EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS

THE ECONOMIC IMPACT OF THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

SIXTH QUARTERLY REPORT

MARCH 18, 2011

THE ECONOMIC IMPACT OF THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009
SIXTH QUARTERLY REPORT

EXECUTIVE SUMMARY

As part of the unprecedented accountability and transparency provisions included in the American Recovery and Reinvestment Act of 2009 (ARRA), the Council of Economic Advisers (CEA) is charged with providing to Congress quarterly reports on the effects of the Recovery Act on overall economic activity, and on employment in particular. This is the sixth report and it provides an assessment of the effects of the Act through the fourth quarter of 2010.

As discussed in previous quarterly reports, evaluating the impact of countercyclical macroeconomic policy is inherently difficult because we do not observe what would have happened to the economy in the absence of policy. Because of the challenges in the analysis, the report estimates the impact of the Recovery Act using independent approaches and supplements those estimates with those of numerous outside analysts.

Among the key findings of the study are the following:

- Following implementation of the ARRA, the trajectory of the economy changed significantly. Real GDP began to grow steadily starting in the third quarter of 2009 and private payroll employment increased on net by 1.1 million from the start of 2010 to the end of the fourth quarter.

- The two established CEA methods of estimating the impact of the fiscal stimulus suggest that the ARRA has raised the level of GDP as of the fourth quarter of 2010, relative to what it otherwise would have been, by between 2.3 and 3.2 percent. These estimates are very similar to those of a wide range of other analysts, including the non-partisan Congressional Budget Office.

- CEA estimates that as of the fourth quarter of 2010, the ARRA has raised employment relative to what it otherwise would have been by between 2.5 and 3.6 million.

- The Recovery Act was designed to be temporary. The amount of stimulus outlays and tax reductions has begun to decline and as discussed in the previous report, as it does so, the impact on the level of GDP and employment will begin to lessen over time.

CONTENTS

I. INTRODUCTION

The American Recovery and Reinvestment Act of 2009 (ARRA) was a countercyclical fiscal expansion enacted at a time when U.S. real gross domestic product (GDP) had been contracting at an annual rate of more than 6 percent and employment was falling by more than 750,000 jobs per month. The Act was designed to cushion the fall in demand caused by the financial crisis and the subsequent decline in consumer and business confidence, household wealth, and access to credit. Together with policies to stabilize the financial system, increase liquidity and credit, and address the bursting of the housing bubble, the ARRA was part of a comprehensive policy response to the economic turmoil that gripped the United States and the world economy in the fall of 2008 and early 2009.

As part of the unprecedented accountability and transparency provisions included in the Recovery Act, the Council of Economic Advisers (CEA) was charged with providing quarterly reports to Congress on the effects of the Recovery Act on overall economic activity and on employment. This sixth report provides an assessment of the effects of the Act through the fourth quarter of 2010.

As discussed in previous reports, identifying the impact of policy actions is inherently difficult, and the estimates must be understood to be subject to large margins of error. For this reason, the CEA prepares estimates of the impact of the ARRA from two approaches, and reports estimates from a wide range of private analysts and from the Congressional Budget Office (CBO).

The analysis indicates that the Recovery Act has raised the level of GDP substantially relative to what it otherwise would have been and has saved or created between 2.5 and 3.6 million jobs as of the fourth quarter of 2010.

The report begins in Section II with a summary of the spending and tax reductions that have occurred under the ARRA to date. As of the end of December 2010, about 80 percent of the original $787 billion included in the Act has been outlayed or has gone to American households and businesses in the form of tax reductions. In the first and second quarter of 2010, much of the higher level of stimulus was due to a surge in tax refunds and reduced final liabilities. However, public investment spending, which now totals $142 billion, also increased significantly (this spending supports projects such as grid modernization, transportation infrastructure construction, and health care delivery). In the third quarter, ARRA related public investment spending ($33 billion) was larger than in any other quarter thus far, and in the fourth quarter, the public investment spending was $22 billion. In addition, there was continued tax relief and aid to states and individuals in the third and fourth quarters.

Section III contains the key analysis of the overall economic impact of the Recovery Act. It shows that GDP began to grow in the third quarter of 2009, and has now grown for six quarters in a row, including continued growth in the fourth quarter of 2010. Payroll employment grew in March 2010 for the first time since January 2008, and has generally trended upward through the fourth quarter of 2010, excluding temporary Census workers. Employment growth, excluding temporary Census workers, averaged 15,000 per month in the first quarter of 2010, 97,000 per month in the second quarter, 65,000 per month in the third quarter, and 141,000 per month in the fourth quarter. Private sector job growth has been even stronger. Private payrolls grew by an average of 27,000 jobs per month in the first quarter of 2010, 114,000 jobs per month in the second quarter, 104,000 jobs per month in the third quarter, and 146,000 jobs per month in the fourth quarter.

Following previous reports, this report estimates the role of the Recovery Act in two ways. One uses estimates of the effects of fiscal policy from standard macroeconomic forecasting models. The second involves a comparison of the actual behavior of GDP and employment relative to a plausible, statistically-determined baseline. The two methods indicate that the ARRA has raised both GDP and employment substantially relative to what they otherwise would have been. A compilation of estimates from prominent private-sector and public-sector analysts across the ideological spectrum shows similar estimated impacts of ARRA. The available direct job creation data provided by a fraction of ARRA fund recipients further corroborate the estimates of the overall impact of the Act.

II. THE PROGRESS OF SPENDING AND TAX REDUCTIONS UNDER THE RECOVERY ACT

The first step in evaluating the effects of the Recovery Act is to analyze the data on spending and tax reductions that have occurred under the Act.

A. Overall Budgetary Impact

Data on the overall budgetary impact of the Recovery Act are available on the Recovery.gov website. The data are broken down into outlays, obligations, and tax reductions. The outlays and obligations by agency are available weekly and the tax reduction data are available quarterly.[1] Outlays represent payments made by the government. Those funds

[1] The outlays and obligations data are based on weekly reports by the relevant agencies. To ensure that it is as up-to-date as possible, the quarterly report uses the agency Financial and Activity Reports provided directly by the Office of Management and Budget. These reports are posted on Recovery.gov with a short lag. The tax reduction estimates are based on the Department of the Treasury Office of Tax Analysis (OTA) tax simulation model for the effect of the ARRA tax provisions. The OTA prepares new estimates semi-annually as part of the annual budget cycle and the mid-session review. The most recent data come from the FY 2012 Budget. To provide the most accurate quarterly estimates of the impact of the ARRA, this report uses the revised tax estimates for all quarters. Because of these revisions, the figures in Table 1 differ slightly from those reported in previous quarterly reports (CEA, 2009b, 2010a, 2010b, 2010c).

represent spending that has already occurred. Obligations represent funds that have been made available but not necessarily outlayed, such as for a highway project where the builder must complete the work properly to be fully reimbursed by the Federal government. In many instances, obligations can generate economic activity even before outlays occur because recipients may begin spending as soon as they are certain funds will be forthcoming.

Table 1 shows outlays, obligations, and tax reductions as of the end of each quarter since the Act's passage (March 2009, June 2009, September 2009, December 2009, March 2010, June 2010, September 2010, and December 2010). As of the end of the fourth quarter of 2010, the sum of outlays and tax cuts was $609 billion, with an additional $125 billion obligated but not yet outlayed. This is very similar to the amount projected to have been spent by this point by the Congressional Budget Office when the Recovery Act was passed.[2] Additionally, the sum of spending, obligations in excess of spending, and tax cuts is $733 billion. Of the remaining funds, a substantial amount represents tax cuts yet to be realized or mandatory programs that will be spent out over the next year (these funds are not considered "obligated" but have specific uses already determined). Little direct spending remains to be obligated.

Table 1. Outlays, Obligations, and Tax Reductions

	Through the end of[a]							
	2009:Q1 (March)	2009:Q2 (June)	2009:Q3 (September)	2009:Q4 (December)	2010:Q1 (March)	2010:Q2 (June)	2010:Q3 (September)	2010:Q4 (December)
	Billions of Dollars							
Outlays	8.6	56.3	110.7	164.2	210.9	257.3	307.9	348.6
Obligations	30.5	157.8	256.3	313.9	362.1	403.8	452.4	473.2
Tax Reductions	2.4	35.7	65.5	94.4	157.8	234.3	251.2	259.9
Sum of Outlays and Tax Reductions[b]	11.0	92.1	176.3	258.6	368.7	491.6	559.1	608.5

Sources: Agency Financial and Activity Reports to the Office of Management and Budget; simulations from the Department of the Treasury (Office of Tax Analysis) based on the FY2011 Mid-Session Review.

Notes: a. Data on outlays and obligations are for the last day of each calendar quarter.

b. Items may not add to total due to rounding.

B. Components of the Recovery Act

The categorization of stimulus into outlays versus tax reductions follows accounting conventions rather than economic function. Following the definitions established in the previous reports, we can also break out the components by function.

Total dollars of stimulus expended to date are split into six categories: individual tax cuts and similar payments; the tax cut associated with the adjustment of the Alternative Minimum

[2] CBO (2009) projected that the spending and revenue effects in fiscal year 2009 (that is, through the third quarter) would be $184.9 billion, and $399.4 billion in fiscal 2010. CBO has since published a revised estimate of the direct effect on the deficit of the ARRA of $814 billion (CBO 2010a). This number is not comparable to the estimated cost at passage of $787 billion because it does not include adjustments for the effect of the ARRA on spending from regular appropriations or other authorizations, which CBO estimates reduced the effect on the deficit in 2009 and 2010. Most of the increase in CBO's estimate of the direct effect on the deficit comes from greater outlays on income-security programs.

Tax (AMT); business tax incentives; state fiscal relief; aid to those most directly hurt by the recession; and public investment spending. The first three are tax changes of some kind and are estimated to be roughly one-third of the total package; the second two represent emergency measures and are also estimated to be roughly one-third of the total; the last encompasses a range of direct spending and covers the remainder.

The outlays and tax reduction data are divided as follows: individual tax cuts include the Making Work Pay tax credit, the child tax credit, and a number of smaller individual tax reductions. It also includes direct payments that were made in lieu of a tax cut to certain groups. These include payments of $250 distributed to individuals who receive Social Security and Supplemental Security Income, Railroad Retirement benefits, or veterans' benefits. The business tax incentives and AMT relief are calculated directly by the Office of Tax Analysis (OTA) as part of its simulation process.[3]

State fiscal relief includes the two main programs in this category: the increase in the Federal government's matching percentage for Medicaid spending (FMAP),[4] and formula grants to state governments for education through the State Fiscal Stabilization Fund. Aid to those directly impacted by the recession includes the increase and extension of unemployment benefits, increased funds for nutritional assistance, and increases in the Temporary Assistance to Needy Families program. Similarly, the government's subsidy of continuing health insurance benefits under COBRA, which is technically a business tax cut, counts as aid to directly impacted individuals.

Public investment outlays include everything else. The obvious components are spending on infrastructure, health information technology, research on renewable energy, and other forms of direct spending excluding transfers. Also included here are tax credits for particular types of private spending, such as weatherization, advanced energy manufacturing, or research and experimentation, since these credits are functionally similar to the direct government spending. Section IV of the report discusses in greater depth the types of public investment in the Act.

C. Trends and Developments

Table 2 shows the breakdown of aggregate outlays and tax relief into these functional categories. For the impact on the economy, what matters is the amount spent each quarter. For this reason, Table 2 also reports the change in the total budgetary impact from the end of the

[3] The quarterly estimates of AMT relief are from unpublished analysis by the OTA. The direct payment data are from the agency Financial and Activity Reports, available on Recovery.gov.

[4] The Federal Medical Assistance Percentage (FMAP) is used to determine the amount of Federal matching for specified State expenditures for assistance payments under the Social Security Act, including Medicaid, and is calculated using a formula set forth in section 1905(b) of the Social Security Act.

previous quarter.

The table shows important changes over time in the magnitude and composition of the fiscal stimulus. After being stable at $80 to $85 billion per quarter over the last three quarters of 2009, total outlays plus tax cuts were $110 billion in the first quarter of 2010, $123 billion in the second quarter, $67 billion in the third quarter, and $49 billion in the fourth quarter.[5] As noted in the prior quarterly report, the ARRA was intended to be temporary and the total outlays plus tax cuts were designed to decline over time.

Table 2. Fiscal Stimulus by Functional Category

	Through the end of[a]							
	2009:Q1 (March)	2009:Q2 (June)	2009:Q3 (September)	2009:Q4 (December)	2010:Q1 (March)	2010:Q2 (June)	2010:Q3 (September)	2010:Q4 (December)
	Billions of Dollars							
Individual Tax Cuts	2.3	28.6	42.8	58.5	101.4	123.9	133.7	142.4
AMT Relief	0.0	7.8	13.8	17.3	28.7	76.2	83.4	83.4
Business Tax Incentives	0.1	10.4	19.0	26.6	32.5	36.6	34.4	33.4
State Fiscal Relief	8.5	28.2	43.8	59.3	75.5	92.1	107.1	121.7
Aid to Directly Impacted Individuals	0.0	9.6	31.8	55.2	71.4	76.6	81.3	86.0
Public Investment Outlays	0.0	7.4	25.1	41.6	59.3	86.3	119.2	141.6
Total[b]	**11.0**	**92.1**	**176.3**	**258.6**	**368.7**	**491.6**	**559.1**	**608.5**
Change in Total (from End of Previous Quarter)	**11.0**	**81.1**	**84.2**	**82.3**	**110.1**	**122.9**	**67.4**	**49.5**

Sources: Agency Financial and Activity Reports to the Office of Management and Budget; simulations from the Department of the Treasury (Office of Tax Analysis) based on the FY2011 Mid-Session Review.

Notes: a. Data on outlays and obligations are for the last day of each calendar quarter.

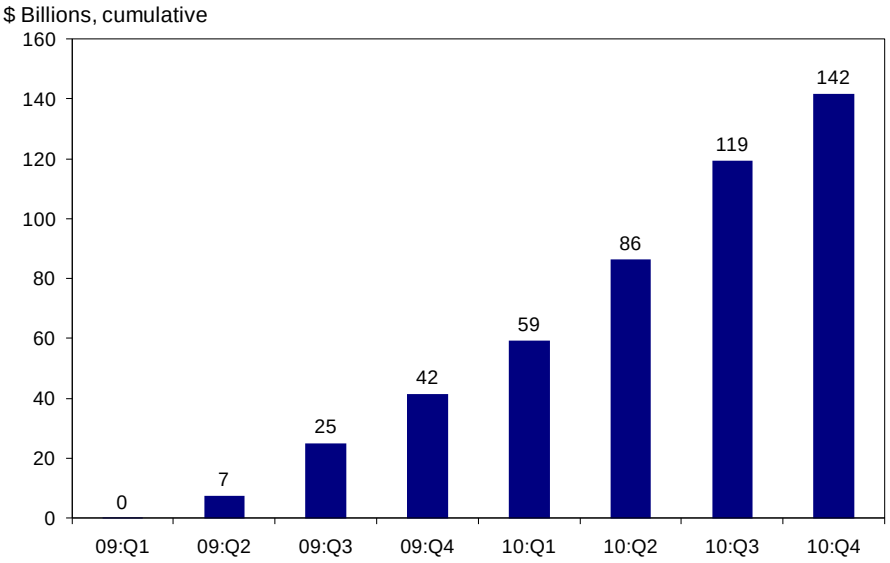
b. Items may not add to total due to rounding.

The composition of the stimulus has evolved as well. As was anticipated at the time of passage, the individual tax cuts and the state fiscal relief were the first items that could be put into effect. For this reason, they comprised a large fraction of total spending in the second quarter of 2009. Aid to those directly impacted by the recession rose substantially in the third and fourth quarters of 2009, reflecting programs like emergency unemployment compensation that provided support to people laid off during the downturn.

Tax cuts, aid to directly impacted individuals, and aid to states have continued, but public investment outlays on items such as infrastructure and clean energy are now accounting for a larger share of the stimulus. These outlays have increased from $7 billion through the end of the second quarter of 2009 to $142 billion through the end of the fourth quarter of 2010 (see figure 1).

[5] Much of the difference from the second to the third quarter can be attributed to the fact that AMT relief was booked in the second quarter. Looking at the amount of ARRA outlays plus tax cuts excluding the AMT shows a total of $76 billion in the second quarter and $61 billion in the third, so the shift in ARRA funding is not as large as it appears when including the AMT.

Figure 1. Public Investment Outlays



Source: Agency Financial and Activity Reports to the Office of Management and Budget.

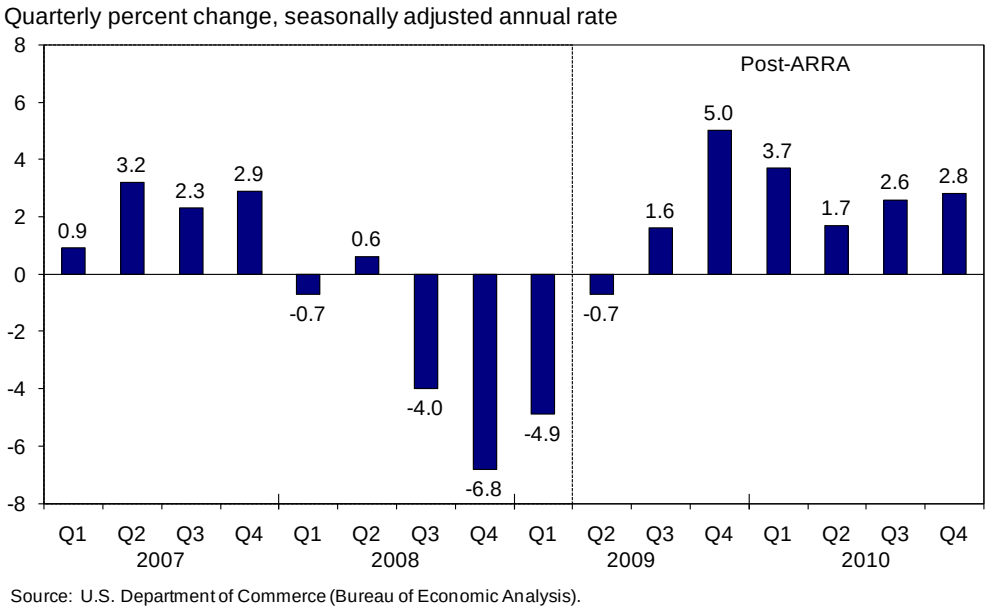
III. Evidence of the Economic Impact of the Recovery Act

This section considers a range of ways of estimating the overall impact of the Recovery Act, beginning with a straightforward examination of the behavior of GDP and employment, and then moving to analyses using an economic model, a statistical forecasting exercise, and then the direct reporting data.

A. The Change in the Economy's Trajectory

Figure 2 shows the growth rate of real GDP from the first quarter of 2007 to the fourth quarter of 2010. The dashed line between the first and second quarters of 2009 identifies the start of the period where the Recovery Act (which was signed February 17, 2009) could start having an impact on the economy. GDP was falling rapidly from the third quarter of 2008 to the first quarter of 2009, but then began to reverse course quickly after the passage of the Recovery Act. After declining at an annual rate of 4.9 percent in the first quarter of 2009, GDP fell at a rate of 0.7 percent in the second quarter, and then rose at a rate of 1.6 percent in the third quarter and 5.0 percent in the fourth. The improvement in growth of 9.9 percentage points from the first quarter to the fourth (that is, the swing from growth at a -4.9 percent rate to growth at a 5.0 percent rate) was the largest over any three quarters since 1983.

Figure 2. Real GDP Growth



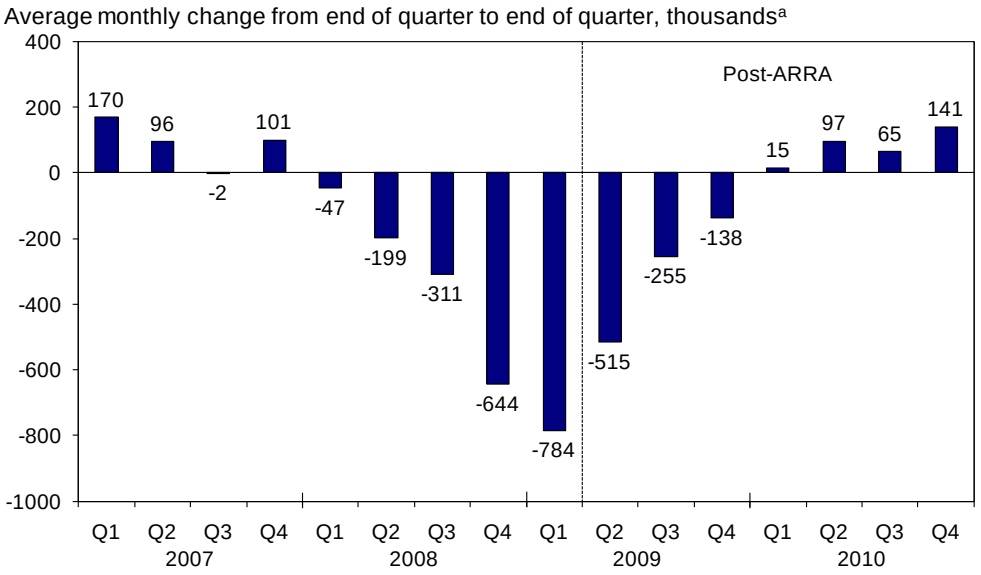
Source: U.S. Department of Commerce (Bureau of Economic Analysis).

After the extremely rapid growth at the end of 2009, growth moderated to 3.7 percent (at an annual rate) in the first quarter of 2010, as the influence of changes in inventory investment dropped. GDP growth moderated to 1.7 percent in the second quarter before increasing to 2.6 percent in the third quarter and 2.8 percent in the fourth quarter. GDP has grown 2.7 percent over the four quarters of 2010 – the fastest fourth quarter to fourth quarter growth rate since 2005.

Figure 3 presents the behavior of the change in payroll employment. Employment shows the same pattern of an accelerating decline before the Recovery Act was passed followed by a significant improvement after. In the first quarter of 2009, the economy lost an average of 784,000 jobs per month. Job losses fell to 515,000 per month in the second quarter, 255,000 per month in the third, and 138,000 in the fourth. The economy began adding jobs in 2010, with average gains of 15,000 per month in the first quarter, 97,000 per month in the second quarter, 65,000 per month in the third quarter, and 141,000 per month in the fourth quarter.[6] The *reversal* in the average monthly change in employment over the past seven quarters was among the largest on record. Private sector job growth has been even better this year than overall employment, moving from deep losses in 2009 to increases averaging 27,000 in 2010:Q1, 114,000 in 2010:Q2, 104,000 in 2010:Q3, and 146,000 in 2010:Q4.

[6] These figures exclude temporary workers hired for the decennial Census.

Figure 3. Payroll Employment Growth



Source: U.S. Department of Labor (Bureau of Labor Statistics).
Note: a. Excludes temporary Census workers.

The timing of the turnaround coincides quite closely with the Recovery Act. The economy is obviously still recovering. Real GDP is below its normal path, and the unemployment rate remains elevated. Job growth averaged 80,000 per month in 2010, and while more robust growth is needed, this is movement in the right direction.

B. Estimates of Effects from an Economic Model

Methodology. As explained in previous quarterly reports, one way CEA estimates the effects of the Recovery Act on GDP and employment is to use existing estimates of the macroeconomic effects of fiscal policy. [7]

In its recent reports on the impact of the Recovery Act, CBO uses a similar approach. CBO reports high and low estimates for the multipliers associated with different types of spending (CBO, 2010a). Table 3 shows how the CEA multipliers compare with the CBO estimates. The CEA multipliers show the impact of a change in the fiscal component on GDP after six quarters. The comparison shows the multiplier estimates are consistently in the middle of the CBO range, and typically toward the lower end.

[7] See Council of Economic Advisers (2009b, p. 23) for more details.

Table 3. Estimated Output Multipliers for Different Types of Stimulus

	CEA[a]	CBO Low	CBO High
Public Investment Outlays[b]	1.5	1.0	2.5
State and Local Fiscal Relief	1.1	0.7	1.8
Income Support Payments[c]	1.5	0.8	2.1
One-time Payments to Retirees	0.4	0.3	1.0
Tax Cuts to Individuals	0.8	0.6	1.5
AMT Patch	0.4	0.2	0.6
Business Tax Incentives	0.1	0.0	0.4

Source: CBO (2010a).
Notes: a. The CEA multipliers show the impact of a permanent change in the component of 1% of GDP after 6 quarters, or, equivalently, the cumulative impact of a one-time change of 1% of GDP over 6 quarters. The CBO multipliers show the cumulative impact of a one-time change of 1% of GDP over several quarters.
b. Includes transfer payments to state and local governments for infrastructure and tax incentives to businesses directly tied to certain types of spending.
c. Includes such programs as unemployment compensation, COBRA, and SNAP.

The CEA model does not give exact numbers for the effects of the Recovery Act. To begin with, there is uncertainty about the size of the economic effects of a typical increase in public investment outlays or a typical tax cut. There is even more uncertainty about the precise timing of those effects (and modest changes in timing can have noticeable effects on the impact at a specific point in time). In addition, the current economic environment could make the effects of stimulus somewhat larger or smaller than normal, or could cause them to occur somewhat more or less quickly. Further, the Recovery Act was in many areas not a conventional stimulus. For types of stimulus that are used less frequently, there is even greater uncertainty about the size and timing of the macroeconomic effects.

As in the earlier reports, the estimate uses figures on actual outlays and tax relief under the Recovery Act. Since CEA's third quarterly report, the Office of Tax Analysis of the Department of the Treasury has prepared revised estimates of the magnitude and timing of the tax provisions of the Recovery Act incorporating actual tax return data for 2009. These revised estimates have led to minor revisions in the estimates of the impact of the Recovery Act in previous quarters.

Results. The results of this analysis are shown in Table 4. They show a sizable impact on production and employment. Specifically, they indicate that the Recovery Act raised the level of real GDP in the fourth quarter of 2010, relative to what it otherwise would have been, by 2.3 percent. This approach also indicates that the Act increased employment, relative to what it otherwise would have been, by 2.5 million as of 2010:Q4.[8] These estimates from the model are consistent with a substantial impact on both the level of GDP and employment through 2010:Q4, but one that is starting to phase down as ARRA's temporary outlays and tax cuts phase down.

[8] Appendix Table 1 provides a breakdown of the estimated employment effects by state.

Table 4. Estimates of the Effect of the ARRA Using CEA Multiplier Model

	2009:Q2	2009:Q3	2009:Q4	2010:Q1	2010:Q2	2010:Q3	2010:Q4
GDP Level (Percent)	+0.8	+1.7	+2.1	+2.5	+2.8	+2.7	+2.3
Employment Level	+400,000	+1,122,000	+1,755,000	+2,227,000	+2,556,000	+2,680,000	+2,513,000

Source: CEA calculations.

C. Estimates of Effects from Comparison to a Statistical Baseline Forecast

Methodology. Following the methodology in previous ARRA reports, the second approach to estimating the effects of the Recovery Act is to compare the actual paths of GDP and employment with the predictions of a sensible statistical forecast of what they would have done. Because this approach is purely statistical, it does not depend on estimates of multipliers as the model-based approach.

The approach's other key advantage is that it can capture factors that might have caused fiscal policy to have unusual effects in the economic circumstances that prevailed when the Act was passed.

The disadvantage of this approach is that the comparison will reflect not just the impact of fiscal policy, but all other influences on the economy following passage of the Act. These include, most obviously, the positive impact of other policy actions like the Financial Stability Plan, monetary policy, and the Federal Reserve's program of buying agency debt and long-term U.S. government bonds, as well as the negative impact of tight credit conditions, among other things. Additional measures taken in 2010 – such as the HIRE act, unemployment insurance extensions beyond those in the ARRA, and the small business jobs bill – all provided support to the economy over and above the Recovery Act. It is difficult to separate the added effects from programs like these in a statistical baseline forecast.

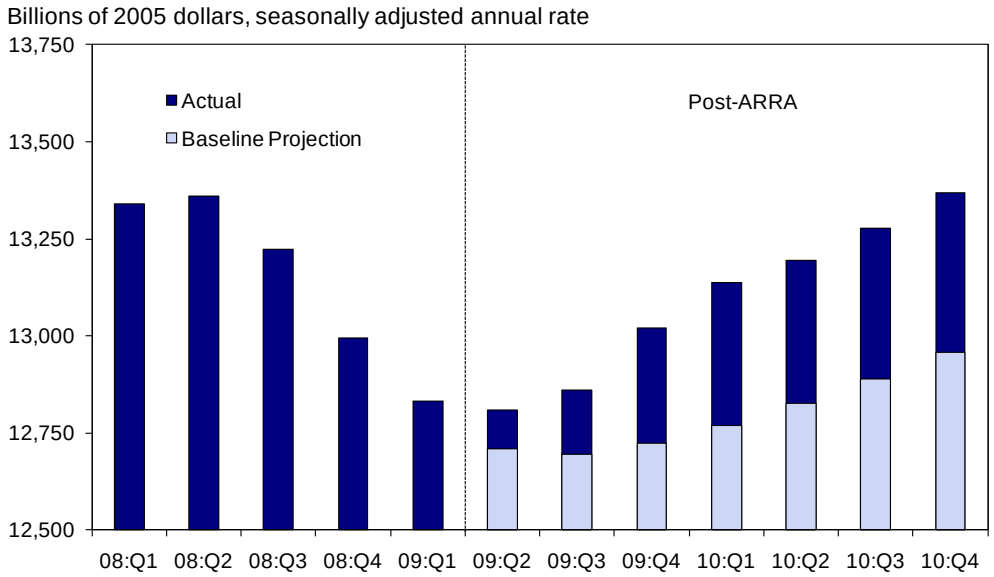
Of course, the estimates from a forecast approach have considerable margins of error. At any given time, the economy is subject to many influences that are not reflected in the past behavior of GDP and employment. These influences may be particularly large in a period as turbulent as the past two years. And, the longer the time that has passed, the larger the role of those disturbances is likely to be. As a result, the estimates from this approach are likely to be less precise as more time elapses. Additional support for the economy provided in the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 will likely have substantial impacts on the economy in 2011. This will have no impact on the estimates from the economic model, but will affect the estimates from the statistical baseline. Thus, it would not be surprising to see the two methods continue to diverge over time.

There are many ways to construct a statistical baseline forecast. The approach used here follows the five previous ARRA reports. It estimates a vector autoregression (or VAR) using the

logarithms of real GDP (in billions of chained 2005 dollars) and employment (in thousands, in the final month of the quarter) over the period 1990:Q1–2007:Q4. It includes four lags of each variable. Because the estimation ends in 2007:Q4, the coefficient estimates used in the prediction are not influenced by developments in the current recession. Rather, they show the usual joint short-run dynamics of the two series over an extended sample. It then forecasts GDP and employment beginning in the second quarter of 2009 using actual data through the first quarter of 2009. Data through the first quarter include the early monetary response to the current crisis, but not the fiscal stimulus or other actions that took effect after the first quarter.

Results. Figure 4 shows the results of this forecasting exercise for GDP, together with the actual path of GDP. Past history would have led one to expect GDP to continue to decline in the second and third quarters of 2009 before beginning to grow moderately in the fourth quarter. The figure shows that actual GDP has risen steadily above the forecast path. It was 0.8 percent above that path in 2009:Q2, 1.3 percent above in 2009:Q3, 2.3 percent above in 2009:Q4, 2.9 percent above from 2010:Q1 through 2010:Q2, and 3.0 percent above in 2010:Q3. In 2010:Q4, the gap between the actual and projected levels of GDP rose to 3.2 percent.

Figure 4. Real GDP: Actual and Baseline Projected Levels



Sources: U.S. Department of Commerce (Bureau of Economic Analysis); CEA calculations.

The top line in Table 5 summarizes the difference between the actual and forecasted paths of GDP using the statistical projection methodology.

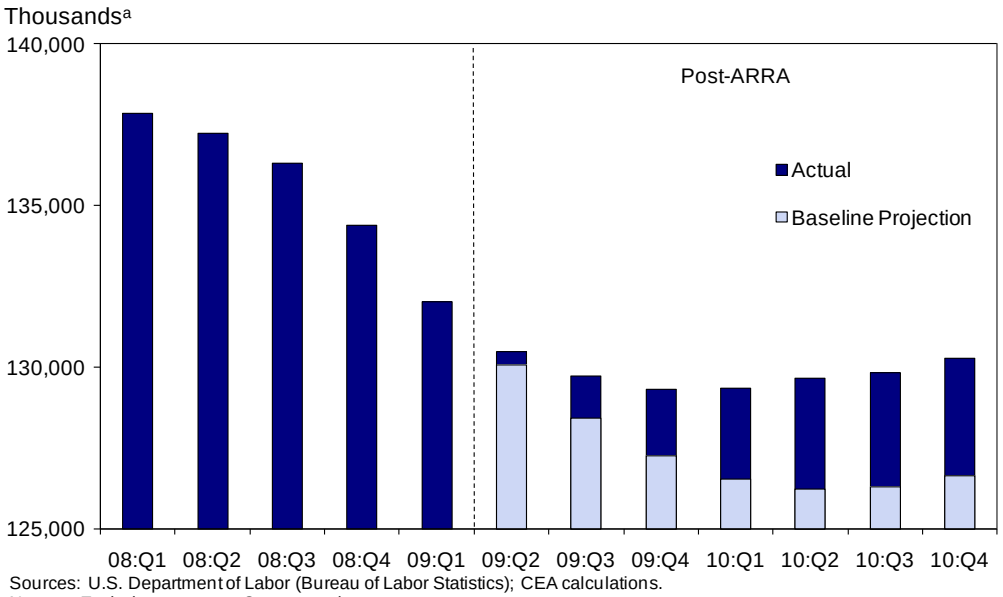
Table 5. Estimates of the Effect of the ARRA Using CEA Statistical Projection Approach

	2009:Q2	2009:Q3	2009:Q4	2010:Q1	2010:Q2	2010:Q3	2010:Q4
GDP Level (Percent)	+0.8	+1.3	+2.3	+2.9	+2.9	+3.0	+3.2
Employment Level[a]	+276,000	+1,004,000	+1,811,000	+2,578,000	+3,224,000	+3,512,000	+3,611,000

Source: CEA calculations.
Note: a. Estimates are for the middle month of the quarter.

Figure 5 shows the results for employment. Because employment growth normally changes relatively slowly, the usual historical patterns would have led one to expect employment losses to moderate only slowly over the course of 2009 and to continue through the middle of 2010. Actual employment losses moderated much more rapidly. As a result, employment was about 276,000 above the forecast path as of the middle of 2009:Q2, 1.0 million above as of the middle of 2009:Q3, 1.8 million above as of the middle of 2009:Q4, 2.6 million above as of the middle of 2010:Q1, 3.2 million above as of the middle of 2010:Q2, 3.5 million above as of the middle of 2010:Q3, and 3.6 million above as of the middle of 2010:Q4.[9] These results are summarized in the second line of Table 5.

Figure 5. Payroll Employment: Actual and Baseline Projected Levels



Sources: U.S. Department of Labor (Bureau of Labor Statistics); CEA calculations.
Note: a. Excludes temporary Census workers.

The projection methodology used here shows that using the past history of GDP and employment and actual data through 2009:Q1, one would have predicted that GDP in the fourth quarter of 2010 was 3.2 percent higher than it would have been, and that employment was about 3.6 million higher than it would have been.

[9] Again, these figures exclude temporary Census workers.

The two methodologies suggest that GDP was between 2.3 and 3.2 percent higher than it would have been without the ARRA. Currently, the economy has recovered all of the output lost during the recession from the peak in output in 2007:Q4. These estimates suggest that without the ARRA, the economy would have recovered less than 40 percent of this output loss. Similarly, the estimates suggest that in 2010:Q4 employment was 2.5 to 3.6 million higher than it would otherwise have been. In terms of direct impact on employment and GDP, the ARRA was intended to stop the economic slide and to be temporary stimulus to fill part of the substantial hole in aggregate demand left by the crisis. The Act was designed to have a peak cumulative impact in the second half of 2010. Because the ARRA was not designed to be permanent, the amount of stimulus outlays and tax reductions will decline over time and thus the impact on GDP and employment has begun to phase out.

D. Evidence of Effects from Recipient Reporting

One hallmark of the Recovery Act has been a commitment to providing timely, transparent, and accountable information about the Act's progress, allowing the public to follow the money as it is spent. In pursuit of this goal, the Act requires every prime recipient of Recovery Act funds subject to Section 1512 of the Act to file quarterly reports on the employment effects of the Act. The recipient reports are designed to reflect an estimate of individual, identifiable jobs and to provide a source of independent evidence of the effects of the Recovery Act.

Section 1512 of the Recovery Act requires prime recipients of Recovery Act funds for "projects and activities" to file quarterly reports. It is obviously not possible to identify specific jobs associated with the Recovery Act for some types of stimulus such as individual tax cuts and extended unemployment insurance benefits that support broad-based spending rather than specific projects. Largely for that reason, there are no recipient reports associated with the components of the Recovery Act that consist of tax reductions, including the Making Work Pay tax credit, and with many categories of spending, including unemployment insurance benefits and aid to states under the temporary Medicaid FMAP increase. Altogether, funds subject to the recipient reporting requirement comprise about one-third of the total funding of the Act.

There have now been six rounds of quarterly recipient reports. The first reports were filed in October 2009 and described activity from the passage of the Act through September 30, 2009. The second reports were filed in January 2010 and covered the period between October 1 and December 31, 2009. In response to feedback from recipients and data users after the first round, the reporting requirements were changed slightly for the second round. The initial instructions asked recipients to make complex judgments about whether a job would have been filled "but for" funding under the Recovery Act. The instructions for the second reports simply

asked recipients to report jobs funded by Recovery Act funds in 2009:Q4, without trying to assess whether the jobs would have existed or not in the absence of the Act. The third, fourth, fifth, and sixth set of results, covering 2010:Q1, 2010:Q2, 2010:Q3, and 2010:Q4 were filed in April, July, October, and January.

As described in the CEA's second quarterly report, the figures from the recipient reporting data do not provide a comprehensive or exact accounting of the jobs created or saved by the Recovery Act (CEA, 2010a, pp. 29-31). One key reason has already been mentioned: the reporting requirements will only apply to about one-third of the overall funding under the Act. Moreover, for the stimulus that has occurred thus far, the fraction is even smaller. The direct spending components of the Act, which are the main ones subject to the reporting requirements, are, as expected, spending out over a longer time horizon than other components. As a result, spending subject to the reporting requirements was initially a relatively small fraction of the total stimulus and comprised a larger share in the two most recent quarters.

Table 6 shows obligations, outlays, and tax reductions in each quarter for both the Recovery Act as a whole and for the subset of programs subject to recipient reporting requirements. The fraction of the stimulus—outlays and tax cuts—covered by the recipient reports was 41% in the fourth quarter of 2010.

Table 6. ARRA Spending Covered by Recipient Reporting

	For the Quarter (Not Cumulative)					
	2009:Q3	2009:Q4	2010:Q1	2010:Q2	2010:Q3	2010:Q4
	Billions of Dollars					
ARRA Total						
Outlays	53.3	53.5	46.7	46.4	50.6	40.7
Obligations	94.3	57.6	48.2	41.7	48.6	20.8
Tax Reductions	29.8	28.8	63.4	76.6	16.8	8.8
Outlays Plus Tax Reductions[a]	83.1	82.3	110.1	122.9	67.4	49.5
Subject to Recipient Reporting Requirement						
Outlays	14.9	17.8	18.8	25.1	26.3	20.5
Obligations	70.5	15.3	26.5	15.8	30.3	5.1
Tax Reductions	0.0	0.0	0.0	0.0	0.0	0.0
Outlays Subject to Reporting Requirement as Percent of Outlays Plus Tax Reductions	17.9%	21.6%	17.1%	20.5%	39.0%	41.4%

Sources: Agency Financial and Activity Reports to the Office of Management and Budget; simulations from the Department of the Treasury (Office of Tax Analysis) based on the FY 2011 Mid-Session Review.
Note: a. Items may not add to total due to rounding.

Although the recipient reporting data cannot be used directly to determine the overall impact of the Recovery Act on employment, the data provide a useful check on the estimates from the aggregate approaches described in Sections III.B and III.C. One simple way to perform such a check is to note that while in the first few quarters direct reporting was available, the funds subject to the reporting requirements were only about 20 percent of the overall stimulus under the Act, and the jobs figures from the recipient reports for each quarter were substantially

more than 20 percent of the corresponding estimates from the model and projection approaches.

Table 7 shows the jobs reported by recipients through the fourth quarter of 2010.

Table 7. Recipient Reported Jobs
(unscaled for the share of ARRA spending subject to recipient reporting requirements)

	2009:Q4	2010:Q1	2010:Q2	2010:Q3	2010:Q4
Recipient reported jobs	608,078	682,322	750,045	675,841	585,523

Source: Recipient reports downloaded from Recovery.gov on March 17, 2011.

In the case of the model approach, we can improve on this simple comparison by asking what the approach implies about the jobs impact from an amount of government spending equal to the amount subject to the recipient reporting requirement. Further, we can adjust the multipliers used in the model to omit the estimates of jobs created by the additional spending by the workers who are employed on the projects (which are obviously not included in the recipient reports); this brings the multiplier-based estimates closer to what the recipients were asked to report. For 2010:Q1, for example, the model approach implies about 500,000 jobs due directly to the spending subject to reporting requirements, as opposed to the 682,000 jobs actually reported. In the fourth quarter the model implies 644,000 jobs were due directly to the spending subject to reporting requirements, slightly above the 586,000 jobs reported. Considerably more jobs are associated with that spending due to the overall impact on the economy, but recipient reporting has consistently validated or exceeded the model's estimate of direct jobs. Given the lags in the impact of any type of stimulus and the differences in the timing of reporting both jobs and outlays, the percentage of spending and jobs subject to direct reporting will not match exactly in a given quarter.

E. Comparison with Other Estimates of the Effects of the Recovery Act

Many other economists and forecasters have estimated the impact of the Recovery Act. Most of those estimates are based on formal macroeconomic models.

Table 8 reports estimates of the contribution of the Recovery Act to GDP since the Act was passed from an array of public and private forecasters.[10] The first row repeats the model-based estimates from Section III.B, and the second row shows the estimates from Section III.C based on the comparison of actual outcomes with projections of the normal evolution of the economy. The next two rows show the low and high estimates prepared by the Congressional Budget Office. The estimates from both of the CEA approaches are well below the top of the CBO range, and are generally in its lower part. The remaining lines of the table show private

[10] Before using estimates from sources used in our earlier reports, we checked with each forecaster to ensure that their estimates of the effects of the Act had not changed.

sector estimates. These estimates are generally similar.

Table 8. Estimates of the Effects of the ARRA on the Level of GDP

	2009:Q2	2009:Q3	2009:Q4	2010:Q1	2010:Q2	2010:Q3	2010:Q4
				Percent			
CEA: Model Approach	+0.8	+1.7	+2.1	+2.5	+2.8	+2.7	+2.3
CEA: Projection Approach	+0.8	+1.3	+2.3	+2.9	+2.9	+3.0	+3.2
CBO: Low	+0.8	+1.2	+1.4	+1.7	+1.7	+1.5	+1.1
CBO: High	+1.3	+2.4	+3.3	+4.1	+4.5	+4.2	+3.6
Goldman Sachs	+0.5	+1.4	+1.9	+2.3	+2.6	+2.4	+2.1
IHS/Global Insight	+0.5	+1.2	+1.7	+2.0	+2.2	+2.3	+2.2
James Glassman, J.P.Morgan Chase	+1.3	+1.8	+2.6	+3.3	+3.8	+3.6	+3.1
Macroeconomic Advisers	+0.5	+1.0	+1.4	+1.7	+2.1	+2.1	+2.1
Mark Zandi, Moody's Economy.com	+0.8	+1.6	+2.2	+2.5	+2.7	+2.7	+2.6

Sources: See text for details.

Fewer estimates of the employment effects of the Recovery Act are available, but those that have been gathered are reported in Table 9.[11] The CEA model-based estimates are well within the range of the other estimates. It is useful to note that the CEA estimate is based on the most recent spending and tax reduction data, whereas some of the private sector estimates have not been updated in many months. Also, the CEA employment effect is derived from the GDP effect using standard estimates of the usual relationship between the two series and the GDP estimate was in the middle of the range of other GDP estimates.

An important note is that the employment effects of the Recovery Act are measured at a point in time and therefore should not be compared to the costs across the entire life of the program.

Table 9. Estimates of the Effects of the ARRA on the Level of Employment

	2009:Q2	2009:Q3	2009:Q4	2010:Q1	2010:Q2	2010:Q3	2010:Q4
CEA: Model Approach	+400,000	+1,122,000	+1,755,000	+2,227,000	+2,556,000	+2,680,000	+2,513,000
CEA: Projection Approach[a]	+276,000	+1,004,000	+1,811,000	+2,578,000	+3,224,000	+3,512,000	+3,611,000
CBO: Low	+300,000	+700,000	+1,000,000	+1,200,000	+1,400,000	+1,400,000	+1,300,000
CBO: High	+500,000	+1,300,000	+2,100,000	+2,800,000	+3,400,000	+3,700,000	+3,600,000
IHS/Global Insight	+228,000	+689,000	+1,245,000	+1,696,000	+2,107,000	+2,342,000	+2,445,000
Macroeconomic Advisers	+248,000	+623,000	+1,057,000	+1,462,000	+1,847,000	+2,119,000	+2,329,000
Mark Zandi, Moody's Economy.com	+500,000	+1,008,000	+1,486,000	+1,893,000	+2,249,000	+2,522,000	+2,492,000

Sources: See text for details.
Notes: a. Estimates are for the middle month of the quarter.

The CEA employment estimates based on the projection approach, in contrast, are above the range of most other estimates for the past two quarters. This difference reflects two facts. First, the other estimates are largely based on economic models similar to that used in the CEA's model approach. Second, the turnaround of employment has been faster than one would have

[11] The sources are the same as for Table 8.

expected given the behavior of the economy before the passage of the Recovery Act and standard estimates of the effects of stimulus. Thus, an approach that takes into account the actual behavior of employment tends to yield higher estimates than ones that rely on a historical multiplier approach. Furthermore, as noted above, a projection approach will include the effects of additional policies passed since the Recovery Act and thus is likely to continue to diverge from model based estimates over time.

In light of the actual behavior of GDP, the estimates in Table 8 suggest that most forecasters believe that in the absence of the Act, GDP would have declined sharply in 2009:Q2 and continued to decline in 2009:Q3, and that growth would have been considerably weaker in the subsequent three quarters than it actually was. Likewise, the estimates in Table 9 imply that most forecasters believe that jobs losses would have moderated much more slowly than they actually did over the course of 2009, and that substantial job losses would have continued into 2010.

IV. CONCLUSION

This report continues the Council of Economic Advisers' assessment of the economic impact of the American Recovery and Reinvestment Act and the response of the economy as of the fourth quarter of 2010.

The analysis indicates that the Recovery Act has played a significant role in the turnaround of the economy that has occurred over the past two years. Real GDP reached its low point in the second quarter of 2009 and has been growing solidly since then, in large part because of the tax cuts and spending increases included in the Act. Employment, after falling dramatically, began to grow again on a sustained basis through 2010. As of the fourth quarter of 2010, the report estimates that the Recovery Act raised employment by 2.5 to 3.6 million jobs relative to what it otherwise would have been.

As discussed in previous ARRA reports, measuring the impact of policy on growth and employment is inherently difficult because no one can observe directly what would have occurred without the policy. But multiple methodologies and multiple sources point to similar estimates of ARRA's impact on the economy.

APPENDIX

ESTIMATED EMPLOYMENT EFFECTS BY STATE

This report finds that ARRA raised employment as of the fourth quarter of 2010 by between 2.5 million and 3.6 million jobs over what it would otherwise have been. This appendix provides a state-by-state estimate for the effects of the entire ARRA. These disaggregate estimates are inherently more uncertain than the aggregate numbers.

The state estimates are calibrated to add up to 3.062 million jobs. This is the midpoint between the estimated employment impact of the ARRA in 2010:Q4 according to the CEA model approach and the CEA statistical projection approach (see Table 9).

There is no perfect way to measure state-level effects. The analysis utilizes three approaches to decomposing employment impacts across states. The first method allocates jobs according to states' shares of national non-farm employment as of March 2009.[12] Georgia, for example, had 3.0 percent of all employment in the country in March 2009, so is allocated 3.0 percent of total job creation.

The second method allocates jobs according to the distribution of Recovery Act outlays through December 31, 2010. Georgia has received 2.9 percent of total outlays, so is estimated to receive 2.9 percent of total job creation. This method provides a more direct measure of where ARRA impacts are likely to be felt than does the first approach, but it has an important drawback in that only a portion of the overall Recovery Act stimulus is included in the outlays data. The most important stimulus not included in this approach is tax relief, which comprises a significant portion of the ARRA. Tax cuts are likely more evenly distributed across states than are outlays, so the use of outlays likely overstates the unevenness of employment effects. Similarly, this method assumes that all of the employment effects of spending in a state are felt within that state alone.

The third method relies on the sectoral composition of employment in each state and estimates the number of jobs created or saved in different industries using a methodology developed in the first quarterly report.[13] Specifically, it decomposes the response of employment in each sector into two components. First, a rising overall level of employment tends to increase employment in each industry in proportion to its share of the overall economy. Second, some sectors are more sensitive to the state of the business cycle than are others. The additional employment due to the Recovery Act has therefore almost certainly produced relative expansion of such procyclical sectors, while countercyclical sectors, such as utilities, health care, and government, have seen their shares of total employment shrink relative to what would have been

[12] U.S. Department of Labor (2010b). We use seasonally adjusted estimates of total nonfarm employment.
[13] See CEA (2009b) for details.

seen in the absence of stimulus.

The estimate assumes that any jobs saved or created in a particular industrial sector (for example, mining and logging) are distributed across states in the same way as are existing jobs in that sector.[14] Georgia has only 1.4 percent of national employment in mining and logging, so is assumed to receive only 1.4 percent of employment effects in that industry. By contrast, Georgia has nearly one-quarter of national textile product mill employment, so any employment impacts in that industry are assigned disproportionately to Georgia. Summing across 42 industries yields the total impact on Georgia employment.[15] The procedure is repeated for each state to obtain the distribution across states.

Appendix Table 1 averages the three approaches for all fifty states, plus the District of Columbia. This average indicates that the in the fourth quarter of 2010, ARRA has saved or created roughly 91,000 jobs in Georgia, 3.0 percent of the national total.

Of course, simply because their populations are larger, larger states have larger jobs impacts. Similarly, because their employment is more cyclically sensitive, industrial states have larger employment effects relative to their populations. Finally, both because of their industrial composition and because state fiscal relief and aid to individuals directly impacted have been larger in states hit harder by the recession, states with higher unemployment rates at the time of passage have seen larger employment effects of the ARRA relative to their populations.

[14] Employment by state and industry is drawn from data published by the U.S. Department of Labor (2009, 2010b). We use data from the March 2009 Current Employment Statistics to determine state employment shares and data from the 2008 Quarterly Census of Employment and Wages to determine state-by-industry employment. Because of limitations in the available data, some of the analysis here uses data beginning in 1990:Q2.

[15] This analysis uses a relatively detailed industry breakdown. Manufacturing is divided into 21 sectors (for example, fabricated metal products). Trade, transportation, and utilities are divided into four sectors (wholesale trade, retail trade, utilities, and transportation/warehousing); financial activities into two (finance/insurance, and real estate/rental/leasing); professional and business services into five (professional/technical services, management of companies, employment services, other administrative/support services, and waste management/remediation); education and health into two (educational services and health care/social assistance); leisure and hospitality into two (arts/entertainment/recreation and accommodation/food services). For data sources and methods used in the sectoral decomposition, see CEA (2009b).

Appendix Table 1. Estimated Impact of the ARRA on Employment by State

State	Jobs Impact in 2010:Q4	State	Jobs Impact in 2010:Q4
	Thousands		Thousands
Alabama	42	Montana	10
Alaska	7	Nebraska	18
Arizona	63	Nevada	28
Arkansas	26	New Hampshire	14
California	352	New Jersey	92
Colorado	50	New Mexico	18
Connecticut	38	New York	208
Delaware	9	North Carolina	90
District of Columbia	18	North Dakota	8
Florida	167	Ohio	118
Georgia	91	Oklahoma	35
Hawaii	13	Oregon	41
Idaho	15	Pennsylvania	132
Illinois	141	Rhode Island	12
Indiana	68	South Carolina	41
Iowa	34	South Dakota	9
Kansas	28	Tennessee	61
Kentucky	41	Texas	228
Louisiana	40	Utah	27
Maine	14	Vermont	7
Maryland	54	Virginia	73
Massachusetts	80	Washington	68
Michigan	102	West Virginia	16
Minnesota	61	Wisconsin	64
Mississippi	25	Wyoming	6
Missouri	60		

Sources: CEA estimates based on data from the Current Employment Statistics and the Quarterly Census of Employment and Wages.

Notes: Entries sum to the midpoint of the estimated cumulative impact of policy on employment level of CEA's model approach and projection approach (3,062,000 jobs impacted).

Changes from previous ARRA reports are generated in part by the benchmark revision to payroll employment which effects the share of national employment and the sectoral composition.

REFERENCES

Congressional Budget Office. Letter to the Honorable Nancy Pelosi. February 13, 2009.

Congressional Budget Office. "The Budget and Economic Outlook: An Update." August 2010a.

Congressional Budget Office. "Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output from July 2010 Through September 2010." November 2010b.

Council of Economic Advisers. "Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009." May 2009a.

Council of Economic Advisers. "The Economic Impact of the American Recovery and Reinvestment Act of 2009, First Quarterly Report." September 2009b.

Council of Economic Advisers. "The Economic Impact of the American Recovery and Reinvestment Act of 2009, Second Quarterly Report." January 2010a.

Council of Economic Advisers. "The Economic Impact of the American Recovery and Reinvestment Act of 2009, Third Quarterly Report." April 2010b.

Council of Economic Advisers. "The Economic Impact of the American Recovery and Reinvestment Act of 2009, Fourth Quarterly Report." July 2010c.

U.S. Department of Commerce. Bureau of Economic Analysis. "National Economic Accounts." Accessed November 2010.

U.S. Department of Labor. Bureau of Labor Statistics. "Quarterly Census of Employment and Wages." Accessed September 2009.

U.S. Department of Labor. Bureau of Labor Statistics. "Current Employment Statistics Survey: National." Accessed November 2010a.

U.S. Department of Labor. Bureau of Labor Statistics. "Current Employment Statistics Survey: State Employment and Unemployment." Accessed November 2010b.

U.S. Recovery Accountability and Transparency Board. Data from Recovery.gov website. http://www.recovery.gov/. Accessed November 2010.