8 percentage point from a year earlier. (See table A-1.)

Approximately 8.2 million persons (not seasonally adjusted) held more than one job in May, 351,000 more than a year earlier. These multiple jobholders made up 6.3 percent of all employed persons. (See table A-9.)

The civilian labor force, 136.2 million persons (seasonally adjusted), and the labor force participation rate, 67.1 percent, were about unchanged in May. Both the level and rate of labor force participation have risen substantially over the past year and a half. (See table A-1.)

Persons Not in the Labor Force (Household Survey Data)

About 1.4 million persons (not seasonally adjusted) were marginally attached to the labor force in May—that is, they wanted and were available for work and had looked for jobs sometime in the prior 12 months. The number of discouraged workers—a subset of the marginally attached who were not currently looking for jobs specifically because they believed no jobs were available for them or there were none for which they would qualify—was 338,000 in May. (See table A-9.)

Industry Payroll Employment (Establishment Survey Data)

Total nonfarm payroll employment rose by 138,000 in May to 121.8 million, after seasonal adjustment. The average monthly employment gain thus far in 1997 has been 229,000, in line with that recorded in 1996. In May, the largest job gains were in the services and construction industries. (See table B-1.)

The services industry added 125,000 jobs over the month. Health services and hotels and lodging places each had a relatively large job gain—26,000 and 13,000, respectively—for the second month in a row. Amusement and recreation services also recorded a strong job increase (32,000) in May, after showing no change in the prior 2 months. Employment growth continued in computer and data processing services, engineering and management services, and social services. In contrast, employment in help supply services declined for the second straight month, with the losses totaling 55,000.

Construction employment grew by 23,000 in May, as favorable weather helped the industry to rebound from a loss of 10,000 jobs (as revised) in April. Job gains in 1997 have totaled 101,000, with the strongest growth in the special trade component. Employment in heavy construction grew by 8,000 over the month but has shown no clear trend over the past year.

In May, employment growth continued in finance (8,000) and real estate (3,000). Employment in insurance showed no change, following a gain in April. Within the transportation industry, trucking and air transportation continued their upward trends.

Retail trade employment held steady in May, following a large increase (as revised) in the prior month. Furniture and home furnishings stores added 9,000 jobs, while employment decreased in general merchandise stores. Employment in eating and drinking places was flat over the month, after posting a large gain in April. Wholesale trade added 7,000 jobs in May, half its monthly average during the prior 12 months.

Government employment was down by 28,000 in May. State governments lost 13,000 jobs, mainly in the noneducation component. Federal employment continued to decline, and has fallen by 286,000 since its most recent peak 5 years ago.

Manufacturing employment edged down by 5,000 in May. There were losses of 6,000 jobs each in food and kindred products and in apparel, where a long-term employment decline continued. A strike in auto manufacturing caused employment to decrease in that industry. Over the month, employment rose in printing and publishing and in chemicals and allied products. Growth continued in electronic components, industrial machinery, and aircraft.

Weekly Hours (Establishment Survey Data)

The average workweek for production or nonsupervisory workers on private nonfarm payrolls was unchanged in May at 34.5 hours, seasonally adjusted. The manufacturing workweek and factory overtime both edged down 0.1 hour to 42.0 and 4.8 hours, respectively. (See table B-2.)

Following a decline in April, the index of aggregate weekly hours of private production or nonsupervisory workers on nonfarm payrolls rose by 0.3 percent to 140.0 (1982=100) in May, on a seasonally adjusted basis. The manufacturing index declined by 0.4 percent to 108.2. (See table B-5.)

Hourly and Weekly Earnings (Establishment Survey Data)

Average hourly earnings of private production or nonsupervisory workers on nonfarm payrolls were up 4 cents in May to $12.19, seasonally adjusted. Average weekly earnings increased by 0.3 percent to $420.56. Over the past year, average hourly earnings have risen by 3.8 percent and average weekly earnings by 4.4 percent. (See table B-3.)

The Employment Situation for June 1997 is scheduled to be released on Thursday, July 3, at 8:30 A.M. (EDT).

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Revisions to Establishment Survey Data

In accordance with annual practice, the establishment survey data have been revised to reflect comprehensive universe counts of payroll jobs (benchmarks). These counts are derived principally from unemployment insurance tax records for March 1996; the benchmarking process resulted in revisions to all not seasonally adjusted data series from April 1995 forward, the time period since the last benchmark was established. In addition, the unadjusted data from January 1988 forward for selected series in the transportation and public utilities division have been revised to reflect Standard Industrial Classification (SIC) coding changes for a group of employers within the air transportation and trucking industries. These recomputations had a slight effect on higher level aggregate series, including total nonfarm employment. All seasonally adjusted data beginning with January 1988 also have been revised. Although the usual practice is to revise 5 years of seasonally adjusted data with benchmark updates, additional years have been included to incorporate an updated version of the X-12 ARIMA seasonal adjustment software.

Table B presents revised total nonfarm employment data on a seasonally adjusted basis for the period January 1996 through February 1997, the last month with final estimates under the previous benchmark. The revised data for April 1996 forward incorporate the effect of applying the rate of change measured by the sample to the new benchmark level and updated bias adjustments, as well as new seasonal adjustment factors. In terms of data revisions, the not seasonally adjusted total nonfarm employment level for March 1996 was raised by 57,000 (54,000 on a seasonally adjusted basis). By February 1997, the previously published level was revised downward by 54,000 (134,000 on a seasonally adjusted basis).

The June 1997 issue of Employment and Earnings will contain an article that discusses the effects of the benchmark and post-benchmark revisions. This issue also will provide revised seasonal adjustment factors for March through October 1997 and revised estimates for all regularly published tables containing national establishment survey data on employment, hours, and earnings.

The BLS public database on the Internet, LABSTAT, contains all historical data revised as a result of this benchmark and updated seasonal adjustment factors. The data can be accessed from http://stats.bls.gov/cgi-bin/dsrv?ee or through the Current Employment Statistics homepage at http://stats.bls.gov/ceshome.htm. The full history of all establishment data series also is available on magnetic tape (call 202-606-5957).

Further information on the revisions released today may be obtained by calling 202-606-6555.

Table B. Revisions in total nonfarm employment, seasonally adjusted, January 1996-February 1997
(In thousands)

Year and month	As previously published	As revised	Difference
1996:			
January	118,070	118,058	-12
February	118,579	118,550	-29
March	118,750	118,804	54
April	118,922	118,966	44
May	119,332	119,263	-69
June	119,537	119,516	-21
July	119,772	119,691	-81
August	120,052	119,983	-69
September	120,050	120,019	-31
October	120,311	120,248	-63
November	120,492	120,450	-42
December	120,723	120,659	-64
1997:			
January	120,982	120,909	-73
February	121,296	121,162	-134

Explanatory Note

This news release presents statistics from two major surveys, the Current Population Survey (household survey) and the Current Employment Statistics survey (establishment survey). The household survey provides the information on the labor force, employment, and unemployment that appears in the A tables, marked HOUSEHOLD DATA. It is a sample survey of about 50,000 households conducted by the Bureau of the Census for the Bureau of Labor Statistics (BLS).

The establishment survey provides the information on the employment, hours, and earnings of workers on nonfarm payrolls that appears in the B tables, marked ESTABLISHMENT DATA. This information is collected from payroll records by BLS in cooperation with State agencies. In June 1997, the sample included about 390,000 establishments employing about 48 million people.

For both surveys, the data for a given month relate to a particular week or pay period. In the household survey, the reference week is generally the calendar week that contains the 12th day of the month. In the establishment survey, the reference period is the pay period including the 12th, which may or may not correspond directly to the calendar week.

Coverage, definitions, and differences between surveys

Household survey. The sample is selected to reflect the entire civilian noninstitutional population. Based on responses to a series of questions on work and job search activities, each person 16 years and over in a sample household is classified as employed, unemployed, or not in the labor force.

People are classified as *employed* if they did any work at all as paid employees during the reference week; worked in their own business, profession, or on their own farm; or worked without pay at least 15 hours in a family business or farm. People are also counted as employed if they were temporarily absent from their jobs because of illness, bad weather, vacation, labor-management disputes, or personal reasons.

People are classified as *unemployed* if they meet all of the following criteria: They had no employment during the reference week; they were available for work at that time; and they made specific efforts to find employment sometime during the 4-week period ending with the reference week. Persons laid off from a job and expecting recall need not be looking for work to be counted as unemployed. The unemployment data derived from the household survey in no way depend upon the eligibility for or receipt of unemployment insurance benefits.

The *civilian labor force* is the sum of employed and unemployed persons. Those not classified as employed or unemployed are *not in the labor force*. The *unemployment rate* is the number unemployed as a percent of the labor force. The *labor force participation rate* is the labor force as a percent of the population, and the *employment-population ratio* is the employed as a percent of the population.

Establishment survey. The sample establishments are drawn from private nonfarm businesses such as factories, offices, and stores, as well as Federal, State, and local government entities. *Employees on nonfarm payrolls* are those who received pay for any part of the reference pay period, including persons on paid leave. Persons are counted in each job they hold. *Hours and earnings* data are for private businesses and relate only to production workers in the goods-producing sector and nonsupervisory workers in the service-producing sector.

Differences in employment estimates. The numerous conceptual and methodological differences between the household and establishment surveys result in important distinctions in the employment estimates derived from the surveys. Among these are:

- The household survey includes agricultural workers, the self-employed, unpaid family workers, and private household workers among the employed. These groups are excluded from the establishment survey.
- The household survey includes people on unpaid leave among the employed. The establishment survey does not.
- The household survey is limited to workers 16 years of age and older. The establishment survey is not limited by age.
- The household survey has no duplication of individuals, because individuals are counted only once, even if they hold more than one job. In the establishment survey, employees working at more than one job and thus appearing on more than one payroll would be counted separately for each appearance.

Other differences between the two surveys are described in "Comparing Employment Estimates from Household and Payroll Surveys," which may be obtained from BLS upon request.

Seasonal adjustment

Over the course of a year, the size of the nation's labor force and the levels of employment and unemployment undergo sharp fluctuations due to such seasonal events as changes in weather, reduced or expanded production, harvests, major holidays, and the opening and closing of schools. The effect of such seasonal variation can be very large; seasonal fluctuations may account for as much as 95 percent of the month-to-month changes in unemployment.

Because these seasonal events follow a more or less regular pattern each year, their influence on statistical trends can be eliminated by adjusting the statistics from month to month. These adjustments make nonseasonal developments, such as declines in economic activity or increases in the participation of women in the labor force, easier to spot. For example, the large number of youth entering the labor force each June is likely to obscure any other changes that have taken place relative to May, making it difficult to determine if the level of economic activity has risen or declined. However, because the effect of students finishing school in previous years is known, the statistics for the current year can be adjusted to allow for a comparable change. Insofar as the seasonal adjustment is made correctly, the adjusted figure provides a more useful tool with which to analyze changes in economic activity.

In both the household and establishment surveys, most seasonally adjusted series are independently adjusted. However, the adjusted series for many major estimates, such as total payroll employment, employment in most major industry divisions, total employment, and unemployment are computed by aggregating independently adjusted component series. For example, total unemployment is derived by summing the adjusted series for four major age-sex components; this

differs from the unemployment estimate that would be obtained by directly adjusting the total or by combining the duration, reasons, or more detailed age categories.

The numerical factors used to make the seasonal adjustments are recalculated twice a year. For the household survey, the factors are calculated for the January-June period and again for the July-December period. For the establishment survey, updated factors for seasonal adjustment are calculated for the May-October period and introduced along with new benchmarks, and again for the November-April period. In both surveys, revisions to historical data are made once a year.

Reliability of the estimates

Statistics based on the household and establishment surveys are subject to both sampling and nonsampling error. When a sample rather than the entire population is surveyed, there is a chance that the sample estimates may differ from the "true" population values they represent. The exact difference, or *sampling error*, varies depending on the particular sample selected, and this variability is measured by the standard error of the estimate. There is about a 90-percent chance, or level of confidence, that an estimate based on a sample will differ by no more than 1.6 standard errors from the "true" population value because of sampling error. BLS analyses are generally conducted at the 90-percent level of confidence.

For example, the confidence interval for the monthly change in total employment from the household survey is on the order of plus or minus 376,000. Suppose the estimate of total employment increases by 100,000 from one month to the next. The 90-percent confidence interval on the monthly change would range from -276,000 to 476,000 (100,000 +/- 376,000). These figures do not mean that the sample results are off by these magnitudes, but rather that there is about a 90-percent chance that the "true" over-the-month change lies within this interval. Since this range includes values of less than zero, we could not say with confidence that employment had, in fact, increased. If, however, the reported employment rise was half a million, then all of the values within the 90-percent confidence interval would be greater than zero. In this case, it is likely (at least a 90-percent chance) that an employment rise had, in fact, occurred. The 90-percent confidence interval for the monthly change in unemployment is +/- 258,000, and for the monthly change in the unemployment rate it is +/- .21 percentage point.

In general, estimates involving many individuals or establishments have lower standard errors (relative to the size of the estimate) than estimates which are based on a small number of observations. The precision of estimates is also improved when the data are cumulated over time such as for quarterly and annual averages. The seasonal adjustment process can also improve the stability of the monthly estimates.

The household and establishment surveys are also affected by *nonsampling error*. Nonsampling errors can occur for many reasons, including the failure to sample a segment of the population, inability to obtain information for all respondents in the sample, inability or unwillingness of respondents to provide correct information on a timely basis, mistakes made by respondents, and errors made in the collection or processing of the data.

For example, in the establishment survey, estimates for the most recent 2 months are based on substantially incomplete returns; for this reason, these estimates are labeled preliminary in the tables. It is only after two successive revisions to a monthly estimate, when nearly all sample reports have been received, that the estimate is considered final.

Another major source of nonsampling error in the establishment survey is the inability to capture, on a timely basis, employment generated by new firms. To correct for this systematic underestimation of employment growth (and other sources of error), a process known as bias adjustment is included in the survey's estimating procedures, whereby a specified number of jobs is added to the monthly sample-based change. The size of the monthly bias adjustment is based largely on past relationships between the sample-based estimates of employment and the total counts of employment described below.

The sample-based estimates from the establishment survey are adjusted once a year (on a lagged basis) to universe counts of payroll employment obtained from administrative records of the unemployment insurance program. The difference between the March sample-based employment estimates and the March universe counts is known as a benchmark revision, and serves as a rough proxy for total survey error. The new benchmarks also incorporate changes in the classification of industries. Over the past decade, the benchmark revision for total nonfarm employment has averaged 0.2 percent, ranging from zero to 0.6 percent.

Additional statistics and other information

More comprehensive statistics are contained in *Employment and Earnings*, published each month by BLS. It is available for $13.00 per issue or $35.00 per year from the U.S. Government Printing Office, Washington, DC 20402. All orders must be prepaid by sending a check or money order payable to the Superintendent of Documents, or by charging to Mastercard or Visa.

Employment and Earnings also provides measures of sampling error for the household survey data published in this release. For unemployment and other labor force categories, these measures appear in tables 1-B through 1-H of its "Explanatory Notes." Measures of the reliability of the data drawn from the establishment survey and the actual amounts of revision due to benchmark adjustments are provided in tables 2-B through 2-G of that publication.

Information in this release will be made available to sensory impaired individuals upon request. Voice phone: 202-606-STAT; TDD phone: 202-606-5897; TDD message referral phone: 1-800-326-2577.

Table A-1. Employment status of the civilian population by sex and age

(Numbers in thousands)

Employment status, sex, and age	Not seasonally adjusted			Seasonally adjusted[1]					
	May 1998	Apr. 1997	May 1997	May 1998	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997	May 1997
TOTAL									
Civilian noninstitutional population	200,278	202,674	202,832	200,278	202,285	202,389	202,513	202,674	202,832
Civilian labor force	133,558	135,181	135,963	133,759	135,848	135,634	136,319	136,068	136,173
Participation rate	66.7	66.7	67.0	66.8	67.2	67.0	67.3	67.2	67.1
Employed	126,391	128,629	129,565	126,428	128,580	128,430	129,175	129,384	129,539
Employment-population ratio	63.1	63.5	63.9	63.1	63.6	63.5	63.8	63.8	63.9
Agriculture	3,696	3,425	3,652	3,474	3,468	3,292	3,386	3,497	3,430
Nonagricultural industries	122,693	125,205	125,912	122,954	125,112	125,138	125,789	125,887	126,209
Unemployed	7,168	6,551	6,398	7,331	7,268	7,205	7,144	6,714	6,634
Unemployment rate	5.4	4.8	4.7	5.5	5.4	5.3	5.2	4.9	4.9
Not in labor force	66,721	67,494	66,870	66,519	66,437	66,754	66,194	66,577	66,659
Men, 16 years and over									
Civilian noninstitutional population	96,048	97,474	97,559	96,048	97,264	97,320	97,387	97,474	97,559
Civilian labor force	72,125	72,755	73,191	72,120	73,106	72,967	73,268	73,232	73,200
Participation rate	75.1	74.6	75.0	75.1	75.2	75.0	75.2	75.1	75.0
Employed	68,258	69,105	69,968	68,188	69,184	69,232	69,478	69,627	69,929
Employment-population ratio	71.1	70.9	71.7	71.0	71.1	71.1	71.3	71.4	71.7
Unemployed	3,867	3,650	3,223	3,932	3,942	3,755	3,790	3,604	3,271
Unemployment rate	5.4	5.0	4.4	5.5	5.4	5.1	5.2	4.9	4.5
Men, 20 years and over									
Civilian noninstitutional population	88,530	89,680	89,768	88,530	89,446	89,556	89,604	89,680	89,768
Civilian labor force	68,095	68,933	69,146	67,996	68,998	68,827	69,111	69,147	69,059
Participation rate	76.9	76.9	77.0	76.8	77.1	76.9	77.1	77.1	76.9
Employed	64,963	65,957	66,584	64,788	65,813	65,818	66,066	66,243	66,418
Employment-population ratio	73.4	73.5	74.2	73.2	73.6	73.5	73.7	73.9	74.0
Agriculture	2,482	2,396	2,568	2,342	2,364	2,276	2,362	2,428	2,421
Nonagricultural industries	62,480	63,560	63,997	62,446	63,449	63,542	63,703	63,815	63,997
Unemployed	3,133	2,976	2,562	3,208	3,185	3,009	3,045	2,904	2,640
Unemployment rate	4.6	4.3	3.7	4.7	4.6	4.4	4.4	4.2	3.8
Women, 16 years and over									
Civilian noninstitutional population	104,230	105,200	105,274	104,230	105,022	105,068	105,127	105,200	105,274
Civilian labor force	61,433	62,426	62,772	61,639	62,742	62,647	63,051	62,866	62,973
Participation rate	58.9	59.3	59.6	59.1	59.7	59.6	60.0	59.8	59.8
Employed	58,133	59,525	59,597	58,240	59,416	59,197	59,697	59,756	59,710
Employment-population ratio	55.8	56.6	56.6	55.9	56.6	56.3	56.8	56.8	56.7
Unemployed	3,300	2,901	3,175	3,399	3,327	3,450	3,354	3,109	3,263
Unemployment rate	5.4	4.6	5.1	5.5	5.3	5.5	5.3	4.9	5.2
Women, 20 years and over									
Civilian noninstitutional population	96,925	97,685	97,767	96,925	97,520	97,571	97,638	97,685	97,767
Civilian labor force	57,735	58,794	58,984	57,885	58,894	58,743	59,130	58,974	59,130
Participation rate	59.6	60.2	60.3	59.7	60.4	60.2	60.6	60.4	60.6
Employed	55,058	56,368	56,464	55,057	56,185	55,955	56,359	56,352	56,481
Employment-population ratio	56.8	57.7	57.8	56.8	57.6	57.3	57.7	57.7	57.8
Agriculture	875	775	782	831	797	775	739	779	743
Nonagricultural industries	54,183	55,613	55,682	54,236	55,369	55,179	55,620	55,613	55,738
Unemployed	2,677	2,406	2,520	2,818	2,729	2,788	2,771	2,581	2,650
Unemployment rate	4.6	4.1	4.3	4.9	4.6	4.7	4.7	4.4	4.5
Both sexes, 16 to 19 years									
Civilian noninstitutional population	14,823	15,309	15,300	14,823	15,318	15,261	15,271	15,309	15,300
Civilian labor force	7,727	7,453	7,532	7,878	7,956	8,065	8,078	7,977	7,994
Participation rate	52.1	48.7	51.2	53.1	51.9	52.8	52.9	52.1	52.2
Employed	6,371	6,285	6,537	6,573	6,601	6,657	6,750	6,748	6,740
Employment-population ratio	43.0	41.1	42.7	44.3	43.1	43.6	44.2	44.1	44.1
Agriculture	341	253	304	301	307	240	285	290	268
Nonagricultural industries	6,030	6,031	6,233	6,272	6,294	6,417	6,465	6,458	6,474
Unemployed	1,356	1,169	1,296	1,305	1,354	1,408	1,328	1,229	1,244
Unemployment rate	17.5	15.7	16.5	16.6	17.0	17.5	16.4	15.4	15.6

[1] The population figures are not adjusted for seasonal variation; therefore, identical numbers appear in the unadjusted and seasonally adjusted columns.

NOTE: Beginning in January 1997, data reflect revised population controls used in the household survey.

HOUSEHOLD DATA

Table A-2. Employment status of the civilian population by race, sex, age, and Hispanic origin

(Numbers in thousands)

Employment status, race, sex, age, and Hispanic origin	Not seasonally adjusted			Seasonally adjusted[1]					
	May 1996	Apr. 1997	May 1997	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997	May 1997
WHITE									
Civilian noninstitutional population	168,096	169,575	169,782	168,096	169,436	169,492	169,569	169,675	169,782
Civilian labor force	112,854	113,867	114,486	113,025	114,377	114,333	114,736	114,618	114,630
Participation rate	67.1	67.1	67.4	67.2	67.5	67.5	67.7	67.6	67.5
Employed	107,536	109,177	110,004	107,576	109,151	109,197	109,630	109,831	110,052
Employment-population ratio	64.0	64.3	64.8	64.0	64.4	64.4	64.7	64.7	64.8
Unemployed	5,317	4,690	4,481	5,449	5,226	5,136	5,106	4,786	4,578
Unemployment rate	4.7	4.1	3.9	4.8	4.6	4.5	4.5	4.2	4.0
Men, 20 years and over									
Civilian labor force	58,367	58,983	59,137	58,281	59,042	58,988	59,161	59,196	59,008
Participation rate	77.4	77.4	77.6	77.3	77.7	77.5	77.7	77.7	77.4
Employed	56,026	56,772	57,284	55,851	56,653	56,592	56,923	57,057	57,112
Employment-population ratio	74.3	74.5	75.2	74.1	74.5	74.5	74.8	74.9	74.9
Unemployed	2,341	2,212	1,853	2,400	2,388	2,275	2,238	2,139	1,895
Unemployment rate	4.0	3.7	3.1	4.1	4.0	3.9	3.8	3.6	3.2
Women, 20 years and over									
Civilian labor force	47,939	48,526	48,705	48,114	48,631	48,619	48,832	48,662	48,674
Participation rate	59.2	59.6	59.8	59.4	59.8	59.8	60.0	59.8	60.0
Employed	45,976	46,902	47,000	46,010	46,750	46,747	46,915	46,902	47,047
Employment-population ratio	56.8	57.6	57.7	56.8	57.5	57.5	57.7	57.6	57.8
Unemployed	1,964	1,624	1,705	2,104	1,881	1,872	1,917	1,759	1,627
Unemployment rate	4.1	3.3	3.5	4.4	3.9	3.9	3.9	3.6	3.7
Both sexes, 16 to 19 years									
Civilian labor force	6,547	6,357	6,644	6,650	6,704	6,746	6,742	6,760	6,748
Participation rate	55.6	52.4	54.7	56.5	55.3	55.6	55.6	55.7	55.5
Employed	5,535	5,503	5,721	5,705	5,747	5,758	5,792	5,872	5,893
Employment-population ratio	47.0	45.4	47.1	48.5	47.4	47.5	47.7	48.4	48.5
Unemployed	1,012	854	923	945	957	988	951	888	855
Unemployment rate	15.5	13.4	13.9	14.2	14.3	14.6	14.1	13.1	12.7
Men	16.1	14.7	13.3	15.3	14.9	14.8	15.0	14.3	12.7
Women	14.8	12.1	14.5	13.0	13.6	14.7	13.1	11.9	12.7
BLACK									
Civilian noninstitutional population	23,549	23,923	23,950	23,549	23,847	23,872	23,895	23,923	23,950
Civilian labor force	15,080	15,285	15,370	15,138	15,372	15,408	15,439	15,395	15,434
Participation rate	64.0	63.8	64.2	64.3	64.5	64.5	64.6	64.2	64.4
Employed	13,571	13,801	13,825	13,584	13,709	13,672	13,784	13,863	13,837
Employment-population ratio	57.6	57.7	57.7	57.7	57.5	57.3	57.7	57.9	57.8
Unemployed	1,510	1,483	1,545	1,554	1,663	1,736	1,655	1,533	1,597
Unemployment rate	10.0	9.6	10.0	10.3	10.8	11.3	10.7	9.8	10.3
Men, 20 years and over									
Civilian labor force	6,808	6,796	6,849	6,793	6,829	6,765	6,803	6,805	6,831
Participation rate	72.4	71.3	71.7	72.3	71.5	71.0	71.5	71.4	71.5
Employed	6,173	6,221	6,287	6,144	6,198	6,159	6,173	6,234	6,255
Employment-population ratio	65.7	65.3	65.8	65.4	65.2	64.7	65.0	65.4	65.5
Unemployed	635	575	563	649	632	605	629	571	575
Unemployment rate	9.3	8.5	8.2	9.6	9.2	9.0	9.3	8.4	8.4
Women, 20 years and over									
Civilian labor force	7,331	7,631	7,641	7,374	7,574	7,536	7,641	7,641	7,693
Participation rate	62.1	63.7	63.7	62.4	63.4	63.9	63.9	63.8	64.1
Employed	6,751	6,997	6,957	6,757	6,880	6,851	6,934	6,997	6,974
Employment-population ratio	57.2	58.4	58.1	57.2	57.6	57.3	57.9	58.4	58.1
Unemployed	580	635	675	617	694	755	708	644	719
Unemployment rate	7.9	8.3	8.8	8.4	9.2	10.3	9.2	8.4	9.4
Both sexes, 16 to 19 years									
Civilian labor force	941	838	879	971	969	1,007	996	920	910
Participation rate	40.2	34.7	36.8	41.5	40.4	42.0	41.1	38.1	37.9
Employed	647	583	572	683	631	662	676	632	608
Employment-population ratio	27.8	24.2	23.8	29.2	26.3	27.6	27.9	26.2	25.3
Unemployed	295	254	307	288	337	346	319	287	302
Unemployment rate	31.3	30.4	34.9	29.7	34.8	34.3	32.1	31.2	33.2
Men	33.1	37.4	35.9	30.0	42.7	37.4	41.4	37.3	32.6
Women	29.5	23.4	34.0	29.3	27.5	31.3	23.7	25.9	33.8

See footnotes at end of table.

Table A-2. Employment status of the civilian population by race, sex, age, and Hispanic origin — Continued

(Numbers in thousands)

Employment status, race, sex, age, and Hispanic origin	Not seasonally adjusted			Seasonally adjusted[1]					
	May 1996	Apr. 1997	May 1997	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997	May 1997
HISPANIC ORIGIN									
Civilian noninstitutional population	19,131	20,180	20,236	19,131	20,013	20,057	20,119	20,180	20,236
Civilian labor force	12,487	13,427	13,630	12,602	13,795	13,840	13,882	13,572	13,748
Participation rate	65.3	66.5	67.4	65.9	68.9	68.0	67.9	67.3	67.9
Employed	11,388	12,358	12,666	11,438	12,653	12,538	12,493	12,470	12,730
Employment-population ratio	59.5	61.2	62.6	59.8	63.2	62.5	62.1	61.8	62.9
Unemployed	1,099	1,069	964	1,184	1,142	1,102	1,169	1,102	1,018
Unemployment rate	8.8	8.0	7.1	9.2	8.3	8.1	8.6	8.1	7.4

[1] The population figures are not adjusted for seasonal variation; therefore, identical numbers appear in the unadjusted and seasonally adjusted columns.

NOTE: Detail for the above race and Hispanic-origin groups will not sum to totals because data for the "other races" group are not presented and Hispanics are included in both the white and black population groups. Beginning in January 1997, data reflect revised population controls used in the household survey.

Table A-3. Selected employment indicators

(In thousands)

Category	Not seasonally adjusted			Seasonally adjusted					
	May 1996	Apr. 1997	May 1997	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997	May 1997
CHARACTERISTIC									
Total employed, 16 years and over	126,391	128,629	129,565	126,428	128,580	128,430	129,175	129,384	129,839
Married men, spouse present	42,618	42,371	42,484	42,395	42,909	42,513	42,509	42,329	42,273
Married women, spouse present	32,491	32,603	32,575	32,339	32,826	32,578	32,699	32,473	32,445
Women who maintain families	7,372	7,908	7,913	7,323	7,501	7,556	7,720	7,838	7,858
OCCUPATION									
Managerial and professional specialty	36,339	37,565	37,391	36,271	37,478	37,525	37,723	37,599	37,318
Technical, sales, and administrative support	37,417	37,998	38,132	37,615	38,163	38,073	38,158	38,150	38,362
Service occupations	17,329	17,319	17,407	17,318	17,171	17,170	17,292	17,267	17,390
Precision production, craft, and repair	13,372	14,087	14,265	13,469	13,902	14,140	14,200	14,301	14,380
Operators, fabricators, and laborers	18,181	18,183	18,514	18,311	18,317	18,144	18,234	18,415	18,647
Farming, forestry, and fishing	3,752	3,478	3,856	3,575	3,528	3,388	3,507	3,605	3,680
CLASS OF WORKER									
Agriculture:									
Wage and salary workers	2,130	1,965	2,117	1,957	1,988	1,932	1,905	1,989	1,941
Self-employed workers	1,517	1,393	1,483	1,472	1,448	1,353	1,414	1,424	1,444
Unpaid family workers	51	67	53	48	62	15	59	70	50
Nonagricultural industries:									
Wage and salary workers	113,630	115,947	116,611	113,940	115,560	115,987	116,533	116,606	116,989
Government	18,567	18,307	18,128	18,240	18,385	18,144	17,994	18,036	17,807
Private industries	95,063	97,640	98,483	95,700	97,176	97,843	98,539	98,572	99,182
Private households	873	871	910	925	1,002	882	869	922	987
Other industries	94,190	96,769	97,573	94,775	96,174	96,962	97,671	97,650	98,195
Self-employed workers	8,940	9,132	9,151	8,882	9,445	9,124	9,292	9,159	9,106
Unpaid family workers	123	126	150	121	162	136	108	130	148
PERSONS AT WORK PART TIME									
All industries:									
Part time for economic reasons	4,175	4,244	3,891	4,311	4,426	4,262	4,153	4,402	4,019
Slack work or business conditions	2,150	2,419	2,192	2,255	2,423	2,378	2,344	2,491	2,309
Could only find part-time work	1,705	1,571	1,395	1,704	1,552	1,550	1,518	1,629	1,391
Part time for noneconomic reasons	17,920	19,139	18,592	17,643	18,340	18,070	18,120	18,176	18,336
Nonagricultural industries:									
Part time for economic reasons	4,003	4,086	3,707	4,109	4,183	4,096	3,937	4,235	3,806
Slack work or business conditions	2,057	2,279	2,079	2,136	2,310	2,277	2,210	2,374	2,159
Could only find part-time work	1,658	1,547	1,354	1,655	1,512	1,523	1,475	1,603	1,347
Part time for noneconomic reasons	17,277	18,562	17,993	17,039	17,737	17,452	17,565	17,661	17,780

NOTE: Persons at work excludes employed persons who were absent from their jobs during the entire reference week for reasons such as vacation, illness, or industrial dispute. Part time for noneconomic reasons excludes persons who usually work full time but worked only 1 to 34 hours during the reference week for reasons such as holidays, illness, and bad weather. Beginning in January 1997, data reflect revised population controls used in the household survey.

HOUSEHOLD DATA

Table A-4. Selected unemployment indicators, seasonally adjusted

Category	Number of unemployed persons (in thousands)			Unemployment rates[1]					
	May 1996	Apr. 1997	May 1997	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997	May 1997
CHARACTERISTIC									
Total, 16 years and over	7,331	6,714	6,534	5.5	5.4	5.3	5.2	4.9	4.8
Men, 20 years and over	3,298	2,924	2,840	4.7	4.6	4.4	4.4	4.2	3.8
Women, 20 years and over	2,818	2,581	2,650	4.9	4.6	4.7	4.7	4.4	4.5
Both sexes, 16 to 19 years	1,305	1,229	1,244	16.6	17.0	17.5	16.4	15.4	15.6
Married men, spouse present	1,302	1,161	1,143	3.0	2.8	2.8	2.8	2.7	2.6
Married women, spouse present	1,251	1,026	1,076	3.7	3.3	3.4	3.2	3.1	3.2
Women who maintain families	676	637	650	8.5	9.1	9.0	9.1	7.5	7.8
Full-time workers	5,903	5,329	5,274	5.4	5.2	5.1	5.1	4.8	4.7
Part-time workers	1,453	1,415	1,283	5.9	5.7	6.0	5.7	5.7	5.2
OCCUPATION[2]									
Managerial and professional specialty	860	755	798	2.3	2.1	2.1	2.0	2.0	2.1
Technical, sales, and administrative support	1,822	1,653	1,526	4.6	4.4	4.3	4.3	4.2	3.8
Precision production, craft, and repair	764	714	683	5.4	5.3	4.7	4.9	4.8	4.6
Operators, fabricators, and laborers	1,648	1,433	1,421	8.3	7.9	8.1	8.1	7.3	7.1
Farming, forestry, and fishing	340	256	243	8.7	7.5	7.5	7.4	6.6	6.2
INDUSTRY									
Nonagricultural private wage and salary workers	5,794	5,221	5,199	5.7	5.4	5.3	5.2	5.0	5.0
Goods-producing industries	1,735	1,578	1,526	6.2	6.0	5.6	5.5	5.4	5.2
Mining	12	13	19	2.2	6.0	4.2	4.0	2.0	3.0
Construction	568	518	500	10.2	10.1	9.0	9.6	8.7	8.4
Manufacturing	1,055	947	908	5.0	4.6	4.5	4.3	4.4	4.2
Durable goods	585	457	446	4.7	4.4	4.0	3.6	3.6	3.5
Nondurable goods	470	490	462	5.5	4.8	5.3	5.2	5.8	5.3
Service-producing industries	4,059	3,643	3,672	5.5	5.2	5.2	5.1	4.9	4.9
Transportation and public utilities	300	208	273	4.2	4.1	4.3	4.1	2.8	3.6
Wholesale and retail trade	1,721	1,658	1,631	6.5	6.4	6.5	6.3	6.2	6.1
Finance, insurance, and real estate	194	255	240	2.6	3.5	3.0	3.2	3.4	3.2
Services	1,844	1,522	1,528	5.7	4.9	5.0	4.8	4.6	4.6
Government workers	599	438	436	3.2	2.9	2.9	2.8	2.4	2.4
Agricultural wage and salary workers	225	212	149	10.3	8.8	8.8	9.5	9.6	7.1

[1] Unemployment as a percent of the civilian labor force.

[2] Seasonally adjusted unemployment data for service occupations are not available because the seasonal component, which is small relative to the trend-cycle and irregular components, cannot be separated with sufficient precision.

NOTE: Beginning in January 1997, data reflect revised population controls used in the household survey.

Table A-5. Duration of unemployment

(Numbers in thousands)

Duration	Not seasonally adjusted			Seasonally adjusted					
	May 1996	Apr. 1997	May 1997	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997	May 1997
NUMBER OF UNEMPLOYED									
Less than 5 weeks	2,767	2,131	2,535	2,754	2,801	2,591	2,650	2,354	2,523
5 to 14 weeks	1,932	1,961	1,891	2,310	2,223	2,382	2,390	2,156	2,022
15 weeks and over	2,467	2,439	2,172	2,354	2,155	2,183	2,084	2,092	2,071
15 to 26 weeks	1,119	1,293	1,144	1,048	943	1,025	1,001	1,058	1,076
27 weeks and over	1,348	1,147	1,028	1,306	1,212	1,138	1,083	1,034	993
Average (mean) duration, in weeks	17.5	16.7	15.7	16.9	16.0	16.0	15.3	15.2	15.1
Median duration, in weeks	8.5	10.2	7.8	8.4	7.7	8.4	7.9	8.3	7.7
PERCENT DISTRIBUTION									
Total unemployed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 5 weeks	38.6	32.5	39.6	37.1	39.0	36.3	37.4	35.7	38.1
5 to 14 weeks	27.0	30.2	28.4	31.1	31.0	33.4	33.6	32.7	30.6
15 weeks and over	34.4	37.2	33.9	31.7	30.0	30.3	29.1	31.7	31.3
15 to 26 weeks	15.6	19.7	17.9	14.1	13.1	14.4	14.1	16.0	16.3
27 weeks and over	18.8	17.5	16.1	17.6	16.9	15.9	15.0	15.7	15.0

NOTE: Beginning in January 1997, data reflect revised population controls used in the household survey.

Table A-6. Reason for unemployment

(Numbers in thousands)

Reason	Not seasonally adjusted			Seasonally adjusted					
	May 1996	Apr. 1997	May 1997	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997	May 1997
NUMBER OF UNEMPLOYED									
Job losers and persons who completed temporary jobs	3,184	3,050	2,696	3,409	3,245	3,163	3,187	2,979	2,902
On temporary layoff	868	888	704	1,070	953	944	1,021	976	871
Not on temporary layoff	2,297	2,062	1,992	2,339	2,293	2,218	2,167	2,003	2,031
Permanent job losers	1,627	1,453	1,391	(1)	(1)	(1)	(1)	(1)	(1)
Persons who completed temporary jobs	670	609	602	(1)	(1)	(1)	(1)	(1)	(1)
Job leavers	621	723	721	688	690	787	784	754	801
Reentrants	2,834	2,239	2,412	2,709	2,505	2,648	2,535	2,420	2,308
New entrants	547	540	569	546	600	647	647	577	574
PERCENT DISTRIBUTION									
Total unemployed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Job losers and persons who completed temporary jobs	44.2	46.8	42.1	48.4	44.8	43.7	44.6	44.3	44.1
On temporary layoff	12.1	15.1	11.0	14.6	13.2	13.0	14.3	14.5	13.2
Not on temporary layoff	32.0	31.5	31.1	31.8	31.7	30.6	30.3	29.8	30.9
Job leavers	8.7	11.0	11.3	9.4	12.3	10.9	11.0	11.2	12.2
Reentrants	39.5	34.2	37.7	36.8	34.6	36.6	35.4	36.0	35.0
New entrants	7.6	8.2	8.9	7.4	8.3	8.9	9.0	8.6	8.7
UNEMPLOYED AS A PERCENT OF THE CIVILIAN LABOR FORCE									
Job losers and persons who completed temporary jobs	2.4	2.3	2.0	2.5	2.4	2.3	2.3	2.2	2.1
Job leavers	.5	.5	.5	.5	.7	.6	.6	.6	.6
Reentrants	2.1	1.7	1.8	2.0	1.8	2.0	1.9	1.8	1.7
New entrants	.4	.4	.4	.4	.4	.5	.5	.4	.4

[1] Not available.

NOTE: Beginning in January 1997, data reflect revised population controls used in the household survey.

Table A-7. Range of alternative measures of labor underutilization

(Percent)

Measure	Not seasonally adjusted			Seasonally adjusted					
	May 1996	Apr. 1997	May 1997	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997	May 1997
U-1 Persons unemployed 15 weeks or longer, as a percent of the civilian labor force	1.8	1.8	1.6	1.8	1.6	1.6	1.5	1.5	1.5
U-2 Job losers and persons who completed temporary jobs, as a percent of the civilian labor force	2.4	2.3	2.0	2.5	2.4	2.3	2.3	2.2	2.1
U-3 Total unemployed, as a percent of the civilian labor force (official unemployment rate)	5.4	4.8	4.7	5.5	5.4	5.3	5.2	4.9	4.8
U-4 Total unemployed plus discouraged workers, as a percent of the civilian labor force plus discouraged workers	5.6	5.1	4.9	(1)	(1)	(1)	(1)	(1)	(1)
U-5 Total unemployed, plus discouraged workers, plus all other marginally attached workers, as a percent of the civilian labor force plus all marginally attached workers	6.4	5.9	5.7	(1)	(1)	(1)	(1)	(1)	(1)
U-6 Total unemployed, plus all marginally attached workers, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all marginally attached workers	9.5	9.0	8.5	(1)	(1)	(1)	(1)	(1)	(1)

[1] Not available.

NOTE: This range of alternative measures of labor underutilization replaces the U1-U7 range published in table A-7 of this release prior to 1994. Marginally attached workers are persons who currently are neither working nor looking for work but indicate that they want and are available for a job and have looked for work sometime in the recent past. Discouraged workers, a subset of the marginally attached, have given a job-market related reason for not currently looking for a job. Persons employed part time for economic reasons are those who want and are available for full-time work but have had to settle for a part-time schedule. For further information, see "BLS introduces new range of alternative unemployment measures," in the October 1995 issue of the *Monthly Labor Review*. Beginning in January 1997, data reflect revised population controls used in the household survey.

Table A-8. Unemployed persons by sex and age, seasonally adjusted

Age and sex	Number of unemployed persons (in thousands)			Unemployment rates[1]					
	May 1996	Apr. 1997	May 1997	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997	May 1997
Total, 16 years and over	7,331	6,714	6,534	5.5	5.4	5.3	5.2	4.9	4.8
16 to 24 years	2,581	2,449	2,357	12.1	12.2	12.0	11.8	11.4	10.9
16 to 19 years	1,305	1,229	1,244	16.8	17.0	17.5	16.4	15.4	15.6
16 to 17 years	636	618	585	19.5	17.7	19.7	19.4	18.5	18.4
18 to 19 years	667	617	657	14.4	16.6	15.2	14.6	13.3	13.7
20 to 24 years	1,276	1,220	1,114	9.5	9.4	8.7	9.0	9.0	8.2
25 years and over	4,784	4,253	4,209	4.3	4.0	4.1	4.0	3.7	3.7
25 to 54 years	4,223	3,750	3,733	4.4	4.2	4.2	4.1	3.8	3.8
55 years and over	561	487	481	3.5	3.1	3.0	3.3	3.0	2.9
Men, 16 years and over	3,932	3,604	3,271	5.5	5.4	5.1	5.2	4.9	4.5
16 to 24 years	1,444	1,331	1,175	12.8	12.9	12.0	12.2	11.8	10.3
16 to 19 years	724	701	630	17.6	18.4	17.9	17.9	17.2	15.2
16 to 17 years	343	350	290	20.5	20.4	19.6	21.4	20.5	17.8
18 to 19 years	381	362	339	15.5	17.1	15.4	15.7	15.2	13.5
20 to 24 years	720	631	544	10.1	9.8	8.6	8.9	8.7	7.5
25 years and over	2,504	2,267	2,113	4.1	4.0	3.9	3.9	3.7	3.4
25 to 54 years	2,204	2,003	1,846	4.2	4.1	4.0	3.9	3.8	3.5
55 years and over	296	272	263	3.3	3.2	3.3	3.5	3.0	2.8
Women, 16 years and over	3,399	3,109	3,263	5.5	5.3	5.5	5.3	4.9	5.2
16 to 24 years	1,137	1,118	1,183	11.3	11.4	11.9	11.3	10.9	11.6
16 to 19 years	581	528	614	15.5	15.5	16.9	14.9	13.8	16.0
16 to 17 years	293	268	295	18.4	14.9	19.7	17.1	16.5	19.0
18 to 19 years	286	255	318	13.2	16.2	15.0	13.3	11.3	13.8
20 to 24 years	556	589	569	8.9	8.9	8.8	9.1	9.3	8.9
25 years and over	2,280	1,988	2,096	4.4	4.1	4.2	4.2	3.8	4.0
25 to 54 years	2,019	1,747	1,887	4.5	4.3	4.5	4.3	3.9	4.2
55 years and over	265	214	218	3.8	2.9	2.6	3.1	3.0	3.0

[1] Unemployment as a percent of the civilian labor force.

NOTE: Beginning in January 1997, data reflect revised population controls used in the household survey.

Table A-9. Persons not in the labor force and multiple jobholders by sex, not seasonally adjusted

(Numbers in thousands)

Category	Total		Men		Women	
	May 1996	May 1997	May 1996	May 1997	May 1996	May 1997
NOT IN THE LABOR FORCE						
Total not in the labor force	66,721	66,870	23,923	24,368	42,797	42,502
Persons who currently want a job	6,215	5,901	2,808	2,488	3,607	3,412
Searched for work and available to work now[1]	1,475	1,431	694	639	780	792
Reason not currently looking:						
Discouragement over job prospects[2]	352	338	221	198	131	140
Reasons other than discouragement[3]	1,123	1,093	474	441	649	652
MULTIPLE JOBHOLDERS						
Total multiple jobholders[4]	7,846	8,197	4,352	4,396	3,494	3,800
Percent of total employed	6.2	6.3	6.4	6.3	6.0	6.4
Primary job full time, secondary job part time	4,455	4,594	2,743	2,773	1,711	1,820
Primary and secondary jobs both part time	1,709	1,713	558	546	1,151	1,167
Primary and secondary jobs both full time	245	282	153	190	87	73
Hours vary on primary or secondary job	1,408	1,608	884	875	524	733

[1] Data refer to persons who have searched for work during the prior 12 months and were available to take a job during the reference week.

[2] Includes thinks no work available, could not find work, lacks schooling or training, employer thinks too young or old, and other types of discrimination.

[3] Includes those who did not actively look for work in the prior 4 weeks for such reasons as child-care and transportation problems, as well as a small number for which reason for nonparticipation was not determined.

[4] Includes persons who work part time on their primary job and full time on their secondary job(s), not shown separately.

NOTE: Beginning in January 1997, data reflect revised population controls used in the household survey.

Table B-1. Employees on nonfarm payrolls by industry

(In thousands)

Industry	Not seasonally adjusted				Seasonally adjusted					
	May 1996	Mar. 1997	Apr. 1997P	May 1997P	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997P	May 1997P
Total	119,888	120,472	121,439	122,453	119,283	120,909	121,162	121,344	121,667	121,805
Total private	100,044	100,522	101,485	102,463	99,847	101,380	101,615	101,799	102,089	102,255
Goods-producing	24,453	24,163	24,411	24,704	24,432	24,581	24,653	24,670	24,663	24,683
Mining	576	562	567	574	579	574	574	572	573	575
Metal mining	53.7	53.5	53.7	54.4	54	55	54	54	54	54
Coal mining	95.8	92.4	92.6	92.9	97	94	93	93	93	93
Oil and gas extraction	317.2	312.7	314.0	317.1	322	317	319	317	319	321
Nonmetallic minerals, except fuels	108.1	103.1	106.6	109.5	106	108	108	108	107	107
Construction	5,430	5,204	5,437	5,566	5,384	5,542	5,604	5,609	5,599	5,622
General building contractors	1,250.2	1,227.1	1,257.4	1,294.8	1,254	1,287	1,298	1,298	1,294	1,299
Heavy construction, except building	799.9	685.3	747.1	804.9	771	774	791	777	768	776
Special trade contractors	3,379.4	3,291.7	3,432.3	3,565.9	3,359	3,481	3,515	3,534	3,537	3,547
Manufacturing	18,447	18,397	18,407	18,464	18,469	18,465	18,475	18,489	18,491	18,486
Production workers	12,739	12,705	12,711	12,762	12,762	12,758	12,762	12,771	12,772	12,783
Durable goods	10,775	10,821	10,836	10,870	10,762	10,821	10,836	10,848	10,856	10,856
Production workers	7,383	7,422	7,434	7,465	7,371	7,417	7,427	7,437	7,440	7,451
Lumber and wood products	774.1	780.5	786.2	796.3	778	789	793	797	799	800
Furniture and fixtures	503.5	507.1	505.2	508.2	503	506	507	507	506	508
Stone, clay, and glass products	546.7	529.5	539.0	548.4	541	543	543	542	541	540
Primary metal industries	710.4	708.9	706.3	707.3	711	708	708	709	709	708
Blast furnaces and basic steel products	241.3	235.9	234.8	234.7	(1)	(1)	(1)	(1)	(1)	(1)
Fabricated metal products	1,440.8	1,461.0	1,464.0	1,468.0	1,441	1,460	1,462	1,463	1,468	1,468
Industrial machinery and equipment	2,117.3	2,142.3	2,145.9	2,149.7	2,112	2,126	2,132	2,136	2,143	2,145
Computer and office equipment	363.2	371.5	373.4	374.8	363	367	370	372	375	375
Electronic and other electrical equipment	1,649.9	1,642.1	1,638.1	1,641.0	1,653	1,645	1,645	1,645	1,643	1,644
Electronic components and accessories	609.9	614.3	617.2	620.3	611	610	612	614	618	622
Transportation equipment	1,790.2	1,812.1	1,809.7	1,812.8	1,781	1,802	1,804	1,810	1,804	1,803
Motor vehicles and equipment	974.8	969.2	960.6	960.4	968	966	964	969	957	953
Aircraft and parts	454.8	489.9	495.2	497.3	455	483	487	491	495	498
Instruments and related products	855.3	852.5	853.4	854.5	855	854	854	853	855	854
Miscellaneous manufacturing	386.6	384.9	388.0	385.9	387	388	388	386	388	386
Nondurable goods	7,672	7,576	7,571	7,594	7,707	7,644	7,639	7,641	7,635	7,630
Production workers	5,356	5,283	5,277	5,297	5,391	5,341	5,335	5,334	5,332	5,332
Food and kindred products	1,665.8	1,653.0	1,648.8	1,660.7	1,698	1,695	1,694	1,698	1,699	1,693
Tobacco products	38.2	40.8	38.2	36.8	41	41	42	42	40	40
Textile mill products	626.2	611.0	608.9	610.9	626	615	612	612	609	609
Apparel and other textile products	875.5	822.8	821.0	820.1	871	835	831	827	822	816
Paper and allied products	679.7	673.1	672.6	675.1	682	678	678	677	677	677
Printing and publishing	1,534.2	1,533.9	1,537.9	1,540.5	1,538	1,534	1,534	1,535	1,540	1,544
Chemicals and allied products	1,031.0	1,025.8	1,025.2	1,027.8	1,034	1,028	1,028	1,028	1,028	1,031
Petroleum and coal products	142.8	136.5	138.0	139.9	142	139	139	140	139	139
Rubber and misc. plastics products	980.3	986.4	987.5	989.7	978	985	987	988	988	988
Leather and leather products	96.7	93.3	92.9	92.5	97	94	94	94	93	93
Service-producing	95,435	96,309	97,028	97,749	94,831	96,328	96,509	96,674	97,004	97,122
Transportation and public utilities	6,250	6,353	6,387	6,437	6,246	6,351	6,376	6,405	6,426	6,433
Transportation	4,034	4,123	4,155	4,202	4,027	4,121	4,142	4,164	4,184	4,194
Railroad transportation	233.2	223.8	226.0	226.1	231	226	227	226	226	224
Local and interurban passenger transit	452.5	467.3	469.8	473.6	436	452	453	455	459	456
Trucking and warehousing	1,631.4	1,640.1	1,653.9	1,677.9	1,641	1,656	1,664	1,671	1,678	1,687
Water transportation	174.9	169.9	176.4	180.5	170	175	175	175	178	175
Transportation by air	1,111.2	1,176.4	1,181.1	1,193.5	1,119	1,168	1,178	1,191	1,194	1,202
Pipelines, except natural gas	14.6	14.2	14.2	14.3	15	14	14	14	14	14
Transportation services	415.7	431.6	434.0	435.8	415	428	431	432	435	436
Communications and public utilities	2,216	2,230	2,232	2,235	2,219	2,230	2,234	2,241	2,242	2,239
Communications	1,328.4	1,358.9	1,363.0	1,365.3	1,332	1,354	1,358	1,364	1,369	1,369
Electric, gas, and sanitary services	887.2	871.1	869.4	870.1	887	876	876	877	873	870
Wholesale trade	6,466	6,571	6,602	6,641	6,457	6,570	6,593	6,611	6,623	6,630
Durable goods	3,794	3,877	3,895	3,914	3,788	3,863	3,879	3,889	3,900	3,908
Nondurable goods	2,674	2,694	2,707	2,727	2,669	2,707	2,714	2,722	2,723	2,722

See footnotes at end of table.

Table B-1. Employees on nonfarm payrolls by industry – Continued

(In thousands)

Industry	Not seasonally adjusted				Seasonally adjusted					
	May 1996	Mar. 1997	Apr. 1997P	May 1997P	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997P	May 1997P
Retail trade	21,589	21,494	21,757	22,071	21,547	21,917	21,922	21,945	22,036	22,032
Building materials and garden supplies	919.2	888.3	936.8	967.0	885	914	918	922	931	931
General merchandise stores	2,633.8	2,674.1	2,692.7	2,705.8	2,720	2,757	2,752	2,783	2,800	2,791
Department stores	2,305.9	2,351.7	2,356.3	2,375.3	2,388	2,420	2,416	2,452	2,446	2,458
Food stores	3,412.9	3,430.3	3,438.9	3,472.9	3,421	3,474	3,477	3,478	3,480	3,481
Automotive dealers and service stations	2,265.6	2,292.8	2,308.5	2,321.8	2,259	2,307	2,311	2,315	2,318	2,315
New and used car dealers	1,029.8	1,051.5	1,053.8	1,055.4	1,029	1,051	1,053	1,055	1,056	1,055
Apparel and accessory stores	1,075.1	1,071.1	1,074.7	1,076.2	1,097	1,107	1,103	1,104	1,104	1,099
Furniture and home furnishings stores	964.8	1,014.7	1,015.6	1,023.1	975	1,020	1,022	1,025	1,026	1,035
Eating and drinking places	7,647.8	7,386.1	7,558.3	7,731.1	7,493	7,552	7,556	7,525	7,579	7,577
Miscellaneous retail establishments	2,669.6	2,736.3	2,741.4	2,773.1	2,697	2,786	2,783	2,793	2,798	2,803
Finance, insurance, and real estate	6,985	6,951	6,985	7,029	6,888	6,971	6,980	6,992	7,019	7,030
Finance	3,286	3,359	3,369	3,384	3,291	3,351	3,355	3,366	3,380	3,388
Depository institutions	2,016.6	2,030.3	2,032.2	2,041.2	2,021	2,032	2,034	2,037	2,041	2,045
Commercial banks	1,458.6	1,476.0	1,477.5	1,485.8	1,463	1,478	1,479	1,482	1,486	1,490
Savings institutions	265.9	253.5	253.1	252.8	266	255	255	254	253	253
Nondepository institutions	512.8	535.4	537.7	541.4	513	533	530	534	537	541
Mortgage bankers and brokers	230.7	241.3	241.8	243.3	229	239	241	242	241	242
Security and commodity brokers	545.4	576.7	580.9	581.8	547	572	576	579	584	584
Holding and other investment offices	210.7	216.1	218.5	219.4	210	214	215	216	218	218
Insurance	2,217	2,215	2,217	2,220	2,218	2,218	2,219	2,217	2,221	2,221
Insurance carriers	1,510.8	1,498.3	1,499.2	1,501.0	1,512	1,505	1,503	1,500	1,502	1,502
Insurance agents, brokers, and service	706.2	717.0	718.1	718.9	706	713	716	717	719	719
Real estate	1,382	1,377	1,399	1,425	1,379	1,402	1,406	1,409	1,418	1,421
Services[2]	34,399	34,990	35,343	35,581	34,277	34,990	35,091	35,176	35,322	35,447
Agricultural services	669.0	580.0	668.6	721.9	618	647	649	648	663	667
Hotels and other lodging places	1,730.6	1,676.5	1,706.5	1,787.9	1,715	1,743	1,746	1,746	1,757	1,770
Personal services	1,168.2	1,257.1	1,257.9	1,185.9	1,182	1,195	1,197	1,196	1,197	1,199
Business services	7,170.4	7,459.1	7,489.4	7,551.5	7,216	7,476	7,521	7,577	7,593	7,601
Services to buildings	905.8	890.8	896.3	906.3	902	893	897	896	901	903
Personnel supply services	2,596.0	2,676.2	2,670.0	2,697.4	2,634	2,743	2,758	2,787	2,752	2,738
Help supply services	2,293.6	2,349.6	2,337.9	2,362.9	2,332	2,427	2,432	2,457	2,419	2,402
Computer and data processing services	1,192.2	1,298.1	1,309.8	1,321.3	1,195	1,268	1,278	1,291	1,307	1,325
Auto repair, services, and parking	1,075.7	1,125.4	1,131.5	1,136.3	1,075	1,117	1,123	1,128	1,131	1,136
Miscellaneous repair services	375.7	377.5	380.9	386.0	375	380	379	380	382	385
Motion pictures	523.7	532.8	529.3	533.9	523	530	532	529	527	532
Amusement and recreation services	1,541.4	1,372.8	1,480.2	1,507.0	1,485	1,490	1,495	1,494	1,494	1,526
Health services	9,438.7	9,603.7	9,626.2	9,654.9	9,433	9,586	9,600	9,612	9,643	9,659
Offices and clinics of medical doctors	1,670.0	1,716.1	1,722.2	1,732.4	1,674	1,713	1,720	1,721	1,727	1,736
Nursing and personal care facilities	1,723.8	1,749.4	1,753.6	1,757.7	1,730	1,750	1,751	1,753	1,759	1,764
Hospitals	3,804.2	3,851.1	3,852.0	3,858.5	3,809	3,841	3,846	3,852	3,856	3,863
Home health care services	667.1	677.0	681.7	684.2	665	677	676	678	684	683
Legal services	921.8	942.9	944.7	945.9	927	942	943	946	950	951
Educational services	2,044.7	2,178.0	2,190.0	2,100.7	2,010	2,042	2,046	2,047	2,060	2,066
Social services	2,425.3	2,459.0	2,470.6	2,491.1	2,401	2,432	2,438	2,445	2,457	2,465
Child day care services	588.1	595.5	597.5	607.3	569	578	579	580	581	587
Residential care	669.4	688.4	690.8	694.1	669	684	686	690	693	694
Museums and botanical and zoological gardens	87.8	81.4	85.4	89.7	85	87	87	87	87	87
Membership organizations	2,185.2	2,178.3	2,185.0	2,197.4	2,187	2,192	2,192	2,193	2,198	2,199
Engineering and management services	2,826.3	2,950.1	2,979.3	2,974.5	2,830	2,916	2,927	2,934	2,957	2,978
Engineering and architectural services	833.3	857.7	863.7	872.2	834	857	862	866	870	873
Management and public relations	864.8	921.8	934.7	943.5	864	913	919	923	936	942
Services, nec	47.1	47.6	48.0	48.4	(1)	(1)	(1)	(1)	(1)	(1)
Government	19,844	19,950	19,954	19,990	19,416	19,529	19,547	19,545	19,578	19,550
Federal	2,773	2,700	2,702	2,702	2,770	2,723	2,716	2,709	2,709	2,698
Federal, except Postal Service	1,920.7	1,849.7	1,853.9	1,854.8	1,914	1,862	1,861	1,856	1,857	1,848
State	4,688	4,748	4,758	4,680	4,629	4,621	4,624	4,622	4,633	4,620
Education	1,983.7	2,069.3	2,074.6	1,993.4	1,926	1,928	1,931	1,929	1,939	1,935
Other State government	2,704.4	2,679.0	2,683.1	2,686.3	2,703	2,693	2,693	2,693	2,694	2,685
Local	12,383	12,502	12,494	12,608	12,017	12,185	12,207	12,214	12,236	12,232
Education	7,090.5	7,237.6	7,206.5	7,254.4	6,700	6,831	6,849	6,853	6,858	6,856
Other local government	5,292.4	5,264.2	5,287.2	5,353.1	5,317	5,354	5,358	5,361	5,378	5,377

[1] This series is not published seasonally adjusted because the seasonal component, which is small relative to the trend-cycle and irregular components, cannot be seperated with sufficient precision.

[2] Includes other industries, not shown separately.

P = preliminary.

NOTE: Data have been revised to reflect March 1998 benchmarks, updated seasonal adjustment procedures, and recomputed seasonal adjustment factors.

Table B-2. Average weekly hours of production or nonsupervisory workers[1] on private nonfarm payrolls by industry

Industry	Not seasonally adjusted				Seasonally adjusted					
	May 1996	Mar. 1997	Apr. 1997[P]	May 1997[P]	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997[P]	May 1997[P]
Total private	34.3	34.6	34.4	34.5	34.3	34.4	34.8	34.8	34.5	34.5
Goods-producing	41.0	41.2	41.2	41.4	41.0	41.1	41.2	41.4	41.4	41.4
Mining	45.2	45.7	45.1	45.9	45.3	44.7	45.8	45.9	45.3	46.1
Construction	38.9	38.4	38.8	39.7	38.5	38.6	38.8	38.9	39.0	39.4
Manufacturing	41.6	42.0	41.8	41.9	41.6	41.8	41.9	42.1	42.1	42.0
Overtime hours	4.3	4.7	4.6	4.7	4.6	4.7	4.7	4.9	4.9	4.8
Durable goods	42.4	42.9	42.7	42.8	42.5	42.5	42.7	42.9	43.0	42.8
Overtime hours	4.7	5.1	5.0	5.0	4.9	5.0	5.0	5.2	5.3	5.2
Lumber and wood products	41.2	40.7	41.2	41.5	40.9	40.7	40.8	41.0	41.2	41.2
Furniture and fixtures	39.1	39.9	39.5	39.7	39.6	39.8	39.9	40.3	40.1	40.3
Stone, clay, and glass products	43.6	42.5	43.0	43.5	43.3	42.6	43.3	43.1	43.1	43.2
Primary metal industries	44.1	44.8	44.6	44.5	44.1	44.4	44.6	44.8	45.0	44.8
Blast furnaces and basic steel products	44.3	44.7	44.4	44.1	44.3	44.7	44.6	44.8	44.7	44.1
Fabricated metal products	42.3	42.5	42.5	42.5	42.5	42.4	42.5	42.6	43.0	42.6
Industrial machinery and equipment	43.0	43.8	43.5	43.5	43.1	43.2	43.4	43.5	43.8	43.6
Electronic and other electrical equipment	41.1	42.2	41.9	41.8	41.4	41.3	41.9	42.1	42.4	42.1
Transportation equipment	44.5	45.0	44.6	44.6	44.3	44.7	44.6	45.0	44.7	44.4
Motor vehicles and equipment	45.9	45.6	45.4	45.5	45.7	45.6	45.3	45.7	45.3	45.2
Instruments and related products	41.5	42.2	41.7	41.8	41.6	41.6	42.1	42.0	41.9	42.0
Miscellaneous manufacturing	39.5	40.3	40.2	39.9	39.8	39.9	40.5	40.2	40.5	40.2
Nondurable goods	40.4	40.7	40.5	40.6	40.5	40.7	40.8	40.9	40.9	40.8
Overtime hours	3.8	4.2	4.1	4.1	4.1	4.2	4.3	4.4	4.4	4.3
Food and kindred products	40.7	40.7	40.4	41.0	41.0	41.2	41.3	41.3	41.1	41.3
Tobacco products	39.9	39.1	38.4	38.6	39.8	39.9	40.8	40.2	39.0	38.3
Textile mill products	40.6	41.2	41.3	41.2	40.7	41.2	40.9	41.2	41.7	41.4
Apparel and other textile products	37.3	37.5	37.2	37.2	37.1	37.2	37.2	37.5	37.5	37.1
Paper and allied products	43.0	43.5	43.4	43.4	43.3	43.7	43.7	43.8	43.9	43.8
Printing and publishing	38.0	38.7	38.4	38.2	38.2	38.3	38.5	38.6	38.6	38.4
Chemicals and allied products	43.0	43.2	43.1	43.2	43.1	43.2	43.3	43.3	43.2	43.4
Petroleum and coal products	42.6	43.0	42.7	42.9	(2)	(2)	(2)	(2)	(2)	(2)
Rubber and misc. plastics products	41.6	41.6	41.6	41.7	41.5	41.4	41.7	41.8	42.1	41.6
Leather and leather products	38.2	38.5	38.0	38.1	38.2	38.4	38.9	38.7	38.4	38.1
Service-producing	32.5	32.9	32.6	32.7	32.5	32.7	33.0	33.0	32.7	32.7
Transportation and public utilities	39.2	39.5	39.3	39.4	39.4	39.5	39.7	39.8	39.4	39.6
Wholesale trade	38.2	38.5	38.3	38.6	38.1	38.2	38.6	38.6	38.4	38.5
Retail trade	28.7	28.7	28.6	28.8	28.8	28.8	29.1	29.1	28.9	28.9
Finance, insurance, and real estate	35.6	36.5	35.8	35.8	(2)	(2)	(2)	(2)	(2)	(2)
Services	32.2	32.6	32.4	32.4	(2)	(2)	(2)	(2)	(2)	(2)

[1] Data relate to production workers in mining and manufacturing; construction workers in construction; and nonsupervisory workers in transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and services. These groups account for approximately four-fifths of the total employees on private nonfarm payrolls.

[2] These series are not published seasonally adjusted because the seasonal component, which is small relative to the trend-cycle and irregular components, cannot be separated with sufficient precision.

[P] = preliminary.

NOTE: Data have been revised to reflect March 1996 benchmarks, updated seasonal adjustment procedures, and recomputed seasonal adjustment factors.

Table B-3. Average hourly and weekly earnings of production or nonsupervisory workers[1] on private nonfarm payrolls by industry

Industry	Average hourly earnings				Average weekly earnings			
	May 1996	Mar. 1997	Apr. 1997P	May 1997P	May 1996	Mar. 1997	Apr. 1997P	May 1997P
Total private	$11.72	$12.17	$12.17	$12.17	$402.00	$421.08	$418.65	$419.87
Seasonally adjusted	11.74	12.14	12.15	12.19	402.68	422.47	419.18	420.56
Goods-producing	13.37	13.72	13.78	13.83	548.17	565.26	567.74	572.56
Mining	15.44	15.98	16.05	16.00	697.89	730.29	723.86	734.40
Construction	15.29	15.67	15.76	15.85	594.78	601.73	611.49	629.25
Manufacturing	12.71	13.08	13.09	13.09	528.74	549.36	547.16	548.47
Durable goods	13.27	13.64	13.64	13.65	562.65	585.16	582.43	584.22
Lumber and wood products	10.34	10.60	10.64	10.71	426.01	431.42	438.37	444.47
Furniture and fixtures	10.08	10.43	10.43	10.50	394.13	416.16	411.99	416.85
Stone, clay, and glass products	12.74	13.03	13.07	13.15	555.46	553.78	562.01	572.03
Primary metal industries	14.82	15.16	15.12	15.14	653.56	679.17	674.35	673.73
Blast furnaces and basic steel products	17.52	17.86	17.88	17.89	776.14	798.34	799.87	788.95
Fabricated metal products	12.46	12.78	12.81	12.82	527.06	543.15	544.43	544.85
Industrial machinery and equipment	13.45	13.93	13.93	13.93	578.35	610.13	605.96	605.96
Electronic and other electrical equipment	12.09	12.49	12.56	12.54	496.90	527.08	526.26	524.17
Transportation equipment	17.19	17.51	17.48	17.47	764.96	787.95	779.61	779.16
Motor vehicles and equipment	17.84	18.01	18.01	17.99	818.86	824.86	817.85	818.55
Instruments and related products	13.04	13.47	13.48	13.55	541.16	568.43	562.12	566.39
Miscellaneous manufacturing	10.34	10.56	10.52	10.54	408.43	425.57	422.90	420.55
Nondurable goods	11.89	12.25	12.27	12.26	480.36	498.58	496.94	497.76
Food and kindred products	11.18	11.40	11.45	11.40	455.03	463.88	462.58	457.40
Tobacco products	21.04	19.40	20.30	20.77	839.50	758.54	779.52	801.72
Textile mill products	9.62	9.92	9.94	9.84	390.57	408.70	410.52	409.53
Apparel and other textile products	7.94	8.24	8.21	8.21	296.16	309.00	305.41	305.41
Paper and allied products	14.59	14.93	15.01	15.05	627.37	649.46	651.43	653.17
Printing and publishing	12.54	13.01	12.97	12.89	476.52	503.49	498.05	492.40
Chemicals and allied products	16.04	16.42	16.43	16.49	689.72	709.34	708.13	712.37
Petroleum and coal products	18.99	20.51	20.01	19.96	808.97	881.93	854.43	856.28
Rubber and misc. plastics products	11.20	11.50	11.54	11.53	465.92	480.70	482.37	480.80
Leather and leather products	8.42	8.86	8.87	8.89	321.64	341.11	337.06	338.71
Service-producing	11.15	11.66	11.64	11.61	382.38	383.61	379.46	379.85
Transportation and public utilities	14.34	14.70	14.78	14.72	562.13	580.65	580.85	579.97
Wholesale trade	12.75	13.28	13.33	13.31	487.05	511.28	510.54	513.77
Retail trade	7.92	8.27	8.29	8.27	227.30	237.35	237.09	238.18
Finance, insurance, and real estate	12.74	13.20	13.10	13.15	453.54	481.80	468.98	470.77
Services	11.67	12.24	12.20	12.17	375.77	399.02	395.28	394.31

[1] See footnote 1, table B-2.
P = preliminary.
NOTE: Data have been revised to reflect March 1996 benchmarks, updated seasonal adjustment procedures, and recomputed seasonal adjustment factors.

Table B-4. Average hourly earnings of production or nonsupervisory workers[1] on private nonfarm payrolls by industry, seasonally adjusted

Industry	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997p	May 1997p	Percent change from: Apr. 1997-May 1997
Total private:							
Current dollars	$11.74	$12.05	$12.10	$12.14	$12.15	$12.19	0.3
Constant (1982) dollars[2]	7.40	7.46	7.47	7.49	7.50	N.A.	(3)
Goods-producing	13.40	13.73	13.76	13.79	13.80	13.86	.4
Mining	15.50	15.98	15.96	15.94	15.96	16.07	.7
Construction	15.37	15.73	15.79	15.80	15.87	15.93	.4
Manufacturing	12.73	13.02	13.03	13.07	13.07	13.11	.3
Excluding overtime[4]	12.06	12.34	12.35	12.37	12.38	12.38	.0
Service-producing	11.17	11.49	11.54	11.59	11.59	11.63	.3
Transportation and public utilities	14.42	14.74	14.64	14.73	14.77	14.80	.2
Wholesale trade	12.76	13.12	13.23	13.30	13.27	13.32	.4
Retail trade	7.93	8.19	8.21	8.25	8.27	8.28	.1
Finance, insurance, and real estate	12.73	12.95	13.08	13.12	13.01	13.15	1.1
Services	11.70	12.05	12.12	12.16	12.16	12.20	.3

[1] See footnote 1, table B-2.
[2] The Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) is used to deflate this series.
[3] Change was .1 percent from March 1997 to April 1997, the latest month available.
[4] Derived by assuming that overtime hours are paid at the rate of time and one-half.

N.A. = not available.
p = preliminary.

NOTE: Data have been revised to reflect March 1996 benchmarks, updated seasonal adjustment procedures, and recomputed seasonal adjustment factors.

Table B-5. Indexes of aggregate weekly hours of production or nonsupervisory workers[1] on private nonfarm payrolls by industry

(1982=100)

Industry	Not seasonally adjusted				Seasonally adjusted					
	May 1996	Mar. 1997	Apr. 1997p	May 1997p	May 1996	Jan. 1997	Feb. 1997	Mar. 1997	Apr. 1997p	May 1997p
Total private	136.0	137.5	138.2	140.2	135.7	138.2	140.0	140.2	139.6	140.0
Goods-producing	111.2	110.0	111.2	113.8	111.0	112.0	113.1	113.3	113.4	113.6
Mining	55.0	55.1	55.1	57.1	55.4	54.8	56:4	56.6	56.0	57.6
Construction	148.8	138.2	147.4	158.6	145.8	151.0	154.5	154.0	153.6	155.9
Manufacturing	106.8	107.6	107.2	107.8	107.2	107.4	107.9	108.3	108.6	108.2
Durable goods	109.3	111.0	110.8	111.4	109.2	110.0	110.7	111.3	111.7	111.3
Lumber and wood products	138.2	138.1	140.8	143.7	138.2	140.3	140.7	142.2	143.3	143.8
Furniture and fixtures	122.2	126.2	124.5	125.8	123.9	125.1	125.7	127.3	126.4	127.6
Stone, clay, and glass products	112.2	105.7	108.9	111.9	109.9	108.9	111.0	110.0	109.4	109.7
Primary metal industries	92.5	94.0	93.4	93.2	92.4	93.1	93.5	93.9	94.3	93.3
Blast furnaces and basic steel products	73.7	72.7	72.0	71.5	74.0	73.4	72.9	73.2	73.0	71.6
Fabricated metal products	113.8	116.2	116.4	117.0	114.2	115.7	116.2	116.7	118.2	117.1
Industrial machinery and equipment	104.9	108.9	108.7	108.7	104.8	106.0	106.9	107.7	109.0	108.5
Electronic and other electrical equipment	107.3	108.9	107.7	108.0	108.1	106.6	108.3	108.8	109.4	108.9
Transportation equipment	125.3	128.1	125.8	127.3	124.1	126.4	126.1	127.6	126.2	125.9
Motor vehicles and equipment	171.5	169.3	165.9	166.5	168.7	167.7	165.9	167.9	164.4	163.6
Instruments and related products	75.1	75.9	74.8	74.7	75.2	75.1	76.0	75.4	75.1	75.1
Miscellaneous manufacturing	101.3	102.5	102.4	101.6	102.3	102.5	104.1	102.5	103.7	102.9
Nondurable goods	103.4	102.8	102.2	102.9	104.4	104.0	104.0	104.3	104.3	104.0
Food and kindred products	112.5	112.0	110.8	113.3	116.3	117.0	117.0	117.4	116.9	117.0
Tobacco products	55.9	60.8	55.1	53.3	62.8	63.2	64.7	63.7	59.9	58.8
Textile mill products	89.5	88.8	88.8	88.7	89.3	89.4	88.2	88.8	89.6	88.8
Apparel and other textile products	78.7	74.1	73.2	73.2	77.7	74.6	74.2	74.3	73.9	72.6
Paper and allied products	107.7	108.8	108.3	109.0	108.9	110.2	110.2	110.2	110.4	110.4
Printing and publishing	122.9	124.8	124.1	123.9	123.9	123.3	123.9	124.3	124.7	125.0
Chemicals and allied products	100.8	100.0	99.8	100.2	101.6	100.1	100.3	100.3	100.3	101.1
Petroleum and coal products	74.8	72.8	73.8	75.9	75.4	78.0	76.3	76.1	74.2	75.9
Rubber and misc. plastics products	142.9	144.8	144.8	144.9	142.5	143.1	144.5	145.0	146.3	144.7
Leather and leather products	44.1	42.2	41.5	41.4	44.0	42.5	43.0	42.8	41.9	41.6
Service-producing	147.1	149.9	150.3	152.0	146.8	150.0	152.1	152.3	151.3	151.8
Transportation and public utilities	126.3	129.2	129.3	130.7	126.7	129.3	130.5	131.4	130.5	131.2
Wholesale trade	122.4	125.1	124.8	126.5	121.9	124.3	125.9	126.3	125.6	126.2
Retail trade	134.3	133.6	134.7	137.7	134.5	136.7	138.2	138.5	137.9	137.9
Finance, insurance, and real estate	123.5	127.6	126.0	126.9	123.6	124.7	128.9	129.0	126.4	126.9
Services	176.3	181.3	181.9	183.0	175.5	180.2	182.6	182.6	181.6	182.2

[1] See footnote 1, table B-2.
p = preliminary.
NOTE: Data have been revised to reflect March 1996 benchmarks, updated seasonal adjustment procedures, and recomputed seasonal adjustment factors.

Table B-6. Diffusion indexes of employment change, seasonally adjusted

(Percent)

Time span	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Private nonfarm payrolls, 356 industries[1]											
Over 1-month span:												
1993	59.7	61.0	49.6	57.6	61.5	56.2	55.5	58.3	62.2	59.6	61.7	59.3
1994	57.6	61.9	67.1	64.5	57.7	63.9	62.5	62.6	61.4	60.3	63.8	62.4
1995	62.4	60.1	54.5	55.6	48.0	53.9	54.1	59.8	57.0	54.9	57.2	57.9
1996	51.7	64.3	60.1	54.9	62.9	60.5	56.5	59.3	54.4	62.6	58.1	61.0
1997	59.3	59.1	59.0	P60.5	P55.8							
Over 3-month span:												
1993	64.7	60.8	60.5	58.6	62.9	63.6	59.6	62.9	64.7	68.9	64.3	63.6
1994	65.3	69.5	70.4	68.7	67.1	67.0	69.1	69.7	65.7	65.6	67.0	66.2
1995	65.4	62.5	58.7	53.2	54.6	52.4	57.9	59.6	59.7	59.0	57.0	58.3
1996	62.6	63.6	62.6	61.2	62.1	63.1	62.6	58.8	62.8	60.4	64.7	65.0
1997	64.6	62.2	P63.3	P63.8								
Over 6-month span:												
1993	62.9	64.6	64.3	64.3	62.2	65.6	66.0	64.9	66.3	66.7	69.4	69.2
1994	71.1	69.8	69.8	70.9	70.1	69.8	69.7	69.4	69.4	67.4	67.7	66.2
1995	66.9	61.4	58.1	56.6	58.1	58.1	56.7	59.8	60.3	59.1	61.5	63.3
1996	62.2	63.5	63.5	63.5	62.6	61.2	65.3	63.6	62.6	64.5	64.2	67.4
1997	P66.7	P66.2										
Over 12-month span:												
1993	64.9	63.9	64.0	65.4	67.0	67.6	67.6	67.0	70.2	69.5	69.2	70.1
1994	70.2	71.6	71.8	71.8	72.1	71.8	71.5	72.1	70.1	69.5	66.6	65.0
1995	63.6	62.4	62.6	63.3	61.7	61.9	58.7	62.2	62.2	61.1	62.2	63.3
1996	63.5	64.7	62.4	62.9	64.7	64.2	65.0	63.1	63.8	P65.7	P64.7	
1997												
	Manufacturing payrolls, 139 industries[1]											
Over 1-month span:												
1993	52.2	56.8	49.6	44.2	53.2	46.4	49.3	51.8	57.9	52.2	54.0	55.8
1994	55.8	59.0	60.4	58.6	52.9	58.6	59.4	58.1	52.9	55.0	58.6	58.3
1995	54.3	56.1	44.2	51.4	42.1	42.8	43.5	52.2	47.1	50.0	47.5	50.7
1996	45.7	54.3	47.8	39.2	52.2	52.2	44.2	52.9	44.2	50.7	49.6	52.2
1997	54.0	50.4	52.9	P50.4	P50.7							
Over 3-month span:												
1993	61.5	59.0	54.0	48.8	48.8	54.3	51.1	58.3	57.2	59.4	54.7	58.3
1994	61.9	64.7	65.5	59.7	57.6	60.1	62.2	57.9	55.0	55.4	60.1	59.4
1995	59.7	50.4	47.5	40.3	42.4	36.3	38.5	43.9	49.3	46.4	45.3	43.9
1996	47.5	47.8	42.1	38.5	43.2	45.0	48.9	43.2	50.4	48.4	52.5	52.5
1997	53.2	51.4	P48.6	P51.8								
Over 6-month span:												
1993	55.8	58.6	58.6	55.8	51.8	57.2	59.7	57.2	57.6	58.3	62.6	60.8
1994	62.2	62.2	62.6	63.3	59.4	56.5	58.5	58.6	58.6	55.0	58.3	55.0
1995	55.8	48.6	43.9	38.8	39.2	39.6	38.8	39.6	43.9	45.0	44.2	44.6
1996	41.4	41.7	41.0	38.1	39.6	40.8	47.5	46.8	45.3	50.4	48.2	53.2
1997	P51.8	P52.5										
Over 12-month span:												
1993	56.8	57.9	55.8	58.6	57.2	57.6	58.6	59.0	61.2	59.7	60.1	57.6
1994	57.9	58.6	60.8	60.8	60.8	63.3	59.4	60.1	57.2	56.5	50.4	49.6
1995	46.0	44.2	46.0	47.8	41.0	41.7	38.5	38.8	36.3	37.4	38.1	39.9
1996	39.6	42.8	39.2	39.6	42.4	40.3	43.5	40.3	43.5	P45.3	P45.0	
1997												

[1] Based on seasonally adjusted data for 1-, 3-, and 6-month spans and unadjusted data for the 12-month span. Data are centered within the span.

P = preliminary.

NOTE: Figures are the percent of industries with employment increasing plus one-half of the industries with unchanged employment, where 50 percent indicates an equal balance between industries with increasing and decreasing employment. Data have been revised to reflect March 1996 benchmarks, updated seasonal adjustment procedures, and recomputed seasonal adjustment factors.

MEASUREMENT ISSUES IN THE CONSUMER PRICE INDEX*

Bureau of Labor Statistics

U.S. Department of Labor

June 1997

*Prepared in response to a letter from Jim Saxton, Chairman of the Joint Economic Committee, to Katharine Abraham, Commissioner of the Bureau Labor Statistics, dated January 28, 1997.

This paper on the Consumer Price Index (CPI) has been prepared in response to a letter from Jim Saxton, Chairman of the Joint Economic Committee, to Katharine Abraham, Commissioner of the Bureau Labor Statistics, dated January 28, 1997. The letter requested "a serious, detailed response by the professional career staff of the Bureau of Labor Statistics (BLS)...to fully inform Congress, the media, and the public of the central issues raised by the Boskin Commission report, and the BLS response to them."

The following pages address the definition and measurement objective of the CPI, together with the BLS response to the estimates of bias put forward in the final report of the Advisory Commission to Study the Consumer Price Index and to the specific recommendations made to the Bureau by the commission. Decisions concerning whether and how the CPI should be used in escalation, however, lie outside the purview of a statistical agency such as the BLS, so the budgetary implications of any bias in the CPI are not discussed.

The Advisory Commission to Study the Consumer Price Index (CPI), established by the Senate Finance Committee and chaired by Michael Boskin, delivered its final report on December 4, 1996.[1] The present paper summarizes the response of the Bureau of Labor Statistics to the findings of the commission.

The advisory commission compares the U.S. CPI to a hypothetical ideal measure of the change in the cost of living and concludes that in several respects the CPI is biased relative to this standard. The categories of bias discussed by the commission include: substitution bias (due in large part to the fixed-weight nature of the index), outlet bias (which may occur if the benefits to consumers from switching to discount outlets are not accounted for in the index), quality change bias (which results when the quality differences between the goods priced in two consecutive periods cannot be accurately measured and deducted from the accompanying price

[1] U.S. Senate, Committee on Finance, *Final Report of the Advisory Commission to Study the Consumer Price Index.* Print 104-72, 104 Cong., 2 sess., (Washington, D.C., Government Printing Office, 1996).

difference between the goods), and new product bias (due to the failure to reflect adequately the value to consumers of new products that are introduced into the market). The commission, using empirical evidence and the members' own judgments about the magnitude of these biases, concludes that the CPI overstates the true cost-of-living change by 1.1 percentage points per year. The commission also discusses the fiscal impact of CPI bias through its use as an adjustment factor in several areas of the federal budget, including Social Security, military and civil service retirement, and the income tax.

The advisory commission emphasizes that the U.S. economy is exceedingly complex and dynamic, with the available offerings of goods and services constantly changing. It also acknowledges that index number construction is a complex and difficult task. It recommends that the BLS make several changes in the methods used in constructing the CPI, including more frequent updates of the market basket and expenditure information required by the index and the use of formulas more consistent with the theoretical cost-of-living concept. Most prominently and fundamentally, the commission recommends explicitly adopting the cost-of-living index as the measurement objective of the CPI, replacing the current index by two indexes—a monthly index that takes account of the changing market basket and a second annual index calculated using a "superlative" formula and subject to revision—and using geometric means for aggregating elementary price quotes. The commission also makes several intermediate and longer run methodological and research recommendations.

The objectives of the present paper are: first, to discuss the relationship of the CPI to the conceptual cost-of-living index; second, to review and critique the advisory commission's estimates of bias; and third, to respond to the detailed recommendations made by the commission. The advisory commission's report also raises a number of issues that will not be addressed here. These include: first, the various uses of the CPI; second, the revenue impacts of changes in the CPI; third, recommendations made to Congress and to the economics profession; fourth, separate indexes for demographic subgroups of the population; and fifth, the potential impact of including social and environmental factors (such as crime, AIDS, and pollution) in an

official index. The first three of these topics generally involve the formulation of policy and so are outside the purview of the Bureau of Labor Statistics. The latter two are topics on which relatively little research has been conducted.[2]

II. The CPI in a Cost-of-Living Framework

The CPI is a measure of the average change in the prices paid by urban consumers for a fixed market basket of goods and services. Measuring price change through the use of a fixed market basket has a long history in economics, going back to the early 1700's in England.[3] Over time the state of the art for specification of the market basket has evolved from a judgmental selection of representative items to the modern survey-based approach of defining a comprehensive categorization of goods and services, selecting a representative sample of items to track, and weighting them according to the consumption of the average consumer during a base period.

The CPI is computed using an index number formula, known as the Laspeyres formula, that measures the change in the cost of a fixed market basket.[4] In this formula the quantities of the goods and services purchased by urban consumers during a base period serve as the weights for the prices, so that the value of the market basket represents the cost of purchasing the same items as were purchased during the base period. The CPI measures the current cost of the market basket relative to its cost during a reference period. In other words, the Laspeyres price index

[2] For experimental index results for the poor and elderly subgroups, see Thesia I. Garner, David S. Johnson, and Mary F. Kokoski, "An Experimental Consumer Price Index for the Poor", *Monthly Labor Review*, vol. 119, no. 9, September, 1996, pp. 32- 42; and Nathan Amble and Ken Stewart, "Experimental Price Index for Elderly Consumers", *Monthly Labor Review*, vol. 117, no. 5, May, 1994, pp. 11-16. These experimental indexes simply reweight CPI price measures to reflect the expenditure patterns of the poor and the elderly, so the price measures are not necessarily representative of the outlets at which these groups shop or the specific items that they purchase. The non-market aspects of quality of life present conceptual and theoretical problems that have not been resolved and, thus, have not received a comprehensive empirical treatment to date.

[3] See W. E. Diewert, "The Early History of Price Index Research," in W. Erwin Diewert and Alice O. Nakamura, eds., *Essays in Index Number Theory*, Volume 1 (Amsterdam, North-Holland, 1993).

[4] The formula used by the BLS for the CPI is sometimes referred to as a "modified" Laspeyres formula because the market basket is representative of expenditures during an earlier period than the period in which it is first used for price comparisons.

answers the question: "What is the value of the base-period market basket in today's prices?" An important underlying assumption in the comparison of market basket values is that the price changes are measured net of any changes in the quality of the goods and services that may have occurred. Indeed, adjusting for changes in product quality is one of the main problems facing index number practitioners and is a problem to which the BLS devotes considerable effort.

The computation of the CPI is an undertaking that involves the collection of prices from approximately 7,300 housing units and 22,500 retail/service establishments each month. The CPI is constructed in two stages. In the first stage, often referred to as the "lower" level, the elementary indexes are constructed. These indexes are the 206 item category indexes constructed for each of the 44 urban areas from which prices are collected for specific items in specific outlets.[5] In the second stage, the "upper" level, the BLS combines the 206 item indexes formulated for the 44 index areas. Thus the overall U.S. CPI is an aggregation of 9,064 indexes.

To construct the market basket of goods and services, the BLS uses information from the Consumer Expenditure Survey (CEX). This is a household survey that collects comprehensive data on consumer spending. Currently the expenditure base period of the CPI is 1982-84, but with the revision scheduled for 1998 the base period will change to 1993-95. To measure price changes, a sample of outlets is selected from locations identified by consumers from the Point of Purchase Survey (POPS). Specific sample items are then selected from each sample outlet, to ensure that the market basket is representative of what households purchase and where they shop. To keep up with changing shopping patterns, the Bureau replaces about 20 percent of the outlet sample in every year, thus turning over the sample every five years.

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[5] Until January 1997 there were 207 strata of items. The construction of these indexes involves the random sampling of outlets and areas, and the use of an aggregation formula. The 27 largest Metropolitan Statistical Areas (MSA) along with Anchorage and Honolulu are selected as self-representing Primary Sampling Units (PSU) with certainty. To represent the remaining urban areas a random sample of representative PSU's is selected. The sample of areas underlying the CPI will change in January 1998 as part of the CPI Revision process, as discussed by Janet L. Williams, "The Redesign of the CPI Geographic Sample," *Monthly Labor Review*, 119, no. 12, December 1996, pp. 10-17.

The CPI is used for many purposes, but measurement of changes in the cost of living is one of the most important of these. The BLS has for many years used the concept of the cost-of-living index as a framework for making decisions about the CPI and accepts the COLI as the measurement objective for the index.[6] The cost-of-living index is a theoretical construct, however, not a single or straightforward index formula readily amenable to practical use.

The cost-of-living index compares the cost to the consumer at different points in time of maintaining a constant standard of well-being, without restrictions on the market basket. It is a theoretical concept based on the well-being of the individual consumer, so that additional assumptions about how to apply it as a measurement objective for an aggregated set of consumers (such as the U.S. urban population) must be made. In addition, for an aggregate measure, assumptions must be made about the implications of the distribution of prices paid for the same good across markets. The general cost-of-living theory does not prescribe how any compensation for changes in well-being would or should be administered. Thus, while the CPI may be described formally in the context of a cost-of-living index, there is no single all-purpose definition of this target.[7]

In the most general sense, the cost-of-living index answers the following question: "What is the minimum change in expenditure that would be required in order to leave a specified consumer unit indifferent (or as well off) between a specified reference period's prices and a comparison period's prices?"[8] The consumer's well-being depends on many aspects of life other than market goods and services, e.g., environmental quality and amenities (such as clean air and

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[6] For a discussion of the relationship of the CPI to the cost-of-living index, see Robert Gillingham, "A Conceptual Framework for the Consumer Price Index," *Proceedings of the American Statistical Association 1974 Business and Economic Statistics Section*, (Washington, D.C., American Statistical Association, 1974).

[7] To some extent, the definition of a price index is motivated by the uses for which it is intended; see Jack E. Triplett, "Escalation Measures: What is the Answer? What is the Question?" in W.E. Diewert and C. Montmarquette, eds., *Price Level Measurement: Proceedings from a Conference Sponsored by Statistics Canada* (Ottawa, Statistics Canada, 1983), pp. 457-87.

[8] An alternative formulation of the cost-of-living index is in terms of required income rather than expenditure. This formulation would imply the inclusion of income- and wage-based taxes. See, for example, Robert A. Pollak, "The Treatment of Taxes in the Consumer Price Index," in *The Theory of the Cost-of-Living Index* (New York, Oxford University Press, 1989), pp. 193-199, and Robert Gillingham and John S. Greenlees, "The Impact of Direct Taxes on the Cost of Living," *Journal of Political Economy*, 95, no. 4, August 1987, pp. 775-796.

low crime), goods provided through taxes (such as national defense and fire protection), health status, and future consumption goals (which depend on both current and expected future income, and savings). All of these aspects of life can, and do, change over time along with commodity and service prices. Most of these also are difficult to measure, and it would be even more difficult to translate them into measured increments to well-being. The cost-of-living index approximated by the CPI is a subindex of the all-encompassing cost-of-living concept, specifically a subindex that is conditional on the excluded factors that affect consumer well being, such as health status and the quantity and quality of government-provided goods and services.[9] The BLS defines the scope of the CPI to include only market goods and services or government-provided goods for which explicit user charges are assessed.

In the case of medical care, for example, the CPI includes direct out-of-pocket expenditures for medical care commodities and services, plus expenditures for the purchase of health insurance. This definition includes the employee-paid share of premiums for employer-provided health insurance coverage, as well as Medicare Part B monthly insurance premiums, but excludes the portion of income and payroll tax payments used to fund the provision of medical care for elderly and low-income beneficiaries. Although the advisory commission states that all medical care spending should be included in the CPI, the BLS believes that the exclusion of Medicaid and Medicare Part A is appropriate and consistent with the treatment of public schools and other tax-funded goods and services.[10]

Practical price index measures exist that do not hold the market basket of goods and services fixed at its original value. Some of these index measures, known as "superlative" indexes, have been shown theoretically to be closer to the cost-of-living concept than measures

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[9] See Pollak, *Theory of the Cost-of-Living Index*, and Gillingham, "A Conceptual Framework."

[10] U.S. Senate, Committee on Finance, *Final Report*, p. 37. The proper treatment of employer-provided medical care, as well as other in-kind employee compensation, involves more difficult conceptual issues, and depends in part on the uses made of the index. See Ralph Turvey et al., *Consumer Price Indices: An ILO Manual* (Geneva, International Labour Office, 1989).

that track the cost of a fixed basket.[11] The major superlative indexes are the Fisher and Törnqvist measures. Using these formulas, one can construct an index that accounts for the changes that consumers make in the quantities of the goods and services they consume in response to changes in relative prices. By substituting goods that have become relatively cheaper for those that have become relatively more expensive, consumers can achieve the same standard of well-being for less than the cost of purchasing their original market basket. The difference between an index that accurately accounts for this substitution and an index that does not (e.g. the Laspeyres index used in the CPI) is known as *substitution bias*. Because the CPI holds the market basket fixed at base period quantities, it incurs substitution bias by putting too much weight on the relatively more expensive items from which consumers have shifted away. The superlative indexes, because they adjust for changes in consumer expenditures, tend to avoid this type of bias. The superlative indexes do, however, require estimation of the comparison period market basket. Because it takes time to collect and process consumer expenditure data, a superlative index can be produced only with a time lag.[12]

III. Review of Advisory Commission Bias Estimates

Substitution Bias

The Commission report produces two estimates of substitution bias in the CPI: one for the lower level of aggregation and one for the upper level of aggregation. At the lower level of aggregation individual price quotes are aggregated to form subindexes for each category of goods, such as apples, watches, or dental services. At the upper level of aggregation these

[11] See W. E. Diewert, "Exact and Superlative Index Numbers," in Diewert and Nakamura, eds., *Essays in Index Number Theory*, Volume 1, pp. 223-252.

[12] Whereas the BLS collects and processes CPI price data monthly, most CPI expenditure data are drawn from the CEX household interview survey, which is conducted quarterly. Fully edited expenditure data for a given year are not available until late in the following year. As will be described in section VII below, the BLS plans to take steps to expedite the processing of the CEX data, but updating of expenditure weights on a monthly basis would be prohibitively expensive.

subindexes are collected into an all-items index. The formula currently used to aggregate the individual price quotations to form the subindexes does not account for consumers' ability to substitute across items within item categories when the relative prices of those items change—for example, when the price of Delicious apples increases and the price of Granny Smith apples falls. Similarly, the formula used to aggregate the subindexes to form the overall CPI does not reflect the substitution across item categories that takes place when the relative prices of items in different categories change—for example, when the price of apples falls relative to the price of oranges.

For substitution bias at the upper level the commission's estimate of 0.15 percentage point per year is based on BLS research that compares indexes calculated using superlative formulas to an index calculated using the fixed-weight Laspeyres formula.[13] The BLS and the advisory commission essentially agree on the size and nature of the bias at this level.

Substitution bias at the lower level is sometimes confused with the separate problem of *formula bias*.[14] To understand what is meant by "formula bias," recall that the CPI measures the change in the cost of purchasing goods and services using a formula that weights each item's price by the quantity that was purchased during a base period. Because the household

[13] The original research was published in Ana M. Aizcorbe and Patrick C. Jackman, "The Commodity Substitution Effect in CPI Data, 1982-1991," *Monthly Labor Review*, 116, no. 12, December 1993, pp. 25-33. These estimates subsequently have been updated by BLS staff. Until the introduction of the updated market basket in January 1998, the CPI may exceed the superlative indexes by somewhat more than this amount, as indicated by John S. Greenlees, "Expenditure Weight Updates and Measured Inflation," paper prepared for Third Meeting of the International Working Group on Price Indices, Voorburg, Netherlands, April 16-18, 1997 (Washington, D.C., Bureau of Labor Statistics); and Matthew D. Shapiro and David W. Wilcox, "Alternative Strategies for Aggregating Prices in the CPI," paper presented at Federal Reserve Bank of St. Louis Fall Policy Conference on Measuring Inflation and Real Growth, St. Louis, October 16-17, 1996 (University of Michigan).

[14] For example, the commission is unclear about whether, in their usage, substitution bias equals, includes, or is distinct from formula bias. At one point they state "...what we called 'formula bias' [we] now refer to as Lower Level Substitution Bias" (see U.S. Senate, Committee on Finance, *Final Report*, p. 19). Subsequently, they state "BLS has reduced so-called formula bias, the part of Lower Level Substitution Bias resulting in substantial measure from the introduction of sample rotation procedures" (p. 44). Then they state "Changing to geometric means will not only solve the 'formula bias' problem...but will also alleviate the below-stratum-level substitution bias" (p. 51). The last of these statements, indicating that formula bias and substitution bias are distinct phenomena, most closely agrees with definition of formula bias that was given when it was originally identified by BLS research; see Marshall B. Reinsdorf, "Price Dispersion, Seller Substitution, and the U.S. CPI," BLS working paper 252 (Washington, D.C., Bureau of Labor Statistics, 1994). Appendix A of the present paper describes an additional confusion with the commission's example of the related property of "time reversibility."

expenditure surveys give information on dollar expenditures rather than quantities, the CPI quantity weights must be derived indirectly, as expenditures divided by price. Until 1995 quantity weights for the items in the sample were formed by, first, projecting the initial price collected for each item backwards using information on price trends for similar items, and, then, dividing the appropriate expenditure figure by this backwards-projected price. This procedure, however, had an unintended consequence. Items that were on sale as of the point in time when they were first priced were systematically overweighted—expenditure divided by a low price gives a high quantity weight. Because the prices of sale items are apt to rise in subsequent months, this procedure imparted an upward bias, i.e., formula bias, to the index. The BLS introduced procedures (principally what is known as "seasoning") to eliminate this formula bias beginning in January 1995 for food-at-home and shelter, and June and July 1996 for all other items.

To calculate the lower level substitution bias the commission first asserts that the geometric means index is an unbiased estimate of the true cost-of-living index. They cite BLS research showing from June 1992-December 1994 the difference between the growth rate of the geometric means index and the CPI was 0.49 percentage point per year.[15] Then the commission makes an adjustment to take account for the changes made by the BLS during 1995 and 1996 to eliminate formula bias, which the BLS has estimated to have reduced the rate of growth of the CPI by 0.24 percentage point per year.[16] Their estimate of lower level substitution bias therefore is computed as the difference between 0.49 and 0.24, or 0.25 percentage point per year.

This estimate, however, may be too large. As described in Appendix A, the commission fails to mention several strong assumptions about the distribution of price changes that they

[15] The research paper cited by the commission is Brent R. Moulton and Karin E. Smedley, "A Comparison of Estimators for Elementary Aggregates of the CPI," paper presented at Western Economic Association International conference, San Diego, July 7, 1995 (Washington, D.C., Bureau of Labor Statistics).

[16] See Robert McClelland, "Evaluating Formula Bias in Various Indexes Using Simulations," BLS working paper 289, 1996; and Brent R. Moulton, "Estimation of Elementary Indexes of the Consumer Price Index," paper presented at American Statistical Association conference, Chicago, August 5, 1996 (Washington, D.C., Bureau of Labor Statistics).

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implicitly use when claiming that the geometric means index is unbiased, or to note that, under these same assumptions, the Laspeyres formula currently used by the BLS also is unbiased. There is, moreover, reason to believe that the assumptions in question may not hold for many or most of the CPI component strata. If they do not hold, the geometric means index still may be unbiased, but only if the elasticity of substitution is exactly equal to one.[17] If, on the other hand, this elasticity is zero, the "seasoned" Laspeyres used by the BLS will correctly show price change with no substitution.

As will be described in section IV, the BLS has made a commitment to evaluate the likely applicability of the geometric mean aggregation formula this year, item category by item category, and to make a decision by the end of the year about whether to adopt the geometric mean approach to calculating some components of the CPI. It is unlikely that the conditions necessary for the geometric mean formula to be unbiased will be found to hold in all cases. Thus, the commission's estimate of lower level substitution bias may be too large.

New Outlet Bias

The commission estimates that the entry of lower-priced outlets causes a bias of 0.1 percent per year. This estimate appears to be based on research conducted at the BLS by Reinsdorf, which compared price levels in newly selected outlet samples with price levels in outlet samples leaving the CPI.[18] His estimates imply a price decline of about 0.25 percent a year, which gives a figure of 0.1 percent per year on an assumption that 40 percent of the CPI is affected by new outlet bias.

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[17] The elasticity of substitution is a measure of consumer willingness to substitute between commodities and is defined by economists as the proportionate change of relative quantities demanded divided by the proportionate change of relative prices.

[18] See Marshall Reinsdorf, "The Effect of Outlet Price Differentials on the U.S. Consumer Price Index," in Murray F. Foss, Marilyn E. Manser and Allan H. Young, eds., *Price Measurements and Their Uses*, (Chicago, University of Chicago Press, 1993).

This estimate is subject to considerable uncertainty for three reasons. First, the effect of outlet entry is likely to vary from year to year, and Reinsdorf's data cover only two years from the late 1980's. Those years may be unrepresentative of long run trends. Second, Reinsdorf's estimates have large enough standard errors so that conservative statistical hypothesis tests would not rule out the hypothesis that the true effect of outlet changes is zero. Third, there is no assurance that the item categories studied by Reinsdorf, food and gasoline, are representative of other categories that may be subject to outlet bias.

Two additional considerations suggest that the estimate of 0.25 percent per year for the items affected by new outlet bias is too high. First, this bias estimate is based on an assumption that the new lower-priced outlets provide service of the same quality as the higher-priced incumbents. In many discount and off-price stores reductions in costly retailer services help make the low prices possible. (Examples of retailer services that might be less available at the lower-priced outlets include knowledgeable sales staff, breadth and depth of product assortment, assurance of item availability and quality, convenient location and hours, liberal return policy and store ambiance.) Furthermore, under some circumstances, entry by low-priced outlets with reduced services also could cause incumbents to reduce their services, thereby creating a downward bias unless adjustments for these quality reductions were made in the CPI. Indeed, because of the likelihood of quality declines, Reinsdorf interprets the 0.25 percent figure as an upper bound estimate of outlet bias in those components of the index where such bias might plausibly exist.

Second, changes other than entry of lower-priced outlets probably contribute to the price declines in Reinsdorf's data. Since 1978, the BLS has updated its sample of brands and product versions at the same time that it updates its outlet samples. Thus, if consumers were shifting over time to cheaper brands or product versions, these choices would be reflected, through the probability sampling methods used by the BLS, in selections of cheaper brands or product versions in the newly sampled outlets, making their price advantage appear larger than it really is. In a more recent study, Reinsdorf compares growth rates of sample average prices for food items

and CPI food indexes over periods from 1948 to 1963 and from 1967 to 1976, when the BLS rarely changed the product version in the sample.[19] These comparisons imply a price decline from new outlets of just 0.1 percent per year, compared to the 0.25 percent estimate above. This figure reflects price differences between outlets entering and leaving the sample because, for most of those years, the BLS had a policy of allowing price differences between outlets to affect its average price series but not its indexes.

Quality and New Products Bias

The largest share of the bias in the CPI that the commission concludes exists—0.6 percentage point per year, or more than half of the total of 1.1 percentage points per year—arises from an alleged failure to make adequate adjustment for changes in the quality of the goods and services people buy and to account properly for the value to consumers of newly available goods.

Before commenting on the evidence marshaled by the commission in support of its conclusions in the quality/new goods area, we emphasize that the BLS already has procedures in place designed to account for changes in the quality of the items being priced. (It often mistakenly has been assumed, though not by the commission, that the BLS makes few or no such adjustments.) Although these adjustment procedures are not perfect, they do have a very important effect on the rate of price change the BLS reports. The best available information on this point applies to a CPI subindex covering roughly the commodities and services component of the market basket (about 70 percent of the total, with shelter the largest exclusion). During 1995, this subindex would have risen by 3.9 percentage points had these procedures not been applied. Because of their application, however, the subindex actually rose by only 2.2 percentage points over the year. Roughly speaking, these figures imply that the adjustments made by the

[19] Reinsdorf, "Price Dispersion."

BLS for changes in the quality of these goods and services amounted to 1.7 percentage points over the course of a single year.[20]

The BLS also has established procedures for bringing new items into the index. The BLS has updated the expenditure share information used to aggregate the CPI subindexes only once every ten years or so, but the specific stores in which prices are collected and the specific items priced are reselected on a five-year cycle. Although more frequent sample rotations undoubtedly would be desirable, it is a fact that the BLS, by replacing 20 percent of the sample each year through the POPS and the initiation of new samples of outlets and items, already devotes considerable resources to ensuring that the sample of items priced is representative of what consumers actually are purchasing.

The commission does not argue, of course, that the BLS is not making a good effort to address quality/new goods biases, but rather that, in spite of a good effort, residual bias remains. The report's approach to assessing this residual bias is to divide the CPI into 27 categories, and then to make a judgment about the magnitude of the bias in each case. Unfortunately, the evidence applicable to many of these categories is rather sparse.

Of the 27 categories, the commission assigns eight a quality/new goods bias of zero (fuels, housekeeping supplies, housekeeping services, other private transportation, public transportation, health insurance, entertainment services, and tobacco). Each of the remaining 19 categories is assigned an estimated bias, in all cases positive (i.e., they concluded that price change is overstated because quality change is understated or the value of new products ignored). The commission supported its estimates of bias using three types of evidence: first, analysis of published and unpublished studies of quality/new goods bias for particular goods, second,

[20] See Brent R. Moulton and Karin E. Moses, "Addressing the Quality Change Issue in the Consumer Price Index," forthcoming in *Brookings Papers on Economic Activity 1997:1* (Washington, D.C., Bureau of Labor Statistics, 1997). These figures are somewhat different from those reported in an earlier version of their paper. They refined their prior estimates principally to exclude some "quality adjustments" that are made to account for simple changes in units of measurement or package size.

quantitative evidence assembled by the commission from independent sources of data, and third, in the absence of direct evidence, estimates based on the judgment of the members.

For nine of the 19 categories (food at home other than produce, fresh fruits and vegetables, food away from home, alcoholic beverages, other utilities including telephone, other house furnishings, motor fuel, nonprescription drugs and medical supplies, and personal and educational expenses), absent evidence, the commission is forced to fall back on its best judgment. The alleged bias in these categories accounts for 0.11 of the 0.61 percentage point bias the commission attributes to quality/new goods problems. The food and beverages categories are an example; the commission's estimates of upward biases in these categories rest exclusively on judgments regarding the value to consumers of increased variety on grocery and liquor store shelves, together with the value of greater choice in restaurants, as shown in the following quotation from the report:[21]

> "...there is little if any published evidence on the food category, other than [Jerry] Hausman's ... attempt to establish the value for the introduction of a new variety of breakfast cereal...How much would a consumer pay to have the privilege of choosing from the variety of items available in today's supermarket instead of being constrained to the much more limited variety available 30 years ago? A conservative estimate of the value of extra variety and convenience might be 10 percent for food consumed at home other than produce, 20 percent for produce where the increased variety in winter (as well as summer farmers' markets) has been so notable, and 5 percent for alcoholic beverages where imported beer, microbreweries, and a greatly improved distribution of imported wines from all over the world have improved the standard of living."

[21] U.S. Senate, Committee on Finance, *Final Report*, p. 28.

In putting forward these estimates, the commission does not cite any published or unpublished studies, and indeed they comment on the absence of such evidence. Moreover, the commission does not specify how their estimates were developed in the absence of evidence. In several places the report characterizes the commission's specific estimates of bias as "conservative," but it generally is not clear why this is believed to be so. The commission's standard, the cost-of-living index, is defined as a function of consumer preferences, so reasonable questions to ask are, "Whose preferences are being described?" and "How were they assessed?" Although economists have methods for drawing inferences about preferences from market data on observed consumer choices, the report does not indicate that the commission used such methods in these cases. Appendix B presents an analysis of two categories, fresh fruits and vegetables and motor fuel, which attempts to quantify the missed consumer benefit or "surplus" that was described by the commission.[22] In both cases this analysis concludes that the commission's estimates overstate the bias.

For four categories (shelter, apparel and upkeep, new vehicles, and used cars) members of the commission have produced evidence that bears on the trend in prices for particular sorts of items. The alleged bias in these categories accounts for 0.16 of the 0.61 percentage point bias the commission attributes to quality/new goods problems. In each of these cases there are significant problems with the inferences drawn by the commission.

An example of these problems is found in the commission's estimate of the quality bias in the index for rent of shelter. The commission's reasoning is essentially as follows. Over the period 1976 to 1993 the median rent increased about 1 percent per year faster than the CPI rent index. This fact might suggest that the quality changes already accounted for in the index are substantial. According to the advisory commission, however, these quality adjustments remain inadequate because of a supposed 20 percent increase in the average size of apartments between

[22] The analysis is taken from Moulton and Moses, "Addressing the Quality Change Issue."

1976 and 1993.[23] In addition, they estimate that other improvements including "appliances, central air conditioning, and improved bathroom plumbing, and other amenities" amount to 10 percent over the past 40 years, giving a net upward bias of 0.25 percent per year.

There are two fundamental problems with this analysis. First, rents generally increase less than proportionally to apartment size, which implies that the advisory commission's proportional adjustment for apartment size would overstate the value of the increase. Second, the commission's factual premise—the assertion that average apartment size has increased 20 percent from 1976 to 1993—appears to be wrong. Although data giving an exact measure of the growth in size of rental units since 1976 are not available, a recent study analyzing data from the Residential Energy Consumption Survey, the American Housing Survey, and Current Construction Reports concluded that the increase was probably about 6 percent—i.e., the commission's estimate is too high by roughly a factor of three.[24] After correcting this error, the data cited by the commission no longer support an upward bias of the CPI rent index.

Another example is the commission's estimate that the growth in prices of new and used cars has been overstated by 0.6 percentage point per year in the recent past. This estimate is based on a flow of services approach in which the cost of consuming automobile services declines as the useful life of the car increases. The commission presents data showing that the average age of cars on the road has risen, which it takes as a measure of the increase in the useful life of a car. To justify treating the increase in average age of cars as reflective of bias, the commission also assumes that current CPI procedures do not capture any of the increases in automobile durability that may have occurred. This latter assumption, however, is incorrect; Appendix C lists some of the many durability-related model changes for which adjustments have

[23] U.S. Senate, Committee on Finance, *Final Report*, p. 30. The commission provides no direct support for this estimate, although reference is made to the changing characteristics of new single-family houses over the same period. They also cite increases in the average number of bathrooms, and in the share of units containing central air conditioning, within the stock of rental units.

[24] Brent R. Moulton, "Issues in Measuring Price Changes for Rent of Shelter," unpublished paper presented at Conference on Service Sector Productivity and the Productivity Paradox, Ottawa Canada, April 11-12, 1997 (Washington, D.C., Bureau of Labor Statistics).

been made in the CPI over the past few years. Like other automobile quality adjustments in the CPI, these are derived from manufacturer cost data, marked up to retail values. The commission provides no evidence that this adjustment procedure would lead to an underestimate of the value of quality improvements that have contributed to enhanced durability.

Finally, the commission's estimate that the CPI has overstated the rate of growth of apparel prices by 1.0 percentage point per year since 1985 rests on a comparison of the official CPI data with price indexes constructed using Sears catalogue prices for items whose characteristics remain unchanged from one year to the next. Clearly one ought to have reservations about drawing any general conclusions based upon the prices charged by a single catalogue merchant. Moreover, BLS research has shown that price changes often are timed to coincide with changes in product characteristics, particularly in the apparel market segment where changing fashion is so important.[25] To the extent that this is true, the commission's reliance on the data for unchanging items is likely to result in a downward bias, vitiating its criticism of the CPI apparel index.

For the six remaining categories (appliances including electronic, prescription drugs, professional medical services, hospital and related services, entertainment commodities, and personal care) the advisory commission reviewed existing studies of bias in the price trends for specific items to draw inferences about likely bias in the price trends for unstudied related items within the category. These six categories can be categorized as constituting two major areas of the index: medical care and high-tech consumer goods. More than half (0.34 percentage point)

[25] See Jack E. Triplett, "Quality Bias in Price Indexes and New Methods of Quality Measurement," in Zvi Griliches, ed., *Price Indexes and Quality Change: Studies in New Methods of Measurement*, (Cambridge, MA, Harvard University Press, 1971); Paul A. Armknecht, "Quality Adjustment in the CPI and Methods to Improve It," in *American Statistical Association 1984 Proceedings of the Business and Economic Statistics Section* (Washington, D.C., American Statistical Association, 1984); Paul A. Armknecht and Donald Weyback, "Adjustments for Quality Change in the U.S. Consumer Price Index, Journal of Official Statistics 5, 1989, pp. 107-23; Paul R. Liegey, Jr., "Adjusting Apparel Indexes in the Consumer Price Index for Quality Differences," in Murray F. Foss, Marilyn E. Manser, and Allan H. Young, eds., *Price Measurements and Their Uses*, (Chicago, University of Chicago Press, 1993); Paul R. Liegey, Jr., "Apparel Price Indexes: Effects of Hedonic Adjustment," *Monthly Labor Review* 117, May 1994, pp. 38-45; Marshall B. Reinsdorf, Paul Liegey, and Kenneth Stewart, "New Ways of Handling Quality Change in the U.S. Consumer Price Index," BLS working paper no. 276 (Washington, D.C., Bureau of Labor Statistics, 1995); and Moulton and Moses, "Addressing the Quality Change Issue."

of the quality/new goods bias the commission believes exists in the overall CPI is judged to occur in just these areas of the index. These clearly are components of the index in which the BLS faces particularly difficult measurement problems, though the inferences that the commission has drawn about the magnitude of any bias in these index components involves some degree of speculation and extrapolation.

The advisory commission's estimate of bias in the medical care component of the index appears to have been largely based on just two recent empirical studies, one of cataracts, the other of heart attacks, which both identified large quality improvements that are missed in the calculation of the CPI.[26] Although we acknowledge that there have been enormous improvements in medical technology over time, we also note the heterogeneity of the medical services category, which includes services as diverse as dentistry, eyeglasses and eye care, psychological counseling, podiatry, chiropractic, and physical therapy. Thus we are not convinced that the two conditions cited by the commission should be considered representative with respect to the unmeasured quality advances in the treatment of all medical conditions.

In some cases quality bias in the medical care component of the index may have arisen as a result of failure by the BLS to capture improvements in procedures that led to shorter hospital stays and out-patient treatment. The BLS recently has taken steps that, at least in principle, should address medical care quality improvements of this type. For hospital services, beginning in January 1997 the CPI has adopted the practice that previously had been used in the Producer Price Index (PPI) of pricing completed treatments (as represented by the service bundles on selected patient bills) rather than individual medical inputs. This change should permit BLS staff to track changes in treatment over time.[27] This change, however, will not resolve all quality

[26] The studies cited by the commission are Matthew D. Shapiro and David W. Wilcox, "Mismeasurement in the Consumer Price Index: An Evaluation," in Ben S. Bernanke and Julio J. Rotemberg, eds., *NBER Macroeconomics Annual 1996*, (MIT Press, 1996); and David M. Cutler, Mark McClellan, Joseph P. Newhouse, and Dahlia Remler, "Are Medical Prices Declining?" NBER working paper no. 5750 (Cambridge, MA, National Bureau of Economic Research, 1996). The latter study, of heart attacks, was supported in part by the BLS.

[27] See Elaine M. Cardenas, "Revision of the CPI Hospital Services Component," *Monthly Labor Review*, vol. 119, no. 12, December 1996, pp. 40-48.

adjustment problems in the medical care component. Some kinds of quality change are difficult to evaluate, involving changes in patient outcomes, such as improved mortality or reduction in pain. The BLS is continuing to support and encourage research on this topic, but we are skeptical that it will be possible to develop methods that will permit reliable evaluation of all kinds of quality changes on an on-going basis within the monthly CPI.

The area of high-tech consumer goods (e.g., consumer electronics) is one for which there are a number of published studies documenting systematic quality bias of the CPI. Most of these studies are based on the method of "hedonic" quality adjustment (i.e., adjustments based upon the empirical relationship between the prices of various items and their characteristics), with studies having been conducted of personal computers, television, video equipment, etc. The BLS is currently applying hedonic methods in the PPI for personal computers and peripherals. Projects are underway at the BLS to develop hedonic quality adjustment methods and improved sampling of new products within the appliance category of the CPI.

In addition to these specific comments about the nature of the evidence on quality/new goods biases assembled by the commission, there are several general remarks to be made. The commission's estimates of bias are made case by case using a variety of methods, without any clear statement of what methods are appropriately used in each circumstance. The absence of a well defined methodology for deriving the commission's estimates represents a fundamental reason why the BLS reaction to the quality/new products section of the report has been skeptical. Also, in general, the commission's discussion of quality/new goods biases does not include explicit recommendations regarding the adoption of procedures to correct the problems it believes exist. In part, this appears to reflect a lack of consensus among economists about what is practical and theoretically justified for measuring the benefit to consumers from new products.[28] For production of the CPI and other national statistics the BLS must use methods that are objective, reproducible, and verifiable.

[28] For examples of some of the methods that have been proposed, see the papers in Timothy F. Bresnahan and Robert J. Gordon, eds., *The Economics of New Goods*, (Chicago, University of Chicago Press, 1997).

The commission also failed to make any systematic effort to explore the possible existence of negative biases in the CPI. Other analysts have hypothesized reduced convenience and comfort of air travel and deteriorating quality of higher education as examples of quality decreases that are ignored in the CPI. More generally, whereas the commission notes some service quality improvements, such as the introduction of automatic credit-card readers at gasoline pumps, the BLS often hears complaints about broad-ranging declines in the quality of customer service, which are equally difficult to incorporate in the CPI.

A more subtle issue is that price increases for many goods occur intermittently and often are timed to coincide with model replacements or other quality improvements. The BLS commonly adjusts for quality differences between successive models by, in effect, treating the difference in price between them as wholly attributable to a difference in quality. There is a risk that this procedure may over-adjust for quality change, imparting a downward bias to the index. Methods have been introduced to try to minimize that possibility, but the commission paid little attention to this potential problem.

From a BLS perspective, the most important question about possible quality/new goods problems is what we might do to improve our procedures and ameliorate those problems. Recognizing the particular difficulties associated with measuring medical care prices and high-tech consumer goods prices, the BLS has devised and announced important improvements in our methods. These include the changes noted above in our hospital price measurement procedures, and prospective changes in our sample rotation procedures that will allow us to update item samples in rapidly changing market segments more frequently than once every five years (at the cost of less frequent updates in more static market segments). In addition, the President's 1998 budget includes funds to improve the accuracy, timeliness, and relevance of the consumer price data available from the BLS. The FY 1998 budget request, if approved, would allow us to make important progress in the quality/new goods area, by supporting greater use of hedonic techniques and implementation of more aggressive procedures for identifying and beginning to price new goods promptly once they appear in the marketplace.

IV. Short Run Recommendations[29]

Recommendation i. The BLS should establish a cost of living index (COLI) as its objective in measuring consumer prices.

The advisory commission's report begins with one overarching recommendation: "The BLS should establish a cost of living index (COLI) as its objective in measuring consumer prices." The BLS basically concurs with this; indeed, the BLS long has said that it operates within a cost-of-living framework in producing the CPI. That framework has guided, and will continue to guide, operational decisions about the construction of the index.[30] Putting things slightly differently, if the BLS staff or other technical experts knew how to produce a true cost-of-living index on a monthly production schedule, that would be what we would produce. While the BLS has no fundamental disagreement with the commission about what the objective of our CPI program ought to be, we disagree to some extent about what changes to the index would be feasible and prudent and about the timetable on which those changes could be implemented.

Because the cost-of-living concept does not imply a single all-purpose cost-of-living index, the BLS will continue to need to make choices about the specific issues of formula, coverage, and index construction. The BLS will continue to describe the scope and theoretical assumptions of its price measures, as well as any necessary caveats with respect to their use.

Recommendation ii. The BLS should develop and publish two indexes: one published monthly and one published and updated annually and revised historically.

Recommendation iii. The timely, monthly index should continue to be called the CPI and should move toward a COLI concept by adopting a "superlative" index formula to account for

[29] The advisory commission uses two different methods for numbering their recommendations. See U.S. Senate, Committee on Finance, *Final Report*, pp. 2-3 and pp. 49-55. Herein we follow the numbers and text from pp. 2-3.
[30] *BLS Handbook of Methods*, Bulletin 2490, 1997, p. 170.

changing market baskets, abandoning the pretense of sustaining the fixed-weight Laspeyres formula.

Recommendation iv. The new annual COL index would use a compatible "superlative-index" formula and reflect subsequent data, updated weights, and the introduction of new goods (with their history extended backward).

Because these three recommendations address methods for dealing with the upper-level substitution bias problem, we will discuss them together. The commission recommends that the BLS should move to a "trailing Tornquist" formula for the monthly index.[31] The *Final Report* did not explicitly define this formula, but based on subsequent discussions with commission members, we interpret this to mean a geometric mean formula in which the weights are lagged expenditure shares, the weights are regularly updated, and the indexes are chained. The commission also recommends that the BLS develop a new annual index that is calculated using a superlative formula and is subject to revision.

The BLS continues to investigate several experimental indexes that use a superlative formula at the upper level of aggregation. These include formulas which, due to the need for current expenditure data, create indexes that must be produced with a lag, as well as new methods that may approximate the superlative formula and allow the production of indexes in a timely fashion.

While the method of calculating the current CPI could be changed to incorporate a superlative formula, the CPI would then have to be produced with a lag. Moreover, the expenditure data that are required to derive the weights for the superlative index are available with sufficient precision to be used in calculating such an index only at annual intervals, and thus would not support a true monthly CPI.

[31] U.S. Senate, Committee on Finance, *Final Report*, p. 50.

The timeliness of the CPI might be maintained by using some form of an approximation to a superlative index. The commission's proposed "trailing Tornquist" formula, however, has been shown to produce price changes that systematically understate the increases in the cost of living, as measured by the superlative formulas.[32] More recently, other approximation strategies have been proposed, including a method based on the "constant elasticity of substitution" (CES) formula.[33] But such an approximation would not track the superlative indexes precisely—during some years an index based on an approximation would rise more than the superlative index, during other years it would rise less. This feature raises the issue of whether such an index subsequently would need to be revised once the data were available to calculate the superlative index. Another issue that needs to be addressed in considering use of approximations is the issue of estimating the subaggregate indexes, i.e., the indexes for intermediate levels of aggregation, such as for "food" or "transportation." Some of these indexes may consist of item categories that are relatively close substitutes—fresh fruits, for example, consists of apples, bananas, oranges, etc.—whereas others may consist of item categories that probably are not close substitutes—medical professional services, for example, includes physicians, dentists, and eyecare. Because the CES function is based on a single elasticity parameter which is assumed to be the same for all items, while consumers' willingness to substitute is likely to vary across categories of items, further research is needed to determine whether a simple approximation such as the CES would produce sensible approximations for all of these subaggregates. Also, the use of an index based on statistical approximation might be difficult to interpret and explain to users of the data. We believe we would gain little, and possibly do much damage to the credibility of our statistical system, if we were to move hastily to adopt untested techniques for producing the official CPI.

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[32] See Ana M. Aizcorbe, Robert A. Cage, and Patrick C. Jackman, "Commodity Substitution Bias in Laspeyres Indexes: Analysis Using CPI Source Data for 1982-1994," paper presented at the Western Economic Association International Conference in San Francisco, July 1996 (Washington, D.C., Bureau of Labor Statistics); and Shapiro and Wilcox, "Alternative Strategies."

[33] See Shapiro and Wilcox, "Alternative Strategies." The CES formula that they proposed was originally derived by P.J. Lloyd, "Substitution Effects and Biases in Nontrue Price Indices," *American Economic Review*, vol. 65, June 1975, 301-13, and was suggested by BLS staff as a method for approximating a superlative index without current expenditure data.

The President's 1998 budget includes funds to improve the accuracy and timeliness of the CPI, and an important part of this request will support the production of a superlative index, produced to a greater degree of accuracy than is now possible. The BLS plans to begin publishing this measure in early 2002. In the interim, the superlative measures we currently produce can be used to estimate the magnitude of the upper level substitution bias in the CPI, and indeed are the best measures currently available for this purpose.

Recommendation v. The BLS should change its procedure for combining price quotations by moving to geometric means at the elementary aggregates level.

To address lower-level substitution bias, the commission has suggested adoption of a geometric mean formula for aggregating price quotations, a formula that has been under investigation by the BLS over the past several years. As discussed above, the current CPI formula does not allow for the potential substitution among items within a category, such as between different varieties of apples, when the relative prices of those items change. The proposed geometric mean formula is based on an alternative assumption, namely that consumers substitute among items in such a way as to hold the share of their expenditures devoted to each item constant. Although this assumption is not likely to hold exactly for any particular stratum, the geometric mean formula should provide a close approximation to the exact cost-of-living subindex in cases where the stratum consists of substitutes, such as different varieties of apples, and the price elasticity of demand for each variety is fairly large. If the elasticity of substitution is zero, then the fixed weight Laspeyres formula is the appropriate measure of the cost-of-living subindex. Again this assumption is not likely to hold exactly, but the Laspeyres index should provide a close approximation to the exact cost-of-living subindex in cases where the price elasticity of demand for each variety is quite small. It may be more plausible to assume that consumers substitute freely between, for example, types of apples or between brands of

television sets when their relative prices change than to assume similar substitutability between, for example, types of prescription drugs.

The BLS has begun issuing a monthly experimental measure that is constructed using the geometric mean formula in all index components, and will make a decision by the end of this year as to which components of the official CPI should employ the geometric mean formula.[34] Scanner data, studies of substitutions between brands, and other information will be used to assess the propensity of consumers to substitute across items within individual item categories as the relative prices of those items change. The likely date for implementation of any changes decided upon for the official CPI is with the release of January 1999 CPI data.

Our best estimate is that the use of the geometric mean formula in all CPI subindexes would lower the growth rate of the index by approximately one-quarter of one percent per year. Partial adoption of the geometric mean formula, which is more likely than a full adoption, would be expected to have a downward impact of between zero and one-quarter of one percent per year, depending on how many, and which, indexes use the new formula.

V. Intermediate Run Recommendations

Recommendation vi. The BLS should study the behavior of the individual components of the index to ascertain which components provide most information on the future longer-term movements in the index and which items have fluctuations which are largely unrelated to the total and emphasize the former in its data collection activities.

Sample resources for the CPI are allocated between the two major price surveys, commodities and services (C&S) and housing, according to the relative importance and variability of the survey estimators for each component, while taking into account the relative costs of each survey. The sample for the C&S component of the CPI was designed to allocate

[34] See Bureau of Labor Statistics. "The Experimental CPI using Geometric Means (CPI-U-XG)." (Washington, D.C., Bureau of Labor Statistics, April 10, 1997).

resources systematically among major item groups and sample cities, utilizing models to minimize the sampling variance of estimated price change, as measured by the all-items (less shelter), national CPI, subject to cost and sample coverage constraints. Solution allocations among items, outlets, and cities thus strike a balance with respect to the contributions of components of sampling variability by sample items, their relative importance with respect to the total consumer budget, and the relative cost of data collection and processing, while keeping within the cost and coverage constraints of the program.[35]

The commission's recommendation suggests that data collection activities should focus on a different objective, namely to provide information on the future longer term movements of individual prices or the index as a whole. Forecasting inflation is a widespread and important use of the CPI, of course, but one that is conceptually distinct from the measurement of cost-of-living changes. If prediction of future inflation, or the measurement of "inflationary pressure," were the measurement objective of the CPI, this might imply different choices with respect to the formulas and weights used in construction of the index, as well as with respect to the allocation of the sample. The commission, however, emphasizes the use of the CPI as a measure of past and contemporaneous changes in the cost of living in choosing the index formulas and weights, on the one hand, while emphasizing the uses of the CPI in forecasting future price movements in determining the sample allocation, on the other. This appears to be an internally inconsistent strategy.

The commission suggests that resources devoted to the sample for bananas, a perishable fresh fruit whose price-change sampling variability has been estimated to be substantial, but whose price fluctuations are "not systematically related to the underlying trend movements of the CPI," would be better allocated to surgical treatments, consumer electronics, and communication services.[36] The potential for saving resources by reducing data collection of items like bananas is

[35] See S.G. Leaver, W.H. Johnson, R.M. Baskin, S. Scarlett, and R. Morse, "Commodities and Services Sample Redesign for the 1998 Consumer Price Index Revision," *Proceedings of the Survey Research Methods Section, American Statistical Association*, 1996. forthcoming.
[36] U.S. Senate, Committee on Finance, *Final Report*, p. 51.

fairly limited because the marginal cost of collection and processing is quite small—the stores are already being visited to collect other grocery items and very little analysis is required after collection. Because the sample has been allocated to minimize the variance, a reallocation of resources away from any item with a high sampling variance toward other items necessarily would result in an increase in the variability of its index and the reliability of the all-items index would be diminished.

Recommendation vii. The BLS should change the CPI sampling procedures to de-emphasize geography, starting first with sampling the universe of commodities to be priced and then deciding, commodity by commodity, what is the most efficient way to collect a representative sample of prices from which outlets, and only later turn to geographically clustered samples for the economy of data collection.

Because geographical coverage impinges on many aspects of the CPI data collection and index estimation process, the practical meaning of this recommendation is somewhat unclear. By the same token, the importance of the geographic structure underlying the CPI makes it a continuing subject of BLS research.

The statement that the BLS should decide commodity by commodity, what is the most efficient way to collect a sample, has been and will continue to be the standard practice. In several cases, for example, postage and used cars, the BLS currently collects data on a national level. In most cases, however, it is not possible to select samples of specific items at the national level because of the lack of a national list (or *frame*) of items to sample, together with the sales volume information needed to determine the probabilities of selection. Moreover, if specific items were selected nationally, there would not usually be a feasible way to determine whether a selected item was, in fact, carried by any particular sample retail outlet. These considerations have led the Bureau to do sampling locally, by first selecting the urban area, then the outlet, and finally the specific item within the outlet. This method helps to ensure that the sample of items is

timely and representative. The BLS is currently investigating potential uses of point-of-sale (scanner) data which are available from private vendors, and in the future it might be possible in some cases for the BLS to use such data to draw national samples of items.[37]

Recommendation viii. The BLS should investigate the impact of classification, that is item group definition and structure, on the price indexes to improve the ability of the index to fully capture item substitution.

As part of the 1998 CPI revision activities, the BLS has just completed a process of modifying the item classification structure.[38] The ability of the index to capture consumer substitution was one of the prominent factors that was considered in developing the new item classification. In putting together the item classification, the BLS "also tried to see that [the strata] formed natural groups, as consumers would view them...For example, using the consumer view, items within the same stratum should have some affinity, such as substitutes (butter and margarine), or complements (washers and dryers)."[39]

The commission points to some examples which cross item boundaries, such as "on-line news services which compete with newspapers, automobile purchases with leases, and drugs with surgical procedures they replace" as examples for which direct price comparisons are needed so that the full substitution effect can be measured.[40] The BLS is sympathetic to the commission's concern, and will continue to work to improve the CPI item structure.[41] It seems to us, however, that no feasible item classification system would completely capture the current and

[37] See Ralph Bradley, Bill Cook, Sylvia G. Leaver, and Brent R. Moulton, "An Overview of Research on Potential Uses of Scanner Data in the U.S. CPI," paper presented at the Third Meeting of the International Working Group on Price Indices, Voorburg, Netherlands, April 16-18, 1997 (Washington, D.C., Bureau of Labor Statistics).
[38] Walter Lane, "Changing the Item Structure of the Consumer Price Index," *Monthly Labor Review* vol. 119 no. 12, December 1996, 18-25.
[39] Lane, "Changing the Item Structure," p. 22.
[40] See U.S. Senate, Committee on Finance, *Final Report*, p. 52.
[41] The January 1997 consolidation of three CPI strata—hospital room, other inpatient services, and outpatient services—into one hospital services stratum was designed in part to capture substitution among those three settings for treatment provision. The inclusion of new cars and new trucks in a single new vehicles stratum is an example of a similar change taking place as part of the January 1998 introduction of the revised CPI market basket.

possible future developments in consumer substitution behavior. Nor does it seem to us that the item classification system is necessarily the most significant impediment to measuring the effects of these substitutions. The more fundamental issue is the need to develop systematic methods for identifying the substitution and accounting for differences in quality between the substituted items.

Recommendation ix. There are a number of additional conceptual issues that require attention. The price of durables, such as cars, should be converted to a price of annual services, along the same lines as the current treatment of the price of owner-occupied housing. Also, the treatment of "insurance" should move to an ex-ante consumer price measure rather than the currently used ex-post insurance profits based measure.

When the BLS adopted the rental equivalence approach to pricing housing services in 1983, BLS staff were aware that the same conceptual issues arise in the pricing of other consumer durables.[42] In principle the CPI is intended to measure the cost of consuming goods and services, and durable goods provide a flow of services over time rather than immediate consumption. To implement a flow-of-services approach, however, requires information on either rental equivalence or user cost of the durable asset. In the case of housing, the existence of rental markets makes it relatively easy to implement the rental equivalence approach, while the long life of housing assets and the likelihood of price appreciation made the standard asset price approach uniquely problematic. During the mid-1980s, BLS researchers investigated the potential use of automobile leasing data to price automotive services, but at that time concluded that the leasing markets were not sufficiently developed to support a leasing equivalence approach to index construction. Subsequently, automobile leasing has grown to the point that in 1998 an automobile leasing stratum will be added to the CPI market basket. Currently BLS

[42]See "Changing the CPI Homeownership Method to Rental Equivalence." *CPI Detailed Report*, Bureau of Labor Statistics, January 1983, pp. 3-17.

researchers are reexamining the flow-of-services approach for automobiles, possibly using a leasing equivalence methodology. For durables other than automobiles, the lack of widespread rental markets as well as the lack of data needed for direct estimation of user cost suggest that the flow of services approach may not be practicable. As explained in our discussion of the commission's quality bias estimate for automobiles, we do not agree with the commission's premise that failure to price a flow of services necessarily leads to systematic quality bias.

The commission recommends that the BLS move the CPI for insurance to an "ex ante consumer price measure" from the currently used "ex post insurance profit based measure." The current CPI for health insurance does not directly price policies purchased by consumers.[43] Instead, an indirect approach to measuring the price of a policy is used; the price is seen as deriving from the services provided by the insurer and the value of benefits paid to providers of health care. The BLS prices these two parts separately, obtaining from insurers information on retained earnings to measure changes in the value of the insurance service component, and using the price indexes in the CPI medical care component to measure changes in the cost of the health benefits paid to providers. It is possible that direct pricing of health insurance policies would have the virtue of automatically reflecting cost-reducing innovations in the treatment of medical problems (such as the substitution of less-costly outpatient procedures). The countervailing difficulty, however, is that health insurance policies can increase or decrease in price due to changes in coverage or in the characteristics of the covered populations, and these changes may be very difficult to observe or adjust for in the index.

The current CPI approach was adopted in 1964. Prior to that the CPI collected the price of the most widely-sold community-rated Blue Cross/Blue Shield policy. That approach was dropped, however, when it became evident that the quality of the policies was changing in ways for which it was difficult to adjust the policy price. In 1984-85 the Bureau experimented with the direct pricing of a sample of health insurance policies but the experiment was terminated because

[43] Automobile and tenants insurance policies are priced directly in the CPI.

it again proved too difficult to maintain constant quality and coverage of risk over time. The BLS recognizes the importance of the health insurance price movements to consumers as well as to policy makers and will continue to search for ways to overcome the obstacles to accurate adjustment for changes in policy characteristics.[44]

Recommendation x. The BLS needs a permanent mechanism for bringing outside information, expertise, and research results to it. At the request of the BLS, this group should be organized by an independent public professional entity and would provide BLS an improved channel to access professional and business opinion on statistical, economic, and current market issues.

The BLS already has in place many mechanisms for bringing in outside information, expertise, and research results. Business and labor research advisory committees meet regularly with BLS staff and management and have long been a source of outside information and expertise. A price research division has been a part of the price index programs since 1965, and much of the discussion of CPI bias has been based upon the results of research conducted by BLS staff. BLS economists and statisticians regularly solicit opinions from outside researchers by presenting research papers at conferences and submitting them for publication at peer reviewed journals. Academic researchers are regularly invited to present their research findings to BLS staff in seminars. The Bureau's ASA-NSF-BLS fellowship program brings in scholars for extended on-site research projects. The BLS has funded research by academic economists when research by experts was needed to solve difficult measurement problems.[45]

The BLS agrees that continued input from outside researchers is useful, and is currently studying the possibility of creating an academic advisory commission. In addition, the BLS is interested in having outside researchers address the important measurement issues that it faces,

[44] For discussions of past BLS research on the direct pricing of health insurance policies, and on the user-cost and leasing-equivalence approaches to pricing of automobile services, see Paul A. Armknecht and Daniel H. Ginsburg, "Improvements in Measuring Price Changes in Consumer Services: Past, Present, and Future," in Zvi Griliches, ed., *Output Measurement in the Service Sectors*, (Chicago, University of Chicago Press, 1992).

[45] See, e.g., Pollak, *Theory of the Cost-of-Living Index*; and Cutler, et al., "Are Medical Prices Declining?"

and will provide researchers with access to research databases to the extent possible, while meeting data confidentiality requirements.

VI. Longer Run Recommendations

Recommendation xi. The BLS should develop a research program to look beyond its current "market basket" framework for the CPI.

This recommendation suggests that the BLS should develop research programs exploring "quality of life" issues such as time-saving benefits of new medical procedures and new communication devices, and changes in the social or natural environment caused by rising crime or new diseases. Because these things clearly affect our standard of living, a complete accounting of U.S. economic progress would include them.

We do, however, have a reservation about this recommendation. Implicit in this recommendation is a suggestion that the BLS should adjust the CPI for these effects. We think that valuing changes in time allocation or in the general social environment may require too many subjective judgments to furnish an acceptable basis for adjusting the CPI. Furthermore, arriving at a comprehensive measure of changes in the quality of life will be quite difficult, yet making such adjustments in only a few selected cases could make the CPI less accurate if these cases are not representative. Finally, it is unclear whether "quality of life" valuations really belong in an index used for the escalation of payments and adjustment of tax parameters. For example, the advisory commission suggests that the CPI rent index should have made a quality adjustment for changes in climate as renters migrated to the south.[46] Such a quality-of-life adjustment, however, is properly viewed as out of scope under the current definition of the CPI.[47] Most of the uses of the CPI have evolved within the context of an index limited to market goods

[46] U.S. Senate, Committee on Finance, *Final Report*, p. 30.

[47] The commission's discussion of the appearance of AIDS, however, suggests agreement with the idea that not all changes in the quality of life ought to be reflected in the CPI (U.S. Senate, Committee on Finance, *Final Report*, p. 47)

and services, and presumably the appropriate uses of an index that incorporated changes in crime levels, disease incidence, or income tax rates would be somewhat different from the current uses of the CPI.

Recommendation xii. BLS should investigate the ramifications of the embedded assumption of price equilibrium and the implications of it sometimes not holding.

Any systematic method for distinguishing quality change from price change must be based on some theoretical framework and set of assumptions. In most cases the BLS, like academic economists who do research in this field, relies on one or another assumption about price equilibrium. An equilibrium assumption underlies hedonic methods for quality adjustment, for example, as well as the matched model price comparisons commonly used by the BLS.[48] Although virtually all systematic methods for quality adjustment are based to some extent on assumptions about price equilibrium, the nature of the assumptions differs between methods. Of the methods used for quality adjustment by BLS, two (the "overlap method" and the "link method") are based on a particularly strict equilibrium assumption—that quality differences can be inferred from the price differences between individual items.[49] The hedonic method, in contrast, allows for random deviations of prices from equilibrium values and may allow for differences in rates of price change between items of different vintages.

The commission recommends that the BLS investigate the assumption of price equilibrium that underlies certain quality adjustment and item substitution procedures. We agree that reducing reliance upon this assumption can sometimes make the CPI more accurate,

[48] See Jack E. Triplett, "Concepts of Quality in Input and Output Price Measures: A Resolution of the User Value-Resource Cost Debate," in Murray F. Foss, ed., *The U.S. National Income and Product Accounts: Selected Topics* (Chicago, University of Chicago Press, 1983).

[49] For discussion of the quality adjustment methods used by the BLS, see Paul A. Armknecht, Walter F. Lane, and Kenneth J. Stewart, "New Products and the U.S. Consumer Price Index," in Timothy F. Bresnahan and Robert J. Gordon, eds., *The Economics of New Goods* (Chicago, University of Chicago Press, 1997); Reinsdorf, Liegey, and Stewart, "New Ways of Handling Quality Change;" and Moulton and Moses, "Addressing the Quality Change Issue."

particularly for long run comparisons. Indeed, the BLS already has made considerable progress in doing this. Recent tabulations indicate that item replacements adjusted for quality using the methods that embody a strong price equilibrium assumption (i.e., the "overlap method" and the "link method") declined from about 2 percent of prices collected in 1983 to 0.62 percent in 1995.[50] In addition, the CPI for prescription drugs now reflects consumers' savings from buying therapeutically equivalent generic substitutes for branded products. We plan to continue research on avoiding bias from unwarranted price equilibrium assumptions.

Recommendation xiii. The BLS will require a number of new data collection initiatives to make some progress along these lines. Most important, data on detailed time use from a large sample of consumers must be developed.

The final longer run recommendation is that the BLS should develop new data collection initiatives on time use and "quality of life" issues. These data would support the research programs described in the commission's first longer run recommendation. We agree that time use data would be valuable to researchers, and we concur with the focus on using them for supplementary indicators rather than as part of the main cost-of-living framework.

VII. Conclusion

The advisory commission report has performed a service by calling to the attention of policy makers the many and varied issues that the BLS faces in constructing the CPI. Most public attention has been focused on the commission's estimates of CPI bias, but the central argument of the report is that almost every assumption underlying the procedures used around the world for price index construction is called into question by the pace and form of market developments. The issues are not new to index number experts (many of the issues are discussed, for example,

[50] Moulton and Moses, "Addressing the Quality Change Issue," Table 4.

in the articles in the December 1993 *Monthly Labor Review*), but the quantitative and budgetary importance of price measurement problems and techniques have not always been appreciated by users.

As discussed earlier in this paper, the BLS has a vigorous program of research and development activities aimed at improving the CPI. In one category are the activities related to upper- and lower-level substitution bias. These include:

- The continued monthly publication of the experimental geometric mean index (the CPI-U-XG) and the evaluation of the geometric mean formula for use in the CPI-U and CPI-W, probably beginning in January 1999.
- The continuing annual publication of experimental superlative indexes, and (assuming approval of the Bureau's associated budget requests) introduction of an official superlative index as a supplement to the CPI-U and CPI-W in 2002. With the development of the CPI-U-XG, the experimental superlative indexes can be constructed and compared using individual category indexes based on both arithmetic and geometric mean formulas.
- Introduction of a new CPI market basket in January 1998 based on 1993-95 consumer expenditure patterns, and consideration of a more frequent schedule of market basket updates than the roughly ten-year cycle followed in the past. The BLS FY 1998 budget initiative also calls for development of an enhanced processing system that will enable us to construct expenditure weights that are just two years old when introduced into the index. (By contrast, the 1993-95 market basket will be 3 1/2 years old when it is introduced in January 1998.)

The advisory commission recommends using a geometric mean formula for upper-level aggregation, and annual market basket updates, to approximate a superlative index while avoiding the need for index lags or revisions. Evidence indicates that such an index would be downward-biased relative to a cost-of-living index. As recommended by Shapiro and Wilcox,

however, one could develop an index based on the CES formula that provides a close approximation to a superlative index over some historical period. The BLS plans to estimate such an index as part of its experimental superlative index program. Additional research is needed on the approximation properties of the CES formula, especially below the U.S. all-items level, before it could be considered for use in the CPI-U or CPI-W. Moreover, a move away from the arithmetic-mean Laspeyres formula above the category level could make the CPI more difficult to use and explain, and these considerations would have to be weighed against the potential advantages of a closer approximation to a cost-of-living index. Also weighing in would be the potential disadvantages of using a formula based upon an approximation to a superlative index, which might need to be revised once the data were available to calculate the superlative index.

This paper has emphasized that substitution bias, and especially upper level substitution bias, accounts for a relatively small part of the total bias that the advisory commission argues exists in the CPI. Quality change in existing goods and services, the introduction of new products, the establishment of new outlets, and the disappearance of older products and outlets, present extremely important issues for which there are, as yet, no general solutions. The absence of general solutions explains why the commission has no short-run recommendations in these areas. The BLS will continue to study the pertinent intermediate-run recommendations—use of leasing equivalence for automobiles, direct pricing of health insurance, and investigation of improved item classification structures—but these are unlikely to solve the fundamental measurement problems even in specific CPI components. Finally, the absence of systematic, well-accepted ways to deal with these problems also means that there are no rigorous ways to measure the new outlet or quality/new goods biases potentially created in the CPI. The advisory commission, like other observers, was forced to use introspective or extrapolation methods to obtain many of their bias estimates.

The BLS specifically rejects several of the estimated quality or new goods biases, in cases where the commission presented new evidence. Examples of these cases noted in Section III above include the estimates of a 0.25 percentage point annual bias in shelter, a 1.0 percentage

point annual bias in apparel and upkeep, and 0.59 percentage point annual biases in new and used cars. Together, these comprise 0.16 of the 0.6 total estimated quality/new goods bias in the overall CPI. In addition, the evidence presented in Appendix B suggests that the commission's estimates of bias for the food and motor fuel components likely are overstated. Most of the remaining estimated bias comes from two areas of the index: medical care and high-tech consumer goods. These clearly are components of the index that present particularly difficult measurement problems, but the quantitative evidence is very fragmentary and the BLS is reluctant to speculate as to what the magnitude of any bias in these index components might be. Finally, some analysts have cited potentially countervailing declines in quality, particularly in services, that are not reflected in the CPI or in the advisory commission's bias estimates.

For the BLS, the primary task is not to evaluate the bias estimates set forward by the advisory commission or other groups, but rather to employ the most accurate methods available for dealing with quality change and with new goods and outlets. Those methods must be rigorous, objective and reproducible, minimizing the role of analyst judgment, although these considerations make it very difficult to incorporate in the CPI the benefits of some types of product innovation.[51] Improvements in medical care that enable patients to lead more active lives have undoubted value, for example, but that value cannot now be, and may never be, measured objectively enough to be reflected in official data series. Notwithstanding such limitations, the BLS is taking several steps to improve its methods for dealing with quality change and new products:

- Effective in January 1997, two improvements were made in the hospital and related services component of the CPI. The hospital room, other inpatient, and outpatient subcomponents were consolidated to enable the index to reflect shifts in the mix and importance of treatment. At the same time, there was a shift from pricing individual

[51] Martin Feldstein, in testimony before the Senate Finance Committee (February 11, 1997), has agreed that the CPI must be based on tested and reliable statistical methods, even though in his view the resulting estimate will overstate the true increase in the cost of living.

items (like units of blood) to pricing the collections of services on selected patient bills; among the benefits of this change are a better reflection of alternative reimbursement methods and an enhanced potential for quality adjustment.

- In 1999, the BLS will implement a change in the CPI's sample rotation procedures from a city-based to an item-based sequence. This ultimately will make it possible to update item samples in rapidly changing market segments more frequently than once every five years (at the cost of less frequent updates in more static market segments).
- The BLS FY 1998 budget request calls for data collection to support greater use of hedonic techniques that explicitly account for changes in the characteristics of items being purchased. (Even in the absence of such funding, the use of hedonic regression for quality adjustment likely will expand into product categories such as personal computers and televisions.) The requested resources also would support implementation of more aggressive product initiation procedures for identifying and beginning to price new goods promptly once they appear in the marketplace.
- Other potential intermediate-term changes include the direct pricing of health insurance policies and a leasing equivalence approach to pricing of automobile services, as recommended by the advisory commission. Both approaches have been evaluated by the BLS in the past and rejected as infeasible, but new developments in the leasing and medical care markets argue for their continued consideration.

Unfortunately, the ongoing controversies surrounding cost-of-living measurement and, more generally, appropriate federal indexation policy, have led much of the public to conclude that the CPI is somehow "broken." Although the BLS rejects that notion, it is evident that the expanding number of users of the CPI have objectives and priorities that sometimes can come into conflict. When this happens, the result can be an index that is less than optimal for certain purposes. One example mentioned above reflects the competing objectives of an index that is free of upper-level substitution bias (as might be desired, for example, for benefit indexation),

and of one that is not subject to lags or routine revision (for example, for indexing debt instruments). Some also have argued the need for specialized indexes for program beneficiaries or other population subgroups. It is, in fact, commonplace to observe that there is no single best measure of inflation. The BLS response to this situation has been to develop a "family of indexes" approach, including experimental measures designed to answer different questions from those answered by the CPI-U and CPI-W. This "family of indexes" now includes the CPI-U-XG, the CPI-E corresponding to the market basket of elderly consumers, and the experimental superlative measures, and under the BLS FY 1998 budget request will include a production-quality superlative measure beginning in 2002. As mentioned above, an experimental CES index is a likely addition to the group.

The BLS is engaged in numerous CPI program enhancements that have not been mentioned above. Some are part of the six-year CPI revision program now underway: conversion to computer-assisted data collection and a telephone-based POPS survey, improvements to the housing sample and estimator, and enhancements to the CEX survey processing system. In addition, the FY 1998 budget request, if approved, would support an expansion in the CEX sample, permitting more accurate expenditure weights and a more timely CPI market basket. The solutions to many CPI measurement issues, however, must await methodological breakthroughs in economics, or improved availability of data. Unfortunately, the techniques available for measuring the gains in consumer welfare from new products (and the losses from product disappearances) are in their infancy, and may never be adaptable for implementation in a large, ongoing price measurement program like the CPI. The increased use of scanner data in U.S. consumer markets offers broader opportunities, and the BLS has been engaged in a significant research effort to explore the many possible uses of these data, in identification of new products and outlets, sampling of items, and ultimately in the computation of the CPI itself.

In summary, the concluding statements of the BLS report to the House Budget Committee in April 1995 remain applicable today. The BLS is intensely aware of the sensitive nature of the

data it produces, and of the critical need for these data to be as accurate as possible. It will continue to investigate the measurement issues that it and others have identified, and will introduce corresponding improvements to the index as quickly as it can.

Appendix A. Technical Issues About Lower Level Substitution Bias

This appendix describes two technical problems with the commission's discussion of lower level substitution bias and formula bias. The first of these problems involves the commission's discussion of "time reversibility."[1] The commission describes this property as a "requirement or test for an index number...that the index should remain the same if the underlying prices undergo a reversal." Their example of this property, however, is incorrect. In their example, the quantity of beef is 1.0, and the price of beef starts at 1.0 in period 1, rises to 1.6 in period 2, and then falls back to 1.0 in period 3. The commission claims that in such a case the CPI would add the 60 percent increase between periods 1 and 2 to the 37.5 percent decrease between periods 2 and 3 to show a total increase of 22.5 percent between periods 1 and 3. Adding the percentage changes, however, is contrary to any reasonable procedure and is not an accurate description of current or past BLS methods. The ratio of the price of beef in period 2 to its price in period 1 is 1.6, and the ratio of the price in period 3 to the price in period 2 is 0.625. So in this case the CPI would multiply the relative changes ($1.6 \times 0.625 = 1$), correctly showing no change in price between periods 1 and 3. Thus it is inaccurate to attribute the bias shown in this example to the CPI.

A second problem is the commission's assertion that the geometric mean formula would eliminate lower level substitution bias. The commission states that the difference between a geometric means index and a Laspeyres index "is an estimate of the bias of the Laspeyres formula, since [Matthew] Shapiro and [David] Wilcox...have shown that the geometric mean provides an unbiased estimate of the underlying cost-of-living index."[2] This statement is surprising, because it is well known that the geometric mean index is unbiased only under restrictive conditions. The basis for the commission stated view appears to be as follows:

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[1] U.S. Senate, Committee on Finance, *Final Report of the Advisory Commission to Study the Consumer Price Index*. Print 104-72, 104 Cong., 2 sess. (Washington, D.C., Government Printing Office, 1996), p. 17.

[2] U.S. Senate, Committee on Finance, *Final Report*, p. 42. The article cited in this quotation is Matthew D. Shapiro and David W. Wilcox, "Mismeasurement in the Consumer Price Index: An Evaluation," in Ben S. Bernanke and Julio J. Rotemberg, eds., *NBER Macroeconomics Annual 1996*, (MIT Press, 1996).

> "Shapiro and Wilcox...have provided an elegant rationale for the geometric approach based on the correlation of relative prices over time. Provided that this correlation is small, a modification of the geometric mean is approximately unbiased for the underlying cost of living index, and this characterization does not require information about the underlying system of consumer's preferences" (U.S. Senate, Committee on Finance, *Final Report*, p. 19).

This statement mischaracterizes the discussion in Shapiro and Wilcox. That article made several important assumptions that are not mentioned by the commission, including assumptions about consumers' preferences. These assumptions are stated by Shapiro and Wilcox when they describe the results of BLS research:[3]

> "Several recent papers [by BLS authors]...have explored another alternative to the Laspeyres-based formula, namely the modified geometric means estimator...Under the same assumptions as we used above (CES utility, stationary distribution of relative prices, etc.), one can show that the modified geometric means estimator is approximately unbiased for the true cost-of-living index" (Shapiro and Wilcox, "Mismeasurement," p. 111).

The assumptions made by Shapiro and Wilcox are fairly restrictive. For example, the assumption of a stationary distribution of relative prices is an assumption that all of the prices in a stratum follow the same underlying trend. Prices in heterogeneous strata very likely violate this assumption because dissimilar goods may well follow different trends. Prices even in relatively

[3]The BLS authors cited by Shapiro and Wilcox are Brent R. Moulton, "Basic Components of the CPI: Estimation of Price Changes," *Monthly Labor Review*, 116, no. 12, December 1993; Marshall B. Reinsdorf and Brent R. Moulton, "The Construction of Basic Components of Cost-of-Living Indexes," in Timothy F. Bresnahan and Robert J. Gordon, eds., *The Economics of New Goods* (Chicago, University of Chicago Press, 1997); and Brent R. Moulton and Karin E. Smedley, "A Comparison of Estimators for Elementary Aggregates of the CPI," paper presented at Western Economic Association International conference, San Diego, CA, July 7, 1995 (Washington, D.C., Bureau of Labor Statistics).

homogeneous strata, such as tomatoes, can violate this assumption if some goods are produced with different technologies, such as hand-picked versus mechanically picked tomatoes.

Moreover, if all of these assumptions hold (stationarity, small correlation of relative prices over time, CES utility), the seasoning method now used to estimate the CPI component indexes also is unbiased. As Shapiro and Wilcox state, under their assumptions:

> "If ρ_{l-n} (the autocorrelation of the relative prices between periods l and n) is small, [the "seasoned" version of the CPI]...should provide quite an accurate estimate of the rate of increase in the true cost-of-living subindex, regardless of the elasticity of substitution" (Shapiro and Wilcox, "Mismeasurement," p. 110).

The fact that the growth rates of geometric means index and the seasoned index actually differ implies that an assumption, probably stationarity, is being violated. This weakens the commission's argument that the geometric means index necessarily approximates a true cost-of-living index and points to the importance of taking account of consumer substitution behavior. If relative prices are not stationary, then the geometric mean formula may still be the exact measure of the stratum cost-of-living subindex, but only if the elasticity of substitution equals one.[4] Alternatively, the seasoned Laspeyres formula may still be the exact measure of the stratum cost-of-living subindex, but only if the elasticity of substitution equals zero. The BLS intends to determine which of these assumptions provides the closest approximation, item category by item category.

[4] Shapiro and Wilcox, "Mismeasurement," fn. 22, p. 111.

Appendix B. Critique of Advisory Commission's Bias Estimates for Fresh Fruits and Vegetables and Motor Fuel[1]

Fresh fruits and vegetables.

The quote cited above [see section III] indicates that the advisory commission attributes a bias of 20 percent over the period 1967-96 due to increased seasonal availability and variety. It is reasonable to think that, to the extent that consumers value the increased seasonal availability of produce, they will consume more of it. Our analytical framework is to consider the "November strawberry" to be a new good, distinct from the "June strawberry," and measure the consumer surplus associated with the new good.[2]

Among the various methods that have been proposed for incorporating new goods in a cost-of-living index, Jerry Hausman's suggestion of calculating the consumer surplus from a linearized demand curve is particularly easy to apply to back of the envelope calculations.[3] Hausman's linearized method implies that the percentage bias of the price index from failure to incorporate the consumer surplus from a new good, n, is approximately

(1) $$\text{bias} = -0.5 \times S_n / \delta_n$$

where S_n is the percentage expenditure share of the new good after introduction and δ_n is its price elasticity of demand. Thus the calculation of consumer surplus and bias can be inferred

[1] This appendix is an excerpt from a study by BLS researchers: Brent R. Moulton and Karin E. Moses, "Addressing the Quality Change Issue in the Consumer Price Index," forthcoming in *Brookings Papers on Economic Activity 1997:1* (Washington, D.C., Bureau of Labor Statistics, 1997).

[2] See W. Erwin Diewert, "The Treatment of Seasonality in a Cost-of-living Index," in W.E. Diewert and C. Montmarquette, eds., *Price Level Measurement: Proceedings from a Conference Sponsored by Statistics Canada* (Ottawa, Statistics Canada, 1983).

[3] See Jerry Hausman, "Cellular Telephone, New Products and the CPI," unpublished paper (Massachusetts Institute of Technology, 1997). Hausman refers to his linearized method as a "lower bound" on the consumer surplus, but it is unclear to us whether the conditions for the method to be a lower bound—a convex shaped demand curve—necessarily hold in all cases.

from information on the expenditure share, which is often readily available, and the elasticity of demand, which can be estimated or inferred from elasticity estimates for similar goods.[4]

New varieties or seasonal availability of fresh fruits and vegetables face many substitutes, not only from other fresh produce, but also from frozen fruits and vegetables. We assume a value of -1.0 for δ_n. Under these assumptions, equation 1 implies that the increased consumption of new seasonal items and varieties as a share of current consumption would need to be quite large—about 40 percent of 1996 expenditures—to be consistent with the advisory commission's estimated index bias of 20 percent.[5]

Table B1 presents U.S. Department of Agriculture data on changes in per capita consumption of fresh fruit from 1975 to 1995. The change in consumption is shown, somewhat unconventionally, as a percentage of 1995 consumption, because the shares in equation 1 refer to current period consumption. As the advisory commission observes, per capita consumption of many fruits has indeed increased substantially over this period: in particular, limes, cranberries, grapes, kiwifruit, mangos, papayas, and strawberries. Despite these large increases, however, most of these items continue to represent a small percentage of overall fruit consumption, so that the total increase in per capita fruit consumption as a share of 1995 consumption is only 14 percent (measured in pounds). The largest absolute increase in consumption of fruit is that for bananas. We are confident there was no important improvement in seasonal availability of bananas and that there were only minor increases in consumption of new varieties of bananas over this period. In addition, consumption of apples did not change significantly and consumption of oranges decreased. We wonder whether the use of apples for baking may have decreased during this period, which might mask a possible increase in the consumption of raw apples.

[4] If a new variety fully replaces an old one, the consumer surplus calculation should deduct the lost surplus of the disappearing variety from the surplus gained from the new variety.

[5] Ideally, one would examine monthly consumption data to isolate seasonal changes in consumption, but such data do not appear to be available.

We do not attempt to calculate the overall bias using equation 1 because doing so would require average price or expenditure data for each of the detailed categories, which we have not been able to assemble. As mentioned earlier, under Hausman's model and our earlier assumptions, to be consistent with the commission's bias estimate consumption of new varieties and seasonal items would need to increase by about 40 percent over thirty years, which annualizes to 25 percent over the twenty years for which we have data. If increased consumption of seasonal varieties was relatively unimportant for apples, bananas, and citrus fruits, which, according to the Consumer Expenditure Survey of the Bureau of Labor Statistics, together represent 61 percent of dollar expenditures on fresh fruit in 1995, it would be difficult for increased seasonal consumption of the other fruits to produce an estimated bias as large as the commission proposes.

Table B2 shows changes in consumption of vegetables from 1972 to 1995. Unlike the data for fruit, the data for vegetables show important increases in consumption for many items and thus appear, at first glance, to be consistent with the advisory commission's estimates of bias. Under the assumptions stated above, our consumer surplus calculations indicate that for the commission's estimate to hold, the growth in consumption over thirty years would need to be about 40 percent of current consumption, which annualizes to 29 percent over the twenty-three years for which we have consumption data. This is, in fact, very close to the overall increase over this period: 27 percent. We are skeptical, however, about concluding that the increase in consumption derives entirely from improved seasonal availability. A BLS food specialist, Bill Cook, has suggested that the increase in seasonal availability of fresh vegetables mostly occurred before 1985, as evidenced by a 1984 internal BLS study showing that 91 percent of the CPI price quotes for the "other fresh vegetables" category were by then available year round.[6] Table B2 shows, however, that almost half of the increase in consumption of fresh vegetables occurred

[6] Internal memorandum from William L. Weber to Dan Ginsburg, U.S. Bureau of Labor Statistics, May 25, 1984.

after 1985. Part of the increase appears to have been driven by shifts in preferences, perhaps as a response to improved knowledge about the health benefits of fresh vegetables.

Motor fuel

For the motor fuel category, the advisory commission attributes "a small upward bias of 0.25 percent per year to the CPI for ignoring the convenience and time-saving contribution of automatic credit-card readers built into gasoline pumps."[7] Because the commission applies this estimate over a ten-year period, the estimate of the cumulative bias from this source amounts to 2.5 percent.[8] Our approach to measuring the consumer surplus created by pay-at-the-pump credit card technology is to attempt to value the saving in time. Suppose that paying at the pump saves two minutes per fill-up, and that the customer's time is valued at $18 per hour (average total compensation per hour for all workers in private industry was $17.49 in 1996). Then the value of paying at the pump is 60 cents per fill-up. Assuming that ten gallons are purchased, the quality bias for the customer who pays at the pump is 6 cents per gallon, or roughly 4.5 percent of the cost of a gallon of gasoline.

Since this service is of value only to the customers who use it, one must next determine the approximate percentage of gasoline purchasers who use pay-at-the-pump technology. Although we have not found direct information on this percentage, the September 1996 issue of the trade journal *National Petroleum News* reports that 28 percent of the retail facilities operated by thirteen oil companies had installed pay-at-the-pump technology as of 1996.[9] Since many of

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[7] U.S. Senate, Committee on Finance, *Final Report of the Advisory Commission to Study the Consumer Price Index*. Print 104-72, 104 Cong., 2 sess. (Washington, D.C., Government Printing Office, 1996), p. 36.

[8] We also note that the report does not address possible unmeasured decline in retail services, such as the introduction of fees for providing air for tires at some service stations. In addition, the advisory commission incorrectly assumes that the CPI does not make quality adjustments for air pollution mandates and, agreeing with this supposed BLS practice, makes no bias adjustment for the mandates itself. Since BLS does, in fact, make cost-based adjustments for motor fuel pollution mandates, the commission presumably should have counted these as downward bias (see U.S. Bureau of Labor Statistics, "Quality Adjustment for Gasoline," *CPI Detailed Report*, January 1995, p. 8).

[9] "Pay-at-the-Pump Shows Solid Growth in '90s," *National Petroleum News*, September 1996, p. 22.

the customers at these stations do not use credit cards, we attempt to find the percentage of gasoline customers who do so. We have not found published information, but an industry source has told us that roughly 35 percent of sales are made through credit cards.

A naive estimate of the proportion of sales using pay-at-the-pump technology would thus be 10 percent (28 percent × 35 percent). However, there are at least three reasons why this estimate is too low: first, pay-at-the-pump technology was doubtless first targeted at high-volume sites in areas with high credit card usage; second, the availability of the technology induces customers to make more use of credit cards; and third, the technology is spreading rapidly, so that even estimates published in September 1996 will understate current availability. Consequently we take 25 percent as our estimate of the percentage of customer sales made with pay-at-the-pump technology at the end of 1996. Under these assumptions, we calculate the cumulative index bias from neglecting the benefits of this technology as approximately 1.1 percent (4.5 percent × 25 percent), which is less than half of the advisory commission's estimate.

Table B1. Per Capita Consumption of Fresh Fruits, by Type, 1975-95
Units as indicated

Type of fruit	Pounds per capita			Change, 1975-95	
	1975	1985	1995	As percentage of 1995 consumption	In pounds
Citrus					
Oranges and temples	15.9	11.6	12.3	-29.6	-3.6
Tangerines and tangelos	2.6	1.5	2.0	-27.9	-0.6
Lemons	2.0	2.3	2.9	32.1	0.9
Limes	0.2	0.6	1.2	81.7	1.0
Grapefruit	8.4	5.5	6.0	-38.4	-2.3
Total	29.0	21.5	24.4	-18.9	-4.6
Noncitrus					
Apples	19.5	17.3	18.9	-3.0	-0.6
Apricots	0.1	0.2	0.1	20.0	0.0
Avocados	1.2	1.8	1.4	10.9	0.2
Bananas	17.6	23.5	27.4	35.6	9.8
Cherries	0.7	0.4	0.2	-187.5	-0.5
Cranberries	0.1	0.1	0.3	53.3	0.2
Grapes	3.6	6.8	7.6	52.7	4.0
Kiwifruit	...	0.1	0.5	...	...
Mangos	0.2	0.4	1.1	85.8	1.0
Peaches and Nectarines	5.0	5.5	5.4	8.5	0.5
Pears	2.7	2.8	3.4	19.4	0.7
Pineapples	1.0	1.5	1.9	46.6	0.9
Papayas	0.2	0.2	0.4	56.8	0.2
Plums and Prunes	1.3	1.4	0.9	-41.5	-0.4
Strawberries	1.8	3.0	3.8	52.1	2.0
Total	55.1	65.1	73.5	25.0	18.4
Total	84.1	86.5	97.9	14.1	13.8

Source: U.S. Department of Agriculture, Economic Research Service, *Fruit and Tree Nuts*, FTS-278, October 1996) (table F-29).

Table B2. Per Capita Consumption of Fresh Vegetables, by Type, 1972-95
Units as indicated

Type of vegetable	Pounds per capita			Change 1972-95	
	1972	1985	1995	As a percentage of 1995 consumption	In pounds
Asparagus	0.4	0.5	0.6	33.3	0.2
Broccoli	0.7	2.6	3.2	78.1	2.5
Carrots	6.5	6.5	10.1	35.6	3.6
Cauliflower	0.8	1.8	1.3	38.5	0.5
Celery	7.1	6.9	6.4	-10.9	-0.7
Sweet Corn	7.8	6.4	7.8	0.0	0.0
Bell Peppers	2.4	3.8	5.8	58.6	3.4
Onions	10.7	13.6	17.7	39.5	7.0
Tomatoes	12.1	14.9	16.6	27.1	4.5
Cabbage	8.5	8.8	9.1	6.6	0.6
Spinach	0.3	0.7	0.6	50.0	0.3
Cucumbers	3.0	4.4	5.6	46.4	2.6
Artichokes	0.4	0.7	0.4	0.0	0.0
Snap Beans	1.5	1.3	1.6	6.3	0.1
Eggplant	0.4	0.5	0.4	0.0	0.0
Escarole or endive	0.6	0.4	0.2	-200.0	-0.4
Garlic	0.4	1.1	2.1	81.0	1.7
Lettuce					
Head	22.4	23.7	21.6	-3.7	-0.8
Leaf or Romaine	...	3.3	6.0	...	...
Watermelon	12.3	13.5	15.9	22.6	3.6
Cantaloupe	7.0	8.5	9.9	29.3	2.9
Honeydews	1.0	2.1	2.4	58.3	1.4
All Others	0.8	0.8	0.7	-14.3	-0.1
Total	107.1	126.8	146.0	26.6	38.9

Source: U.S. Department of Agriculture, Economic Research Service, *Vegetables and Specialties: Situation and Outlook Yearbook*, VGS-269, July 1996 (table 14).

Appendix C. Examples of New Car Reliability/Durability Quality Adjustments in the CPI Since 1992

- Improved corrosion protection - body, electrical system, fuel tank, pump, shocks, brakes and cables
- Increased warranties
- Body side cladding
- Sealing improvements
- Stainless steel exhaust
- Longer life spark plugs - 100,000 mile life
- Improved steering gears
- Powertrain improvements
- Dextron III transmission fluid - 100,000 mile life
- Water pump front face - 150,000 mile life
- Battery saver
- Increased catalyst load - 100,000 mile life
- Rust resistant fuel injection -100,000 mile life
- Clearcoat paint
- sided galvanized steel body panels
- Serpentine drive belt

JUL 25 1997

Honorable Pete Stark
House of Representatives
Washington, D.C. 20515-0513

Dear Congressman Stark:

At the June 6 hearing of the Joint Economic Committee, you asked the Bureau of Labor Statistics (BLS) for information on recent job growth and related issues.

As you know, employment in the United States has expanded considerably over the past few years. In an effort to gauge the quality of the jobs that have been created, we have examined trends in employment across occupations and industries. Findings from this research indicate that the recent increase in employment, though somewhat concentrated in relatively low-wage *industries*, occurred in both relatively higher-paying and lower-paying *occupations*. I have enclosed an article on this subject from the June 1996 Monthly Labor Review, "The nature of employment growth, 1989-95," and a chart and table which update the research through 1996.

As I mentioned at the hearing, information for States is more limited, but estimates of State-level employment by industry are available through the Current Employment Statistics program (CES), often referred to as the payroll survey. I have enclosed tables showing employment levels by State and major industry for 1992 through 1996, and the employment growth rates over that time. As you can see from the tables, the largest percent increases in total nonfarm employment occurred in several Western States, namely Nevada, Utah, and Arizona. A more detailed analysis is presented in an article in the November 1996 Monthly Labor Review, "A decade of economic change and population shifts in U.S. regions," a copy of which also is enclosed.

Better information on occupational employment at the State level soon will be forthcoming, as a result of the recent redesign and expansion of the Bureau's Occupational Employment Statistics (OES) survey. This annual survey, which now covers about 400,000 business establishments per year, will provide estimates of occupational employment and median occupational wages by industry, for over 700 occupations. These data will be available for States, Metropolitan Statistical Areas, and up to four non-metropolitan areas per State--a total of about 500 areas in all.

(Prior to the changes recently introduced, the OES provided occupational employment data for only about one-third of the economy each year, and, except in a few States, did not provide information on occupational wage levels.) We are excited about the useful information the new OES will be providing, and expect to announce a schedule on which the data will become available in the not-too-distant future.

Although not a source of State-level data, the BLS occupational employment projections provide a valuable perspective on the labor market of the future. The Bureau's Office of Employment Projections updates these projections every 2 years. I have enclosed the November 1995 Monthly Labor Review, which contains five articles presenting the latest forecasts to the year 2005. A table showing projections for specific occupations begins on page 64.

One topic that arose at the hearing is the potential collection of data on job vacancies. My staff discussed the collection and use of such data with staff from your office and Congressman Brown's office at a meeting on June 18. BLS has conducted two pilot studies on the feasibility of collecting job vacancy information by occupation. We learned that, from an operational viewpoint, collecting such information at the national level or by State is feasible but relatively costly. The pilot study done in the early 1990s estimated the cost of collecting annual national data on vacancies by occupation to be $11 million per year, and the cost today presumably would be higher. Obtaining data for States and substate areas, the levels at which job placement and training programs operate, would be far more expensive.

Further, even if we had the funding for such an undertaking, understanding job vacancy data and using them to make judgments regarding welfare-to-work programs could prove extremely difficult. I must tell you that this is not an area in which BLS has expertise or experience. In addition, I am concerned that a survey with a national design likely would not provide the kinds of information that State and local governments would find most useful for program planning and evaluation. As Congressman Brown suggests in his letter of June 16, should limited funds be allocated, it might be best to conduct pilot surveys on job vacancies in several local areas to assess the quality and usefulness of such information.

Honorable Pete Stark--3

JUL 25 1997

If you have any questions about this information, please let me know, or have a member of your staff call Philip Rones, BLS Assistant Commissioner for Current Employment Analysis, on 202-606-7378.

Sincerely yours,

KATHARINE G. ABRAHAM
Commissioner

Enclosures

BLS/OEUS/DLFS
COHANY/kdt X6378
cc: Gen. Files, Comm. RF, Abraham, Acting Assoc. Comm., Rones, Nardone, RF, DF

Table 2. Employment levels in 1989 and 1996, change in employment, 1989-96, and 1993 median usual weekly earnings by major occupation and industry

(Numbers in thousands)

Occupation	Industry	Employment		1989-96 change in total employment[1]		1993
		1989	1996	Number	Percent	Median weekly earnings[2]
Highest-earning group						
Total		40,539	46,873	6,334	15.6	(3)
Professional specialty	Mining	63	44	-19	-30.1	$1,083
Executive, administrative, and managerial	Mining	104	90	-14	-13.5	942
Sales occupations	Mining	9	10	1	14.4	(4)
Professional specialty	Construction	145	165	20	13.8	875
Professional specialty	Manufacturing	1,805	1,882	77	4.2	819
Executive, administrative, and managerial	Manufacturing	2,560	2,840	280	11.0	804
Professional specialty	Finance, insurance, and real estate	206	271	63	30.6	786
Professional specialty	Transportation and public utilities	479	529	50	10.3	779
Executive, administrative, and managerial	Transportation and public utilities	929	1,159	230	24.7	764
Technicians and related support	Mining	30	21	-10	-32.4	(4)
Professional specialty	Public administration	782	951	169	21.6	722
Executive, administrative, and managerial	Construction	1,016	1,221	205	20.2	699
Technicians and related support	Transportation and public utilities	278	332	53	19.2	682
Professional specialty	Wholesale trade	89	100	11	12.6	675
Executive, administrative, and managerial	Public administration	1,223	1,325	102	8.3	669
Professional specialty	Agriculture	71	88	16	22.9	649
Precision production, craft, and repair	Mining	233	208	-25	-10.8	644
Precision production, craft, and repair	Transportation and public utilities	1,263	1,185	-78	-6.2	624
Executive, administrative, and managerial	Finance, insurance, and real estate	2,108	2,274	166	7.9	620
Sales occupations	Finance, insurance, and real estate	1,851	2,052	201	10.8	604
Technicians and related support	Public administration	252	208	-44	-17.4	602
Technicians and related support	Finance, insurance, and real estate	141	162	21	14.8	599
Executive, administrative, and managerial	Services	4,726	6,347	1,621	34.3	598
Executive, administrative, and managerial	Wholesale trade	510	563	54	10.5	598
Technicians and related support	Manufacturing	744	631	-113	-15.2	596
Sales occupations	Transportation and public utilities	349	288	-61	-17.5	595
Sales occupations	Wholesale trade	1,835	2,005	170	9.3	591
Executive, administrative, and managerial	Agriculture	78	108	29	37.5	(4)
Precision production, craft, and repair	Public administration	239	221	-18	-7.8	582
Professional specialty	Services	11,542	14,312	2,771	24.0	578
Sales occupations	Manufacturing	754	766	12	1.6	578
Service occupations	Mining	8	7	-1	-10.7	(4)
Service occupations	Public administration	1,383	1,585	222	16.3	558
Technicians and related support	Wholesale trade	40	52	12	29.1	(4)
Operators, fabricators, and laborers	Mining	188	143	-45	-24.1	518
Professional specialty	Retail trade	351	410	58	16.6	515
Administrative support, including clerical	Transportation and public utilities	2,173	2,319	147	6.7	502

See footnotes at end of table.

Table 2. Employment levels in 1989 and 1996, change in employment, 1989-96, and 1993 median usual weekly earnings by major occupation and industry

(Numbers in thousands)

Occupation	Industry	Employment		1989-96 change in total employment[1]		1993
		1989	1996	Number	Percent	Median weekly earnings[2]
Middle-earning group						
Total		38,141	37,131	-1,010	-2.6	(3)
Precision production, craft, and repair	Manufacturing	4,135	3,814	-321	-7.8	502
Sales occupations	Construction	66	65	-1	-1.5	502
Sales occupations	Public administration	24	25	1	3.7	(4)
Precision production, craft, and repair	Construction	4,443	4,442	-1	0.0	488
Technicians and related support	Construction	54	45	-9	-17.0	(4)
Precision production, craft, and repair	Wholesale trade	322	320	-2	-0.7	486
Operators, fabricators, and laborers	Transportation and public utilities	2,372	2,747	375	15.8	463
Administrative support, including clerical	Mining	81	47	-34	-41.9	454
Operators, fabricators, and laborers	Public administration	151	108	-43	-28.3	448
Technicians and related support	Services	2,019	2,312	293	14.5	436
Executive, administrative, and managerial	Retail trade	1,543	1,818	275	17.8	424
Precision production, craft, and repair	Services	1,848	2,055	207	11.2	415
Administrative support, includ clerical	Public administration	1,480	1,353	-127	-8.6	414
Service occupations	Transportation and public utilities	273	251	-22	-7.9	414
Precision production, craft, and repair	Finance, insurance, and real estate	144	165	21	14.7	413
Precision production, craft, and repair	Retail trade	1,237	1,137	-100	-8.1	410
Precision production, craft, and repair	Agriculture	46	41	-5	-10.4	(4)
Administrative support, including clerical	Manufacturing	2,404	2,033	-371	-15.4	394
Operators, fabricators, and laborers	Construction	1,513	1,499	-14	-0.9	379
Service occupations	Agriculture	18	28	10	56.6	(4)
Service occupations	Manufacturing	350	264	-86	-24.5	348
Operators, fabricators, and laborers	Manufacturing	8,980	8,186	-794	-8.8	345
Operators, fabricators, and laborers	Wholesale trade	970	1,057	87	9.0	343
Technicians and related support	Retail trade	80	123	44	54.8	343
Administrative support, including clerical	Finance, insurance, and real estate	3,149	2,744	-405	-12.9	342
Administrative support, including clerical	Construction	442	452	10	2.4	342

Table 2. Employment levels in 1989 and 1996, change in employment, 1989-96, and 1993 median usual weekly earnings by major occupation and industry

(Numbers in thousands)

Occupation	Industry	Employment		1989-96 change in total employment[1]		1993
		1989	1996	Number	Percent	Median weekly earnings[2]
Lowest-earning group						
Total[3]		39,543	42,703	3,160	8.0	(3)
Administrative support, including clerical	Wholesale trade	803	749	-54	-6.8	341
Technicians and related support	Agriculture	29	40	11	38.6	(4)
Farming, forestry, and fishing	Manufacturing	92	101	9	9.8	333
Farming, forestry, and fishing	Transportation and public utilities	12	7	-6	-45.1	(4)
Farming, forestry, and fishing	Public administration	55	25	-30	-54.4	(4)
Administrative support, including clerical	Services	6,286	6,905	619	9.8	305
Operators, fabricators, and laborers	Agriculture	88	58	-28	-32.2	304
Service occupations	Construction	36	32	-4	-10.5	(4)
Operators, fabricators, and laborers	Finance, insurance, and real estate	62	56	-6	-9.5	(4)
Farming, forestry, and fishing	Construction	17	21	4	21.7	(4)
Administrative support, including clerical	Retail trade	1,601	1,577	-24	-1.5	273
Administrative support, including clerical	Agriculture	114	174	60	52.7	265
Service occupations	Finance, insurance, and real estate	279	298	19	7.0	255
Sales occupations	Services	902	1,120	218	24.2	250
Operators, fabricators, and laborers	Services	1,807	1,944	137	7.6	234
Farming, forestry, and fishing	Services	410	367	-43	-10.5	234
Farming, forestry, and fishing	Agriculture	2,771	2,888	118	4.2	230
Farming, forestry, and fishing	Finance, insurance, and real estate	68	54	-12	-17.8	229
Sales occupations	Retail trade	8,334	9,055	721	8.6	225
Service occupations	Wholesale trade	45	48	3	6.4	(4)
Farming, forestry, and fishing	Wholesale trade	15	62	47	312.1	(4)
Service occupations	Services	8,881	9,680	799	9.0	216
Sales occupations	Agriculture	21	19	-2	-10.0	(4)
Operators, fabricators, and laborers	Retail trade	2,219	2,401	182	8.2	209
Farming, forestry, and fishing	Retail trade	23	39	16	67.7	(4)
Service occupations	Retail trade	4,576	4,983	407	8.9	187

[1] Change (number and percent) was calculated from unrounded estimates, not from the rounded estimates shown in the total employment columns.
[2] Data refer to all wage and salary workers.
[3] Not available
[4] Data not shown where the 1993 employment base was less than 50,000.
[5] Includes farming, forestry, and fishing workers in mining, not shown separately.

NOTE: Detail may not sum to totals due to rounding. Employment growth was calculated using annual averages for 1989-95. To increase comparability with data for 1990 forward, data for 1989 were adjusted to incorporate 1990 census-based population controls. (See text footnote 3.)

Chart 1. Employment growth (decline) by earnings group, 1989-96

Total Nonfarm Employment, Annual Averages

State	1992	1993	1994	1995	1996	Net Change 1992-1996	Pct. Change 1992-1996
Alabama	1,674.5	1,716.8	1,758.5	1,803.6	1,824.5	150.0	8.96%
Alaska	247.2	252.9	259.3	262.0	263.2	16.0	6.47%
Arizona	1,517.0	1,584.4	1,692.1	1,795.7	1,895.6	378.6	24.96%
Arkansas	963.1	994.0	1,034.1	1,069.4	1,085.6	122.5	12.72%
California	12,153.5	12,045.3	12,159.5	12,422.2	12,775.0	621.5	5.11%
Colorado	1,596.9	1,670.7	1,755.9	1,834.4	1,896.9	300.0	18.79%
Connecticut	1,526.2	1,531.1	1,543.7	1,561.5	1,582.8	56.6	3.71%
Delaware	341.3	348.6	356.0	366.4	376.8	35.5	10.40%
District of Columbia	673.6	670.3	658.8	642.6	623.0	(50.6)	-7.51%
Florida	5,358.7	5,571.4	5,789.4	5,996.1	6,182.5	823.8	15.37%
Georgia	2,987.2	3,109.2	3,265.9	3,402.3	3,528.3	541.1	18.11%
Hawaii	542.8	538.8	536.2	532.8	529.3	(13.5)	-2.49%
Idaho	416.4	436.5	460.9	477.3	492.3	75.9	18.23%
Illinois	5,234.9	5,330.5	5,452.9	5,593.1	5,676.0	441.1	8.43%
Indiana	2,554.2	2,626.9	2,712.7	2,786.5	2,812.8	258.6	10.12%
Iowa	1,252.6	1,278.6	1,319.9	1,358.1	1,380.4	127.8	10.20%
Kansas	1,115.0	1,133.3	1,165.8	1,198.0	1,228.2	113.2	10.15%
Kentucky	1,508.5	1,547.9	1,597.2	1,642.8	1,671.1	162.6	10.78%
Louisiana	1,626.9	1,658.6	1,722.1	1,772.4	1,810.7	183.8	11.30%
Maine	511.9	519.4	531.6	538.2	540.0	28.1	5.49%
Maryland	2,081.3	2,102.4	2,145.8	2,182.7	2,205.9	124.6	5.99%
Massachusetts	2,795.1	2,840.2	2,903.8	2,976.1	3,036.4	241.3	8.63%
Michigan	3,927.4	4,005.8	4,146.8	4,273.9	4,345.0	417.6	10.63%
Minnesota	2,184.9	2,242.7	2,310.4	2,378.6	2,431.7	246.8	11.30%
Mississippi	960.3	1,002.3	1,055.5	1,074.5	1,090.2	129.9	13.53%
Missouri	2,333.7	2,394.5	2,470.5	2,521.0	2,564.2	230.5	9.88%
Montana	316.6	325.6	340.2	350.8	359.0	42.4	13.39%
Nebraska	750.1	767.2	796.1	816.4	834.4	84.3	11.24%
Nevada	638.7	671.4	738.0	788.1	842.5	203.8	31.91%
New Hampshire	487.0	502.4	523.1	539.7	559.7	72.7	14.93%
New Jersey	3,457.9	3,493.1	3,552.8	3,600.7	3,640.0	182.1	5.27%
New Mexico	601.5	626.2	657.2	682.4	694.0	92.5	15.38%
New York	7,729.9	7,752.0	7,818.7	7,872.3	7,917.1	187.2	2.42%
North Carolina	3,125.5	3,244.7	3,358.9	3,459.5	3,555.2	429.7	13.75%
North Dakota	277.2	284.8	294.9	301.8	308.9	31.7	11.44%
Ohio	4,847.7	4,918.3	5,076.0	5,221.0	5,295.9	448.2	9.25%
Oklahoma	1,221.7	1,247.0	1,279.5	1,316.1	1,354.2	132.5	10.85%
Oregon	1,267.6	1,308.4	1,362.9	1,418.4	1,474.7	207.1	16.34%
Pennsylvania	5,075.5	5,122.8	5,192.4	5,253.1	5,308.2	232.7	4.58%
Rhode Island	424.8	430.0	434.2	440.1	441.8	17.0	4.00%
South Carolina	1,527.7	1,570.1	1,607.2	1,646.1	1,676.0	148.3	9.71%
South Dakota	308.7	318.7	332.0	343.5	348.9	40.2	13.02%
Tennessee	2,245.0	2,328.5	2,423.0	2,499.0	2,534.4	289.4	12.89%
Texas	7,269.1	7,481.5	7,750.9	8,022.5	8,242.1	973.0	13.39%
Utah	768.7	809.8	859.7	907.7	954.6	185.9	24.18%
Vermont	251.0	257.2	263.8	270.0	274.8	23.8	9.48%
Virginia	2,848.4	2,918.9	3,003.6	3,069.7	3,130.3	281.9	9.90%
Washington	2,222.4	2,253.0	2,304.3	2,346.9	2,411.8	189.4	8.52%
West Virginia	640.0	652.6	674.8	687.8	698.4	58.4	9.12%
Wisconsin	2,357.9	2,412.7	2,490.8	2,558.5	2,601.6	243.7	10.34%
Wyoming	205.6	210.3	216.8	219.4	221.4	15.8	7.68%

Mining Employment, Annual Averages

State	1992	1993	1994	1995	1996	Net Change 1992-1996	Pct. Change 1992-1996
Alabama	11.0	10.7	10.6	10.9	10.6	(0.4)	-3.64%
Alaska	10.5	10.3	10.7	10.0	10.0	(0.5)	-4.76%
Arizona	12.6	12.3	11.7	12.9	14.4	1.8	14.29%
Arkansas	3.5	3.6	3.5	3.5	3.5	0.0	0.00%
California	35.4	34.9	31.9	30.0	29.6	(5.8)	-16.38%
Colorado	16.6	16.1	15.6	14.8	13.6	(3.0)	-18.07%
Connecticut	0.9	0.9	0.7	0.7	0.8	(0.1)	-11.11%
Delaware	0.1	0.1	0.1	0.1	0.1	0.0	0.00%
District of Columbia	0.1	0.1	0.1	0.1	0.1	0.0	0.00%
Florida	7.1	6.3	6.8	6.8	6.9	(0.2)	-2.82%
Georgia	7.5	7.5	7.6	7.7	7.8	0.3	4.00%
Hawaii	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Idaho	2.6	2.2	2.4	2.7	3.1	0.5	19.23%
Illinois	17.3	15.5	15.0	13.7	12.6	(4.7)	-27.17%
Indiana	7.1	6.5	6.8	6.4	6.3	(0.8)	-11.27%
Iowa	2.1	2.1	2.2	2.1	2.1	0.0	0.00%
Kansas	9.1	8.8	8.3	8.0	7.9	(1.2)	-13.19%
Kentucky	30.0	27.7	27.7	25.0	23.0	(7.0)	-23.33%
Louisiana	48.1	46.1	46.3	45.9	49.0	0.9	1.87%
Maine	0.1	0.1	0.1	0.1	0.1	0.0	0.00%
Maryland	1.2	1.1	1.1	1.1	1.1	(0.1)	-8.33%
Massachusetts	1.2	1.2	1.3	1.3	1.2	0.0	0.00%
Michigan	8.9	8.8	8.7	8.4	7.6	(1.3)	-14.61%
Minnesota	7.7	7.5	7.5	7.8	7.9	0.2	2.60%
Mississippi	5.2	5.2	5.1	4.9	5.2	0.0	0.00%
Missouri	4.8	4.5	4.7	4.9	4.8	0.0	0.00%
Montana	5.8	5.5	5.4	5.3	5.4	(0.4)	-6.90%
Nebraska	1.5	1.4	1.4	1.3	1.2	(0.3)	-20.00%
Nevada	12.9	12.6	12.3	13.2	14.6	1.7	13.18%
New Hampshire	0.4	0.4	0.5	0.5	0.5	0.1	25.00%
New Jersey	1.9	1.9	1.9	2.0	1.9	0.0	0.00%
New Mexico	15.1	15.9	15.7	15.9	15.4	0.3	1.99%
New York	4.9	5.0	5.0	4.8	4.6	(0.3)	-6.12%
North Carolina	3.4	3.4	3.5	3.7	3.8	0.4	11.76%
North Dakota	3.9	3.8	3.7	3.8	4.1	0.2	5.13%
Ohio	14.6	14.1	14.6	13.8	13.8	(0.8)	-5.48%
Oklahoma	37.4	35.7	34.4	31.7	31.5	(5.9)	-15.78%
Oregon	1.6	1.7	1.6	1.7	1.9	0.3	18.75%
Pennsylvania	23.5	21.2	20.7	19.4	19.4	(4.1)	-17.45%
Rhode Island	0.2	0.2	0.2	0.2	0.2	0.0	0.00%
South Carolina	1.8	1.8	1.8	1.8	1.8	0.0	0.00%
South Dakota	2.7	2.5	2.4	2.3	2.3	(0.4)	-14.81%
Tennessee	5.0	4.7	4.6	4.6	4.6	(0.4)	-8.00%
Texas	170.2	166.0	162.2	155.9	156.4	(13.8)	-8.11%
Utah	8.5	8.4	8.2	8.1	7.9	(0.6)	-7.06%
Vermont	0.6	0.5	0.6	0.6	0.6	0.0	0.00%
Virginia	13.5	12.7	12.1	11.3	10.8	(2.7)	-20.00%
Washington	3.4	3.2	3.4	3.4	3.4	0.0	0.00%
West Virginia	31.4	26.2	27.9	27.2	25.7	(5.7)	-18.15%
Wisconsin	2.3	2.4	2.4	2.5	2.5	0.2	8.70%
Wyoming	17.6	17.7	17.6	17.0	15.9	(1.7)	-9.66%

Construction Employment, Annual Averages

State	1992	1993	1994	1995	1996	Net Change 1992-1996	Pct. Change 1992-1996
Alabama	75.8	78.0	82.5	86.8	93.5	17.7	23.35%
Alaska	10.2	11.5	12.3	12.8	12.5	2.3	22.55%
Arizona	79.8	89.1	107.0	119.7	126.5	46.9	58.92%
Arkansas	37.4	38.5	41.3	44.3	47.3	9.9	26.47%
California	471.7	445.7	484.3	485.4	510.5	38.8	8.23%
Colorado	74.8	86.0	97.1	102.1	111.1	36.3	48.53%
Connecticut	47.4	47.8	49.3	50.4	51.6	4.2	8.86%
Delaware	17.6	17.9	17.4	19.3	20.5	2.9	16.48%
District of Columbia	9.0	8.6	9.0	8.7	8.5	(0.5)	-5.56%
Florida	266.5	285.3	296.0	308.3	323.5	57.0	21.39%
Georgia	120.4	127.7	139.6	151.6	164.7	44.3	36.79%
Hawaii	31.5	32.3	29.2	28.3	23.5	(8.0)	-25.40%
Idaho	22.2	24.7	28.7	29.6	30.4	8.2	36.94%
Illinois	196.9	200.4	211.0	216.7	220.8	23.9	12.14%
Indiana	113.6	118.1	126.4	129.7	132.1	18.5	16.28%
Iowa	47.2	48.5	52.9	55.0	58.5	11.3	23.94%
Kansas	45.0	45.8	49.2	51.6	56.8	11.8	26.22%
Kentucky	68.0	70.6	73.7	73.7	76.9	8.9	13.09%
Louisiana	98.0	97.8	104.3	106.2	112.7	14.7	15.00%
Maine	21.1	20.8	21.0	21.7	23.0	1.9	9.00%
Maryland	120.2	121.1	125.5	127.4	130.3	10.1	8.40%
Massachusetts	73.6	80.1	88.0	89.8	93.9	20.3	27.58%
Michigan	128.3	132.7	142.6	152.7	167.7	39.4	30.71%
Minnesota	77.3	78.3	81.1	83.9	88.8	11.5	14.88%
Mississippi	35.4	39.6	43.5	45.4	48.7	13.3	37.57%
Missouri	90.9	98.8	111.1	111.8	115.5	24.6	27.06%
Montana	12.7	13.5	14.9	16.1	17.0	4.3	33.86%
Nebraska	28.3	30.4	33.2	34.7	36.7	8.4	29.68%
Nevada	39.2	48.9	55.7	61.6	74.8	35.6	90.82%
New Hampshire	16.3	16.8	17.8	19.4	20.8	4.5	27.61%
New Jersey	110.2	115.3	122.2	123.0	123.4	13.2	11.98%
New Mexico	31.0	35.7	41.6	44.1	42.7	11.7	37.74%
New York	245.3	243.5	249.6	251.3	254.1	8.8	3.59%
North Carolina	145.2	154.1	165.3	174.6	188.5	43.3	29.82%
North Dakota	11.0	11.8	12.8	13.8	15.0	4.0	36.36%
Ohio	176.9	183.3	200.9	205.0	212.7	35.8	20.24%
Oklahoma	39.7	42.8	46.6	48.3	50.3	10.6	26.70%
Oregon	50.4	54.0	61.3	66.7	78.3	27.9	55.36%
Pennsylvania	197.5	197.4	202.0	199.6	201.7	4.2	2.13%
Rhode Island	12.2	12.6	13.1	13.4	13.6	1.4	11.48%
South Carolina	79.9	82.1	84.3	87.1	93.5	13.6	17.02%
South Dakota	12.5	13.2	14.0	14.1	14.7	2.2	17.60%
Tennessee	88.3	94.3	101.0	108.9	112.7	24.4	27.63%
Texas	343.8	355.3	381.1	409.0	435.9	92.1	26.79%
Utah	34.9	39.8	48.1	54.8	60.2	25.3	72.49%
Vermont	11.2	11.6	11.8	12.3	12.6	1.4	12.50%
Virginia	146.1	153.8	162.7	168.1	174.8	28.7	19.64%
Washington	119.2	119.1	123.0	122.0	127.2	8.0	6.71%
West Virginia	27.7	31.3	34.1	32.8	34.3	6.6	23.83%
Wisconsin	90.7	93.3	96.2	99.0	105.3	14.6	16.10%
Wyoming	11.5	12.3	13.6	14.2	14.2	2.7	23.48%

Note: Hawaii publishes Construction combined with Mining

Manufacturing Employment, Annual Averages

State	1992	1993	1994	1995	1996	Net Change 1992-1996	Pct. Change 1992-1996
Alabama	380.7	384.2	388.4	391.8	382.6	1.9	0.50%
Alaska	18.0	17.1	16.6	16.9	16.2	(1.8)	-10.00%
Arizona	173.2	176.5	186.4	194.0	199.5	26.3	15.18%
Arkansas	237.0	244.3	254.0	259.3	253.5	16.5	6.96%
California	1,890.5	1,805.1	1,777.3	1,794.2	1,853.2	(37.3)	-1.97%
Colorado	185.9	188.1	190.9	192.4	196.0	10.1	5.43%
Connecticut	305.7	294.1	285.1	279.0	275.2	(30.5)	-9.98%
Delaware	67.4	65.6	63.5	61.5	58.1	(9.3)	-13.80%
District of Columbia	14.0	13.8	13.0	13.0	13.1	(0.9)	-6.43%
Florida	482.9	485.2	484.0	486.5	490.4	7.5	1.55%
Georgia	545.2	558.2	577.3	586.9	584.7	39.5	7.25%
Hawaii	19.7	19.2	17.8	17.0	16.6	(3.1)	-15.74%
Idaho	65.7	69.2	71.9	71.0	72.6	6.9	10.50%
Illinois	919.3	933.1	952.1	962.2	972.0	52.7	5.73%
Indiana	628.6	642.9	664.4	683.8	673.7	45.1	7.17%
Iowa	230.2	236.1	244.9	250.3	247.4	17.2	7.47%
Kansas	182.7	183.5	187.9	191.4	196.1	13.4	7.33%
Kentucky	286.9	294.6	305.1	313.6	311.6	24.7	8.61%
Louisiana	185.0	185.4	186.5	188.0	188.3	3.3	1.78%
Maine	92.2	90.9	91.4	91.1	88.1	(4.1)	-4.45%
Maryland	183.7	180.2	178.2	176.0	173.9	(9.8)	-5.33%
Massachusetts	465.7	454.8	447.2	446.1	444.1	(21.6)	-4.64%
Michigan	900.6	908.3	951.5	979.7	966.9	66.3	7.36%
Minnesota	397.1	406.5	414.7	425.8	428.3	31.2	7.86%
Mississippi	251.9	255.7	261.0	257.6	245.7	(6.2)	-2.46%
Missouri	412.0	411.1	414.1	420.6	414.0	2.0	0.49%
Montana	22.5	23.0	23.0	23.4	23.8	1.3	5.78%
Nebraska	100.7	103.8	108.8	112.2	113.7	13.0	12.91%
Nevada	26.1	29.5	33.7	36.6	38.6	12.5	47.89%
New Hampshire	97.4	97.6	100.3	102.6	104.6	7.2	7.39%
New Jersey	530.3	516.6	509.3	489.2	485.3	(45.0)	-8.49%
New Mexico	41.0	42.7	44.7	45.1	45.9	4.9	11.95%
New York	1,014.4	980.5	956.1	941.7	921.8	(92.6)	-9.13%
North Carolina	834.4	847.8	859.9	864.2	846.8	12.4	1.49%
North Dakota	18.3	19.5	21.4	21.3	21.6	3.3	18.03%
Ohio	1,050.6	1,049.7	1,070.2	1,102.3	1,093.9	43.3	4.12%
Oklahoma	163.8	168.6	169.8	170.7	173.6	9.8	5.98%
Oregon	209.0	211.7	221.3	229.3	235.3	26.3	12.58%
Pennsylvania	953.0	943.1	942.0	940.7	929.1	(23.9)	-2.51%
Rhode Island	89.5	88.1	86.8	84.9	82.4	(7.1)	-7.93%
South Carolina	371.0	374.8	377.4	377.2	365.2	(5.8)	-1.56%
South Dakota	37.0	39.6	43.5	46.6	47.8	10.8	29.19%
Tennessee	514.5	526.4	538.9	536.9	522.2	7.7	1.50%
Texas	969.6	987.6	1,009.0	1,032.8	1,054.3	84.7	8.74%
Utah	106.9	110.7	116.7	124.2	129.4	22.5	21.05%
Vermont	43.7	43.6	43.9	45.1	45.9	2.2	5.03%
Virginia	407.4	405.1	404.3	402.9	398.5	(8.9)	-2.18%
Washington	347.7	340.8	336.9	332.4	344.1	(3.6)	-1.04%
West Virginia	82.2	82.9	81.6	82.4	81.9	(0.3)	-0.36%
Wisconsin	549.6	561.8	583.9	601.6	601.2	51.6	9.39%
Wyoming	9.3	9.6	9.9	9.7	10.8	1.5	16.13%

T.P.U. Employment, Annual Averages

State	1992	1993	1994	1995	1996	Net Change 1992-1996	Pct. Change 1992-1996
Alabama	83.0	85.1	87.1	89.6	90.2	7.2	8.67%
Alaska	22.6	22.9	23.3	22.9	22.7	0.1	0.44%
Arizona	80.8	79.0	83.2	87.2	92.1	11.3	13.99%
Arkansas	55.9	57.0	59.4	63.6	64.9	9.0	16.10%
California	607.4	610.6	619.0	630.2	641.5	34.1	5.61%
Colorado	99.8	104.3	108.3	117.5	120.3	20.5	20.54%
Connecticut	68.0	69.5	70.4	71.3	73.1	5.1	7.50%
Delaware	14.6	14.9	15.3	15.6	15.7	1.1	7.53%
District of Columbia	22.1	21.4	20.9	18.9	19.3	(2.8)	-12.67%
Florida	275.8	287.1	296.3	305.5	314.1	38.3	13.89%
Georgia	197.7	203.3	211.4	216.3	221.9	24.2	12.24%
Hawaii	43.2	41.3	41.8	40.7	40.9	(2.3)	-5.32%
Idaho	20.3	20.9	21.8	22.7	23.2	2.9	14.29%
Illinois	302.9	310.6	317.9	323.9	331.0	28.1	9.28%
Indiana	132.9	135.0	137.8	141.0	139.4	6.5	4.89%
Iowa	55.1	57.1	59.1	61.4	62.9	7.8	14.16%
Kansas	64.7	65.8	67.3	68.2	69.8	5.1	7.88%
Kentucky	81.7	84.2	88.1	91.3	93.3	11.6	14.20%
Louisiana	105.4	107.3	110.0	107.7	108.3	2.9	2.75%
Maine	21.5	22.2	22.6	22.3	22.4	0.9	4.19%
Maryland	98.8	99.4	103.9	105.6	106.5	7.7	7.79%
Massachusetts	121.4	124.0	127.4	127.0	129.2	7.8	6.43%
Michigan	154.3	158.7	162.6	167.0	168.4	14.1	9.14%
Minnesota	109.9	110.1	113.6	117.7	119.7	9.8	8.92%
Mississippi	45.0	46.3	48.6	51.1	52.7	7.7	17.11%
Missouri	151.1	152.2	155.9	157.7	159.7	8.6	5.69%
Montana	20.1	20.3	20.7	20.8	20.7	0.6	2.99%
Nebraska	47.2	47.3	48.4	49.6	50.3	3.1	6.57%
Nevada	33.0	35.0	38.2	40.4	42.3	9.3	28.18%
New Hampshire	17.3	18.1	19.0	19.5	19.5	2.2	12.72%
New Jersey	233.2	240.4	248.2	252.8	254.0	20.8	8.92%
New Mexico	28.8	29.2	29.8	31.0	31.2	2.4	8.33%
New York	399.7	401.7	401.2	402.1	402.2	2.5	0.63%
North Carolina	154.0	157.6	161.6	164.9	167.9	13.9	9.03%
North Dakota	17.5	18.0	18.5	18.4	18.4	0.9	5.14%
Ohio	213.3	215.3	222.8	229.3	231.7	18.4	8.63%
Oklahoma	70.8	72.3	72.9	73.9	77.2	6.6	9.35%
Oregon	65.7	66.8	68.9	71.3	72.8	7.1	10.81%
Pennsylvania	261.5	268.2	273.0	272.7	271.9	10.4	3.98%
Rhode Island	14.2	14.4	14.9	14.8	14.9	0.7	4.93%
South Carolina	65.1	66.9	69.0	71.7	73.4	8.3	12.75%
South Dakota	14.6	14.9	15.5	16.0	16.4	1.8	12.33%
Tennessee	120.6	126.8	133.6	138.6	142.8	22.2	18.41%
Texas	432.2	439.8	458.2	475.7	488.2	56.0	12.96%
Utah	44.0	47.1	49.3	51.5	54.0	10.0	22.73%
Vermont	10.8	11.3	11.5	11.9	12.2	1.4	12.96%
Virginia	146.9	149.5	151.7	156.7	161.8	14.9	10.14%
Washington	113.6	114.2	116.5	119.6	122.9	9.3	8.19%
West Virginia	38.2	38.8	39.9	40.2	39.2	1.0	2.62%
Wisconsin	110.1	113.8	116.1	120.1	120.7	10.6	9.63%
Wyoming	14.4	14.5	14.0	13.7	13.8	(0.6)	-4.17%

Trade Employment, Annual Averages

State	1992	1993	1994	1995	1996	Net Change 1992-1996	Pct. Change 1992-1996
Alabama	365.5	377.9	393.4	409.0	418.9	53.4	14.61%
Alaska	47.8	49.0	52.7	54.1	54.6	6.8	14.23%
Arizona	374.1	389.4	420.8	444.5	466.2	92.1	24.62%
Arkansas	212.6	220.7	232.8	242.3	247.4	34.8	16.37%
California	2,834.8	2,811.8	2,845.1	2,915.1	2,973.4	138.6	4.89%
Colorado	385.6	404.0	429.5	453.3	464.5	78.9	20.46%
Connecticut	331.3	330.3	335.4	341.0	346.7	15.4	4.65%
Delaware	74.6	78.4	78.8	82.2	84.1	9.3	12.43%
District of Columbia	54.7	53.2	52.8	52.2	49.7	(5.0)	-9.14%
Florida	1,411.7	1,456.3	1,507.2	1,553.8	1,606.9	195.2	13.83%
Georgia	739.7	773.4	815.4	856.1	896.6	156.9	21.21%
Hawaii	135.8	133.0	133.3	135.8	135.3	(0.5)	-0.37%
Idaho	105.6	109.4	116.7	121.3	125.1	19.5	18.47%
Illinois	1,235.9	1,248.1	1,279.9	1,313.0	1,303.8	67.9	5.49%
Indiana	601.5	617.0	643.0	669.2	680.0	78.5	13.05%
Iowa	316.8	321.7	331.8	340.0	341.1	24.3	7.67%
Kansas	270.9	274.1	284.3	295.5	303.3	32.4	11.96%
Kentucky	354.9	365.7	379.3	393.7	400.9	46.0	12.96%
Louisiana	376.5	385.6	399.5	414.0	422.6	46.1	12.24%
Maine	127.3	130.2	134.3	137.0	136.2	8.9	6.99%
Maryland	500.8	502.5	514.8	527.7	529.1	28.5	5.69%
Massachusetts	640.5	648.4	669.4	687.2	696.5	56.0	8.74%
Michigan	925.5	942.9	970.9	1,003.7	1,024.7	99.2	10.72%
Minnesota	524.6	539.0	556.8	579.5	592.8	68.2	13.00%
Mississippi	201.0	209.8	219.4	228.2	232.6	31.6	15.72%
Missouri	558.3	568.7	587.8	604.2	612.8	54.5	9.76%
Montana	84.5	87.5	92.6	96.1	97.7	13.2	15.62%
Nebraska	189.8	193.1	198.7	204.2	207.5	17.7	9.33%
Nevada	129.8	132.8	144.9	157.0	169.7	39.9	30.74%
New Hampshire	123.7	129.0	134.9	140.9	144.9	21.2	17.14%
New Jersey	809.9	813.6	831.5	848.6	855.3	45.4	5.61%
New Mexico	142.5	148.2	155.6	161.4	164.1	21.6	15.16%
New York	1,565.2	1,562.1	1,582.5	1,611.9	1,620.6	55.4	3.54%
North Carolina	710.4	732.0	764.0	794.8	811.0	100.6	14.16%
North Dakota	73.0	74.7	76.7	79.0	80.2	7.2	9.86%
Ohio	1,159.7	1,181.6	1,227.9	1,272.7	1,300.1	140.4	12.11%
Oklahoma	288.1	289.6	301.2	312.4	318.5	32.4	11.32%
Oregon	318.7	328.9	344.1	357.0	365.0	46.3	14.53%
Pennsylvania	1,148.2	1,150.7	1,169.9	1,193.6	1,205.3	57.1	4.97%
Rhode Island	91.0	93.2	94.9	97.3	98.2	7.2	7.91%
South Carolina	342.3	352.4	367.2	384.9	397.6	55.3	16.16%
South Dakota	80.4	81.6	84.7	87.4	87.6	7.2	8.96%
Tennessee	517.7	535.9	562.1	585.5	596.3	78.6	15.18%
Texas	1,755.4	1,810.1	1,879.6	1,944.2	1,988.3	232.9	13.27%
Utah	183.6	192.3	206.8	219.7	230.5	46.9	25.54%
Vermont	58.5	60.5	62.6	63.9	64.6	6.1	10.43%
Virginia	633.6	649.2	678.7	699.5	713.7	80.1	12.64%
Washington	537.8	546.6	565.1	580.1	590.9	53.1	9.87%
West Virginia	145.5	148.9	154.0	158.0	160.1	14.6	10.03%
Wisconsin	547.3	554.7	571.1	588.2	595.2	47.9	8.75%
Wyoming	48.7	48.3	50.3	51.6	52.1	5.4	11.56%

F.I.R.E. Employment, Annual Averages

State	1992	1993	1994	1995	1996	Net Change 1992-1996	Pct. Change 1992-1996
Alabama	74.1	76.0	77.0	78.2	81.5	7.4	9.99%
Alaska	10.7	11.2	11.9	11.7	11.7	1.0	9.35%
Arizona	94.5	100.9	108.7	107.8	115.1	20.6	21.80%
Arkansas	38.9	40.2	41.6	41.9	43.1	4.2	10.80%
California	791.9	784.2	770.6	731.9	733.1	(58.8)	-7.43%
Colorado	89.9	106.2	111.1	113.4	117.9	18.0	18.02%
Connecticut	142.4	139.8	135.6	132.5	130.6	(11.8)	-8.29%
Delaware	32.8	35.5	39.1	40.9	43.5	10.7	32.62%
District of Columbia	32.9	31.6	31.1	29.9	28.4	(4.5)	-13.68%
Florida	351.9	360.3	375.6	378.7	393.8	41.9	11.91%
Georgia	162.7	167.1	172.1	175.0	180.4	17.7	10.88%
Hawaii	37.9	38.9	38.4	37.1	36.8	(1.1)	-2.90%
Idaho	21.5	22.8	24.1	24.9	25.3	3.8	17.67%
Illinois	378.5	384.5	389.0	383.8	385.7	7.2	1.90%
Indiana	126.9	129.2	131.2	130.9	134.8	7.9	6.23%
Iowa	72.3	74.3	76.2	76.8	77.6	5.3	7.33%
Kansas	57.7	58.3	58.2	57.5	58.6	0.9	1.56%
Kentucky	62.0	63.5	64.2	64.8	67.6	5.6	9.03%
Louisiana	77.2	78.3	79.8	80.7	82.8	5.6	7.25%
Maine	24.5	25.6	26.3	26.0	26.7	2.2	8.98%
Maryland	128.3	130.8	133.8	128.6	128.2	(0.1)	-0.08%
Massachusetts	196.7	201.5	208.9	205.3	208.6	11.9	6.05%
Michigan	191.2	194.6	196.9	196.3	201.1	9.9	5.18%
Minnesota	130.2	135.9	139.9	138.9	142.5	12.3	9.45%
Mississippi	38.4	38.8	39.7	40.0	40.9	2.5	6.51%
Missouri	137.5	141.9	146.1	146.1	149.8	12.3	8.95%
Montana	14.4	14.9	15.6	15.5	16.0	1.6	11.11%
Nebraska	49.4	50.5	51.7	52.6	53.1	3.7	7.49%
Nevada	29.0	31.0	34.2	35.7	37.8	8.8	30.34%
New Hampshire	29.1	29.5	29.3	28.6	28.2	(0.9)	-3.09%
New Jersey	226.6	229.1	230.9	228.4	231.6	5.0	2.21%
New Mexico	26.6	27.9	29.4	30.1	31.5	4.9	18.42%
New York	732.2	729.8	736.9	723.9	721.0	(11.2)	-1.53%
North Carolina	134.3	137.3	141.8	144.6	153.5	19.2	14.30%
North Dakota	13.0	13.5	13.8	13.8	14.4	1.4	10.77%
Ohio	258.4	260.9	269.2	270.3	277.0	20.6	8.03%
Oklahoma	60.6	62.2	64.2	65.4	67.3	6.7	11.06%
Oregon	79.4	84.6	87.8	87.2	90.6	11.2	14.11%
Pennsylvania	300.9	302.7	307.8	303.6	308.7	7.8	2.59%
Rhode Island	25.4	25.4	25.4	24.8	25.2	(0.2)	-0.79%
South Carolina	65.4	66.2	68.2	68.9	72.3	6.9	10.55%
South Dakota	17.3	17.7	18.0	18.8	19.8	2.5	14.45%
Tennessee	101.0	104.1	108.3	111.6	117.2	16.2	16.04%
Texas	421.0	428.6	438.1	436.8	444.0	23.0	5.46%
Utah	37.4	41.6	46.0	47.6	50.4	13.0	34.76%
Vermont	12.1	12.0	12.2	12.2	12.2	0.1	0.83%
Virginia	150.8	157.1	163.7	160.5	162.2	11.4	7.56%
Washington	119.3	121.2	124.1	121.6	123.8	4.5	3.77%
West Virginia	24.6	25.1	26.0	26.9	27.1	2.5	10.16%
Wisconsin	127.0	131.0	134.8	136.5	138.3	11.3	8.90%
Wyoming	7.3	7.7	7.9	7.9	7.9	0.6	8.22%

Services Employment, Annual Averages

State	1992	1993	1994	1995	1996	Net Change 1992-1996	Pct. Change 1992-1996
Alabama	346.6	364.1	375.8	394.2	405.5	58.9	16.99%
Alaska	54.1	56.2	58.0	60.8	62.4	8.3	15.34%
Arizona	425.2	442.3	470.2	519.1	561.4	136.2	32.03%
Arkansas	210.7	219.9	228.6	237.4	246.5	35.8	16.99%
California	3,426.3	3,462.4	3,558.2	3,728.5	3,916.7	490.4	14.31%
Colorado	443.4	469.4	504.1	537.2	564.9	121.5	27.40%
Connecticut	423.1	438.1	449.9	465.7	481.4	58.3	13.78%
Delaware	85.4	88.6	91.4	96.0	102.2	16.8	19.67%
District of Columbia	254.9	256.4	261.4	263.9	262.5	7.6	2.98%
Florida	1,692.7	1,809.2	1,922.9	2,038.2	2,117.6	424.9	25.10%
Georgia	677.0	723.9	778.7	838.5	903.1	226.1	33.40%
Hawaii	163.6	162.6	163.9	164.5	166.1	2.5	1.53%
Idaho	90.5	96.9	102.4	109.4	114.9	24.4	26.96%
Illinois	1,410.2	1,463.8	1,512.0	1,581.2	1,640.0	229.8	16.30%
Indiana	556.0	586.8	612.4	633.8	652.9	96.9	17.43%
Iowa	307.9	316.4	326.1	342.2	359.1	51.2	16.63%
Kansas	259.3	267.5	277.3	289.0	300.6	41.3	15.93%
Kentucky	351.8	365.0	378.3	393.6	408.3	56.5	16.06%
Louisiana	397.1	416.2	444.4	471.6	485.8	88.7	22.34%
Maine	129.5	134.0	141.6	146.8	150.4	20.9	16.14%
Maryland	633.9	649.9	668.4	694.5	715.2	81.3	12.83%
Massachusetts	913.5	942.8	975.7	1,024.9	1,062.6	149.1	16.32%
Michigan	979.6	1,022.4	1,074.6	1,125.1	1,165.4	185.8	18.97%
Minnesota	592.2	613.4	635.2	647.1	671.8	79.6	13.44%
Mississippi	175.5	198.7	224.7	232.4	246.6	71.1	40.51%
Missouri	608.4	642.6	666.0	685.5	707.9	99.5	16.35%
Montana	82.4	85.9	91.7	96.6	101.8	19.4	23.54%
Nebraska	185.6	191.7	202.4	211.0	220.4	34.8	18.75%
Nevada	282.7	295.0	326.7	345.1	363.5	80.8	28.58%
New Hampshire	129.6	136.6	145.2	152.1	162.4	32.8	25.31%
New Jersey	978.9	1,010.7	1,040.4	1,078.3	1,121.8	142.9	14.60%
New Mexico	160.3	167.5	177.4	188.3	192.1	31.8	19.84%
New York	2,340.5	2,404.0	2,464.2	2,540.1	2,610.4	269.9	11.53%
North Carolina	641.4	685.4	724.2	782.2	822.3	180.9	28.20%
North Dakota	73.7	76.4	80.7	80.9	84.6	10.9	14.79%
Ohio	1,241.2	1,277.8	1,329.5	1,378.9	1,415.1	173.9	14.01%
Oklahoma	293.1	305.9	320.1	344.0	364.3	71.2	24.29%
Oregon	311.8	328.3	343.2	362.9	384.7	72.9	23.38%
Pennsylvania	1,491.0	1,530.6	1,583.5	1,604.3	1,651.2	160.2	10.74%
Rhode Island	131.0	134.8	137.2	143.5	146.1	15.1	11.53%
South Carolina	310.3	330.0	344.1	360.3	373.4	63.1	20.34%
South Dakota	78.9	82.6	85.8	87.4	90.1	11.2	14.20%
Tennessee	541.1	572.4	603.8	638.0	655.5	114.4	21.14%
Texas	1,842.5	1,918.1	2,009.1	2,122.4	2,220.7	378.2	20.53%
Utah	196.5	210.5	224.2	238.1	255.5	59.0	30.03%
Vermont	70.5	73.7	76.6	78.0	81.5	11.0	15.60%
Virginia	760.7	793.7	829.2	873.1	911.4	150.7	19.81%
Washington	557.8	577.9	598.1	623.5	649.2	91.4	16.38%
West Virginia	158.2	168.6	174.6	183.8	191.3	33.1	20.92%
Wisconsin	574.1	594.2	617.0	632.0	655.4	81.3	14.16%
Wyoming	41.8	43.0	45.3	47.5	48.1	6.3	15.07%

Government Employment, Annual Averages

State	1992	1993	1994	1995	1996	Net Change 1992-1996	Pct. Chang 1992-1996
Alabama	337.9	340.7	348.0	343.2	341.7	3.8	1.12%
Alaska	73.3	74.8	73.9	72.8	73.1	(0.2)	-0.27%
Arizona	276.7	286.6	294.3	310.5	320.6	43.9	15.87%
Arkansas	167.1	169.8	173.0	177.1	179.3	12.2	7.30%
California	2,095.6	2,080.6	2,093.2	2,107.0	2,117.0	21.4	1.02%
Colorado	291.1	296.7	299.3	303.7	308.6	17.5	6.01%
Connecticut	207.4	210.7	217.2	220.9	223.6	16.2	7.81%
Delaware	48.6	49.7	50.4	50.8	52.6	4.0	8.23%
District of Columbia	285.8	285.3	270.5	254.9	241.4	(44.4)	-15.54%
Florida	870.1	881.6	910.6	918.4	929.2	59.1	6.79%
Georgia	537.1	548.1	564.0	570.3	569.1	32.0	5.96%
Hawaii	111.1	111.5	111.8	111.4	110.1	(1.0)	-0.90%
Idaho	88.1	90.4	92.9	95.7	97.7	9.6	10.90%
Illinois	773.9	774.4	786.0	798.7	810.3	36.4	4.70%
Indiana	387.6	391.3	390.7	391.7	393.7	6.1	1.57%
Iowa	221.0	222.5	226.9	230.3	231.6	10.6	4.80%
Kansas	225.7	229.5	233.4	236.7	235.1	9.4	4.16%
Kentucky	273.3	276.8	280.6	286.9	289.6	16.3	5.96%
Louisiana	339.5	342.0	351.5	358.3	361.3	21.8	6.42%
Maine	95.7	95.4	94.1	93.2	93.1	(2.6)	-2.72%
Maryland	414.8	417.4	420.1	421.8	421.6	6.8	1.64%
Massachusetts	382.6	387.5	390.0	394.6	400.2	17.6	4.60%
Michigan	639.0	639.4	638.9	640.9	643.3	4.3	0.67%
Minnesota	346.1	352.1	359.5	377.9	379.9	33.8	9.77%
Mississippi	207.9	210.1	213.7	214.7	217.9	10.0	4.81%
Missouri	370.7	376.8	384.9	390.3	399.7	29.0	7.82%
Montana	74.2	74.1	76.3	76.9	76.6	2.4	3.23%
Nebraska	147.6	149.0	151.6	150.8	151.5	3.9	2.64%
Nevada	86.0	88.6	92.3	98.5	101.2	15.2	17.67%
New Hampshire	73.1	74.4	76.2	76.2	78.9	5.8	7.93%
New Jersey	568.6	565.6	568.4	568.5	568.6	0.0	0.00%
New Mexico	156.1	159.1	163.1	166.5	171.1	15.0	9.61%
New York	1,427.6	1,425.4	1,423.3	1,396.6	1,382.3	(45.3)	-3.17%
North Carolina	502.5	527.1	538.6	550.6	561.4	58.9	11.72%
North Dakota	66.8	67.1	67.2	71.1	70.7	3.9	5.84%
Ohio	735.1	735.8	741.0	748.7	751.7	16.6	2.26%
Oklahoma	270.1	269.8	270.2	269.7	271.5	1.4	0.52%
Oregon	231.0	232.8	234.7	240.2	246.1	15.1	6.54%
Pennsylvania	699.9	709.0	713.6	719.2	720.9	21.0	3.00%
Rhode Island	61.2	61.4	61.7	61.3	61.3	0.1	0.16%
South Carolina	291.9	295.6	295.3	294.2	298.9	7.0	2.40%
South Dakota	65.4	66.6	67.1	71.0	70.4	5.0	7.65%
Tennessee	356.9	362.0	370.7	373.1	383.1	26.2	7.34%
Texas	1,334.3	1,376.0	1,413.7	1,445.7	1,454.4	120.1	9.00%
Utah	156.9	159.5	161.4	163.6	166.6	9.7	6.18%
Vermont	43.7	44.0	44.7	45.1	45.3	1.6	3.66%
Virginia	589.4	597.8	603.2	597.6	597.1	7.7	1.31%
Washington	423.6	430.0	437.2	444.4	450.4	26.8	6.33%
West Virginia	132.3	132.8	136.5	136.4	138.8	6.5	4.91%
Wisconsin	356.9	361.5	367.1	378.7	383.2	26.3	7.37%
Wyoming	56.8	57.2	58.2	57.8	58.7	1.9	3.35%

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U. S. Department of Labor

Commissioner for
Bureau of Labor Statistics
Washington, D.C. 20212

JUL 25 1997

Honorable Maurice D. Hinchey
House of Representatives
Washington, D.C. 20525

Dear Congressman Hinchey:

At the June 6 hearing of the Joint Economic Committee, you asked for information on several topics, including occupational unemployment, the characteristics of persons not in the labor force, the effects of international trade on the Consumer Price Index (CPI), and the unemployment situation in New York City.

I have enclosed a table that shows both the level and rate of unemployment for the major occupational groups for June 1997, the most recent month for which data are available (see Enclosure 1). As you can see from this table, jobless rates vary considerably across occupations, although for nearly all the groups the rates were lower this year than last. Jobless rates are the lowest in those occupational groups that are generally associated with the highest levels of education.

With regard to your question about the characteristics of persons not in the labor force, I have enclosed a table that provides 1996 data on the demographic characteristics of persons in this group and on their interest in employment (see Enclosure 2). Of the 66.6 million persons not in the labor force, only about 5.5 million say they want a job now. Of that number, only 1.6 million had looked for work in the past 12 months and only 397,000 of these had stopped looking because they thought there were no jobs available. The other 1.2 million who had searched for work within the past year were not currently looking for jobs due to reasons such as lack of transportation or family responsibilities. Of the 61.2 million persons who do not want a job now, many are of school or retirement age, that is ages 16 to 24 (9.1 million) or 65 and over (27 million). We cannot say with certainty whether school attendance or retirement are, in fact, the reasons these individuals are not currently in the labor force. School attendance or retirement need not exclude a person from labor force participation. For example, many students work while in school, and people who "have retired" often take or seek other employment.

In response to your question concerning the CPI, BLS has not conducted studies of the impact of international trade and imports on the overall CPI since the major revision of the

index that was implemented in 1987. Prior to that revision, the CPI program had a general provision for "Country-of-origin" codes, which enabled us, with limited success, to identify imported items and track their direct contributions to changes in the CPI. Over time, however, we lost confidence in the accuracy of our measurement of the importance of imports. It is relatively easy to identify imports at the border, as goods are shipped into the country, but much more difficult in retail outlets. The difficulties may be as mundane as labels indicating country of origin being concealed by plastic packaging. For items in many categories---produce is a good example--country-of-origin information may be burdensome for our respondents to supply and thus difficult for us to collect. Difficulties also arise as a consequence of the production and distribution system having grown more complex. Many goods are produced by multinational firms, and the determination of such items' foreign content is subject to the sometimes-arbitrary cost-accounting procedures of those firms. A further consideration is that imports may have indirect effects on inflation that our direct measurements of imported goods' prices could not capture. Increases in the price of imported oil, for example, will affect the prices of transportation services, which contribute to the retail costs of many items. Conversely, import competition may constrain the ability of domestic firms to increase prices.

I should mention that for some items, particularly in the apparel area, we have resumed the collection of data regarding the country of origin over the past four years. For these items, country of origin has become more important in advertising and may affect the perceived quality of the items.

As a general matter, the BLS has focused its research efforts on the improvement of its measures. While interesting and important, the relationships between exchange rates and import prices, and between the volume of imports and the pricing behavior of domestic firms, are subjects in which the BLS has no special competence. At the hearing, I mentioned having read that Joel Popkin, a well-regarded price index researcher, had done some work in this

area. My staff have spoken with Mr. Popkin, and he has indicated that he would be happy to discuss these issues with you or your staff. Mr. Popkin can be reached at 202--289-0190.

I am enclosing a series of tables in response to your question on the jobless situation in New York City. Unemployment in New York City has been above the U.S. average over most of the past 30 years, with 1987 and 1988 being the most notable exceptions (see Table A). The jobless rate in the city began to rise before the most recent national upturn and, unlike the rate in most areas, has failed to return to pre-recession levels (see Chart 1). In 1996, New York City's unemployment rate was about the same as that for some other major cities, such as Los Angeles and Washington, D.C., places where the 1996 rate also remained well above the 1990 figure (see Table B).

For all major demographic groups in the city, labor force participation rates and employment-population ratios are substantially lower than the U.S. average, and unemployment rates are noticeably higher (see Table C). New York's unemployment rates are also well above the U.S. average for most major industries and occupations (see Tables D and E). A substantially-larger-than-average share of the city's employed population is comprised of African Americans and Hispanics (see Table F).

I hope you find these responses to be informative and the enclosed materials useful. If I can provide further assistance to you on any of these topics, please let me know. Philip Rones, Assistant Commissioner for Current Employment Analysis, on 202--606-6378, would be happy to answer any followup questions for your staff concerning labor force data, and John Greenlees, Assistant Commissioner for Consumer Prices and Price Indexes, on 202--606-6950, may be contacted regarding the CPI.

Sincerely yours,

Katharine Abraham

KATHARINE G. ABRAHAM
Commissioner

Enclosures

Table B.

Annual Average Unemployment Rates for the 20 Largest Cities, 1990 and 1996

City	1990	1996
New York	6.9	8.8
Los Angeles	6.7	9.3
Chicago	8.4	6.7
Houston	6.1	6.4
Philadelphia	6.3	6.9
San Diego	4.8	5.4
Dallas	6.2	5.2
Phoenix	4.9	4.0
Detroit	14.3	9.1
San Antonio	7.9	4.9
San Jose	4.7	4.2
Indianapolis	3.8	3.7
San Francisco	3.8	4.7
Baltimore	8.2	8.1
Jacksonville	5.3	3.8
Columbus	3.9	3.4
Milwaukee	5.7	5.1
Memphis	5.4	5.3
Washington, DC	6.6	8.5
Boston	5.7	4.5

Population ranking is based on 1992 population.

SOURCE: Bureau of Labor Statistics
Local Area Unemployment Statistics

Table A.

Annual Average Unemployment Rates for the U.S., New York State, and New York City, Annual Averages 1968-96

Year	U.S.	New York State	New York City
1968	3.6	3.1	3.1
1969	3.5	3.3	3.6
1970	4.9	4.5	4.8
1971	5.9	6.6	6.7
1972	5.6	6.7	7.0
1973	4.9	5.4	6.0
1974	5.6	6.4	7.2
1975	8.5	9.5	10.6
1976	7.7	10.3	11.2
1977	7.1	9.1	10.0
1978	6.1	7.7	8.9
1979	5.8	7.1	8.7
1980	7.1	7.5	8.6
1981	7.6	7.6	9.0
1982	9.7	8.6	9.6
1983	9.6	8.6	9.4
1984	7.5	7.2	8.9
1985	7.2	6.5	8.1
1986	7.0	6.3	7.4
1987	6.2	4.9	5.7
1988	5.5	4.2	5.0
1989	5.3	5.1	6.9
1990	5.6	5.3	6.9
1991	6.8	7.3	8.7
1992	7.5	8.6	11.0
1993	6.9	7.8	10.4
1994	6.1	6.9	8.7
1995	5.6	6.3	8.2
1996	5.4	6.2	8.8

SOURCE: Bureau of Labor Statistics
Current Population Survey

Table C.

Labor Force Participation Rates, Employment-Population Ratios, and Unemployment Rates by Sex, Age, Race, and Hispanic Origin for the U.S. and New York City, 1996 Annual Averages

Population Group	Labor Force Participation Rates		Employment-Population Ratio		Unemployment Rate	
	U.S.	N.Y.C.	U.S.	N.Y.C.	U.S.	N.Y.C.
Total	66.8	58.7	63.2	51.7	5.4	8.8
Men	74.9	66.4	70.9	60.4	5.4	9.0
Women	59.3	48.7	56.0	44.5	5.4	8.5
Both sexes, 16-19 years	52.3	25.0	43.5	17.8	16.7	29.0
White	67.2	55.7	64.1	51.6	4.7	7.4
Black	64.1	55.4	57.4	48.4	10.5	12.5
Hispanic origin	66.5	52.7	60.6	47.0	8.9	10.8

SOURCE: Bureau of Labor Statistics
Current Population Survey

Table D.

Unemployment Rates by Occupation for the U.S. and New York City, 1996 Annual Averages

Occupational Category	United States	New York City
Managerial and Professional Specialty		
Executive, Administrative & Managerial	2.4	3.2
Professional	2.3	4.5
Technical, Sales, & Administrative Support		
Technical and Related Support	2.8	5.6
Sales	5.2	9.5
Administrative Support (includes clerical)	4.2	8.9
Service Occupations	7.2	9.4
Precision Production, Craft, & Repair	5.5	11.0
Operators, Fabricators, & Laborers		
Machine Operators, Assemblers, & Inspectors	7.7	11.3
Transportation & Material Moving	5.2	6.3
Handlers, Equipment Cleaners, Helpers, & Laborers	11.1	16.7

NOTE: Occupational detail excludes persons with no previous work experience. Farming and fishing occupations are not shown separately.

SOURCE: Bureau of Labor Statistics
Current Population Survey

Table E.

Unemployment Rates by Industry for Nonagricultural Workers in the U.S. and New York City, 1996 Annual Averages

Industry	United States	New York City
Construction	10.1	17.2
Manufacturing		
Total	4.8	8.7
Durable Goods	4.5	10.4
Nondurable Goods	5.2	8.1
Transportation, Communications and Public Utilities	4.1	8.1
Trade	6.4	10.9
Finance, Insurance & Real Estate	2.7	5.0
Services	5.4	8.2
Government	2.8	4.6

NOTE: Industry detail excludes persons with no previous work experience.

SOURCE: Bureau of Labor Statistics
Current Population Survey

Table F.

Percent of Employed Persons in Occupations by Demographic Group, for the U.S. and New York City, 1996 Annual Averages

Occupational Category	New York City Percent of total			United States Percent of total		
	Women	Black	Hispanic origin	Women	Black	Hispanic origin
Total	47.1	27.2	22.7	46.2	10.7	9.2
Managerial and Professional Specialty						
Executive, Administrative & Managerial	43.2	16.3	11.5	43.8	6.9	4.8
Professional	57.0	20.2	9.7	53.3	7.9	4.3
Technical, Sales, & Administrative Support						
Technical and Related Support	48.6	24.3	20.0	52.5	9.4	6.3
Sales	41.5	18.0	17.4	49.5	7.9	7.0
Administrative Support (includes clerical)	70.1	35.0	23.7	79.1	12.5	8.3
Service Occupations	52.0	38.0	32.4	59.4	17.2	13.7
Precision Production, Craft, & Repair	7.8	28.8	26.9	9.0	7.9	11.0
Operators, Fabricators, & Laborers						
Machine Operators, Assemblers, & Inspectors	51.4	20.7	51.4	37.7	15.2	16.4
Transportation & Material Moving	2.1	39.4	24.5	9.5	14.6	10.3
Handlers, Equipment Cleaners, Helpers, & Laborers	9.8	28.4	37.3	19.3	16.4	15.2

NOTE: Occupational detail excludes persons with no previous work experience.
Total includes farming and fishing, not shown separately.

SOURCE: Bureau of Labor Statistics
Current Population Survey

ISBN 0-16-055704-6