

GAO

Report to the Chairman, Committee on  
Commerce, Science, and Transportation,  
U.S. Senate

March 1993

# GROSS DOMESTIC PRODUCT

## No Evidence of Manipulation in First Quarter 1991 Estimates



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**General Government Division**

B-249775

March 10, 1993

The Honorable Ernest F. Hollings  
Chairman, Committee on Commerce,  
Science, and Transportation  
United States Senate

Dear Mr. Chairman:

This report responds to your letter expressing concern about press reports that alleged the Department of Commerce inflated the first quarter 1991 gross domestic product (GDP)<sup>1</sup> to mask the true size of the economic downturn. The press reports alleged that the Bureau of Economic Analysis (BEA)<sup>2</sup> did not incorporate, for political purposes, a downward revision of original employment levels into its October 1991 estimate of first quarter 1991 state personal income growth and its December 1991 estimate of first quarter 1991 GDP growth. You asked us to determine whether there was any political manipulation of these first quarter 1991 estimates. On November 19, 1992, we briefed the Committee on our findings. This report documents and supplements the information we reported at the briefing.

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**Results in Brief**

We found no evidence that BEA manipulated first quarter 1991 personal income or GDP estimates for political purposes. BEA generally followed its standard procedures for using employment data in these estimates and deviated from these procedures only when required by what we believe were reasonable technical judgments.

The role employment data play in BEA's procedures varies for conceptual and timing reasons. GDP is a measure of the total production of the economy and is based almost exclusively on measures of output rather than on income or employment. In contrast, employment data are much more important in the estimation of personal income than GDP. As a consequence, while BEA did account for the employment revision in its December estimate of first quarter 1991 GDP growth, this did not affect the estimated growth in the December or subsequent estimates of first quarter 1991 GDP. Additionally, BEA's procedures call for employment and related

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<sup>1</sup>In December of 1991, the Department of Commerce began to use gross domestic product (GDP) as the primary measure of economic performance. While gross national product (GNP) measures output of U.S. individuals and firms regardless of location, GDP measures output of all individuals and firms located in the United States. According to the Commerce Department, there is little difference between the dollar levels of GDP and GNP.

<sup>2</sup>The Bureau of Economic Analysis is the office within the Department of Commerce that calculates and publishes GDP and personal income statistics.

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wage data to be used in different ways and at different times in state personal income estimates. As a result of these procedures, the incorporation of the revised employment data did not affect the estimated growth of BEA's October estimate of first quarter 1991 state personal income growth as much as was expected by those who made the allegations.

We found several ways that BEA could improve the perceived integrity of its data. For example, we believe BEA could more completely document and explain its data. BEA has not adequately documented or explained to its users several key assumptions it used in its methodology to incorporate employment data into these first quarter 1991 estimates. Additionally, BEA has issued no public response to the allegations made in the press about the accuracy of first quarter 1991 data. To determine user needs and to assure Congress and the general public of the integrity and credibility of its data, BEA also needs additional mechanisms for outside expert review and comment on its procedures. To enhance congressional and public assurance of the integrity of BEA's data, Congress may want to request that BEA testify regularly before Congress when BEA releases major national economic statistics.

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## Background

In late September of 1991, the Bureau of Labor Statistics (BLS)<sup>3</sup> first realized that there was a difference of 650,000 positions, or -0.6 percent, between the first quarter 1991 employment levels measured by BLS. This difference was between BLS' monthly survey, called the Current Employment Statistics (CES) survey, and employment levels obtained by BLS through quarterly unemployment insurance reports (UI) required of all nonagricultural establishments covered under unemployment insurance laws. CES provides monthly data on employment and earnings and UI provides monthly employment levels, as well as quarterly wage and salary data. Preliminary UI data, however, are not available until at least 6 months after the end of the quarter. For that reason, BLS believes that using both measures allows it to accurately determine the level of employment in the country and the rate of change in employment growth. When BLS began to receive first quarter 1991 UI employment data in September, it compared the employment estimates provided by the CES and UI and discovered that CES employment levels may have been overstated. For more information on how BLS measures employment, see pp. 44 to 45.

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<sup>3</sup>BLS is the agency within the U.S. Department of Labor responsible for collecting and publishing national and state data on employment, earnings, and wages.

By September, however, BEA had already issued several of its regularly scheduled estimates of first quarter 1991 GDP and personal income growth, using wage and salary data derived from CES employment data.<sup>4</sup> This situation raised a number of questions about the accuracy of national employment measures, as well as how the possible overestimate affected the already published GDP and personal income growth estimates. Since BEA was scheduled to release additional revised estimates of first quarter 1991 GDP and personal income growth in the next several months, there was also speculation about how the revised employment data, once incorporated by BEA, would affect the growth of the revised GDP and personal income estimates. When BEA revised these data in October and December, however, neither GDP nor personal income growth declined as was expected, causing some press to question BEA's use of employment data in these estimates. Several journalists alleged that BEA politically manipulated the data by not adequately incorporating the revised employment data into these estimates. (For a detailed description of these allegations, see pp. 29 to 30. Additionally, for excerpts of selected articles that raised questions about first quarter 1991 data, see pp. 32 to 40.)

State officials in California raised concerns as well. In October of 1991, California Department of Finance officials began to believe that BEA's estimates for first quarter 1991 California personal income growth were too optimistic, since BEA's data showed growth when California UI data showed a decline for the first quarter of 1991. The California Department of Finance officials said they believed BEA's procedures for calculating California personal income growth produced misleading data because BEA's estimates were higher than California's estimates of personal income growth.<sup>5</sup> (For a detailed description of these concerns, see p. 30.)

In January 1993, the Deputy Commissioner of BLS announced that the difference in reported employment levels was primarily due to a one-time, noneconomic correction in how employment was reported on the UI rather than an error in CES data. BLS has since contracted with the American Statistical Association to do a full review of its research findings and conclusions. The reporting change accounted for 500,000 of the 640,000

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<sup>4</sup>BEA does not collect its own data; instead, it receives data from a number of sources in different formats. For that reason, BEA regularly performs a number of revisions of estimates, with each estimate based on more complete or accurate source data. For more information on data used by BEA in its estimates, as well as BEA's data revision and release schedule, see appendix IV.

<sup>5</sup>GAO contacted three other states that experienced large downward revisions of employment in first quarter 1991 to determine whether this position was shared by other state finance officials. We found the finance officials in these other states—Maryland, New Jersey, and New York—did not share California's belief that BEA's procedures produced misleading data.

difference and meant that the actual difference between the two data sources was 140,000 positions, which was well within recent historical ranges.<sup>6</sup>

## Objective, Scope, and Methodology

As agreed with the Committee, our objective was to determine whether the Department of Commerce manipulated first quarter 1991 GDP and personal income estimates for political purposes. Since the allegations of manipulation concerned BEA's incorporation of the revised employment data into these statistics, to address this objective we identified BEA's standard procedure for incorporating employment data into GDP and personal income estimates. We then reviewed BEA procedures used and decisions made for first quarter 1991 data and determined whether BEA deviated from this standard procedure for first quarter 1991 data. We assessed the reasonableness of any deviations through interviews with BEA officials. We also reviewed the documentation and publication of procedures BEA used for first quarter 1991 data, and we examined existing organizational and procedural safeguards at BEA designed to ensure the actual and perceived integrity of these data.<sup>7</sup> We did not assess the adequacy of BEA's standard methodology. Appendix I contains a detailed explanation of our objective, scope, and methodology.

## No Evidence of Alleged Political Manipulation by BEA in First Quarter 1991 Data

We found no evidence that BEA manipulated first quarter 1991 GDP or personal income statistics for political purposes. BEA generally followed its standard procedures for incorporating employment data into these statistics and deviated from these procedures only when required by what we believe were reasonable technical judgments. (For a detailed description of how BEA estimates GDP, see pp. 54 to 56, and see pp. 57 and 58 for how BEA estimates personal income.) We also found that BEA has many procedural and organizational safeguards that help to ensure the integrity of BEA's data against political manipulation. Finally, other knowledgeable federal officials said they did not believe BEA's first quarter 1991 estimates were manipulated for political reasons.

<sup>6</sup>According to BLS officials, because the UI correction was noneconomic in nature, this announcement also meant that BLS' original CES estimates of job loss during the recession were very close to the final estimate of job loss for the recession.

<sup>7</sup>We agreed with the Committee that we would review other broader issues relating to the accuracy and integrity of national economic statistics after completing this examination.

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**BEA Followed Standard  
Procedure for Using  
Employment Data in State  
Personal Income**

In July of 1991, BEA issued its first scheduled estimate of first quarter 1991 state personal income growth. For the first estimate of state personal income, BEA uses CES employment data<sup>8</sup> to determine wages and salaries for the quarter, which are the largest component of state personal income.<sup>9</sup> (For more detail on how BEA estimates state personal income, see pp. 62 to 63.) As shown in figure 1, the estimated rate of growth for both the sum of all states and for California<sup>10</sup> was shown to each be 1.2 percent from the prior quarter.

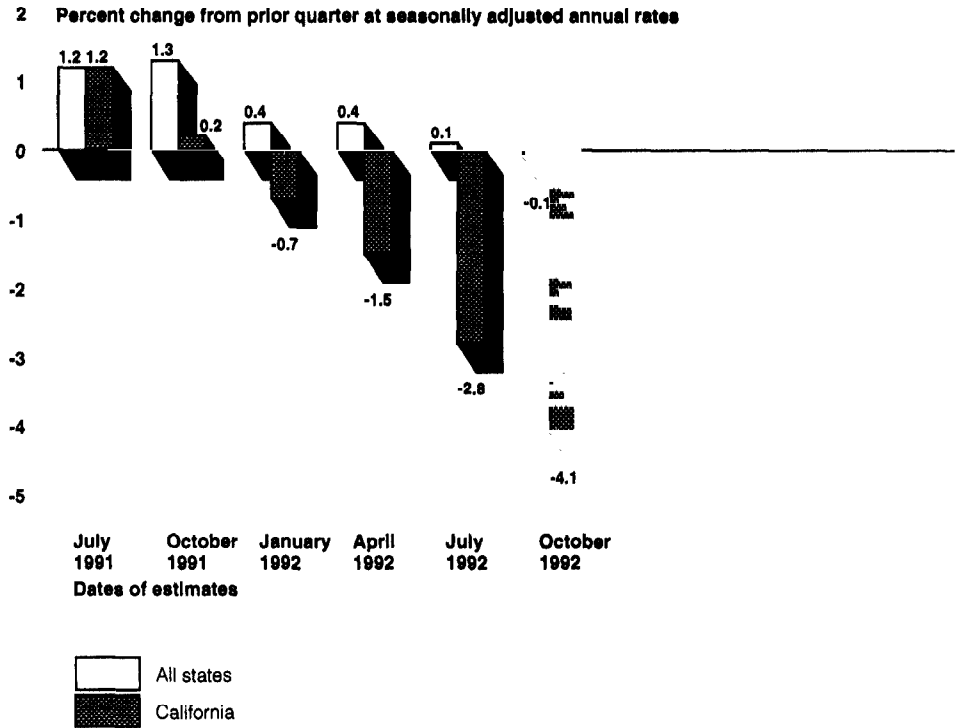
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<sup>8</sup>For manufacturing industries, BEA uses production hours and earnings data as well.

<sup>9</sup>This is necessary because wage and salary data for states are not available from the monthly CES survey. UI data, which provide this information, are not available at the time of BEA's first estimate of quarterly state personal income growth, which is released 4 months after the end of each quarter. UI data do not begin to become available until at least 6 months after the end of the quarter.

<sup>10</sup>California is highlighted here because of California Department of Finance officials' concerns that BEA's estimates of first quarter 1991 personal income growth were too optimistic. The fact that the growth for the sum of all states and California are both 1.2 percent was merely a coincidence.

**Figure 1: Revisions in Estimated Growth of State Personal Income for First Quarter 1991**



Source: BEA.

In October 1991, BEA released its first scheduled revision of estimated growth for first quarter 1991 state personal income. This estimate showed 1.3 percent growth for the sum of all states and 0.2 percent growth for California.<sup>11</sup> BEA was expected by various press and California Department of Finance officials to use the UI data in its October revision of first quarter 1991 state personal income growth.<sup>12</sup> As a result of this expectation, both the press and California officials were surprised when the October revision actually showed better growth for the sum of all states than had the previous estimate and still showed growth for California. This unmet

<sup>11</sup>Between the time of these two estimates, BEA had been told by BLS that it was beginning to investigate the difference between CES and UI employment levels for the first quarter of 1991. However, BLS did not announce the 650,000 difference until November, after BEA had released the state personal income revision.

<sup>12</sup>Because UI data begins to become available about 6 months after the end of the quarter, BEA regularly incorporates UI data into its first revision of state personal income growth, which it performs 7 months after the end of the quarter. BEA uses the wage and salary data from UI.



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expectation resulted in the press allegation that BEA did not use the UI data in state estimates and California officials' concern that BEA's procedures produced misleading state data.

We found BEA did use the UI wage and salary data in its October revision of state personal income in accordance with its standard procedure. Under this procedure BEA takes the growth rate of state wages and salaries as shown by the newly available UI data as a base for estimating individual state personal income levels. It then adjusts the growth of state UI wages and salaries so that the sum of all states' growth is equal to the growth rate of wages and salaries used in the most recently published estimate of personal income at the national level (see description of procedure, pp. 64 and 65. BEA follows this procedure because it allows BEA to introduce the higher quality seasonal adjustments that are possible in the national CES-based estimates. According to BEA, the ideal would be to use quarterly UI wage data both nationally and for the states. The lack of a suitable seasonal adjustment for the UI data so far has precluded this, however. Additionally, UI data are not available until at least 6 months after the end of a quarter.<sup>13</sup>

When BEA began to receive preliminary UI data from BLS in September of 1991, it observed a large discrepancy between the estimated growth in first quarter 1991 UI wages and salaries and BEA's original CES-based estimates of wage and salary growth for the quarter. Despite this large discrepancy, BEA decided to adhere to its standard procedure for several reasons. BEA was not sure at that time whether UI data represented a real economic downturn, or the data were in error. Also, because the data would continue to be revised by the states and BLS for several more months, much of the states' UI data was still subject to change. Finally, seasonal variations in the quarterly UI data are difficult to adequately measure.<sup>14</sup>

Following this procedure for first quarter 1991, BEA based its state personal income growth estimates on UI wage and salary data. It then adjusted the UI-based estimates of state wages and salaries upward to equal the June 1991 estimate of national wage and salary growth, which was still based on CES employment data.

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<sup>13</sup>An alternative to this is the monthly collection of expanded wage data through CES. Having expanded wage data earlier would reduce BEA's reliance on employment change to estimate wage change in its first estimate of state personal income. BLS plans to begin research in this area later this year.

<sup>14</sup>The UI wage and salary data include bonus-type payments that vary greatly in some industries in both magnitude and timing. In addition, the quarterly data reflect a variety of payday patterns in different industries. For such reasons, BEA prefers to use the UI data on an annual basis.

While BEA has traditionally followed this procedure, in 1991 the adjustment required was very noticeable because of the atypically large discrepancy of -0.6 percent between CES and UI employment levels<sup>16</sup> and the subsequent divergence between CES-based wage and salary estimates and UI estimates of wages and salaries for first quarter 1991.<sup>16</sup> For example, the growth in unadjusted wages and salaries for the sum of the states for the first quarter 1991 showed a decline of -6.4 percent. After adjustment, the rate of growth was 0.2 percent. For California, the decline in unadjusted wages and salaries for first quarter 1991 was -7.2 percent, while it was only -0.4 percent after the adjustment.

In December 1991, BEA accounted for the downward revision in employment in its personal income estimates at the national level by reducing the estimated growth rate of first quarter 1991 wages and salaries. When BEA performed its scheduled January 1992 revision of first quarter 1991 state personal income growth, it still adjusted UI wage and salary growth to match the growth in national wages and salaries, but the amount of adjustment required was considerably lessened. As shown in figure 1, the January 1992 revision of state personal income growth for first quarter 1991 showed only 0.4 percent growth for the sum of all states' personal income, compared to the October estimate of 1.3 percent growth. Additionally, for California personal income, the January estimate showed a decline of -0.7 percent as compared to the October estimate, which showed 0.2 percent growth for the quarter.

BEA's subsequent revisions in April and July resulted in still lower estimates of state personal income growth, ultimately declining to only 0.1 percent growth for the sum of all states and a -2.8 percent decline for California. In October 1992, BEA issued its final estimate of first quarter 1991 state personal income growth, which incorporated four quarters of 1991 UI data as well as other data that were available during the year. As shown in figure 1, the result of this final revision was a -.1 percent decline for the sum of all states, and a -4.1 percent decline for California. This final revision showed that personal income for the sum of all states and California did not increase by 1.2 percent over the prior quarter (which was originally estimated in July 1991), but instead declined. According to BEA officials, most of the difference between the original estimate of

<sup>16</sup>According to BLS officials, employment revisions have averaged + 0.2 percent and have ranged + 0.5 percent between 1980 and 1990.

<sup>16</sup>BLS now believes the discrepancy in employment levels between the CES and UI was due to a one-time, noneconomic correction in how employment was reported on the UI. For more information, see pp. 48 to 49.

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California personal income growth and the October 1992 estimate was due to information that became available after the October-November 1991 period when BEA was reestimating personal income at the state and national level.

Additionally, they said almost all of the difference between the January 1992 estimate and the October 1992 estimate was due to revisions California and other states made to their UI data, national estimates from the comprehensive revision of the GDP accounts, various annual 1991 data from the states for nonwage components of personal income, and updated seasonal factors. BEA officials said the larger revision in the California estimate than in that for all states reflects large revisions in the California UI data that were made after the October-November period.

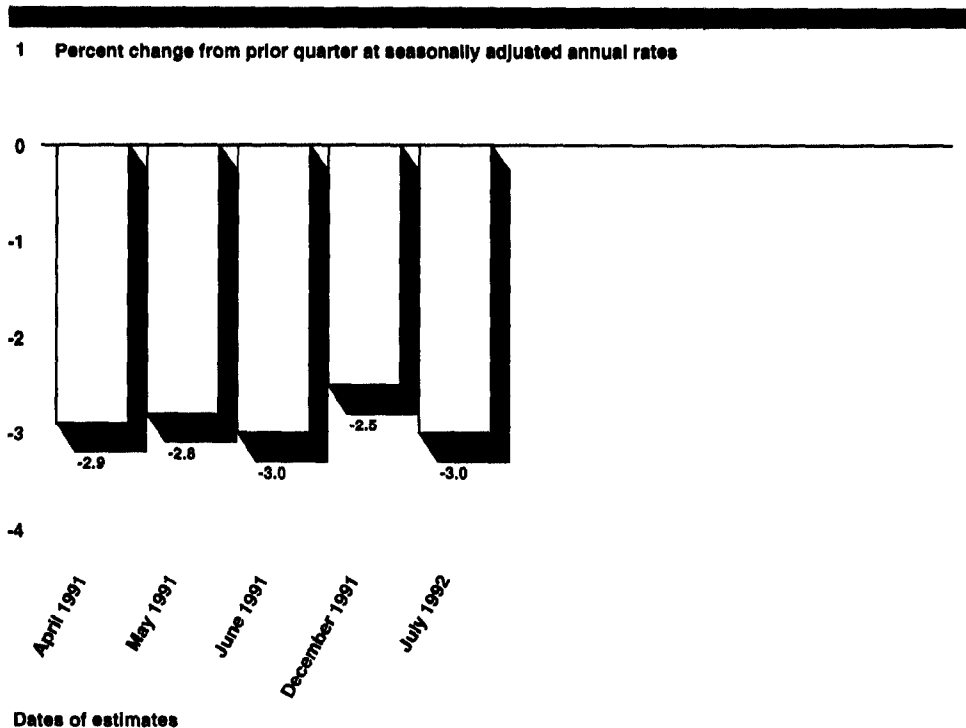
BEA's decision to adhere to standard procedure was a reasonable one for first quarter 1991. Nonetheless, while following standard procedures assures users of the integrity of the data, following these procedures may still produce results that could be misleading to data users focusing solely on estimates of personal income growth for individual states, especially if these users do not fully understand BEA's procedures. This was the case for first quarter 1991 state personal income growth estimates, since both the press and California officials did not understand how the UI data could have been incorporated without an immediate effect on state personal income growth. Additionally, because it took a year (from October of 1991 to October of 1992) for BEA's estimates of first quarter 1991 personal income growth to fully reflect the array of final source data and show what some of the press and California finance officials suspected in October 1991, it is imperative that BEA fully communicate its procedures to users so that they understand how the data are calculated and what the data do and do not include.

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**BEA Incorporated  
Employment Revision Into  
GDP and Personal Income  
as Soon as Possible**

BEA released three regularly scheduled estimates of first quarter 1991 GDP and personal income growth in the first 3 months after the end of the quarter. The GDP estimates, released in April, May, and June of 1991, showed a decline (from the prior quarter) in first quarter 1991 GDP (at an annual rate), ranging from -2.8 percent to -3.0 percent, as adjusted for inflation.

Figure 2: Revisions in Estimated Growth of GDP for First Quarter 1991

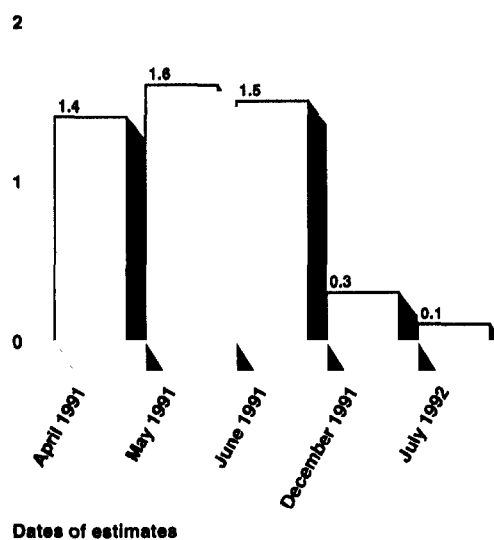


Source: BEA.

In contrast, BEA's estimates of first quarter 1991 personal income growth, released at the same time, showed growth—not adjusted for inflation—ranging from 1.4 to 1.6 percent from the prior quarter.

**Figure 3: Revisions in Estimated Growth of Personal Income for First Quarter 1991**

3 Percent change from prior quarter at seasonally adjusted annual rates



Source: BEA.

In early December 1991, BEA completed a comprehensive revision (which it performs once every 5 years) of GDP and personal income estimates. At this time BEA accounted for the lower estimate of employment based on first quarter 1991 UI data (i.e., the employment revision). The effect of the employment revision was evident in the December estimate of first quarter 1991 personal income growth (see fig. 3). However, the effect of the employment revision on the growth of GDP was not evident, as the December estimate actually showed less of a decline (-2.5 percent) for first quarter 1991 GDP growth than had the prior estimates (see fig. 2). This unexpected result led to the press allegations that BEA increased other components of GDP to make up for the employment revision or did not use UI data at all in the revised estimate. BEA did, in fact, incorporate the employment revision into its December revision of personal income and GDP. However, because employment data are not a major factor in determining the growth rate or level of GDP, the incorporation of the UI data did not affect the growth of GDP.

Two factors were at work in the fall of 1991 that allowed BEA to incorporate the employment revision into the wages and salaries components of GDP and personal income during the December revision. The first was the unusually early public announcement by BLS of the employment revision in 1991. In November 1991, BLS publicly announced the employment revision; BLS would not have ordinarily announced this revision until June of 1992. Second, BEA had delayed its comprehensive revision of these estimates from November of 1990 to December of 1991 because it needed more time to complete selected data analyses needed for the comprehensive revision. Ordinarily, BEA would not have attempted to reflect the UI employment or wage and salary data for the most recent quarter in a comprehensive revision; however, because of the significant divergence between CES and UI wages and salaries data for the first quarter 1991, BEA decided it needed to account for this somehow in its national estimates.<sup>17</sup>

As previously discussed, when BEA began to receive preliminary UI data from BLS in September of 1991, it observed a large discrepancy between the estimated growth in first quarter 1991 UI wages and salaries and BEA's original CES-based estimates of wage and salary growth for the quarter. BEA wanted to make a proper adjustment for these new data, and from September through November BEA officials assessed various ways to incorporate the UI data into the December revision of GDP and personal income. BEA decided to account for the decline in wages and salaries in its December revision by multiplying the average yearly wage by the estimated size of the employment revision (at that time estimated by BLS at 650,000). This calculation resulted in a downward adjustment of \$15 billion to first quarter 1991 wages and salaries. According to BEA officials, the main reason this methodology was chosen was that BEA simply ran out of time trying to determine a better method.<sup>18</sup>

Other components of wages and salaries experienced increases during the December revision, however, so the actual reduction to wages and salaries

<sup>17</sup>In July of 1992, BEA completed its regularly scheduled annual revision of GDP, which incorporated a year's worth of 1991 UI data. The result of this annual revision was that first quarter 1991 GDP growth was -3.0 percent, which was only .1 percentage point lower than BEA had originally estimated in April of 1991 (see fig. 2). We compared this to similar changes over the past 11 years and found the -.1 percentage point is well within the historical average and range. Additionally, we found that over the past eleven years there has been little upward or downward bias between the first estimate and the first annual revision, as the first estimate of GDP growth is neither consistently optimistic nor pessimistic when compared to the later estimates, which are based on more complete source data. See discussion on pp. 59 and 60.

<sup>18</sup>Additionally, this method is similar to how BEA estimates monthly wages and salaries based on CES employment data. For a discussion of this procedure, see pp. 60 to 62.

was \$10 billion for first quarter 1991. This contributed to about a \$14 billion reduction in first quarter 1991 personal income. As a result, the December estimate of first quarter 1991 personal income growth, as shown in figure 3, was only .3 percent, which was lower than the previous estimate of 1.5 percent in June 1991.<sup>19</sup>

The reduction in wages and salaries and, subsequently, personal income growth did not adversely affect the December estimate of GDP growth, however because the growth rate and level of GDP are based on the level of production in the country rather than the level of income (see fig. 2). The income estimate provides a check against the measure of production. According to BEA officials, the two measurements should be fairly equal, although some difference in the total exists. This difference is called the statistical discrepancy; historically, the discrepancy has been fairly small, ranging from -.7 to .6 percent of GDP.

Wages and salaries data are used primarily in the income measurement. The \$15 billion decline contributed to a reduction in the income measurement, which when combined with other changes in both the income and product side resulted in a greater difference between the product and income measurements than in the prior estimate. This meant the statistical discrepancy increased from what it had been in the prior estimate. Despite this increase, however, the statistical discrepancy was still only 0.2 percent of GDP, which is well within the historical range. The press allegation that BEA increased the statistical discrepancy so the UI data would not have an impact suggests a lack of understanding that CES and UI data do not directly affect the GDP estimate. While it is true that the statistical discrepancy increased due to the incorporation of the UI data, this resulted from the standard procedure used for estimating GDP rather than a purposeful attempt on the part of BEA to mask the effect of the employment revision or UI data.

We believe BEA's decision to account for the employment revision in its measurement of GDP and personal income reflects its policy to incorporate all available data into its revisions. We also believe the methodology for doing so was reasonable under the circumstances.

## BEA Has Organizational and Procedural Safeguards

BEA has several existing organizational and procedural safeguards that can help protect the integrity of its data. These safeguards are found in the

<sup>19</sup>In July of 1992, BEA completed its regularly scheduled annual revision of personal income, which incorporated four quarters of 1991 UI data. The result of this annual revision for first quarter 1991 personal income growth was that personal income growth for first quarter 1991 declined to only .1 percent, as compared to the 1.4 percent growth estimated by BEA in April 1991 (see fig. 3).

composition of BEA staff and in the procedures used for the calculation, release, and publication of its data. All of BEA's 11 Senior Executive Service positions are reserved for career civil servants, which helps to ensure that data preparation is not influenced by political partisanship. Second, BEA has security procedures that govern data preparation and release. For example, there is no involvement by political appointees during the preparation of GDP or personal income data. According to BEA officials, BEA completes GDP and personal income estimates under tight security and with only a small group of BEA officials present. Additionally, key BEA officials' performance standards contain schedules of dates for completion and review of specific data elements.

Regarding BEA's release procedures, the Office of Management and Budget announces release dates for quarterly data such as GDP and personal income at the beginning of each calendar year. On the day of the release of these data, BEA publicizes the estimates at 8:30 a.m. The Undersecretary of Commerce's office does not receive the estimates until the morning of the release, in most cases, 1 half-hour before the estimates are made public. Additionally, no Commerce or other policy official is allowed to comment publicly on the estimates until at least 1 hour after the public release. On the afternoon before the release, the estimates are hand-delivered to the Chairman of the Council of Economic Advisers for transmittal to the President of the United States. Career BEA officials told us that there were no other contacts outside BEA in the calculation of first quarter 1991 GDP or personal income statistics and that these safeguards were followed.

BEA produces a monthly publication, the Survey of Current Business, which describes standard methodology, source data, and key assumptions used for various statistics and provides further assurance of the integrity of its procedures. BEA publishes a schedule for the release of statistical information, which it followed for first quarter 1991 GDP and personal income estimates. Each month BEA issues press releases on various economic statistics, including personal income and outlays and indexes of leading, coincident, and lagging indicators. Additionally, it has quarterly press releases for quarterly data, such as GDP and corporate profits.

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### Experts Do Not Believe BEA Actions Politically Motivated

We found that knowledgeable federal experts from the Department of the Treasury, the Federal Reserve, and BLS, and former staff of the Council of Economic Advisers did not believe that BEA's actions, in the first quarter of 1991 or in general, were politically motivated. Federal Reserve officials



even noted that BEA faces a number of obstacles in producing accurate and timely statistics, and does an admirable job despite these obstacles.<sup>20</sup>

## Ways Exist to Improve Perceived Integrity of Data

Despite their expressed confidence in BEA's integrity, even some of these experts said they did not fully understand how BEA uses various data elements in its specific calculations. This lack of knowledge and some of the press allegations and California officials' concerns about first quarter 1991 data (as discussed on pp. 29 to 30) are indications that there was a misunderstanding of the procedures BEA used for making first quarter 1991 estimates. Similar questions and allegations arose about BEA's GDP growth estimates for third quarter 1992. BEA could do more to actively forestall misunderstanding and increase the level of trust.

In October of 1992, the National Academy of Science's Committee on National Statistics published guidelines, contained in Principles and Practices For A Federal Statistical Agency, which call attention to several principles and practices that can aid a statistical agency's ability to maintain credibility for itself and its data. The Academy suggests that a statistical agency should, at a minimum, (1) be open about its data, including making its data widely available and cooperating with users; and (2) have a strong measure of independence to guarantee the integrity of the data. For BEA to ensure its users of the integrity and credibility of its data, it needs to more effectively document and publicize its methodologies and assumptions—especially in situations like first quarter 1991. It also needs to enhance its communication with users to achieve this perceived independence.

## Incomplete BEA Documentation and Explanation of Key Procedures

A 1990 report by the Department of Commerce's Inspector General<sup>21</sup> found BEA needed improvement in documenting estimating procedures, revisions and adjustments. In the case of BEA's use of employment data in first quarter 1991 GDP and personal income estimates, we also found that more complete documentation was needed for revisions and adjustments. BEA officials said BEA provides documentation of its standard methodology in its monthly publication, the Survey of Current Business. While that is true, we found the key assumptions used in these methodologies for selected

<sup>20</sup>We also contacted an economic consultant who had been quoted in the first Barron's article as saying that he had been told by a BLS employee that BEA did not intend to incorporate UI data in the October revision. The consultant told us he had been incorrectly quoted in the article and that he had no knowledge that BEA was not going to include UI data.

<sup>21</sup>Review of Procedures for Developing GNP Estimates, Inspector General, United States Department of Commerce (September 28, 1990) pp. 4 to 5.

first quarter 1991 data were not discussed in the Survey, nor was BEA able to provide us with sufficient documentation of these assumptions.

For example, BEA officials were able to explain to us how and why they estimated the \$15 billion adjustment to wages and salaries. They noted that when they were first determining how to account for the decline in first quarter UI wages, they assessed other economic data, such as federal tax receipts, to determine whether the UI wage data represented an actual economic downturn. After assessing these data, none of which was truly superior, however, they concluded that the best course of action was to adjust the CES-based estimate by the product of the 650,000 positions and average earnings. There is no discussion of this in the Survey, nor were BEA officials able to provide any written documentation showing these research efforts or the review and approval process that determined this was the best method available. In the January 1992 Survey, BEA announced that it had reduced wages and salaries by \$15 billion to account for the employment revision, but this announcement did not explain how the \$15 billion was estimated.

Furthermore, BEA officials were unable to completely document—nor is there any explanation of this in the Survey—how factors offset the \$15 billion so the final reduction in wages and salaries was \$10 billion, nor how this contributed to the \$14 billion reduction in personal income. According to BEA officials, BEA's standard methodology clearly explains how a revision in wages and salaries contributes to a revision in personal income, and there are limits to how much additional detail the press or other users want or find useful. Additionally, BEA officials said that to retrieve or replicate data at each intermediate step of the process would require an inordinate amount of effort. Nonetheless, in this instance, BEA officials said they believe it would have been useful if BEA had been able to complete and publish a methodology paper synthesizing existing explanations of how personal income is calculated, as it may have aided user understanding of this issue.

Regarding BEA's state personal income procedures, BEA officials said they did not issue any warning about the large upwards adjustment of the October estimates of state personal income because BEA followed its standard procedure of adjusting state growth to equal national growth. The officials said this procedure, as well as limitations with the data, is fully explained in several Survey articles, most recently in 1989 and 1990, and in a detailed methodology paper about state estimates published in 1989. BEA officials said the 1990 article was prepared primarily to provide

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state users some idea of the limitations of using BEA state personal income data in state revenue estimates. The 1990 article said that

“...an important factor limiting the improvements in the reliability of the estimates achieved by the introduction of the [UI] data into the state wage and salary estimates is that the second estimate of wages and salaries is controlled to [national] estimates that have not yet incorporated the [UI] data.”

Additionally, BEA officials said they presented these findings to a conference of state tax administrators and sent this article, as a part of its regularly quarterly mailing, to its Users Group, which includes one or more state offices from each state. Nonetheless, the revision made to first quarter 1991 data was unusual in that UI data were significantly lower than CES-based data (yet were still revised upwards to match the CES-based national estimates) and BEA officials said they knew the UI data were not stable. We believe that this situation merited an additional explanation at the time of the release. In the end, it turned out that the cumulative revision to the original estimate of state personal income growth estimates (from July 1991 to October 1992) was actually larger than it historically had been (according to the 1990 article) for several states, and for California the revision was almost twice as large.

California Finance officials told us they had known that BEA adjusted data to the national total, and they were under the impression that large states received a disproportionate share of the conforming adjustments. However, they had not fully understood how these adjustments were made nor that some nonwage income items were also adjusted on the basis of CES-based wage and salary growth. As a result, California Finance officials did not understand why BEA's estimates were so much more optimistic than California data showed they should be. Although the officials now are aware of BEA's procedures, they still question the rationale of adhering to such a policy when it produces state data they believe are misleading.

The central issue for California Finance officials is that this procedure adjusts the growth in UI wages and salaries to match CES-based estimates of wage and salary growth, when California Finance officials do not believe CES adequately measures employment in this state. California Finance officials said they believe BEA should be willing to deviate from its standard procedures in unusual circumstances such as these. They said BEA should at least be more forthcoming about what BEA does in situations like the first quarter 1991. (For a detailed discussion of California Finance officials' concerns with CES, see pp. 51 to 52.) According to California

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Finance officials, the magnitude of the BEA personal income revisions, and the amount of time it took for these revisions to be reported, underscores California's problem with federal economic statistics. The officials said procedural delays in incorporating source data are not acceptable when the data are used for estimating revenue, because accurate revenue estimating requires up-to-date, correct source data.

Moreover, at no time, either before or after BEA released the revised GDP estimates, was there an explanation either in the Survey or in a special press release that stated that the employment revision would have no effect on GDP levels, in spite of the press speculation to the contrary. BEA officials noted that BEA held a press briefing before it released the results of the comprehensive revision, and the issue did not surface at that time which indicated that the press was not concerned about this issue. After the release of the data, however, BEA did receive several calls from reporters asking about the effect of the employment revision. In that regard, BEA officials acknowledge that it might have been helpful to place the announcement of the \$15 billion revision in the December rather than the January Survey. Nonetheless, an additional public statement by BEA at the time of the data release would have established its position and might have focused the issue as a technical or procedural disagreement rather than an allegation of political manipulation.

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## No Response to Allegations

In addition to incomplete documentation and explanation before or at the time of the data releases, BEA issued no public response to the press allegations or California's concerns. BEA has not issued any kind of a public statement defending its first quarter 1991 estimates or explaining that it followed standard methodology for making those estimates. BEA officials said in October 1992 that in past years, BEA used to respond to allegations but found the truth never caught up with the allegations. As a result, they are not sure a public explanation would have been effective for first quarter 1991 data. Additionally, they said they believed the allegations made for first quarter 1991 were from a small segment of the press and one state and were not widespread. BEA officials said that BEA cannot successfully respond to such uninformed views when they present BEA's methods inaccurately.

In the last several months, a number of press reports have raised questions and allegations about the integrity and accuracy of BEA's estimates of 1992 GDP growth. The reports raising these questions have been found in a wide variety of publications. Although we did not evaluate the basis of these

recent articles, the Commerce Department and BEA have publicly acknowledged this undercurrent of suspicion by responding to the allegations. On November 6, 1992, BEA wrote a letter in its defense to the editor whose newspaper had published an article implying political manipulation of third quarter 1992 GDP estimates by saying that the preliminary estimate of 2.7 percent GDP growth for the third quarter of 1992 (issued the week before the presidential election) was not credible. Later, beginning on November 18, 1992, BEA also held several briefings with representatives of several newspapers in an effort to fully inform the press about how BEA makes its estimates.

An article in The New York Times called the briefing a "highly unusual step of inviting closer scrutiny of its [BEA's] methods for compiling reports on gross domestic product." The article said that the Commerce Department had "... responded with plausible, generally persuasive explanations of suspiciously high numbers over the last three weeks. But [Commerce] officials said they feared that confidence was not fully restored in the Government data ...". A BEA official quoted in the article said he felt the economic fraternity might accept the figures and be reassured, noting, however, that "Outside the Beltway, the notion that this [political manipulation of the data] could happen again is not very far-fetched." BEA officials subsequently told us that this does not represent BEA's official viewpoint, which is that BEA believes today there is no question among the mainstream press that BEA has high standards of integrity and that estimates are free of political manipulation.

BEA officials said the criticisms raised with regard to the third quarter 1992 statistics merited attention because they were raised by more knowledgeable reporters and were, at the time, reasonable, as the quarterly GDP showed more positive growth than many economic experts had expected. Moreover, the allegations primarily concerned methodological procedures, rather than allegations of political manipulation. BEA officials said the continued upturn of the economy supported BEA's early estimates.

BEA's response to the most recent allegations is a positive example of how BEA should respond when its integrity and methods are questioned. BEA's belief, however, that the allegations and criticisms voiced about first quarter 1991 data represented merely views of "uninformed" commentators and therefore did not merit a response is faulty, for, as demonstrated in appendix II, one or two allegations can have far reaching effects into a variety of other sources. Regarding the allegations made

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about first quarter 1991 data, it would have greatly benefitted BEA to have issued a public statement explaining the distant, or even nonexistent, relationship of employment revisions to GDP, especially in light of the press speculation about the issue. Additionally, BEA could have refuted the allegations of manipulation sooner with such an explanation. Moreover, as suggested before, if BEA had informed its state users that the UI wage data did not appear to be stable at that time, and might continue to be significantly revised either up or down, this would have provided a warning to state users to use state personal income estimates with more than the usual degree of caution.

BEA's current belief that some allegations require a response while others do not also could present the appearance of inconsistency. BEA needs to use appropriate criteria that allow it to make consistent decisions on how it should respond to allegations, whether they be allegations of political manipulation or methodological procedures.

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## BEA Can Enhance Communication With Users

As shown above, there can be much discussion, yet little understanding, about how GDP and personal income are estimated and how BEA uses employment data in these calculations. It is BEA's responsibility to communicate more effectively with its users on how it uses employment as well as other data in its calculations. BEA seeks and receives considerable advice from federal, business, and academic experts on conceptual issues involved in constructing the framework of national economic accounting and identifying its long-term direction. Additionally, last year BEA began discussions with the Department of Commerce about creating a formal advisory board for obtaining additional expert advice. We believe these reviews can help BEA establish the general direction and concepts used in national economic accounting. They are not necessarily designed, however, to provide BEA with guidance or advice on specific cases for which source data are questionable, such as in first quarter 1991.

BEA does not believe outside advice can be sought during the development of quarterly estimates because it would be impossible to achieve a consensus of unbiased persons on a particular issue within the required time frame. Nonetheless, when reliable or appropriate source data needed to measure selected national economic statistics are missing or are otherwise questionable, BEA's estimates can be said to be part science and part art. In these situations, BEA is forced to make judgments, as it did for the first quarter 1991 in deciding whether and how to incorporate the employment revision and UI data. In instances such as this, when reliable

or current data are not available and disputes about estimating methods exist, BEA needs mechanisms for outside expert review and comment on its procedures, including discussions with users to determine what would best suit users' needs. Such reviews could be done by the formal advisory board BEA seeks to establish or by other means. By demonstrating openness about its procedures and a willingness to explain its judgments, BEA could use these expert reviews to reduce suspicion and increase the level of trust. The reviews would be especially helpful in times such as first quarter 1991, or even more recently, when controversy and distrust exist about the perceived integrity of BEA's estimates.

We understand that BEA must meet its data release schedules and, therefore, must use its judgment as to when and how it can use outside peer review and comment. For that reason, these expert reviews could be done after the data are released—particularly when serious allegations are made about the integrity and credibility of BEA's estimates. If later published, these reviews also would serve to inform users how BEA uses various data elements in its methodologies, as well as ensure the public and Congress that BEA's judgments are based on sound technical considerations and not political motivations.

It is not easy to explain or understand the methods used to produce economic statistical data such as the GDP or personal income. For this reason, it is BEA's responsibility to reassure users at all levels of technical proficiency that the economic data released by BEA are credible and produced with the greatest professional integrity. As a result, even if BEA fully documents and widely explains its calculations, issues public statements defending its estimates when questioned, and obtains independent outside expert review of its procedures and methods, more regular testimony may be needed to help assure Congress and general users of the integrity of BEA's data.

It is of some note that the head of BEA does not customarily speak before Congress or public bodies to present the results of BEA's data analysis, as this is usually done by the Undersecretary of Economic Affairs. The head of BLS currently testifies each month when it releases labor force statistics; this could be a model for BEA to use as well. Congress may want to request that BEA regularly testify before the Joint Economic Committee, perhaps on a quarterly basis, when BEA issues its sensitive economic statistics, such as GDP. This would serve to enhance the perceived integrity of BEA's data for general users and the public.

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## National Academy of Sciences Emphasizes Importance of Independence

The recent report by the National Academy of Sciences emphasizes that the organizational independence of a statistical agency can affect the perceived integrity of the data it produces. It notes that a perception of independence is necessary in order for the agency to be effective. As a result, the Academy suggests several features and practices that help to establish a statistical agency's independence. It notes that not all these aspects are necessary, as circumstances may govern what form independence takes.

BEA exhibits several of the aspects of independence suggested by the Academy. For example, BEA has a professionally qualified agency head. It has procedures that control the release of data, and it adheres to data release schedules. BEA also strives to separate data release from policy analysis by making all of BEA's press releases and the Survey publications factually based and consistently formatted. According to BEA officials, BEA leaves the policy analysis of the data to the users.

BEA does not exhibit other aspects of independence suggested by the Academy, such as organizationally defined independence and presidential appointment and Senate confirmation of the agency head who reports directly to the Secretary and has primary authority for the selection and promotion of BEA's senior professional staff. Additionally, the Academy recommends that the head of an agency have the authority to present the results of data analysis before public bodies and Congress, which, as previously stated, the head of BEA does not regularly do.

Just because BEA lacks some aspects of independence does not mean it is insufficiently independent or less independent than those agencies that exhibit independence in a different way. The appropriate form and degree of independence necessary to ensure not only the fact but the perception of BEA's statistical integrity is a complex issue outside the scope of this review. It should be assessed in a context larger than just that of the circumstances surrounding the issuance of first quarter 1991 economic data.<sup>22</sup>

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## Conclusions

We found no evidence that BEA manipulated first quarter 1991 personal income or GDP estimates for political purposes. BEA generally followed its standard procedures for using employment data in these estimates and

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<sup>22</sup>In that regard, GAO is currently examining the issue of BEA's independence as a part of a larger review of how several federal statistical agencies, also including the Bureau of the Census, the Bureau of Labor Statistics, and the National Center for Health Statistics, compare in their policies and practices with many of the guidelines recommended by the National Academy of Sciences.



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deviated from these procedures only when required by reasonable technical judgments.

The role employment data play in BEA's procedures varies for conceptual and timing reasons. GDP is a measure of the total production of the economy and is based almost exclusively on measures of output rather than income or employment. Employment data are more important in the estimation of personal income than GDP. As a consequence, while BEA did account for the employment revision in its December estimate of first quarter 1991 GDP growth, this did not affect the estimated growth of the December or subsequent estimates of first quarter 1991 GDP. Additionally, BEA's procedures call for employment data to be used in different ways and at different times in state personal income estimates. As a result of these procedures, the incorporation of the revised employment data did not affect the estimated growth of BEA's October estimate of first quarter 1991 state personal income growth as much as was expected by those who made the allegations.

We found several ways, however, that BEA could improve the perceived integrity of its data. For example, we believe BEA could more completely document and explain its data. BEA has not adequately documented or explained to its users several key assumptions it used in its methodology to incorporate employment data into these first quarter 1991 estimates. Additionally, BEA has issued no public response to the allegations made about the accuracy of first quarter 1991 data. To determine user needs and to assure Congress and the general public of the integrity and credibility of its data, BEA also needs additional mechanisms for outside expert review and comment on its procedures. To enhance congressional and public assurance of the integrity of BEA's data, Congress may also want to request that BEA testify regularly before Congress when it releases major national economic statistics.

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## Recommendation

We recommend that the Secretary of Commerce instruct the head of BEA to formulate a strategy to provide better explanation and documentation of BEA's procedures to general users and assure Congress and the general public of the integrity and credibility of BEA's estimates. This strategy should include a review of the principles and procedures for documenting and explaining its methodology and calculations, responding to allegations of political manipulation, and creating additional mechanisms for outside expert review and comment.

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## Matter for Congressional Consideration

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Congress may want to consider requesting that BEA testify at regular intervals when it releases major national economic statistics.

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## Agency Comments

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We discussed a draft of this report with BEA, BLS, and California Department of Finance officials and incorporated their comments as appropriate. BEA officials agreed with our description of how they used employment data for first quarter 1991 estimates, while BLS officials agreed with our description of their procedures and efforts undertaken to assess the causes of the 1991 employment revision.

BEA officials said BEA generally ensures complete documentation and explanation of BEA's procedures to its users, but BEA is always willing to enhance the effectiveness of its communication. Nonetheless, staff and time resources limit BEA's ability to participate in additional types of communication. BEA officials said they would be willing to testify regularly before Congress in an effort to keep Congress and the public more informed of the results of BEA's data analysis.

BLS officials said they continued to believe BLS' employment measures are adequate based on the results of their research on the 1991 benchmark revision and the small size of the 1992 benchmark revision. However, BLS officials also recommend that users of BLS employment data should exercise caution when making wage or revenue estimates since there is not any simple, direct, relationship between employment and wage movements. They said they would welcome broad outside review specifically addressing CES and UI employment data not only to assure users of the integrity and adequacy of BLS' employment data, but also to provide users with more information on the limitations in the direct use of employment data in revenue and income estimates. BLS officials said the efforts required to combat the misinformation supplied to the press during this time, including preparing testimony for Congress, contacting policy makers and data users, developing special public information packages, making follow-up calls and holding briefings with journalists, was a severe drain on BLS' limited resources.

California Finance officials said they agreed that neither BLS nor BEA politically manipulated first quarter 1991 personal income or GDP estimates. However, the officials said they continued to have concerns about the procedures used by BLS and BEA, since there appears to be an emphasis by both agencies on following standard procedure, even when

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deviating from that procedure may provide more appropriate data for state users. They said better communication and documentation would enhance states' ability to effectively use federal data in state revenue forecasting.

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As arranged with the Committee, unless you publicly announce its contents earlier, we plan no further distribution of this report until 15 days after its issue date. At that time we will send copies to the Secretary of Commerce, the Undersecretary for Economic Affairs of the Department of Commerce, the Director of the Bureau of Economic Analysis, the Deputy Commissioner of the Bureau of Labor Statistics, and other interested parties.

The major contributors to this report are listed in appendix V. If you have any questions about this report, please contact me on (202) 512-8676.

Sincerely yours,



L. Nye Stevens  
Director, Government Business  
Operations and Information  
Issues

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**Abbreviations**

BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
CES	Current Employment Statistics Survey
GDP	Gross Domestic Product
GNP	Gross National Product
NIPA	National Income and Product Account
UI	Unemployment Insurance Reports

# Objective, Scope, and Methodology

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Our objective was to determine whether the Department of Commerce manipulated the first quarter 1991 GDP and personal income figures for political purposes. We identified and examined the allegations made by press and by state officials about first quarter 1991 estimates, and we interviewed cognizant officials at BEA, BLS, and four states that experienced large employment revisions. We found that the allegations of political manipulation concerned whether BEA incorporated a downward revision of employment into its estimates of GDP as well as personal income.

As a result, we identified BEA's standard procedure for incorporating employment data into GDP and personal income. To determine whether BEA deviated from this procedure for first quarter 1991 GDP and personal income estimates, we reviewed BEA procedures and decisions made for first quarter 1991 data and discussed these with appropriate BEA officials. On the basis of this evidence, we determined when procedures used for first quarter 1991 data represented a deviation from standard procedure and whether the reasons for these deviations were reasonable. Additionally, we compared the magnitude of historical revisions in these data series to the revisions made in first quarter 1991. We did not examine in detail the procedures and methods used to incorporate other source data into GDP or personal income, nor did we assess the adequacy of BEA's methodology or independently verify data used in this report.

We also assessed how well BEA documented and publicized key decisions and procedures used for first quarter 1991 data, especially when there were any deviations from standard procedures. We also examined existing procedural and organizational safeguards at BEA designed to ensure the public of the integrity of BEA's data.

We interviewed cognizant officials in BEA and BLS and key officials in organizations that provide source data to BEA and those that use BEA data for forecasting, such as the Internal Revenue Service, the Council of Economic Advisers, the Department of the Treasury, and the Federal Reserve Board. We also obtained and examined procedures and methodology at BLS for measuring and analyzing employment growth rates and trends.

As agreed with the Committee, we obtained informal agency comments and incorporated them as appropriate. We did our work in Washington, D.C., from June to October 1992 in accordance with generally accepted government auditing standards.

# Chronology of Events for First Quarter 1991 Data

BLS' realization in the fall of 1991 that original employment levels estimated by CES may have been overestimated for the first quarter of 1991 caused several journalists and California state officials to raise a number of concerns about how well employment is measured. The suggestion of a large possible downward revision in employment also raised questions about how BEA's next scheduled revision of first quarter 1991 GDP and personal income growth would be affected, since BEA's original estimates of these data had used the original employment levels. When BEA revised its original estimates in October and December of 1991, however, the new estimates of GDP and personal income did not appear to be affected as much as the press and California officials expected they would have been if BEA had used the revised employment data.

The allegations about the accuracy of employment measurement, as well as the integrity of BEA's data and its methodology, then began. The allegations and concerns have continued throughout 1992; recent articles now question BLS and BEA's procedures and results for 1992 data. Discussed below are the press allegations and California officials' concerns with regard to first quarter 1991 GDP and personal income. The concerns raised by California officials with regard to BLS' 1991 employment revision are also discussed in appendix III. Figure II.1 depicts the chronology of events for first quarter 1991 data, including when BLS and BEA released original and revised estimates of employment, GDP and personal income growth, the statements and concerns made by California Department of Finance officials, and excerpts of many of the subsequent news reports about and interpretations of first quarter 1991 data.

## Political Manipulation Alleged by the Press

In October 1991, when BEA released its revised figures for first quarter 1991 state personal income growth, the estimated growth for the sum of all states' personal income actually increased from the growth rate shown in the original estimate, which had used CES-based wages and salaries. An October 1991 *Barron's* article alleged that BEA purposely did not incorporate the UI data (which showed a lower level of wages and salaries than did the CES-based data). According to the article, a private consultant had been told by a BLS employee that the employment revisions for large states would probably not be reflected in the revised estimates. According to the article, the slightest appearance of a weaker labor market would be too much of an embarrassment to the President, who had vetoed the unemployment benefits extension bill.<sup>1</sup> After this article was released, a

<sup>1</sup>GAO contacted this consultant, who said he had been misquoted in the article. According to the consultant, he had no knowledge that BEA did not plan to incorporate the UI data into the revised estimates.

number of other articles followed that continued to question BEA's procedures and calculations.

The December 1991 estimate of GDP (adjusted for inflation) actually showed a better rate of growth than had the previous estimate that had been released in June 1991. This occurred despite BEA's incorporation of the revised employment data. In December 1991, another Barron's article appeared, which reported that while BEA did incorporate the revised employment data into its GDP estimate, it nonetheless increased the statistical discrepancy so there was no economic impact of the employment revision. In May 1992, an article in the San Francisco Examiner alleged that the revised employment data were simply not included in this revision of first quarter 1991 GDP growth.

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**California Officials Said  
1991 BEA State Data  
Misleading**

A procedural concern about BEA's estimates originated in the California Department of Finance in October 1991 when BEA released its October revision of first quarter 1991 state personal income growth. Because there was a 320,000 difference between first quarter CES and UI employment levels as well as a decrease in state revenue withholding for the quarter, California Finance officials believed the UI wage data for the quarter were accurate. As a result, they expected to see California personal income growth become negative once the employment revision was incorporated. Instead, BEA's published estimates showed California personal income at a growth of about 0.2 percent, which, while it was a decrease from the estimated growth shown in the original estimate, was still too optimistic for California Department of Finance officials. This estimate caused California Finance officials to question how BEA was able to make personal income growth remain positive when available California data showed a definite decline from the prior quarter. For that reason, California officials have said that BEA's procedures produced misleading data.



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**Appendix II  
Chronology of Events for First Quarter 1991  
Data**

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**Appendix II  
Chronology of Events for First Quarter 1991  
Data**

**Figure II.1: Chronology of Events for First Quarter 1991 Data**

<b>1st Quarter 1991</b>		
<b>January</b>	<b>February</b>	<b>March</b>
<b>BLS &amp; BEA</b>	<p>BLS releases preliminary estimate of January 1991 employment and earnings based on CES.</p> <p>BEA releases personal income and wages and salaries estimates for January 1991. Wages and salaries based primarily on CES.</p>	<p>BLS releases:</p> <ul style="list-style-type: none"><li>• preliminary estimate of February 1991 employment and earnings</li><li>• revised estimate of January 1991 employment and earnings</li></ul> <p>Estimates based on CES.</p> <p>BEA releases personal income and wages and salaries estimates for February 1991. Wages and salaries based primarily on CES.</p>

**California  
Department  
of Finance**

**The press**

**Appendix II  
Chronology of Events for First Quarter 1991  
Data**

**Chronology of Events for First Quarter 1991 Data**

<b>2nd Quarter 1991</b>		
April	May	June
<p><b>BLS releases:</b></p> <ul style="list-style-type: none"> <li>• preliminary estimate of March 1991 employment and earnings</li> <li>• revised estimate of February 1991 employment and earnings</li> <li>• final estimate for January 1991 employment and earnings</li> </ul> <p>All estimates based on CES.</p> <p>BEA releases personal income and wages and salaries estimates for March 1991.</p> <p>BEA releases advance estimate of first quarter 1991 growth of GDP and personal income:</p> <ul style="list-style-type: none"> <li>• GDP -2.9 percent<sup>a</sup></li> <li>• personal income +1.4 percent<sup>b</sup></li> </ul>	<p><b>BLS releases:</b></p> <ul style="list-style-type: none"> <li>• revised estimate of March employment and earnings</li> <li>• final estimate for February employment and earnings</li> </ul> <p>All estimates based on CES.</p> <p>BEA releases preliminary estimate of first quarter 1991 growth of GDP and personal income:</p> <ul style="list-style-type: none"> <li>• GDP -2.8 percent</li> <li>• personal income +1.6 percent</li> </ul>	<p>BLS releases final estimate of March 1991 employment and earnings based on CES.</p> <p>BEA releases final estimate of first quarter 1991 growth of GDP and personal income:</p> <ul style="list-style-type: none"> <li>• GDP -3.0 percent</li> <li>• personal income +1.5 percent</li> </ul>

Based on taxable wages calculated from CES employment data, expects mild loss in employment and wages in first quarter 1991. Initial estimate of personal income closely agrees with BEA estimate.

Makes adjustments from tax accounting system to reduce first quarter 1991 revenue.

**Appendix II  
Chronology of Events for First Quarter 1991  
Data**

**Chronology of Events for First Quarter 1991 Data**

**3rd Quarter 1991**

	July	August	September
<b>BLS &amp; BEA</b>	<p>BEA releases preliminary estimate of first quarter 1991 growth of state personal income based primarily on wages calculated from CES:</p> <ul style="list-style-type: none"> <li>• all states +1.2 percent<sup>a</sup></li> <li>• California +1.2 percent</li> </ul>	<p>BLS starts to receive UI wage and employment data from states for first quarter:</p> <ul style="list-style-type: none"> <li>• sees significant drop in employment from levels estimated by CES</li> </ul>	<p>BLS continues to receive and edit UI data.</p> <p>BEA starts to receive UI data from BLS, also sees large discrepancy between original CES employment estimates and UI estimates.</p>

**California  
Department  
of Finance**

Starts to receive UI data; realizes wage data significantly lower than CES-based wage estimates. Wage estimates roughly consistent with first quarter withholding. Preliminary UI data show employment 170,000 less than indicated by CES.

Revises personal income estimate down sharply.

Expects UI employment to show 300,000 fewer positions than CES for California. Discusses revision with private and public economists, experts, press.

**The press**

**Barrons** article released:

- California and other states' employment levels lower than CES originally showed
- questionable accuracy of BLS' employment measures

**Appendix II  
Chronology of Events for First Quarter 1991  
Data**

**Chronology of Events for First Quarter 1991 Data**

**4th Quarter 1991**

October

BEA releases first revised estimate of first quarter 1991 growth of state personal income based on wages obtained from state UI reports:

- all states +1.3 percent
- California +0.2 percent

BEA discusses incorporating new employment and wage data into the GDP and personal income comprehensive revision.

November

BLS announces 1991 employment revision in testimony before Joint Economic Committee:

- revision will be -.6 percent, or -650,000 positions
- cause of large revision unknown at this time

BEA performs comprehensive revision of GDP and personal income:

- reduces wages by \$15 billion to account for employment and wage reduction
- other factors offset reduction to make total wage reduction \$10 billion
- reduction in personal income \$14 billion

December

BEA releases results of comprehensive revision:

- GDP -2.5 percent
- personal income +0.3 percent

Releases results of interim employment and budget revision:

- difference of 370,000 positions between CES and UI
- believes BEA's revised estimates for California personal income growth much too optimistic
- revises wages further down

Releases Economic Indicators report:

- national revision could be 2 million positions
- state wage and employment data showed decline
- BEA increased other components of state income to show growth

Revises wages down further to be consistent with withholding.

Commission on State Finance issues state forecasts:

- national employment revision could be 1 million<sup>d</sup> positions

Barrons article released:

- BEA left the level of personal income growth for first quarter unchanged by not using the UI data
- a consultant had been told that job losses experienced by several large states would probably not be reflected in income revision
- the slightest appearance of a weaker labor market would be too much of an embarrassment to the President, who had just vetoed the unemployment benefits extension bill

Washington Post article released:

- BLS' testimony is evidence that original employment figures too optimistic
- although decline in payroll numbers does not necessarily mean a decline in GDP, if revised employment and payroll data are accepted by BLS, first quarter 1991 GDP could be much weaker than originally thought

Wall Street Journal article released:

- BLS employment data used to calculate GDP

Wall Street Journal article released:

- BLS employment revision could lead to substantial downward revision of GDP

San Francisco Chronicle article released:

- original employment estimates badly flawed
- CES did not catch economic hardships of small employers

Barrons article released:

- government will do anything to make things look better
- BEA did incorporate \$12 billion to adjust for downward revision of employment and wages, but increased statistical discrepancy by \$16 billion
- BEA made sure there was no economic impact of employment error

Appendix II  
Chronology of Events for First Quarter 1991  
Data

Chronology of Events for First Quarter 1991 Data

1st Quarter 1992

January

February

March

BLS & BEA

BEA releases second revised estimate of first quarter 1991 growth of state personal income based on wages obtained from state UI reports:

- all states +.4 percent
- California -0.7 percent

BLS issues press reports:

- discuss magnitude of employment revision
- provide detailed questions and answers about BLS efforts to assess causes of revision

BLS discusses 1991 employment revision in testimony before Joint Economic Committee. Says revision will still be about -650,000 positions.

BLS writes letter to California State Department of Finance in response to erroneous statements of size of national employment revision.

BEA announces \$15 billion adjustment in Survey of Current Business.

California  
Department  
of Finance

Determines final estimate of downward employment revision in California is 370,000 positions.

The press

Los Angeles Times article released:

- national employment revision could be 2 million
- CES may not adequately measure employment in smaller firms

Detroit News article released:

- California estimates of employment revision in Michigan were inaccurate
- Michigan lost 401 jobs--not the 100,000 jobs estimated by California

USA Today article released:

- BLS overcounted employment by 2 million
- recession has been misreported and President Bush has been misled

Los Angeles Times article released:

- BEA personal income more optimistic than California data

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**Appendix II  
Chronology of Events for First Quarter 1991  
Data**

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**Chronology of Events for First Quarter 1991 Data**

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**2nd Quarter 1992**

April

BEA releases third revised estimate of first quarter 1991 growth of state personal income based on wages obtained from state UI reports:

- all states +.4 percent
- California -1.5 percent

May

June

BLS publicly releases results of employment revision:

- revision is -640,000 positions (-.6 percent)
- the drop is concentrated in January 1991
- assessments of the causes of revision underway

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San Francisco Chronicle article released:

- California officials say BLS threatened to cut off access to employment data

San Francisco Examiner article released:

- BEA is estimating Californians earned more than California's own tax revenue suggests
- misleading BEA statistics could be fraud and lying to Congress
- Washington could be ignoring information that could make it harder for President Bush to get reelected
- the 650,000 job mistake was ignored in 1991 GDP

Appendix II  
Chronology of Events for First Quarter 1991  
Data

Chronology of Events for First Quarter 1991 Data

3rd Quarter 1992

	July	August	September
<b>BLS &amp; BEA</b>	<p>BEA performs annual revision of GDP and personal income first quarter 1991 growth:</p> <ul style="list-style-type: none"><li>• incorporates a year of 1991 UI data into wages and personal income</li><li>• GDP -3.0 percent</li><li>• personal income +0.1 percent</li></ul> <p>BEA releases fourth revised estimate of first quarter 1991 growth of state personal income:</p> <ul style="list-style-type: none"><li>• all states +0.1 percent</li><li>• California -2.8 percent</li></ul>	<p>BLS continues to assess causes of revision:</p> <ul style="list-style-type: none"><li>• surveys payroll firms to see whether reporting change affected UI employment</li><li>• evaluates potential causes of revision due to CES</li></ul>	

California  
Department  
of Finance

The press

- The Lisio Report released:
- BLS career bureaucrats attempted to discredit California officials to get out of embarrassing situation
  - BEA is massaging adjustments into data to keep employment up before the election
  - despite downward revision of \$55 billion to wage and salary income, first quarter 1991 GDP hardly affected



**Appendix II  
Chronology of Events for First Quarter 1991  
Data**

**Chronology of Events for First Quarter 1991 Data**

**4th Quarter 1992**

October	November	December
<p>BLS believes employment revision due to UI reporting correction, not fault of CES.</p> <p>BEA releases final revised estimate of first quarter 1991 growth of state personal income:</p> <ul style="list-style-type: none"> <li>• all states -0.1 percent</li> <li>• California -4.1 percent</li> </ul>	<p>BLS testifies before Joint Economic Committee that 1992 revision will be typical.</p> <p>BLS believes problems in California could be result of how California uses CES in projections of revenue.</p>	

Determines employment drop resulted in over a \$10 billion loss in taxable wages from original estimates based on CES.

Believes employment revision due to failure of CES to measure California economy:

- If employment drop had been reporting error only, California would not have experienced parallel decline in wages

Wall Street Journal article released:

- states such as California are frustrated by national data that overestimate the number of jobs
- economists have complained that apparent inaccuracies in the federal jobcount added to wide spread misunderstanding of recession in 1990 and 1991

Philadelphia Inquirer article released:

- economists do not believe federal economic figures
- the government's methods for calculating job growth are obsolete
- Labor Department was embarrassed when tax return data showed 640,000 fewer jobs than Labor had counted

(Figure notes on next page)

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**Appendix II  
Chronology of Events for First Quarter 1991  
Data**

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Note: All data in the figure are at seasonally adjusted annual rates.

\*GDP is measured in dollars adjusted for inflation.

<sup>b</sup>Personal income is measured in dollars not adjusted for inflation.

<sup>c</sup>State personal income is measured in dollars not adjusted for inflation.

<sup>d</sup>Estimates from California ranged from 1 to 2 million.

# Measuring Employment: Questions and Issues

BLS is the agency within the United States Department of Labor responsible for collecting and publishing data on national and state levels of employment, hours, earnings, and wages. BLS collects these data through two measures: (1) a monthly sample of establishments, which is called the Current Employment Statistics (CES) survey; and (2) quarterly reports required by unemployment insurance laws (UI). These data are used in BEA's estimates of GDP, personal income, and state personal income.<sup>1</sup> Once a year, BLS determines a benchmark level of employment by reconciling the difference in the employment levels estimated by these two measures. In 1991, the difference was unusually large at -640,000 positions, or -.6 percent, as the average revision over the past decade has been under 200,000 positions.<sup>2</sup> Historically, a downward revision in employment such as this has generally been thought to mean original CES employment levels were overestimated.

BLS publicly announced the expected revision in testimony before the Joint Economic Committee in November 1991. After making several public statements about how it determined the magnitude of the revision in 1991 and the potential causes of the revision, BLS completed its research in January 1993. In January 1993, in testimony before the Joint Economic Committee, BLS testified that it had completed its research. It announced that 500,000 of the original employment revision (640,000 positions) was due to a one-time, noneconomic correction in how employment was reported in the UI. According to BLS officials, BLS now believes the 1991 benchmark revision was actually 140,000 positions, which is well within the historical average. BLS also announced at that time that it expects a relatively small national employment revision for 1992—under 100,000 positions.

Because of the results of their research, which showed the original 1991 CES estimates to be more accurate, BLS officials continue to believe CES is an adequate measure of monthly employment levels. They are not sure, however, whether the use of CES employment data in wage and revenue estimates is the most effective, as they do not believe there is a simple, direct relationship between changes in employment and changes in wages and revenue.

<sup>1</sup>BEA uses other employment data in its calculations, albeit in a minor way. See appendix IV for more information on other employment data used by BEA.

<sup>2</sup>BLS originally estimated the revision at -650,000 positions; this was later revised to -640,000 positions.

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## BLS Uses Two Methods to Estimate Employment Levels

Because it would be prohibitively time-consuming and costly to survey all industries and all establishments on a monthly basis, BLS measures employment through a monthly sample survey as well through data obtained from quarterly reports required by unemployment insurance laws. CES is BLS' monthly sample of employment and earnings; it produces very timely estimates of monthly changes in employment and earnings levels and provides BLS the ability to control the data quality of individual reports. It is necessary, however, to periodically recalibrate these sample estimates against full population counts. That is the role of the UI reports, which collect employment and wage data from practically the entire universe of the country's nonagricultural establishments subject to unemployment insurance laws. However, the data are collected only once a quarter and are not reported to BLS until about 6 months after the end of each quarter.

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## Current Employment Statistics Survey (CES) Focuses on Month-To-Month Change

Every month state employment security agencies, through a contract with BLS, collect data on employment and earnings from over 380,000 nonagricultural establishments for the CES survey.<sup>3</sup> These data, which are provided voluntarily by the establishments, include monthly employment levels, hours, and earnings based on the number of employees who worked during any part of the pay period that included the 12th of the month.<sup>4</sup> CES data are collected from a sample representing about one-third of the jobs in U.S. establishments subject to unemployment insurance laws. The smaller sample size allows BLS to more tightly control the quality of the monthly data. BLS chooses the CES sample by stratifying the universe of establishments into more homogeneous groups based primarily on industry and size. These groups are called estimating cells. This sampling method practically ensures that larger establishments will be included in the sample, but there is less assurance that smaller establishments will be included. Nonetheless, over half of the establishments sampled in CES have fewer than 50 people.

To determine employment and earnings estimates from this sample, BLS first derives employment and earnings for each estimating cell based on the data provided by the sampled establishments in that cell. Because

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<sup>3</sup>An establishment is an economic unit that produces goods or services, such as a factory, mine, or store. Establishments included in CES are classified by industry on the basis of their major product or activity as determined by the establishments' percent of total sales.

<sup>4</sup>The monthly earnings data from CES are currently limited to only production and nonsupervisory workers and do not include nonwage cash payments. From these data, BEA calculates monthly and quarterly estimates of wages. The quarterly estimates are used in BEA's calculation of GDP and national and state personal income.

there are numerous estimating cells for each industry, BLS sums the totals of each of these industry estimating cells to achieve an employment and earnings total for a particular industry. BLS aggregates the totals for each industry to derive the employment and wage totals for all establishments sampled. BLS then adjusts the totals to compensate for any sampling biases in CES or its inability to capture the entry of new establishments. Although CES data are collected monthly, some establishments in the sample report late and may take up to 3 months after the reporting month to submit and edit their data. As a result, BLS publishes three estimates of each month's data, with each successive estimate based on a greater rate of response from the establishments sampled. Table III.1 shows the release dates and names of the CES estimates, as well as the percent response upon which each estimate was based in 1991.

Table III.1: CES Release Dates, Names, and Response Percentages

Date of release	Name of release	Percent of response
First Friday after end of reporting month	Preliminary	54
30 days later	Revised	82
60 days later	Final	90

Source: BLS.

Every month BLS publishes three estimates of employment—a preliminary release for the previous month, a revised release for 2 months prior, and a final release for 3 months prior.

### Unemployment Insurance Reports (UI) Provide Universal Coverage

BLS' quarterly estimates of employment levels and wages are obtained through the use of UI reports. At the end of each quarter, state employment security agencies, through a contract with BLS, collect data on monthly employment levels and total wages paid in the quarter from over 6.5 million reporting units.<sup>5</sup> The units report data for the universe of the nation's nonagricultural establishments subject to unemployment insurance laws. As these laws cover about 98 percent of employees in the total nonfarm sector and 97 percent of those in the private nonfarm sector, UI data are considered to represent the universe of nonfarm employees working in the United States. In UI reports, as in CES, respondents are asked to report the number of employees employed during any part of the pay period that includes the 12th of each of the months in the quarter.

<sup>5</sup>A reporting unit is the economic unit for which an establishment submits reports of employment and wage information required by unemployment insurance laws. Establishments must have different reporting units for each location of service and for each different good or service they provide.

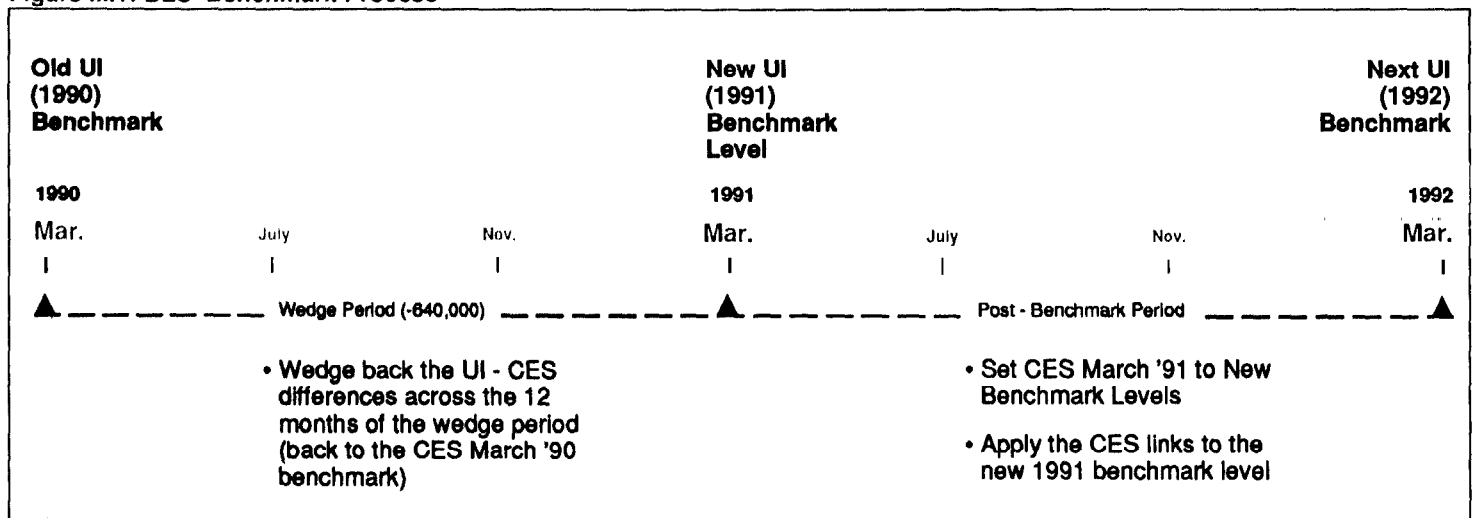
However, these respondents are also asked to report total wages paid during this quarter.

BLS does not begin to receive UI data, however, until about 6 months after the end of the quarter. For example, although the first quarter of a year ends in March, UI data are generally not submitted to BLS until September and are not finalized until December. BLS publishes annual UI data once a year.

## BLS Compares CES and UI to Determine Employment Level

The use of both data instruments allows BLS to set employment trends according to CES, the more accurate gauge of monthly change, while using the UI as a fixed, point-in-time anchor to set the levels of employment. By reconciling the differences in estimated employment between the two, BLS believes it is able to provide an accurate assessment of the annual level of employment (by using the UI count) while maintaining accurate month-to-month changes in employment (by using the monthly CES changes). This is called the benchmark process; the benchmark process for 1991 is illustrated in figure III.1.

Figure III.1: BLS' Benchmark Process



Source: BLS.

BLS receives preliminary UI employment data in September for the first quarter of the particular year. It compares the level of employment defined by UI for March of that year to the level estimated by CES for the same time period. As the UI is a universe count, its employment level for March is maintained, while the CES level is adjusted. The difference between the two surveys—called the benchmark revision—has averaged + .2 percent and ranged + .5 percent between 1980 and 1990.

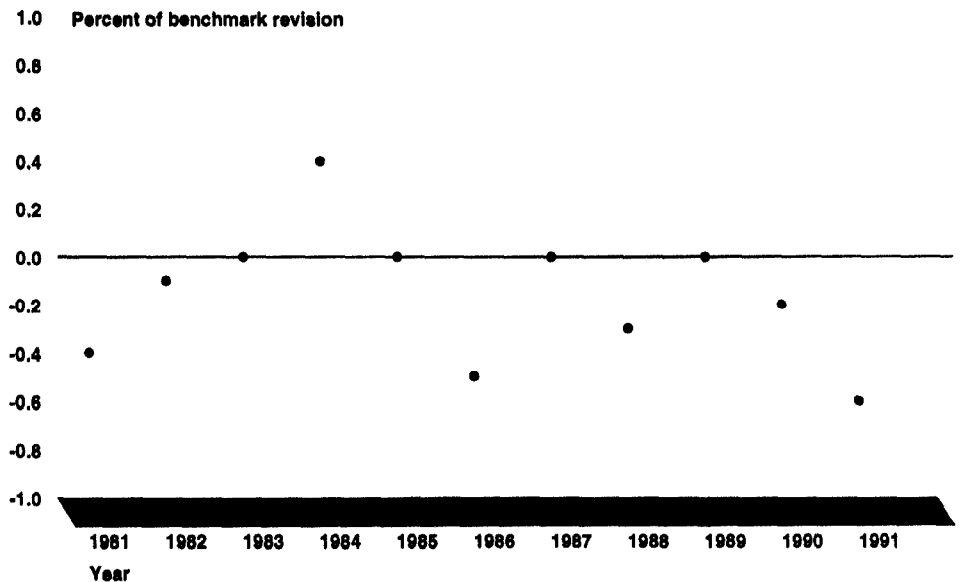
BLS then revises monthly CES estimates for the preceding year (from the current March to the prior April) following the establishment of this benchmark level of employment. The benchmark difference for the current year (in 1991 it was 640,000 positions for March) is “wedged back” incrementally to the previous April. For example, the prior April receives 1/12 of the difference, May receives 2/12, June receives 3/12, and so on, so the current March will amount to 12/12 of the difference. According to BLS officials, the wedging procedure reflects BLS’ assumption that the difference occurred incrementally during the year. Also on the basis of this benchmark level of employment, BLS revises CES monthly estimates for the succeeding year (from the current March to the next March). BLS then has a benchmarked level of employment for the current March, which will be used as a starting point for the next year’s benchmark process. BLS normally releases the results of its benchmark revision in June of the next year.

**BLS Originally Reported an  
Atypically Large Revision in  
1991**

In November 1991, BLS reported that the benchmark revision was atypically large, at -640,000 positions (-0.6 percent). The downward adjustment affected all major industries except manufacturing. It especially affected the services industry, which showed a decrease of 1.6 percent. BLS officials attributed much of the decrease in the services area to changes in the definitions of what constituted services positions. Historically, the CES survey estimates and the UI universe counts have tracked very closely. Figure III.2 shows a pattern of relatively small annual revisions since 1981. It was the break in this pattern in 1991 that caused the extensive media attention.

Appendix III  
Measuring Employment: Questions and  
Issues

Figure III.2: Benchmark Revision,  
1981-1991



Note: The revision indicates the percent difference between original CES levels of employment and UI levels of employment.

Source: BLS.

BLS first realized there would be a large revision in 1991 when it began receiving preliminary UI data in September 1991 for the first quarter of that year. At that time, BLS noticed that UI employment levels for first quarter 1991 were significantly lower than CES estimates for the same time period. BLS immediately began research to determine the cause of the large discrepancy; however, according to BLS, the analysis was made difficult by the fact that the difference was widespread across industries. In November of 1991, the Commissioner of BLS publicly announced the likely downward revision (at that time estimated at 650,000) in her regular monthly testimony before the Joint Economic Committee. The early announcement of the expected revision represented a deviation from standard procedure, since BLS ordinarily does not announce the benchmark revision until June of the following year. According to BLS officials, however, BLS believed it needed to inform Congress and the public about the expected revision in order to combat erroneous estimates in the press about the expected size of the revision.



These statements of erroneous estimates had been widely cited in press reports beginning in September of 1991 and were estimated at as high as 2 million positions. The primary source of these erroneous estimates was the California Department of Finance.<sup>6</sup>

Between November 1991 and June 1992, in an effort to accurately inform BLS' data users and to combat misinformation in the press, BLS issued a number of press releases and testimonies about the expected revision and BLS' efforts to determine the causes of the revision. For example, in February 1992, the Deputy Commissioner of BLS testified before the Joint Economic Committee and discussed the continuing allegations made by the press and California officials that the employment revision could be as much as 2 million positions. He said BLS still estimated the revision would be about -650,000 positions. He also noted that the unemployment count would be unaffected by this adjustment.

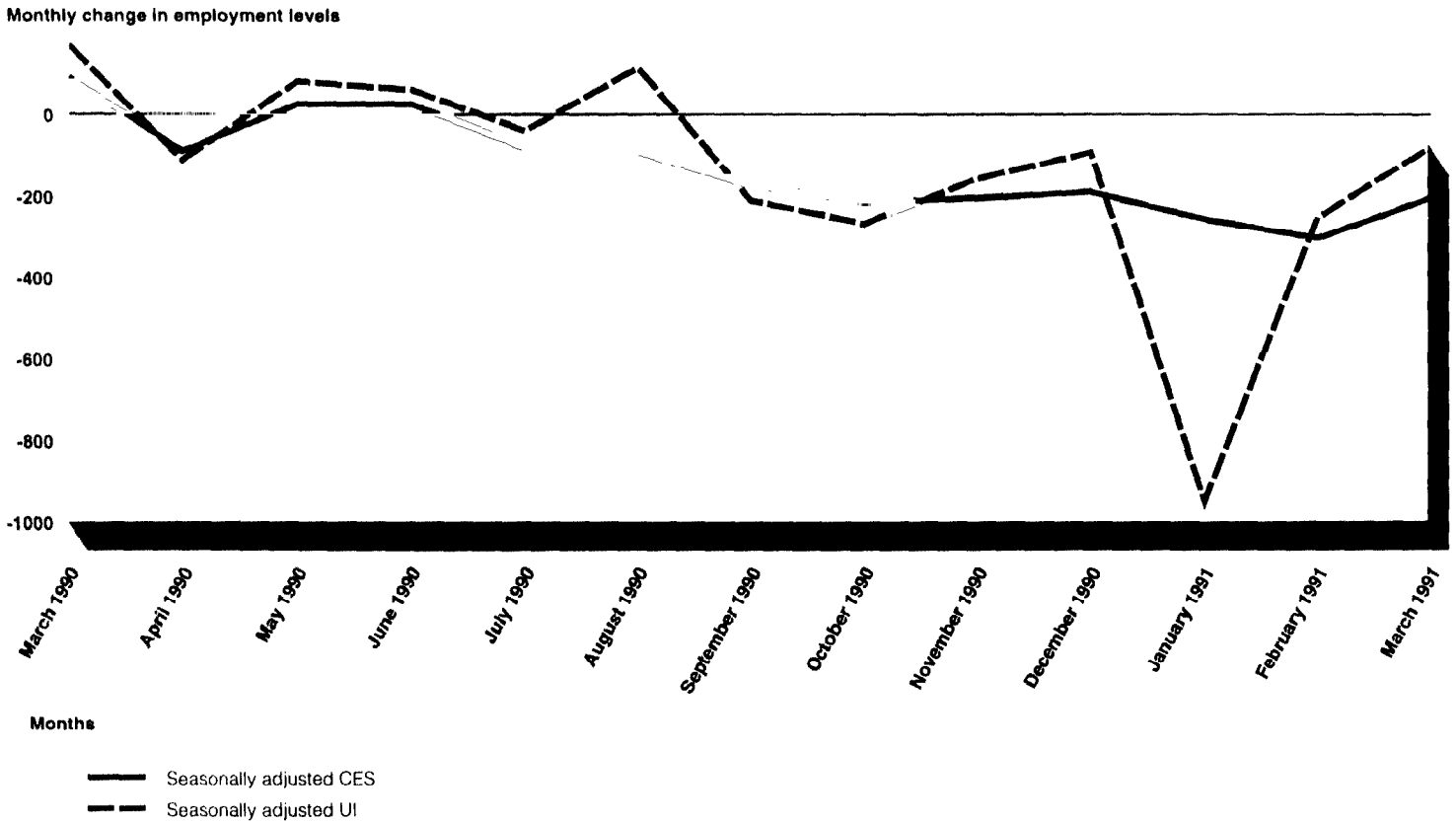
In February BLS also issued a set of detailed questions and answers in response to continued speculation in news reports about the expected revision. In June 1992 BLS issued the final results of the revision, along with a public explanation of how it performed the benchmark and current efforts it was undertaking to assess the causes of the revision. At this time BLS announced that the final downward employment revision was actually 640,000 positions, or about -.6 percent. At this time, BLS also explained in detail that the employment decline in 1991 occurred during a 1-month time frame. As shown in figure III.2, the CES estimates and UI records tracked very closely with each other for all months except for January 1991.

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<sup>6</sup>California officials said their original estimates were the total of the benchmark revisions in the largest states; they did not realize there was such a wide discrepancy between the total of the states' estimates and the national estimate. They claim there was a lack of explanation or communication between BLS and the public about this. BLS officials denied this, providing documentation that showed they had briefed the Finance staff on numerous occasions between November 1991 and February 1992 that the projected national employment revision would be approximately 650,000 positions. According to BLS officials, despite these briefings, California officials continued to provide misinformation to the press.

Appendix III  
 Measuring Employment: Questions and  
 Issues

Figure III.3: Estimated Change in Monthly Employment Levels by CES and UI, March 1990 to March 1991



Source: BLS.

At that time, BLS also discussed the preliminary findings of its research, which suggested that a significant portion of the 1991 revision could be attributed to changes in UI employment reporting procedures put in place in January 1991. In addition, BLS also ruled out a number of possible CES survey causes that had been suggested, and it reported that other major national employment-related indicators had not shown a significant worsening of the economy during January 1991 as suggested by the UI data.

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BLS officials believe the atypically large revision in 1991 brought to the forefront many long-standing concerns about CES' ability to adequately measure employment. Research completed by BLS, however, has allowed it to discount many possible sources of the benchmark revision due to potential inadequacies in the CES. For example, there has long been a question of whether CES can adequately measure business births and deaths on a timely basis. However, BLS investigated the possibility that business deaths contributed disproportionately to the 1991 revision and found that nearly all of the January employment decline was in firms that are still viable.

BLS also ruled out another concern about CES that CES is biased towards larger and more stable establishments due to how the CES sample is drawn. It is possible that the sample, which covers more employees in large establishments than in small ones, could have prevented detection of a sudden employment decline concentrated among smaller and less stable establishments. BLS officials said, however, that there was no evidence of systematic survey bias, as the discrepancy occurred all in 1 month, and BLS believes such a bias would build gradually over the course of many months.

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### UI Reporting Change Primary Cause of 1991 Revision

In January 1993, in his testimony before the Joint Economic Committee, the Deputy Commissioner of BLS discussed the final results of BLS' research into the causes of the 1991 revision. He said that 500,000 of the 640,000 revision resulted from a one-time, noneconomic improvement in the UI employment counts and was not due to an error in CES employment data. As a result, the actual benchmark revision for 1991 was 140,000, which is well within the historical average and range. Additionally, BLS found that approximately 200,000 of the benchmark revision in California for 1991 (-320,000 positions) was due to the correction.

According to BLS, the drop in the January 1991 UI employment counts was due to the implementation of new employment reporting procedures. As a result of a BLS effort to clarify employment definitions, UI respondents realized that they were reporting employment levels on the basis of the number of paychecks issued rather than the number of employees on the rolls. This practice resulted in an overestimate of employment levels.<sup>7</sup> Other overstatements resulted from reporting employees who worked at

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<sup>7</sup>The overestimation of employment could result if someone receives two checks—for instance, a regular payroll check and a bonus check. While this represents only one employee, it represents two checks and the payroll firm may have reported it as two employees.

any time during the month or quarter, or from counting individuals who were still on an employer's file but no longer employed.

According to BLS, the effect was magnified beyond what might have been expected to result from individual respondent corrections because many UI reports are prepared using standard payroll or tax processing industry software. As software was corrected, the effect was reflected in corrected employment counts for a large number of firms.

The remaining issue for BLS is how to adjust the historical, pre-1991 employment series to correct for historical overreporting in the UI data. While the precise methodology is still being developed, BLS may incorporate the 500,000 overcount into the series by assuming that the overcount occurred incrementally over the last 10 years, culminating in the 500,000 error in 1991. According to BLS officials, however, this will not significantly affect historical data; existing month-to-month movements will essentially be preserved at a slightly lower total employment level.

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### **BLS Anticipates a Typical Revision for 1992**

In November 1992, the Deputy Commissioner had told the Joint Economic Committee that BLS expected the 1992 benchmark to produce a typical, relatively small revision of less than 100,000 positions, which is well within the historical revision over the past decade. He confirmed this in his January 1993 testimony. Again, BLS officials said they believed such an announcement was necessary to preempt and address potential questions about the size of the current year's benchmark revision.

BLS officials said all states except for California will have a typical revision in 1992. California will have a larger than normal revision, but one smaller than last year. According to BLS officials, a typical national revision and a large revision only in California is further evidence that there is not an ongoing systemic problem in either data series used to measure employment. BLS officials said the larger than typical revision in California was the result of more reporting improvements being made by UI respondents in California.<sup>8</sup>

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### **Implications of the 1991 Revision**

The atypically large employment revision in 1991 caused many questions and allegations to be raised about the measurement of employment and its use in national economic statistics. Additionally, despite BLS' continued public announcements about the revision and its recent announcement

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<sup>8</sup>BLS officials also said that California's CES estimates have been fairly accurate over the last decade.

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that the expected 1992 revision will be typical and its more recent announcement that the revision was due to a one-time, noneconomic improvement in UI reporting, questions and allegations continue over the adequacy of employment measures.

BLS officials said they are aware of the concerns and questions about the accuracy of employment data; they said they believe there continues to be repeated confusion in the press about the various measures of employment, and especially, its relationship to wages and revenue. They also believe this confusion contributed to some of the press allegations concerning BLS' ability to adequately measure employment. BLS has already asked for an outside review of its research and methodology used for first quarter 1991 data, and would welcome a broader review to not only assure users of the integrity and adequacy of BLS' employment data, but also to provide information for BLS users on the limitations in the use of employment data wage and revenue forecasts.

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**California Department of  
Finance Has Concerns  
With CES Adequacy**

While BLS officials maintain CES is a valid measure of monthly employment and earnings, the California Department of Finance continues to express its concerns about CES for several reasons. For several decades the Department has used the employment levels estimated by CES and the average wages as identified by UI to project taxable wages for the state budget. In 1991, the projections made from CES called for a slight reduction in wages; however, the wages reported by UI showed a further decline of about \$10 billion. According to California officials, this decline in wages caused about one-third (\$900 million) of the state's revenue shortfall for the 1991-1992 fiscal year. Because of this real decline in taxable wages, California Finance officials do not believe the employment decline in 1991 represented merely a reporting change. They believe that if it had only been a reporting change, wages from the UI would not have decreased significantly from the original CES-based estimates. Although California will experience another large employment revision in 1992, Finance officials said they do not expect to see any additional decline in estimated wages similar to first quarter 1991 because they did not use CES to estimate wages for 1992.

The fundamental issue for the Finance Department is the adequacy of CES for estimating employment and subsequently, state wage revenues. California Finance officials said they believe that UI is inherently a better measure of employment and wages because UI data represent virtually a census of nonagricultural employees working in the country and UI wage

data have historically tracked very closely with California tax return data. The officials admit, however, that perhaps CES may be adequate for other states, but not California. The officials said they believe one of the major problems could be California's sheer size; it alone makes up 12 percent of the population and 14 percent of personal income. As a result, if there are deficiencies in CES, it is likely California would experience them to a greater degree than a smaller state. Another problem could be that the recession in California has hit hardest in those areas CES may not measure adequately, such as services and construction.

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**BLS Does Not Believe  
Employment Data Best  
Indicator of Revenue and  
Wages**

BLS officials said the California Department of Finance has not demonstrated the relationship between employment and wages and revenue; as a result, it may be using CES data incorrectly in its revenue forecasting model. According to BLS officials, there may not be a simple, direct link between employment and wage movements, so CES employment data may not be the best basis for estimating state revenue. To determine the relationship between the employment change and wage change, BLS compared the historical relationship between the two as reported in UI reports, which are generally considered the most accurate measure of employment levels. BLS' analysis for the last two decades indicated that there was no direct relationship between a change in employment and a change in wages. For example, while employment dropped about 4 percent between fourth quarter 1990 and first quarter 1991 (this includes the 640,000), wages dropped almost 10 percent. As a result, BLS officials question whether employment data reported by either CES or UI should be used in revenue estimates. BLS' analysis also causes it to question the relative importance of employment in these estimates, when wages seem to change with a greater volatility than does employment. BLS officials pointed out also that the limited scope of CES data (CES covers only production nonsupervisory workers and excludes cash payments) limits BEA's ability to construct wages and salaries for all employees. BLS has proposed research, which is scheduled to begin this year, to expand the scope of CES to obtain wage data.

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**BLS Would Welcome a  
Review of Employment**

BLS officials said BLS has made extensive efforts to fully inform the public of how employment is measured and to ensure the public of BLS' integrity. BLS officials said they believe the press and state allegations are based on incorrect data or faulty assumptions. The officials believe the allegations made by the California Department of Finance may have been explicit efforts to blame other sources for California's poor revenue forecast

performance in 1991. California Finance officials deny this, saying that California's fiscal condition merely reflects the state's economy; the problem, however, was that the economy was far better reflected in state UI data than in official BEA or BLS data.

Although BLS continues to believe CES is an adequate measure of employment, as the recent announcement about the 1991 benchmark indicates, BLS officials acknowledge that a great deal of confusion continues about how employment data is measured and how it should be used. BLS is interested in assuring the public that its data collection methods produce accurate data. To that end, BLS has contracted for an outside review by the American Statistical Association of its research findings and conclusions about the cause of the 1991 benchmark revision. BLS officials said BLS would also welcome an additional outside study to prove not only the integrity and accuracy of BLS' data, but also to help it obtain information on how others use its data, and potential limitations in using employment data in wage and revenue estimates.

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# Measuring GDP and Personal Income and the Use of BLS Employment Data

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BEA is the agency within the U.S. Department of Commerce responsible for calculating and releasing a vast array of statistics designed to measure U.S. economic performance and competitiveness. At the heart of these statistics are the National Income and Product Accounts (NIPAS), which summarize the production, distribution, consumption, and saving undertaken in the United States. One of the NIPA accounts measures gross domestic product (GDP), the total production of goods and services in the United States. Another NIPA account measures personal income, which includes income received by persons regardless of whether the income earned contributes to national production. Using similar concepts, BEA also estimates personal income for each state and the District of Columbia. BLS employment, hours, earnings, and wage data from CES and UI are among the many sources used by BEA in these estimates.

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## Estimates of National Production and Income

The NIPAS provide a statistical depiction of the production, distribution, consumption, and saving undertaken in the U.S. economy. Two of the accounts within the NIPAS measure GDP and personal income.<sup>1</sup> As shown below, while CES and UI data are used in the NIPA account measuring GDP, they are not critical to determining the actual level of GDP. CES and UI data, however, are more important in the NIPA calculation of personal income, as wages and salaries account for over half of the level of income.

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## Estimating the Gross Domestic Product

GDP measures the total market value of all goods and services produced by labor and property located in the United States. It is used extensively to track the economy's cyclical fluctuations and to monitor long-term growth. As shown in table IV.1, one of the accounts of the NIPAS measures GDP. The right side of this account, commonly referred to as the "product side," measures GDP as the sum of goods and services sold to final users. The largest component of the product side is personal consumption expenditures. Other major components of the product side are government purchases of goods and services, gross private domestic investment, and net exports (exports less imports).

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<sup>1</sup>The other accounts within the NIPA structure measure government receipts and expenditures, foreign transactions, and gross saving and investment.



**Appendix IV  
Measuring GDP and Personal Income and  
the Use of BLS Employment Data**

**Table IV.1: National Income and  
Product Account Structure, 1991**

In billions of dollars

<b>Income payments and other costs</b>		<b>Goods and services sold to final users</b>	
Compensation of employees	\$3,390.8	Personal consumption expenditures	\$3,887.7
Wages and salaries	2,812.2		
Other labor income	288.3		
Social insurance contributions	290.3		
Proprietor's income	368.0	Gross private domestic investment	721.1
Rental income	-10.4	Net exports of goods and services	-21.8
Corporate profits	346.3	Government purchases of goods and services	1,090.5
Net interest	449.5		
<b>National income</b>	<b>4,544.2</b>		
Other costs and charges	1,111.4		
<b>Total charges against GDP</b>	<b>5,655.6</b>		
Statistical discrepancy	21.9		
<b>Gross domestic product</b>	<b>\$5,677.5</b>	<b>Gross domestic product</b>	<b>\$5,677.5</b>

Source: BEA.

The left side of the account, commonly called the "income side," measures the sum of income payments and other costs incurred in the actual production of GDP, i.e., it is the sum of charges against GDP. The largest component on the income side is compensation of employees, the wages and salaries part of which is based primarily on BLS' CES and UI data. Other labor income—social insurance contributions—is based on several sources, including tabulations by the Internal Revenue Service. Other components of the income side are proprietors' income, rental income of persons, corporate profits, and net interest. The income side also includes other costs and charges, such as government subsidies, capital consumption, and the flow of capital for U.S. production.

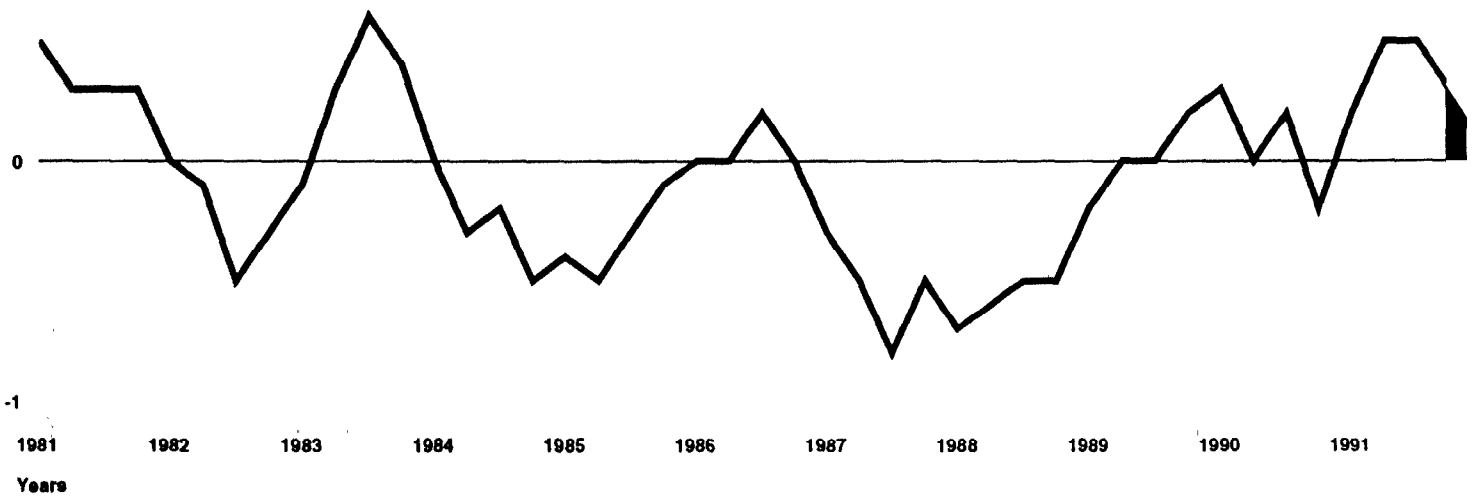
For the most part, the product and income side of this account can be measured independently of each other, and this independent measurement allows BEA to check for accuracy. For example, it is possible to measure not only the sales of new cars but also the wages and salaries and the profits earned by the automobile manufacturers and their suppliers in

**Appendix IV  
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making those new cars. Conceptually, the income side should add up to the product side of the account; in practice, however, there is always some difference between the two sides. The balancing item that reconciles the two sides is called the statistical discrepancy, which is always placed on the income side and is small in percentage terms. According to BEA officials, when the statistical discrepancy becomes too large, BEA looks for errors and may modify its estimates. The statistical discrepancy, as shown in figure IV.1, ranged from  $-.7$  to  $.6$  percent of GDP over the last 11 years. Even in the first quarter 1991 when the statistical discrepancy increased \$10 billion after BEA accounted for the first quarter 1991 UI data in December 1991, the discrepancy was still only  $.2$  percent of GDP, which is within the historical range.

**Figure IV.1: Statistical Discrepancy as a Percent of GDP 1981-1991**

1 Percent as of each quarter



Note: A negative percent means the income side of NIPA is greater than the product side. A positive percent means the product side of NIPA is greater than the income side.

Source: BEA.

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**Appendix IV  
Measuring GDP and Personal Income and  
the Use of BLS Employment Data**

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The official measure of GDP is based on the product side because there is wide agreement that the product side measurement is more accurate than the income side measurement.<sup>2</sup> CES and UI data from BLS play only a minor role in the product side and thus have little effect on the level or growth of GDP.<sup>3</sup>

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**Estimates of Personal  
Income**

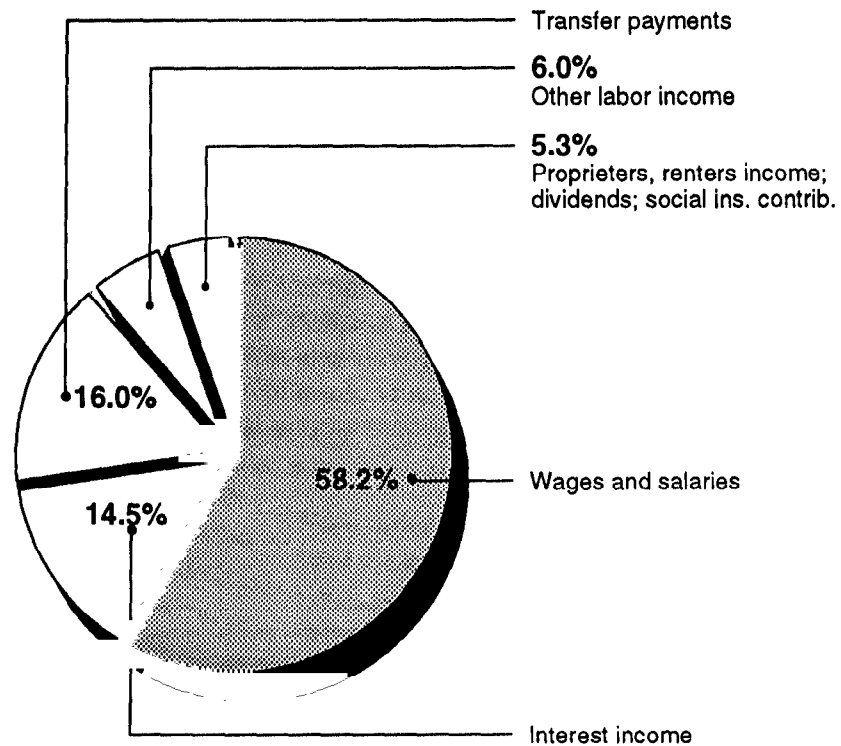
Personal income, unlike the income measured as charges against GDP, includes transfer payments, which is income received by persons whose services did not contribute to production. Transfer payments can include Social Security, welfare, unemployment insurance, and Medicare. However, wages and salaries—based on BLS' CES and UI data—are the largest component; in 1991, they accounted for almost 60 percent of personal income.

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<sup>2</sup>Developments in recent years have improved the accuracy of the product side over the income side. For example, there have been improvements in the quarterly estimates of several product side components, such as business inventory component of gross private domestic investment, while the growth of taxpayer misreporting may have diminished the accuracy of the income side, given that the adjustments for this misreporting are rough estimates.

<sup>3</sup>There are some income data from BLS, such as for physicians, that are used to impute components of the product side. Additionally, there are some additional wage data that are used to estimate both output and income of certain sectors of the economy (such as the use of wages of government workers and domestic workers of nonprofit institutions). These data are not derived from CES or UI.

Figure IV.2: Components of Personal  
Income, 1991



Note: Social insurance contributions are always negative components of personal income.

Source: BEA.

## Release Schedule of GDP and Personal Income

BEA strives to make its estimates both timely and accurate; however, because BEA does not collect its own data but rather receives data from a number of other sources, it does not have a great deal of control over when or how it receives its source data. To respond to the competing demands for timeliness and accuracy, BEA releases initial estimates for a specific period based on preliminary source data, then releases several revisions that incorporate better and more complete source data.

BEA revises and releases GDP and personal income estimates on the same quarterly and annual schedule; personal income estimates are also available monthly as a part of BEA's personal income and outlays release. Personal income data (including monthly wages and salaries) are released about 30 days after the end of the reference month. BEA then uses these

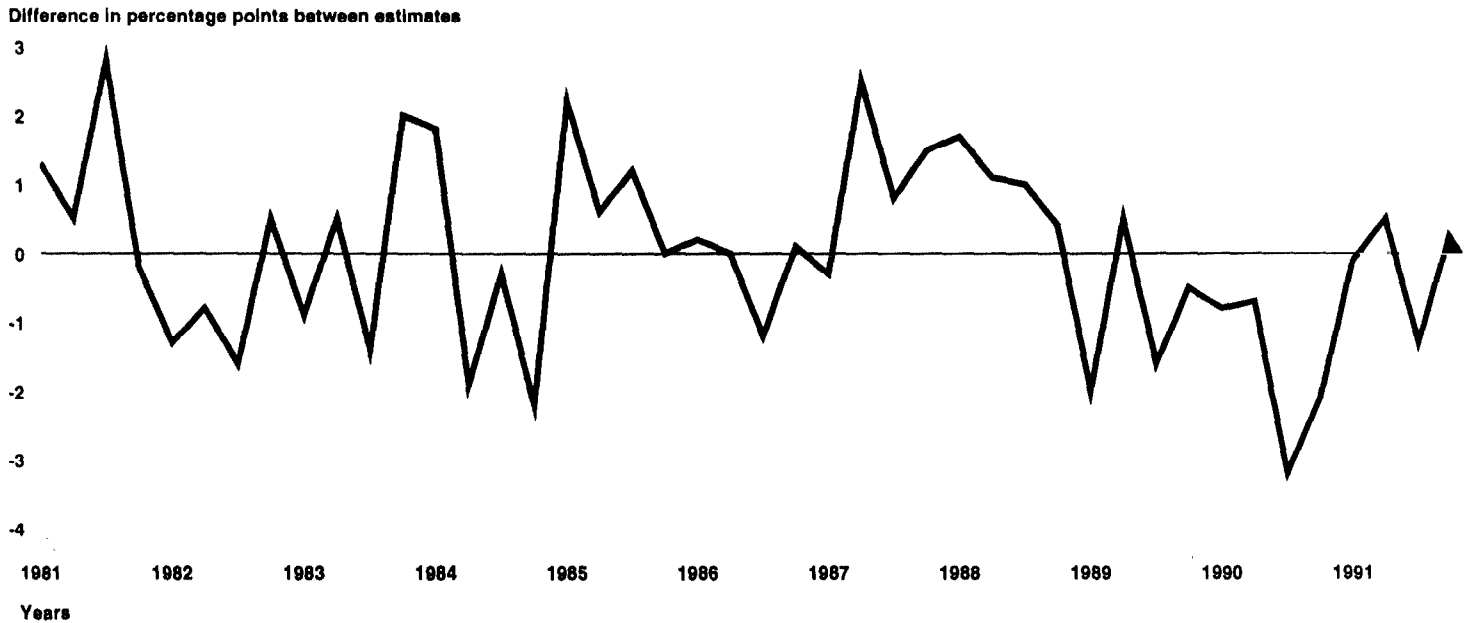
monthly estimates to derive the quarterly estimates of wages and salaries used in personal income and GDP quarterly estimates.

The first estimate of quarterly GDP and personal income (called the advance estimate) is released about 30 days after the end of the reference quarter. BEA then revises this estimate and releases a second estimate (called the preliminary estimate) approximately 30 days later. BEA revises the estimate again and issues a third estimate (called the final estimate) of GDP and personal income approximately 30 days later. The final estimate remains fixed until the following July, when BEA performs an annual revision of quarterly and annual GDP and personal income.

The annual revision incorporates new and revised source data from annual surveys and administrative records, along with updated seasonal factors. For example, the annual revision incorporates annual UI wage and salary data. The annual revision typically covers GDP and personal income annual estimates for the past 3 years, and quarterly estimates for the prior 12 quarters. It also covers the first quarter of the current year of the July revision.

As shown in figure IV.3, the degree of revisions in estimated growth between the advance estimate and the first annual revision for GDP has ranged from 2.8 to -3.2 percentage points over the last 11 years, with an absolute average value of 1.1 percentage points (i.e., the average change without regard to sign). This means that the advance estimates of growth have been between 2.8 percentage points lower or 3.2 percentage points higher than the growth shown at the first annual revision. For first quarter 1991 GDP growth, the difference between the advance estimate and the first annual revision was -.1 percentage point, which is well within the historical average and range. As also shown in figure IV.3, in the last 11 years there has been little upward or downward bias in the revisions, as the advance estimates of GDP are neither consistently optimistic or pessimistic when compared to the later estimates, which are based on more complete source data.

Figure IV.3: Degree of Revisions in GDP Growth Estimates From the Advance Estimate to the First Annual Revision, 1981-1991



Source: BEA.

Approximately every 5 years, BEA performs a comprehensive revision of both the quarterly and annual GDP and personal income estimates. The comprehensive revision differs from the annual revision in that in addition to incorporating new data, such as the results of the latest economic censuses, the comprehensive revision also incorporates definitional and statistical changes and covers more years of data.

### Use of BLS Data to Estimate Wages and Salaries for GDP and Personal Income

BEA uses the monthly CES data to estimate monthly wages and salaries, which is the largest component of monthly estimates of personal income. For most industries, BEA determines wages and salaries by multiplying CES employment levels times average hourly earnings and weekly hours.

Total wages of production and nonsupervisory workers, and the total salaries of supervisory, clerical, and other nonproduction employees for

manufacturing industries are estimated separately. Wages are the product of production worker employment, average weekly hours for which pay is received, and average hourly earnings (including overtime). BEA estimates total salaries by applying the estimated percentage change in the product of the employment level and the straight time hourly earnings of production workers to the prior period total salaries estimate. This procedure reflects the assumptions that (1) the average weekly hours for which salaried workers are paid remains constant, and (2) the straight-time hourly earnings of wage earners and the hourly earnings of salaried workers both change by the same percentage during the year.

For those employees not covered by CES, BEA uses other information to estimate monthly wages and salaries. These include the wages and salaries of farm employees, which are derived from USDA information; federal civilian employees, which incorporate information provided by the Office of Personnel Management; military wages and salaries, which are based on Department of Defense strength figures and BEA's average earnings estimates; and private households, which are prepared by using data from the Current Population Survey (a separate household survey).

BEA sums the monthly estimates of wages and salaries to derive an estimate for total wages and salaries for the quarter.<sup>4</sup> These estimates are then used in BEA's advance, preliminary, and final estimates of GDP and personal income.

About 6 months after the end of each quarter, BEA begins to receive UI data from BLS that shows total employment and wages and salaries for the entire quarter. UI data represent a census of those employees covered by CES, so BEA only needs to estimate the wages and salaries for the small number of employees not covered by UI (generally the same as those not covered by CES, discussed above). With the 6-month lag in UI data, the first chance BEA normally has to incorporate UI wage data into its quarterly GDP and personal income estimates is the following July as part of the first scheduled annual revision of quarterly GDP and personal income estimates.

By this time BEA has received four quarters of UI wage and salary data. BEA then adjusts the average annual level of CES wages and salaries<sup>5</sup> to equal

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<sup>4</sup>BEA estimates the quarterly values of other labor income (i.e., employer contributions) included in personal income by assuming that a direct relationship exists between employer contributions and wages and salaries in each type of industry division (manufacturing, retail trade, services, etc.).

<sup>5</sup>BEA derives its annual estimates of other labor income from the Internal Revenue Service, the Health Care Financing Administration, and private sources, such as the U.S. Chamber of Commerce and trade associations.

the annual average level of UI wages and salaries. The quarterly estimates are then revised so that the level of wages and salaries for the year reflects the level of wages shown by the UI. The estimates, however, still maintain the quarterly pattern of change identified by CES data.

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## Estimates of State Personal Income

In addition to its national measures of income, BEA also estimates state personal income, the largest component of which is wages and salaries based on BLS' CES and UI data. State personal income estimates have a different revision and release schedule than do the national estimates, and the sum of the 50 states' and the District of Columbia's personal income is slightly different from personal income because of different source data used at the national level. BEA methodology, however, calls for the rate of growth in the wages and salaries used to estimate state personal income to be adjusted to equal the rate of growth in the wages and salaries used to estimate personal income at the national level.

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## Estimating State Personal Income

State personal income includes all income received by, or on behalf of, all residents of a state; it does not, however, include the earnings of federal civilian and military personnel stationed abroad and of U.S. residents employed abroad by U.S. firms. In calculating state personal income, BEA ties the actual rate of growth of wages and salaries in state personal income to the rate of growth of the wages and salaries used to estimate the most recent personal income estimates at the national level. In this fashion, BEA uses national wage and salary growth estimates to act as a control for the state wage and salary growth estimates. Specifically, standard procedure calls for BEA to determine the difference, by industry, between the rate of wage and salary growth for the sum of all states and the rate of wage and salary growth for national estimates used in the most recent estimate of personal income at the national level. This difference is then allocated across all states, with each state receiving a proportional share of the gap by industry. In so doing, BEA adjusts the sum of all states' industry wage and salary growth to equal the growth of the wages and salaries in that industry at the national level. For example, if there were a 5-percent gap between the construction wages and salaries at the national level and the construction wages and salaries for the sum of all states, BEA would adjust each state's construction wages and salaries by 5 percent. This then yields an additive system wherein state growth sums to the national growth.<sup>6</sup> After adjusting the wages and salaries, BEA then adds in

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<sup>6</sup>According to BEA, different source data and estimating schedules for the national and state estimates can still result in temporary statistical differences between the growth in the two estimates.



other labor income, which it receives from other sources often on an annualized or national basis. It allocates other labor income based on the proportion of wages and salaries by industry for each state. BEA then allocates nonwage data based on other available and relevant state data.<sup>7</sup>

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## **Release of State Personal Income Estimates**

BEA publishes quarterly and annual estimates of state personal income and its wages and salaries component. The first estimate of quarterly state personal income is released 4 months after the end of the reference quarter and is based on the wage and salary data BEA estimates from CES and other sources discussed above. Three months later (7 months after the end of the reference quarter), BEA issues a revised state personal income estimate that incorporates available UI data. These estimates are then revised at successive 3-month intervals as improved UI data become available.

Every year in October, the quarterly estimates for the prior 13 quarters are revised on the basis of annual estimates released 2 months prior in August. Additionally, every April, the prior 15 quarters of estimates are also revised on the basis of updated state data. In January and July of each year, at least the quarter immediately preceding the current quarter is revised according to updated state data.

BEA also publishes annual estimates of state personal income. The preliminary annual estimates, which are published in April of the year following the reference year, are derived primarily from quarterly data, and most private wages are based on three quarters of a year's worth of UI data. Four months later, in August, after BEA has received the final quarter of UI data, BEA publishes annual estimates of state personal income. These are developed independently of the quarterly series in greater component detail, mainly from federal and state government administrative records. In April of the next year (16 months after the close of the reference year), revised annual estimates are published that incorporate newly available information. After these three steps, the annual estimates are subject to further revision in April and August for several succeeding years as additional data become available. Routine revisions of the state personal income estimates for a given year are normally completed with the fourth yearly April publication. Thereafter, further changes result only from a comprehensive revision of all the national income and product accounts

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<sup>7</sup>For example, a nonwage income item such as UI benefits paid to individuals is allocated by state on the basis of unemployment benefits reported by the Department of Labor.

(approximately every 5 years) or to improve the estimates through the incorporation of additional or more current state and local area data.

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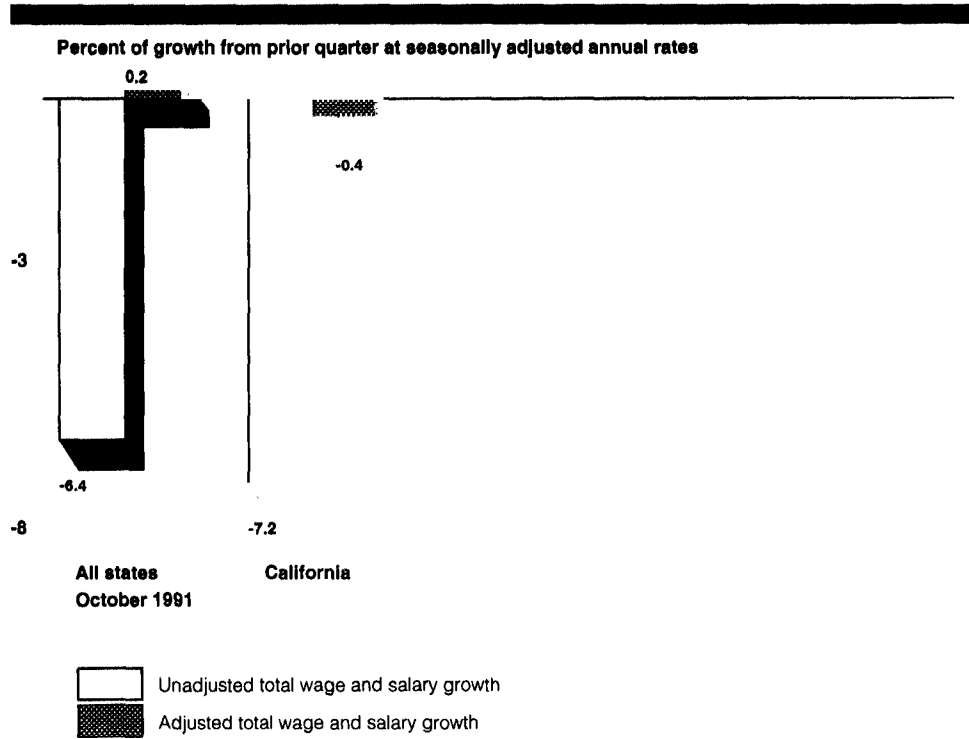
### **Use of BLS Data to Estimate Wages and Salaries for State Personal Income**

BEA uses BLS CES employment data to determine the first estimate of state wages and salaries (the largest component of state personal income). For most industries, the wage and salary data produced in the first estimate of state personal income (released 4 months after the end of the reference quarter) are determined using the growth in CES-based employment change for those industries. For manufacturing, wage and salary estimates are made by using the growth rate of the product of employment and production workers' average earnings.

After BEA begins to receive state UI employment and wage data about 6 months after the end of the reference quarter, however, the procedure differs. Because BEA has access to the UI data for that particular quarter before it makes its first revision (7 months after the end of the quarter), BEA is able to incorporate quarterly UI data into its first revision of state personal income. Standard procedure at BEA, however, calls for BEA to adjust the states' wage and salary growth in various industries as shown by the UI data so that the growth is equal to the rate of wage and salary growth for that industry that was used in the most recent estimate of personal income at the national level. Because the previous national estimate of wage and salary growth at this time is always based on CES, the amount of adjustment required depends on the difference between CES-based wages and salaries and UI-based wages and salaries.

In 1991, the adjustment was particularly noticeable, as UI wages and salaries were significantly different from the original CES-based wages and salaries estimates. As shown in figure IV.4, the original decline (for all industries) of first quarter 1991 total wages and salaries (before adjusting the UI-based industries to the national growth rate) for the sum of all states and California was -6.4 and -7.2 percent, respectively. However, after adjustment upwards to match the original CES-based estimates of wages and salaries used in the national data, wages and salaries growth was 0.2 percent growth for the sum of all states and only a -0.4 percent decline for California.

Figure IV.4: Growth Rate of First  
 Quarter 1991 Wages and Salaries  
 Before and After Adjustment by BEA



Source: BEA.

State personal income estimates continue to be revised every 3 months to incorporate updated UI data. The growth rate in UI wages and salaries, however, continues to be adjusted to equal those used in personal income at the national level. Even after BEA has completed its annual revision of personal income at the national level in July and its state annual revision in August (when national and state wages and salaries are based on a year's worth of UI data), the need for adjustment continues. Although at this point all wage and salary levels of annual estimates for personal income at the national and state level are based on a year's worth of UI data, the national wage and salary quarterly estimates still maintain the original CES pattern of estimated quarterly growth in wages and salaries. As a result, the quarterly rate of change for wages and salaries at the state level is still adjusted to the original CES-based estimates of the quarterly rate of change used in national data.

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