

**EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS**



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

THIRD QUARTERLY REPORT

APRIL 14, 2010

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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) was charged with providing to Congress quarterly reports on the effects of the Recovery Act on overall economic activity, and on employment in particular. In this third report, we provide an assessment of the effects of the Act through the first quarter of 2010.

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, we approach the task of estimating the impact of the Recovery Act from a number of different directions, and supplement our estimates with those of numerous outside analysts.

One section of the report looks at trends in the size and composition of Recovery Act spending and tax reductions. We find that:

- The magnitude of the fiscal stimulus increased substantially in the first quarter of 2010 (from \$83 billion in 2009:Q4 to \$112 billion in 2010:Q1) largely because of a surge in tax refunds and lower final tax liabilities due to the Making Work Pay tax credit.
- Government investment outlays in areas such as infrastructure and clean energy, which increased \$16 billion in 2010:Q1, are expected to rise further throughout 2010.

Another section evaluates the economic impact of the Recovery Act from a number of different perspectives. The key findings are:

- Following implementation of the ARRA, the trajectory of the economy changed materially toward moderating output decline and job loss. Real GDP began rising in the third quarter of 2009 and payroll employment began to grow in the first quarter of 2010.
- The two CEA methods of estimating the impact of the fiscal stimulus suggest that the ARRA has raised the level of GDP as of the first quarter of 2010, relative to what it otherwise would have been, by between 2.5 and 2.9 percent. These estimates are very similar to those of a wide range of other analysts.
- The CEA estimates that as of the first quarter of 2010, the ARRA has raised employment relative to what it otherwise would have been by between 2.2 and 2.8 million. These estimates are similar to those of other analysts, and are broadly consistent with the direct recipient reporting data available for 2009:Q4.

A special section of the report focuses specifically on the impact of the tax relief and income support provisions of the Recovery Act. This analysis shows that:

- To date, there has been more than \$200 billion of tax relief and income support provided to households by the ARRA. These funds have had a disproportionately large impact on the incomes of middle- and lower-income families. There has been greater spending in states with larger populations and, for those programs aimed at families in need, in states with more economic distress.
- CEA estimates that without these provisions, household real disposable income would have fallen substantially in 2009 and consumer spending would not have rebounded as it did. Indeed, consumer spending would likely have continued to fall.
- As of 2010:Q1, the tax relief and income support provisions of the Recovery Act have saved or created between 1.1 and 1.4 million jobs, or roughly one-half of the total number of jobs saved or created by the Act.

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I. INTRODUCTION

The American Recovery and Reinvestment Act of 2009 (ARRA) is the boldest countercyclical fiscal expansion in American history. It was enacted at a time when U.S. real gross domestic product (GDP) was 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 stem the tide of foreclosures, 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 in particular. In this third report, we provide an assessment of the effects of the Act through the first quarter of 2010.

As discussed in our 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. We also regularly analyze in more detail the impact of specific programs and provisions of the Act in order to more thoroughly understand and evaluate its effects.

Our multifaceted analysis indicates that the Recovery Act has played an essential role in changing the trajectory of the economy. It has raised the level of GDP substantially in its first full year of existence and has saved or created between 2.2 and 2.8 million jobs as of the first quarter of 2010. The tax relief and income support provisions of the ARRA alone account for roughly half of the beneficial employment effects.

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 March 2010, nearly one-half 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. Importantly, the fiscal stimulus provided by the Act increased substantially in the first quarter of 2010. This was largely due to a surge in tax refunds and reduced final tax liabilities related to the Making Work Pay tax credit. Government investment spending on items such as infrastructure and clean energy totaled \$16 billion in 2010:Q1 and is expected to rise through the end of the year.

Section III contains the key analysis of the overall economic impact of the Recovery Act. It shows that economic conditions have changed radically in the 14 months since the Recovery Act was passed. GDP began to grow in the third quarter of 2009, grew 5.6 percent in the fourth quarter of 2009, and appears to have grown solidly in the first quarter of 2010. Payroll employment grew by an average of 54,000 per month in the first quarter of 2010, and the unemployment rate has declined from an average rate of 10 percent in the fourth quarter of 2009 to an average rate of 9.7 percent in the first quarter of 2010. The economy is obviously far from healthy, but it appears to be firmly on the road to recovery.

We estimate the role of the Recovery Act in effecting this dramatic turnaround in two ways. One involves a comparison of the actual behavior of GDP and employment with a plausible, statistically-determined baseline. The second uses estimates of the effects of fiscal policy from standard macroeconomic forecasting models. 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 shows that our estimated impacts are similar to those of economists across the ideological spectrum. We also examine the available direct job creation data provided by a fraction of ARRA fund recipients and find that the results provide further corroboration of our estimates of the overall impact of the Act.

The Recovery Act included a wide range of tax reductions and income support payments for families. These components of the Act have provided tax cuts to 95 percent of working families, extensions and expansions of unemployment insurance for workers who have lost their jobs in the downturn, and other vital types of support. Section IV of the report presents a compilation of these provisions and shows that without them, real per capita disposable personal income would have fallen substantially in 2009, instead of rising as it actually did. Microeconomic analysis of the distribution of the tax cuts and income support payments across income quintiles, education groups, and states shows that the tax cuts and income support payments were particularly important for middle- and low-income families. We estimate that the tax reduction and income support payments played a crucial role in the rebound of consumer spending in 2009, and likely were responsible for roughly half of the total number of jobs saved or created by the Recovery Act as of the first quarter of 2010.

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. It is certainly possible that the Act could have effects even if no tax changes or spending had yet occurred. For example, its passage could have affected confidence, and expectations of a tax cut in the future could affect household

spending today. But, it is likely that the Act's most significant impact has been from funds that have actually been spent and tax cuts that have actually reached consumers.

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 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 because recipients may begin spending as soon as they are certain funds are available.

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, and March 2010). As of the end of the first quarter of 2010, the sum of outlays and tax cuts was \$373 billion, with an additional \$151 billion obligated but not yet outlayed. This is similar to the amount projected to have been spent by this point by the Congressional Budget Office (CBO) when the Recovery Act was passed.² Additionally, the sum of spending, obligations in excess of spending, and tax cuts is \$525 billion.

¹ The outlays and obligations data are based on weekly reports by the relevant agencies. To ensure that our report is as up-to-date as possible, we use 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 FY2011 budget cycle. However, the data shown on Recovery.gov do not reflect many of the revisions made by OTA for the FY2011 cycle. To provide the most accurate quarterly estimates of the impact of the ARRA, we report and use the revised tax estimates for all quarters. Because of these revisions, the figures in Table 1 for 2009 differ slightly from those reported in our second quarterly report (CEA, 2010).

² CBO (2009) projected that \$184.9 billion would have been spent in fiscal year 2009 (that is, through the third quarter), and \$399.4 billion in fiscal 2010. Assuming that the fiscal 2010 budget impact was spread evenly across the four quarters yields total projected spending of \$384.6 billion by the end of March 2010. CBO recently published a revised estimate of the direct effect on the deficit of the ARRA of \$862 billion (CBO 2010a Appendix A). 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.

Table 1. Outlays, Obligations, and Tax Reductions

	Through the end of				
	2009:Q1 (March ^a)	2009:Q2 (June ^b)	2009:Q3 (September ^c)	2009:Q4 (December ^d)	2010:Q1 (March ^e)
	Billions of Dollars				
Outlays	8.6	56.3	110.7	164.2	210.9
Obligations	31.5	157.8	256.3	313.9	362.1
Tax Reductions	2.5	36.4	67.2	96.8	162.5
Sum of Outlays and Tax Reductions ^f	11.1	92.8	178.0	261.0	373.4

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 FY2011 budget.

Notes: a. Data on outlays and obligations are for March 27, 2009.

b. Data on outlays and obligations are for June 26, 2009.

c. Data on outlays and obligations are for September 30, 2009.

d. Data on outlays and obligations are for December 31, 2009.

e. Data on outlays and obligations are for March 31, 2010.

f. 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, but in a broader sense is somewhat arbitrary. For example, the Making Work Pay tax credit, which reduced taxes for 95 percent of working families, is treated as a tax cut, while the \$250 extra payment to seniors and veterans is treated as an outlay. Yet, both are thought to affect economic activity by putting more money into the hands of consumers. For this reason, it is useful to consider a more functional decomposition. The decomposition is not only interesting in its own right, but is necessary for our later model-based analysis of the impact of the program.

We divide the total dollars of stimulus expended to date into six categories: individual tax cuts and similar payments; the tax cut associated with the adjustment of the Alternative Minimum Tax (AMT); business tax incentives; state fiscal relief; aid to those most directly hurt by the recession; and direct government 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 remaining one-third.

We divide the outlays and tax reduction data into these functional categories as follows. Individual tax cuts include the Making Work Pay tax credit, the child tax credit, and a number of smaller individual tax reductions. We also include 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

We define state fiscal relief to include just the two main programs in this category: a substantial increase in the Federal government's matching percentage for Medicaid spending (FMAP), 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, is treated as aid to directly impacted individuals for our functional classification.

Government 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.

C. Trends and Developments

Table 2 shows our breakdown of aggregate outlays and tax relief into these functional categories. For the impact on the economy, what matters is less the cumulative level of expenditures under the Act, but rather the amount spent each quarter. For this reason, Table 2 also reports the change in the total budgetary impact from the end of the previous quarter.

The table shows important changes over time in the magnitude and composition of the fiscal stimulus. After being stable at roughly \$80 to \$85 billion per quarter over the last three quarters of 2009, total outlays plus tax cuts rose to \$112 billion in the first quarter of 2010. This surge stems from increases in individual tax credits and AMT relief. This was expected: families are making smaller payments or receiving larger refunds on their 2009 tax returns due to the tax provisions of the Recovery Act. Section IV discusses in detail the tax credits available in the ARRA, how families are benefiting, and the impact these credits are having on the overall economic recovery.

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.

Table 2. Fiscal Stimulus by Functional Category

	Through the end of				
	2009:Q1 (March ^a)	2009:Q2 (June ^b)	2009:Q3 (September ^c)	2009:Q4 (December ^d)	2010:Q1 (March ^e)
	Billions of Dollars				
Individual Tax Cuts	2.3	28.7	42.9	56.3	101.1
AMT Relief	0.0	7.2	12.7	15.9	26.3
Business Tax Incentives	0.1	13.1	24.0	33.3	40.5
State Fiscal Relief	8.5	28.2	43.8	59.3	75.5
Aid to Directly Impacted Individuals	0.1	9.8	32.2	57.5	75.0
Government Investment Outlays	0.1	5.7	22.3	38.7	55.0
Total^f	11.1	92.8	178.0	261.0	373.4
Change in Total (from End of Previous Quarter)	11.1	81.7	85.2	83.0	112.4

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 FY2011 budget.

Notes: a. Data on outlays and obligations are for March 27, 2009.

b. Data on outlays and obligations are for June 26, 2009.

c. Data on outlays and obligations are for September 30, 2009.

d. Data on outlays and obligations are for December 31, 2009.

e. Data on outlays and obligations are for March 31, 2010.

f. 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.

Looking forward, we expect government investment outlays on items such as infrastructure and clean energy to account for a growing share of the stimulus. Government investment outlays have already increased substantially, rising from just \$6 billion through the end of the second quarter of 2009 to \$55 billion through the end of the first quarter of 2010. An additional \$128 billion has been obligated for government investment spending, in many cases representing projects that have already begun but not yet received full federal reimbursement. As the economy continues to recover and the ARRA turns toward “reinvestment,” about half of the spending still to come will take the form of government investment outlays.⁴

⁴ Combining the CBO estimates for specific categories (CBO, 2010a) with the data shown in Table 2, about 15 percent of the unspent stimulus will take the form of state fiscal relief, 10 percent will go to directly impacted individuals, 30 percent will come through tax provisions, and the remainder will constitute direct government spending. As discussed above, we classify some of the tax credits as direct spending; including the cost of these credits in government spending yields a total share of about one-half.

III. EVIDENCE OF THE ECONOMIC IMPACT OF THE RECOVERY ACT

In this section, we consider a range of ways of estimating the overall impact of the Recovery Act. We begin with a straightforward examination of the behavior of GDP and employment, and then move on to more sophisticated analyses using a statistical forecasting exercise, an economic model, and the direct reporting data. Although none of these approaches is definitive, together they provide considerable evidence that the Recovery Act has played a critical role in moving the economy from accelerating decline to the beginnings of recovery.

A. The Change in the Economy's Trajectory

The first way that we investigate the impact of the Recovery Act is to consider the behavior of real GDP and employment. Are the changes that we have observed in these two key indicators over the past year consistent with the Act having substantial effects?

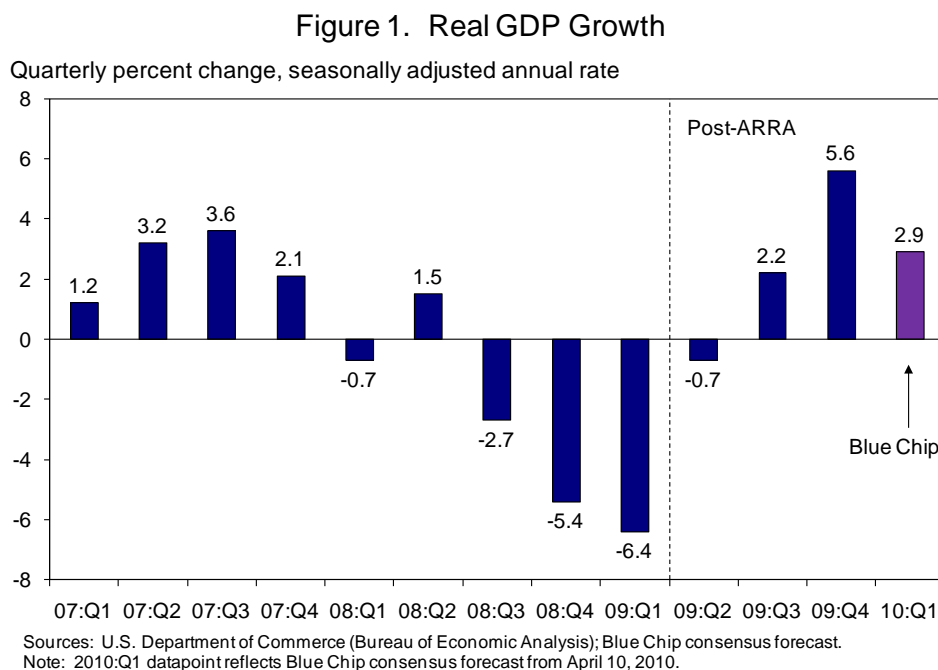
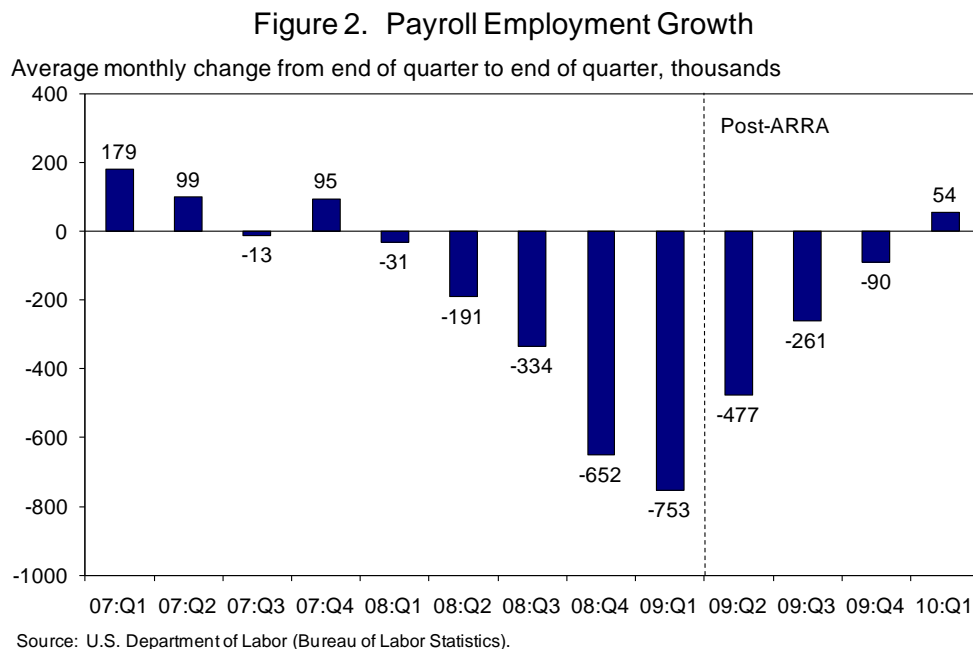


Figure 1 shows the growth rate of real GDP. The dashed line between the first and second quarters of 2009 separates the period before the Recovery Act (which was signed February 17, 2009) could have had a significant impact on the economy from the period after. GDP fell progressively more rapidly from 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 6.4 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 2.2 percent in the third quarter and 5.6 percent in the fourth. The improvement in growth of 12 percentage points from the first quarter to the fourth (that is, the swing from growth at a -6.4 percent rate to growth at a 5.6 percent rate) was the largest over any three quarters since 1981, and the second largest since 1958.

Figure 1 also shows the April 10 Blue Chip Consensus forecast for real GDP growth in the first quarter of 2010. That forecast is 2.9 percent (Blue Chip Economic Indicators, 2010). Forecasters believe that the extremely rapid growth we saw in 2009:Q4 moderated considerably in 2010:Q1, as the influence of temporary inventory investment changes lessened substantially. Importantly, real GDP growth is expected to remain solid in 2010 and to increase somewhat in 2011. The first official GDP estimate for 2010:Q1 will be released on April 30.

Figure 2 presents the behavior of the change in payroll employment. Employment shows the same pattern of an accelerating decline reversing course rapidly after the Recovery Act was passed. In the first quarter of 2009, the economy lost on average an astounding 753,000 jobs per month. Job losses fell to 477,000 per month in the second quarter, 261,000 per month in the third, and 90,000 in the fourth. The economy began adding jobs in the first quarter of 2010, with average gains of 54,000 per month. The *change* in the average monthly change in employment over the past four quarters was among the largest on record.



The economy is obviously still far from healthy. Real GDP is substantially below its normal path, and the unemployment rate remains at 9.7 percent. Moreover, job growth of 54,000

per month is well short of the robust job growth needed to bring down the unemployment rate quickly. But economies do not switch from rapid decline to robust growth all at once. Given what we now know about the frightening momentum of economic decline in the first quarter of 2009, it would have been hard for the economy to stabilize much faster than it did.

The timing of the change in trajectory is highly suggestive of an important role for the Recovery Act. At the time the Act was passed, the economy was in freefall. Real output stabilized dramatically in the quarter after the Act was passed, and began growing again in the next quarter. Similarly, job losses began to moderate rapidly in the quarter after the Act was passed, and continued to slow greatly in the subsequent two quarters. A year after passage of the Act, extraordinary job losses have been replaced by modest job gains.

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

The timing and magnitude of the change in the trajectories of GDP and employment suggest an important role for the Recovery Act. One limitation of this analysis is that it does not attempt to describe the counterfactual for what would have happened in the absence of the fiscal stimulus. To address this issue, here we consider a sensible statistical forecast of the likely path of GDP and employment in the absence of stimulus. We can then interpret the discrepancy between actual developments and this forecast as an estimate of the impact of policy.

There are many ways to construct a statistical baseline forecast. The particular approach that we use is to estimate 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. We include 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. We then forecast GDP and employment beginning in the second quarter of 2009 using actual data through the first quarter of 2009.⁵ Data through the first quarter include the monetary response to the current crisis, but not the fiscal stimulus or other actions that took effect after the first quarter. We have experimented with a variety of other ways of projecting the no-stimulus path of GDP and employment. The results of those exercises are similar to those we report below.

Figure 3 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.

⁵ The estimation methodology in this report is the same as in previous CEA reports on the Recovery Act. The estimates have changed slightly, however, because comprehensive data revisions have altered some of the data used in the estimation.

The figure shows that actual GDP has risen steadily above the forecast path. It was 0.7 percent above that path in 2009:Q2, 1.4 percent above in 2009:Q3, and 2.5 percent above in 2009:Q4. The Blue Chip forecast of 2.9 percent growth in the first quarter of this year suggests that the gap between the actual and forecasted levels of GDP in 2010:Q1 was about 2.9 percent.⁶

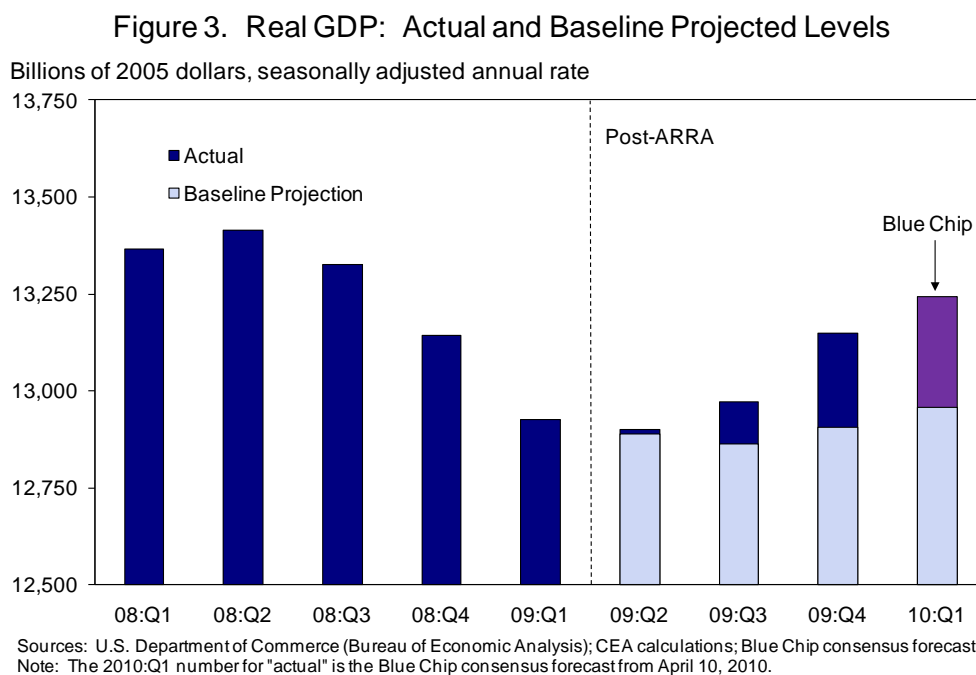


Table 3 summarizes the difference between the actual and forecasted paths of GDP using the statistical projection methodology.

Table 3. Estimates of the Effect of the ARRA Using CEA Statistical Projection Approach

	2009:Q2	2009:Q3	2009:Q4	2010:Q1
GDP Level (Percent)	+0.7	+1.4	+2.5	+2.9
Employment Level	+334,000 ^a	+1,060,000 ^b	+1,945,000 ^c	+2,825,000 ^d

Source: CEA calculations.

Notes: a. Datapoint reflects an estimate for May.

b. Datapoint reflects an estimate for August.

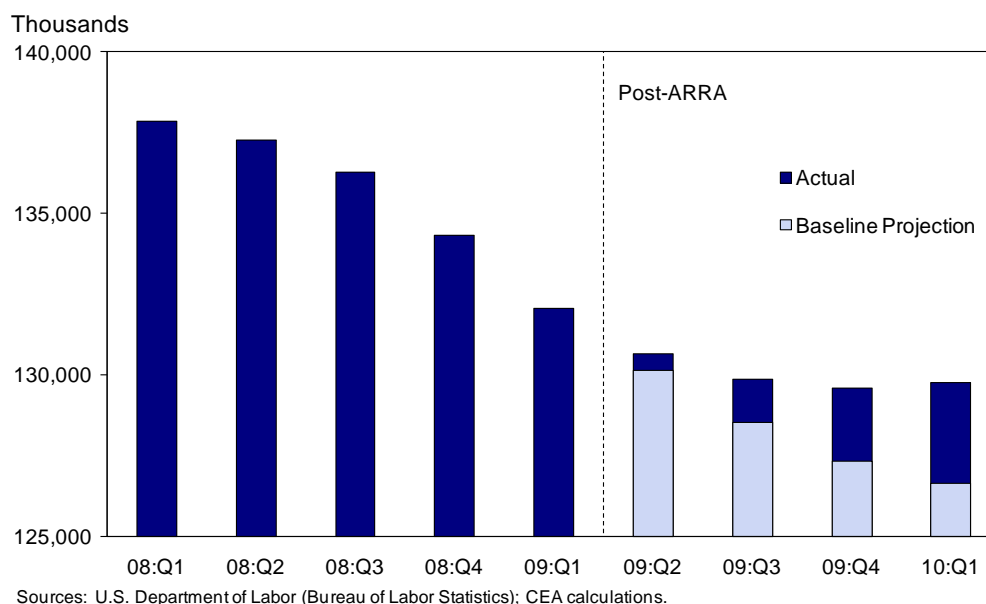
c. Datapoint reflects an estimate for November.

d. Datapoint reflects an estimate for February.

⁶ These differences in the actual and projected levels of GDP imply substantial differences in the growth rates of GDP. Specifically, they imply that GDP growth in 2009:Q2 was 2.8 percentage points higher than the baseline projected growth; in 2009:Q3 it was 2.9 percentage points higher; in 2009:Q4 it was 4.4 percentage points higher; and in 2010:Q1 it was 1.6 percentage points higher.

Figure 4 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 300,000 above the forecast path as of the middle of 2009:Q2, 1.1 million above as of the middle of 2009:Q3, 1.9 million above as of the middle of 2009:Q4, and 2.8 million above as of the middle of 2010:Q1. These results are also summarized in Table 3.

Figure 4. Payroll Employment: Actual and Baseline Projected Level



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 first quarter of 2010 would be about 2.9 percent lower than it actually was, and that employment would be about 2.8 million lower than it actually was. To ascribe much of these differences to the Recovery Act, the key policy action taken in 2009:Q1, is certainly plausible. However, other policy actions, such as the Financial Stability Plan, monetary policy, and the Federal Reserve's program of buying agency debt and long-term U.S. government bonds, surely contributed to the difference. Also, any other factors not captured by the past history of GDP and employment, such as unusual moves in foreign demand or asset prices, would also be captured in the difference.

The overall effect of the policies other than the Recovery Act and non-policy factors on GDP and employment could be either positive or negative. For example, while the various actions to improve financial conditions have surely had a positive impact, the continuing

stringency in credit conditions is most likely restraining GDP and employment relative to their usual cyclical patterns. Thus, the forecast residuals could either overestimate or underestimate the impact of the Recovery Act.

Equally important, the estimates from this approach have considerable margins of error. At any 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 year. 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 reliable as more time elapses, and should be viewed only as rough guides to the effects of the Recovery Act.

C. Estimates of Effects from an Economic Model

Another way to estimate the effects of the Recovery Act on employment and GDP is to use existing estimates of the macroeconomic effects of fiscal policy. That is, one can use mainstream estimates of economic multipliers for the effects of fiscal stimulus. The version of this approach that we use here is identical to that used in the CEA's first two quarterly reports on the Recovery Act.⁷

This exercise, like the one based on statistical projections, will obviously not yield exact figures 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 government purchases or a "typical" tax cut. There is even more uncertainty about the precise timing of those effects, and modest changes in timing have noticeable effects on the impact at a specific point in time. In addition, the current exceptional 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. Finally, the Recovery Act—appropriately—was not just typical 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, we use figures on actual outlays and tax relief under the Recovery Act. Since CEA's second quarterly report, the Office of Tax Analysis of the Department of Treasury has made minor revisions to their estimates of the tax provisions to better align their coverage with the data on outlays, leading to minor revisions in our estimates of the impact on GDP and employment in 2009.

The results of this analysis are shown in Table 4. They imply that the Recovery Act is having a substantial beneficial effect on production and employment. Specifically, they suggest that the Recovery Act raised the level of GDP relative to what it otherwise would have been by

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

0.7 percent in the second quarter of 2009; 1.7 percent in the third quarter; 2.1 percent in the fourth quarter; and 2.5 percent in the first quarter of 2010.⁸ The approach also suggests that the Act increased employment relative to what it otherwise would have been in 2009:Q2 by about 400,000 jobs; in 2009:Q3 by about 1.1 million jobs; in 2009:Q4 by about 1.7 million jobs; and in 2010:Q1 by about 2.2 million. Both the GDP and employment estimates are broadly similar to the estimates described in Section III.B based on the statistical projection approach.

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

	2009:Q2	2009:Q3	2009:Q4	2010:Q1
GDP Level (Percent)	+0.7	+1.7	+2.1	+2.5
Employment Level	+380,000	+1,095,000	+1,742,000	+2,230,000

Source: CEA calculations.

D. Evidence of Effects from Recipient Reporting

One hallmark of the Recovery Act has been an unprecedented commitment to providing timely, transparent, and accountable information about the Act’s progress, allowing the public to “follow the dollar” 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 the types of stimulus, such as individual tax cuts and extended unemployment insurance benefits, that support spending on a broad range of goods and services produced by a wide range of firms. 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 two rounds of recipient reports. The first reports were filed in

⁸ These effects on the level of GDP again imply large impacts on the growth rate of GDP. Specifically, the model estimates indicate that the ARRA raised GDP growth in 2009:Q2 by 2.8 percentage points; in 2009:Q3 by 3.8 percentage points; in 2009:Q4 by 1.7 percentage points; and in 2010:Q1 by 1.5 percentage points.

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 first set of reports indicated a total of 640,329 full-time-equivalent jobs created or saved by the Recovery Act in the period through September 30. The second set of reports identified 608,317 full-time equivalent jobs funded by the Act in 2009:Q4. The third set of reports, covering 2010:Q1, are being filed this month.

As described in the CEA’s second quarterly report, there are many reasons that 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, 2010, 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, were expected to spend out more slowly than other components and to play an important role in providing support to the economy over an extended period. As a result, spending subject to the reporting requirements has been only a relatively small fraction of the total stimulus so far.

Table 5 shows obligations, outlays, and tax reductions in 2009:Q3, 2009:Q4, and 2010:Q1 for both the Recovery Act as a whole and for the subset of programs subject to recipient reporting requirements.⁹ Only 18 percent of the stimulus—outlays and tax cuts—in 2009:Q3 was covered by recipient reports. For 2009:Q4, the figure was 21 percent; and for 2010:Q1, it was 17 percent.

⁹ The numbers in the table do not match those implied by Table 10 of the CEA’s second quarterly report exactly because of a subsequent modification to the list of projects subject to Section 1512 reporting.

Table 5. ARRA Spending Covered by Recipient Reporting

	For the Quarter (Not Cumulative)		
	2009:Q3	2009:Q4	2010:Q1
	Billions of Dollars		
ARRA Total			
Outlays	53.3	53.5	46.7
Obligations	94.3	57.6	48.2
Tax Reductions	30.8	29.5	65.7
Outlays Plus Tax Reductions ^a	84.1	83.0	112.4
Subject to Recipient Reporting Requirement			
Outlays	14.9	17.8	18.8
Obligations	70.5	15.3	26.5
Tax Reductions	0.0	0.0	0.0
Outlays Subject to Reporting Requirement as Percent of Outlays Plus Tax Reductions	17.7%	21.4%	16.8%

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 budget.

Notes: 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 the funds subject to the reporting requirements were only 18 percent of total outlays and tax cuts in 2009:Q3, the jobs figures from the recipient reports are substantially more than 18 percent of the estimates from the projection and model approaches for 2009:Q3. Likewise, funds subject to reporting requirements in the fourth quarter were just 21 percent of total outlays and tax cuts, but the jobs numbers from the reports are well above 21 percent of the estimates of the overall jobs effects from the aggregate approaches for 2009:Q4. Indeed, for both quarters, the figures from the direct reports are over 30 percent of the estimates from the two aggregate approaches. Thus, this comparison suggests that the jobs estimates from the aggregate approaches are, if anything, somewhat low.

In the case of the model approach, we can improve on this simple comparison by asking what the approach implies about the jobs impact not from all of the Recovery Act, but only 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. This comparison again yields a considerably smaller estimate from the model approach than from the recipient reporting data for both 2009:Q3 and 2009:Q4. Thus, it again suggests that the model is not overstating the jobs effects.

In short, the recipient reports support the view that the ARRA has had a large, rapid impact on employment. Indeed, the recipient reports not only reinforce the reliability of the broader estimates produced by the CEA's statistical and economic models, they suggest that these models could be understating the jobs impact of the Recovery Act.

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

Many other economists and forecasters have estimated the likely effects of the Recovery Act. Most of those estimates are based on formal macroeconomic models. These estimates serve as a check of the reasonableness of our own estimates.

Table 6 reports estimates of the contribution of the Recovery Act to GDP in the four quarters since the Act was passed from an array of public and private forecasters.¹⁰ The first row repeats the estimates from Section III.B based on the comparison of actual outcomes with projections of the normal evolution of the economy, and the second row shows our model-based estimates from Section III.C. The next two rows show the low and high estimates prepared by the Congressional Budget Office. The estimates from both of our approaches are well below the top of the CBO range, and are generally in its lower part. The remaining lines of the table show the private sector estimates that we have been able to gather. These estimates are generally similar to ours.

Table 6. Estimates of the Effects of the ARRA on the Level of GDP

	2009:Q2	2009:Q3	2009:Q4	2010:Q1
	Percent			
CEA: Projection Approach	+0.7	+1.4	+2.5	+2.9
CEA: Model Approach	+0.7	+1.7	+2.1	+2.5
CBO: Low	+0.9	+1.3	+1.5	+1.5
CBO: High	+1.5	+2.7	+3.5	+3.9
Goldman Sachs	+0.5	+1.4	+1.9	+2.3
IHS/Global Insight	+0.5	+1.2	+1.7	+2.0
James Glassman, J.P.Morgan Chase	+1.2	+1.8	+2.6	+3.3
Macroeconomic Advisers	+0.5	+1.0	+1.4	+1.7
Mark Zandi, Moody's Economy.com	+0.8	+1.6	+2.2	+2.5

Sources: See text for details.

¹⁰ The sources are as follows. CBO: CBO (2010b). Goldman Sachs: described in Goldman Sachs (2009); updated figures from Alec Phillips, email communication, April 7, 2010. IHS/Global Insight: figures from Nigel Gault, email communication, January 11, 2010. James Glassman, J.P.Morgan Chase: Glassman (2010). Macroeconomic Advisers: Macroeconomic Advisers (2009a, 2009b); exact figures from email communication, August 10, 2009. Moody's economy.com: described in Zandi (2010); exact figures from Mark Zandi, email communication, April 7, 2010. 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.

Fewer estimates of the employment effects of the Recovery Act are available. Those that we have been able to gather are reported in Table 7, together with the estimates from our two approaches.¹¹ Again, our estimates are generally within the range of other projections, though somewhat above the median. The fact that such a range of public and private forecasters broadly agree with the CEA's estimates of the impact of the Recovery Act on GDP and employment should increase confidence that the Act is having a substantial stimulative effect.

Table 7. Estimates of the Effects of the ARRA on the Level of Employment

	2009:Q2	2009:Q3	2009:Q4	2010:Q1
CEA: Projection Approach	+334,000 ^a	+1,060,000 ^b	+1,945,000 ^c	+2,825,000 ^d
CEA: Model Approach	+380,000	+1,095,000	+1,742,000	+2,230,000
CBO: Low	+300,000	+700,000	+1,000,000	+1,200,000
CBO: High	+500,000	+1,300,000	+2,100,000	+2,700,000
IHS/Global Insight	+228,000	+688,000	+1,248,000	+1,707,000
Macroeconomic Advisers	+248,000	+623,000	+1,057,000	+1,462,000
Mark Zandi, Moody's Economy.com	+500,000	+1,008,000	+1,486,000	+1,896,000

Sources: See text for details.

Notes: a. Datapoint reflects an estimate for May.

b. Datapoint reflects an estimate for August.

c. Datapoint reflects an estimate for November.

d. Datapoint reflects an estimate for February.

To the degree that the estimated employment effect from our model approach in 2010:Q1 is somewhat larger than that of some other forecasters, it is useful to note that our estimate is based on the most recent spending and tax reduction data, whereas some of the private sector estimates have not been updated since last summer. Also, our employment effect is derived from the GDP effect using standard estimates of the usual relationship between the two series. That our GDP estimate is squarely in the middle of the range of other GDP estimates therefore adds credence to our employment estimate. Finally, our projection approach takes into account the actual behavior of employment, which has changed dramatically over the previous year, while most of the other estimates are based largely on a historical multiplier approach.

In light of the actual behavior of GDP, the estimates in Table 6 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 2009:Q4 and 2010:Q1 than it actually was. Likewise, the estimates in Table 7 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 be continuing in 2010.

¹¹ The sources are the same as for Table 6.

IV. THE TAX RELIEF AND INCOME SUPPORT PROVISIONS OF THE RECOVERY ACT

An important aspect of the Recovery Act is the substantial direct contributions it has made to family incomes, through tax cuts, cash payments, and in-kind transfers. These resources account for over one-third of the total size of the Act, and roughly half of the stimulus under the Act in 2009.¹² Payments to individuals and families were made through a number of programs, including one-time payments to seniors and retirees, the Making Work Pay tax credit, extensions and expansions of unemployment insurance benefits, and increases in benefits from the Supplemental Nutrition Assistance Program. These payments have gone to over 95 percent of working families, helping them to maintain their consumption despite economic conditions that might otherwise have led them to pull back.

The direct contributions to family incomes represent economic stimulus just as much as do the other components of the Recovery Act. Because these payments went out very quickly—many within the first quarter after the Act was passed—and because recipients are likely to spend additional funds quickly, they pump dollars back into the economy while also reducing the strain on local governments to provide safety net services.

Equally important, for those families that have been directly affected by the recession through job loss, diminished retirement savings, or reduced income, Recovery Act assistance has helped them put food on the table, keep up with rent and mortgage payments, cover college tuition bills, and maintain health insurance coverage. And, because much of this support was provided through expansions of already-established programs, the Act was able to quickly funnel supplemental resources to families in need without additional application burdens or delays in enrollment processing.

A. The Components of the Recovery Act that Directly Affect Family Incomes

We begin by summarizing the most important individual tax credits and transfer programs in the Recovery Act. As discussed in Section IV.B, this list omits several additional ways in which the Act is supporting family incomes.

- The **Making Work Pay (MWP) refundable tax credit** provides wage earners with a credit up to \$400 (\$800 for joint filers) for the 2009 and 2010 taxable years. This credit is calculated at a rate of 6.2 percent of earned income and is phased out for individual taxpayers with an adjusted gross income of \$75,000 and above and joint filers with an adjusted gross income of \$150,000 and above. It was implemented through reductions in workers' paychecks beginning on April 1, 2009. **The Department of the Treasury**

¹² See Table 2, which shows total 2009 spending under Individual Tax Cuts, AMT Relief, and Aid to Directly Impacted Individuals of \$130 billion out of a total budget impact in the calendar year of \$261 billion.

Office of Tax Analysis estimates that over 100 million families will benefit from the Making Work Pay tax credit in 2010.¹³

- Relief from the **Alternative Minimum Tax (AMT)** was extended for 2009, and the income threshold for exemption was increased. These changes are estimated to help over 26 million families avoid the AMT, which imposes higher tax burdens and substantial complexity on those who are subject to it.
- The Recovery Act significantly strengthened the **unemployment insurance (UI)** system in order to ensure that this critically important safety net would meet the needs of people who lost their jobs during the recession. As a result, almost all UI recipients receive an additional \$25 per week in benefits through the Federal Additional Compensation program. In addition, an extension of the Emergency Unemployment Compensation (EUC) program and additional federal funds for the Extended Benefits (EB) program provide for additional weeks of benefits to workers who have exhausted their benefits under the regular program but, due to the weak economy, are still out of work. **Nearly 22 million people have benefited from the ARRA unemployment insurance benefits to date.**

In its original form, these additional benefits were only available to those who lost their jobs in 2009. However, at the President's urging, Congress extended this support to unemployment spells beginning through March 31, 2010. Congress has recently allowed the additional support to lapse, but the President is working with Congress to correct that situation in order to provide vital support to the unemployed and the economy as a whole.

- The Recovery Act provides a **65 percent subsidy to help people who have lost their jobs or have experienced reductions in hours to purchase health insurance through the COBRA program**, thereby allowing individuals to maintain their insurance by paying only 35 percent of premiums. Recipients must have been terminated from employment between September 1, 2008 and December 31, 2009 to qualify. The ARRA was later amended to extend the period of termination to March 31, 2010 and the amount of time the subsidy may be claimed from 9 to 15 months. As with the UI provisions, Congress has recently allowed the COBRA subsidies to lapse, and the President is working with Congress to correct that situation.
- The Recovery Act appropriated about **\$20 billion to bolster the Supplementary Nutrition Assistance Program (SNAP)**, which provides vouchers for food purchases to

¹³See <http://www.treas.gov/press/releases/reports/transaction%20report%20final%20final%2009.04.09.pdf>.

households with low assets and gross monthly incomes below 130 percent of the poverty line (or approximately \$28,700 for a family of four). The Act provides an automatic 13.6 percent increase in the SNAP allotment to all recipients, amounting to \$80 per month for a household of four receiving the maximum benefit. The Recovery Act also eased eligibility requirements for unemployed, childless adults by temporarily eliminating time limits for benefit receipt. Largely because of the recession, national SNAP enrollment is at an all-time high, with caseloads increasing in every state (Center on Budget and Policy Priorities, 2009). **As of January 2010, 39.4 million individuals in 18.1 million households were receiving SNAP benefits.**

- The **Economic Recovery Payment (ERP)** provides a one-time automatic payment of \$250 to retirees, disabled individuals, and Supplemental Security Income (SSI) recipients. **Over 50 million people have received ERP payments.** In addition, certain Federal and State pensioners not eligible for Social Security benefits were eligible to receive the refundable \$250 **Government Retiree Credit (GRC)** on their 2009 taxes.
- The Recovery Act created an Emergency Contingency Fund to support states facing large increases in costs under the **Temporary Assistance for Needy Families (TANF) program**. These funds can be used to support increased basic assistance benefits. States may also draw from the \$5 billion fund to establish or expand programs that help TANF participants enter the labor market through subsidized employment, training, and work-study positions. An additional \$319 million was appropriated for TANF supplemental grants to benefit those states with historically high population growth and low average benefits.
- An additional set of tax provisions aim to provide relief to a broad range of families. The ARRA temporarily increased **the Earned Income Tax Credit (EITC)** for families with three or more children and for many married couples regardless of the number of children. Many families are also benefitting from expanded eligibility for the **child tax credit** during taxable years 2009 and 2010. The first \$2,400 of unemployment benefits per recipient in 2009 were **exempted from federal income tax**. State and local sales and excise taxes on the purchase price of qualified vehicles were made **deductible** in 2009, while the refundable **First-Time Homebuyer Credit** was increased to \$8,000 and extended. Finally, the partly-refundable **American Opportunity education tax credit of up to \$2,500** is helping individuals pay college-related expenses in 2009 and 2010.

Table 8 summarizes the various programs. The first column lists the total cost of each program, as estimated in the initial analysis of the Recovery Act by the Joint Committee on

Taxation and CBO. Together, over \$330 billion was devoted to these programs providing tax relief and direct payments to individuals, over one-third of the entire ARRA package.¹⁴

Table 8. Tax Relief and Income Support in the ARRA

	Total Cost (initial estimate)	Budget Impact in 2009 ^a	Budget Impact in 2010:Q1 ^b
Billions of Dollars			
Making Work Pay	116.2	36.9	27.5
AMT Relief	69.8	15.9	10.4
Unemployment Insurance			
Federal Additional Compensation (FAC)	8.8	9.4	2.8
Emergency Unemployment Compensation (EUC08)	27.0	28.8	8.0
UI Modernization	3.0	1.9	0.3
Extended Benefits	0.1	5.7	0.8
COBRA	24.7	3.7	2.3
Supplemental Nutrition Assistance Program (SNAP)	19.9	7.2	2.7
Payments to Seniors	14.4	13.8	0.2
TANF	2.7	0.6	0.5
Other tax relief for individuals and families			
Increase in EITC	4.7	0.0	2.0
Child tax credit	14.8	0.0	8.0
Suspension of tax on unemployment benefits	4.7	1.3	3.0
Sales tax deduction for vehicle purchase	1.7	0.3	0.7
First-time homebuyer tax credit	6.6	3.6	0.8
American Opportunity tax credit	13.9	0.4	2.6
Total^c	332.9	129.7	72.7

Sources: Joint Committee on Taxation; Congressional Budget Office; Agency Financial and Activity Reports to the Office of Management and Budget; Employment & Training Administration.

Notes: a. Data on outlays are for December 31, 2009. Budget impact includes both outlays and reduced tax receipts.

b. Data on outlays are for March 31, 2010. Budget impact includes both outlays and reduced tax receipts.

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

The second column lists the outlays in each program through December 31, 2009. As noted above, tax cuts and payments to individuals are relatively easy to distribute quickly, providing rapid stimulus to the nation's economy. Accordingly, over one-third of the total anticipated expenditure for these programs was distributed during calendar year 2009. Moreover, this understates the speed with which these programs were implemented, as a substantial portion of the tax expenditures in tax year 2009 will not be counted as having been outlayed until refund checks go out in the spring of 2010.

¹⁴ The ultimate cost of these programs may be lower or higher, as the cost of tax provisions depends on the number of people who actually claim the credit or deduction, and the cost of income support programs such as UI and SNAP depends on the number of people who actually enroll in the programs. As the table indicates, the unemployment insurance programs outlayed more money in calendar year 2009 than the original estimate for the entire life of the programs, due to unexpected increases in unemployment.

The third column of Table 8 shows the additional tax cuts and income support provided by the Recovery Act in the first quarter of 2010. As can be seen, outlays in this single quarter are over half as large as the total outlays in 2009. Much of this reflects refundable tax credits that are counted as outlayed when recipients file their 2009 tax returns in early 2010. There is a particularly large impact of the Making Work Pay tax credit in 2010:Q1, combining reduced withholding toward 2010 taxes with increases in refunds on 2009 taxes. The Office of Tax Analysis estimates that increased 2009 tax year refunds due to MWP will amount to \$17.5 billion in 2010:Q1 and an additional \$3.5 billion later in 2010.¹⁵

B. ARRA and Disposable Personal Income

Not every dollar that is spent by the Federal government on these programs flows directly into families' bank accounts. Some of the funds included in Table 8, for example, went to States to fill the holes in their budgets left by increased demand for TANF benefits over the course of the recession. To understand the direct impact of the Recovery Act on family incomes, then, it is necessary to move beyond the Federal accounts. For this purpose, we turn to data from the Bureau of Economic Analysis (BEA) on the impact of the Recovery Act on disposable personal income. These data are only available through the fourth quarter of 2009.

All told, the BEA estimates that the ARRA transfer payments and tax cuts that went directly to households raised disposable income by \$139 billion. This is slightly higher than the total shown in Table 8; the difference is largely attributable to the inclusion of some small programs (such as business tax credits paid to business owners) in the BEA total that are not included in our Table.¹⁶ Figure 5 shows the distribution of the ARRA contribution to disposable income by quarter and category.

About one-quarter of the total payments came from the Making Work Pay tax credit. As noted earlier, for most families this credit was distributed via reduced withholding from their regular paychecks. Thus, its impact was spread evenly across the final three quarters of 2009.¹⁷ Another 19 percent came from other reductions in individuals' taxes, including the AMT relief,

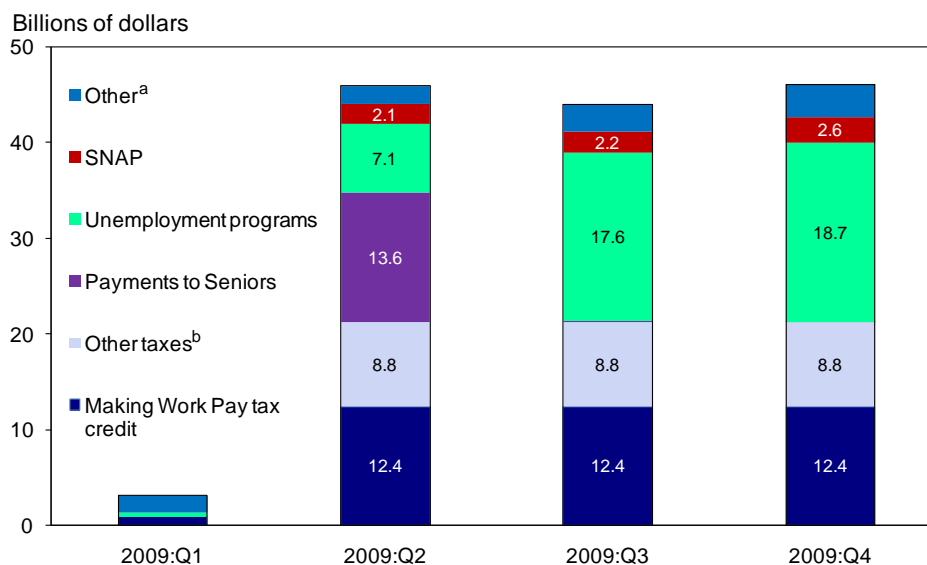
¹⁵ Consistent with this, the IRS reports that average tax refunds through March 12 were up \$266 from the prior year. See White House (2010).

¹⁶ Other such programs include ARRA funding for Pell grants. On the other side of the ledger, the BEA data exclude the TANF payments and UI modernization funds, as each were paid to States rather than individuals, and the First-Time Homebuyer Tax Credit, which the BEA classifies as a capital transfer; but these do not fully offset the additional programs in the BEA data that are not in Table 8. Another difference is that while Table 8 relies on the most current OTA revenue estimates for the tax provisions (for example, the Making Work Pay tax credit), the BEA calculations have not yet incorporated recent revisions. Finally, the BEA estimates may differ due to adjustments for the timing and territorial coverage of the ARRA.

¹⁷ The BEA estimates for 2009 include only the portion of Making Work Pay distributed through reduced paycheck deductions in 2009; the portion distributed through refunds on families' 2009 tax returns in early 2010 is not included in Figure 5. OTA estimates that \$21 billion in tax-year 2009 MWP credits will be paid as income tax refunds in 2010.

the EITC, the child tax credit, and a variety of additional business tax incentives claimed by individuals. Payments to seniors, one-time \$250 checks that went out in the second quarter of 2009, accounted for 10 percent. Most of the remainder of the impact came from provisions targeted specifically to individuals whose incomes had been directly impacted by the recession: nearly one-third through UI programs, and 5 percent through the SNAP.

Figure 5. Direct Effects of the ARRA on Disposable Personal Income



Source: U.S. Department of Commerce (Bureau of Economic Analysis), Effect of the ARRA on Selected Government Sector Transactions (http://bea.gov/recovery/pdf/arra_impact_table_01.pdf).

Notes: a. Includes funding for Pell grants, COBRA, and other programs.

b. Includes AMT, business tax credits claimed by individuals, and other programs.

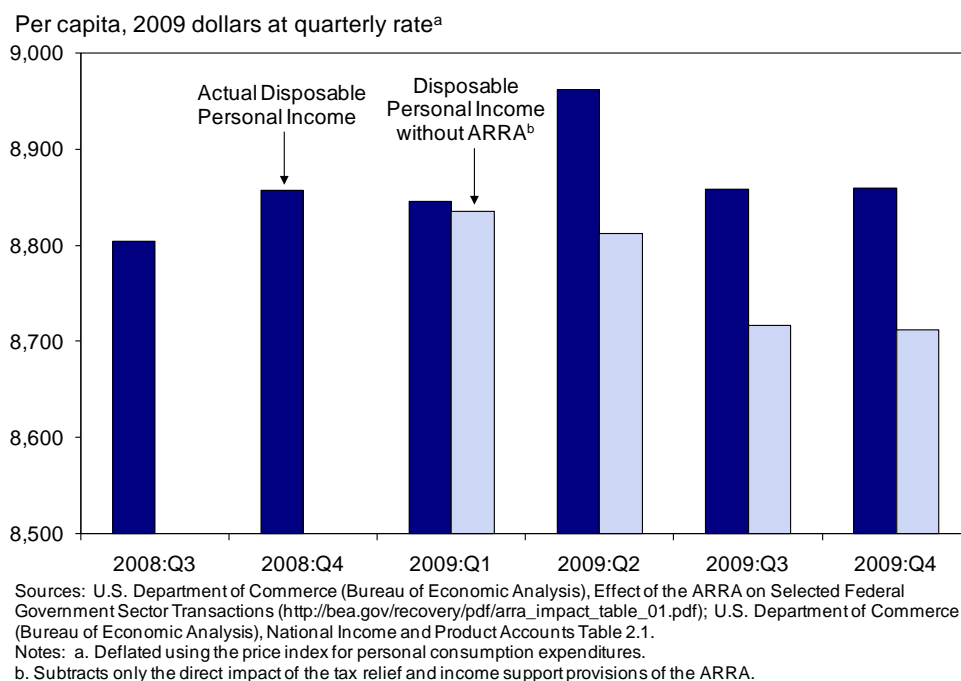
The BEA has not yet published comparable estimates for the first quarter of 2010. However, consistent with the large surge in tax relief and income support shown in Table 8, we expect the direct ARRA contribution to disposable personal income in the first quarter of 2010 to substantially exceed its direct contribution in any previous quarter.¹⁸

Figure 6 shows that the transfers and tax reductions made a dramatic difference in households' purchasing power. The figure shows the behavior of actual per capita real disposable income since 2008:Q3 (the dark blue bars) and the same series minus the direct effects of the tax relief and income support provisions of the Recovery Act (the light blue bars). The light blue bars indicate that absent the family financial assistance provisions of the ARRA,

¹⁸ The impact of 2009 tax refunds in the BEA data will be smaller than in Table 8, as the Table reflects the OTA estimate of the reduction in tax receipts and increase in refunds in 2010:Q1 due to the ARRA while the BEA instead spreads any effects on tax refunds over the entire 2010 calendar year.

real disposable incomes would have fallen throughout 2009.¹⁹ Instead, despite the severe impact of the recession, income in each of the last three quarters of 2009 actually surpassed its 2008:Q4 level. The difference was largest in the second quarter, when the one-time \$250 Economic Recovery Payments were distributed, but even in the third and fourth quarter, household purchasing power was maintained at approximately the same level as in 2008:Q4 by the assistance provided under ARRA. This is a remarkable impact, particularly when one considers that job losses during the recession reduced private wage and salaries by \$300 billion in 2009 relative to 2008.

Figure 6. Disposable Personal Income with and without the ARRA



Extending Figure 6 through the first quarter of 2010 would again require data that the BEA has not yet published. However, from the continued rate of Recovery Act outlays in the quarter, we can confidently conclude that the pattern of ARRA impacts in Figure 6 continued through 2010:Q1. Put simply, the ARRA has continued to give vital support to families' budgets.

It is important to note that the estimates shown in Figure 6 capture only the direct impacts of the financial assistance provisions on the families that received them. These families used their additional disposable income to support higher consumption than would have been possible

¹⁹ Adding up the shortfalls in the four quarters of 2009, average incomes would have been \$354 below what would have occurred had incomes continued at their 2008:Q4 rate throughout 2009.

without the Act, producing further indirect effects on personal income through the additional jobs (and higher wages) created at firms from which the direct recipients purchased goods and services. Many of the financial assistance provisions were designed to go to families facing temporary financial challenges; as we discuss below, these families are likely to have spent the money they received particularly quickly, producing disproportionate indirect effects. To take one example, the Department of Agriculture estimates that 97 percent of SNAP benefits are redeemed within 30 days of issuance.

On top of this, the components of the Recovery Act that did not go directly to families—infrastructure investments, state fiscal relief, and other direct federal spending—had their own impacts on economic activity, strengthening the demand for labor and increasing individual employment and earnings. As discussed in Section III, the CEA estimates that about 2 million people had jobs in 2009:Q4 due to the Recovery Act, and the compensation that those individuals received is not credited to the Act in the BEA's accounts.²⁰ In short, the path that disposable personal income would have followed over 2009 without the Recovery Act would have involved even steeper falls than shown by the light blue bars in Figure 6, which subtract only the direct impact of the Act's tax relief and income support provisions.

C. Who Is Being Helped?

The analysis above focuses on the average impact of the ARRA financial assistance provisions. This impact dramatically understates the importance of the ARRA for families that were directly impacted by job losses. The unemployment insurance, nutritional assistance, and health care provisions were all targeted to families facing periods of low income. Many of these families were able to avoid eviction and keep food on the table only due to the availability of assistance under the Recovery Act. By contrast, other provisions (for example, the payments to seniors and the Making Work Pay tax credit) were more widely spread across the population.

To understand the overall distributional impact of the financial assistance provisions in the Recovery Act, we turn to individual-level data on the receipt of payments under various programs from the Annual Social and Economic Survey conducted in March of each year under the aegis of the Current Population Survey (CPS). This provides information on roughly 100,000 households each year, and asks each to report total income from a variety of sources for the previous calendar year. Data describing income in calendar year 2009 were collected in March 2010 and will not be available for analysis until later in the year. Thus, for a preliminary

²⁰ Further, some of the state fiscal relief was surely used to prevent tax increases and cuts in income support programs. These actions directly affected family income, but are not included in the calculations in Table 8 and Figure 6.

look at the distribution of ARRA payments, we use data from the March 2009 survey, describing income and transfer receipts in 2008, and project these forward to 2009.²¹

We focus on four programs that are most amenable to analysis in the available data: payments to seniors, the Making Work Pay tax credit, the Supplemental Nutritional Assistance Program, and unemployment insurance benefits. Together, these account for 80% of the 2009 outlays summarized in Table 8.²²

The distribution of eligibility for the payments to seniors and the Making Work Pay tax credit is unlikely to have changed much between 2008 and 2009, so the 2008 data likely can be used to provide a quite accurate picture of their impacts. The payments to seniors are the simplest to simulate: using detailed information about each person's age and income sources, we assign the Economic Recovery Payment and the Government Retiree Credit to any individual who would have been eligible if these payments had been available in 2008. For the ERP, this includes adults with income from Social Security, SSI, retirement income for railroad workers, or veteran's payments for retired or disabled individuals; for the GRC, individuals with Federal, state, or local pension income who did not receive the ERP. It is similarly straightforward to simulate family eligibility for the Making Work Pay tax credit, which depends primarily on earned income and Adjusted Gross Income (AGI).²³ We adjust the simulated frequencies we obtain from the CPS to ensure the aggregate expenditures by state match administrative data from the Social Security Administration for the ERP and Office of Tax Analysis estimates for the Making Work Pay tax credit.²⁴

The SNAP and unemployment insurance provisions in the ARRA are somewhat harder to simulate, as the declining economy made many more people eligible for benefits under these programs in 2009 than in 2008. The most recent available data, from January 2010, indicate that more than one in eight U.S. residents—39.4 million individuals in 18.1 million households—are enrolled in the SNAP. This represents an increase of 11.9 million individuals since the start of the recession in December 2007. Similarly, around 11 million households are now receiving UI

²¹ We restrict our analyses to exclude single individuals under age 18 and full-time college students under 24.

²² The largest program not included in our analysis is the Alternative Minimum Tax. The CPS data do not provide enough detail about families' tax returns to permit simulation of AMT obligations. It is safe to assume, however, that the AMT provisions in the ARRA disproportionately benefitted families in the upper portion of the income distribution (see, for example, the Tax Policy Center, 2009a and 2009b, which finds that over 80% of the spending on the ARRA AMT provision went to tax filing units in the upper quintile of the income distribution). Our analysis will thus somewhat understate the share of benefits received by such families.

²³ We assume that married couples file jointly and that everyone else files as single. For applications where we want to consider the individual distribution of MWP credits, we assume that any credits earned by married couples are split evenly across the two people. For this analysis, we do not distinguish between MWP credits received through reduced payroll deductions in 2009 and those received as tax refunds in 2010.

²⁴ Data on state level expenditures for the GRC are not available, and we do not adjust these.

benefits, far more than the roughly 3 million recipients in December 2007.²⁵ Unfortunately, we have relatively little information about how the characteristics of new recipients of benefits under these programs compare with those of the recipients in 2008.

For the SNAP, we rely on information in the CPS about SNAP reciprocity at the household level and assume that the recipients in 2009 resemble the recipients in 2008 in their family incomes, education, and geographic distribution.²⁶ For unemployment insurance benefits, we take advantage of additional data from the monthly CPS survey that is already available for each month of 2009. By comparing data from 2009 and 2008, we can measure changes in the prevalence of unemployment for demographic groups defined by race, education, age, and sex. We assume that the prevalence of unemployment insurance receipt has changed similarly, and modify the distribution of UI receipt in the annual 2008 data to reflect these changes.²⁷ As in our analysis of the MWP and ERP, we make a final adjustment to ensure that our estimates match the distribution across states of UI and SNAP expenditures in 2009.

Table 9 shows how the payments under the four programs are distributed across family income groups. As discussed above, the Making Work Pay tax credit went to 95 percent of working families. 6.5 percent of these tax cuts went to families in the bottom quintile of the income distribution, reflecting the lower labor force participation rates of these families and the low earnings of those who do work. The credits are more evenly distributed across the other four quintiles, though the distribution varies slightly because there are more dual earners in the higher income groups. For the top quintile, Table 9 splits the results into those for the families in the top 5 percent of the income distribution and those in the remainder of the top quintile. By design, the tax credit does not go to very high-income earners. Overall, the MWP tax credit is highly concentrated in families earning between \$12,000 and \$152,000.

²⁵ Statistics reflect caseloads in the week ending March 13, 2010. This comparison combines increases in reciprocity of regular UI benefits with expanded eligibility for UI through Extended Benefits (EB) and Emergency Unemployment Compensation (EUC). In the regular UI program, reciprocity has risen from about 3 million to about 5 million.

²⁶ When we want to consider the distribution of benefits at the individual level, we assume that SNAP support is split evenly across all members of the household.

²⁷ Specifically, we divide individuals into cells defined by race (white non-Hispanic and all others), education (four categories), 10-year age groups, and sex. For each cell, we use data from the monthly CPS survey to compute the fraction of individuals who were unemployed, first in 2008 and then in 2009. We interpret the ratio of these two fractions as an indication of the increase in the prevalence of UI in each cell between years, and use this ratio to reweight the distribution of observed UI receipt in 2008 in the March 2009 CPS data. We assume that ARRA expenditures on UI are split evenly across all recipients, as we are unable to simulate separately the eligibility for extended and emergency benefits.

Table 9. Distribution of ARRA Tax Relief and Income Support across the Family Income Distribution

Income quintile ^a (income range)	Income	Making Work Pay	Unemployment Insurance	Nutrition Assistance	Payments to seniors	Total for these programs
	Percent of total income ^b	Percent of ARRA budget impact in category through Dec. 31, 2009 ^b				
1 (\$0–\$12,000)	1.7	6.5	11.9	56.4	19.4	12.7
2 (\$12,000–\$25,000)	6.2	15.7	18.2	29.9	27.8	18.7
3 (\$25,000–\$43,000)	11.1	21.2	24.2	10.6	22.5	21.8
4 (\$43,000–\$78,000)	22.2	29.6	25.5	2.7	17.1	25.2
5 (>\$78,000)	58.6	27.1	20.2	0.4	13.2	21.5
Excl. top 5% (>\$78,000–\$152,000)	31.3	25.1	16.9	0.3	10.5	19.0
Top 5% (>\$152,000)	27.3	2.0	3.3	0.0	2.7	2.5

Sources: CEA estimates based on data from the Current Population Survey, the Office of Tax Analysis, Agency Financial and Activity Reports to the Office of Management and Budget for December 31, 2009, and the Social Security Administration.

Notes: a. Income quintiles are based on family units, defined as a person and his or her spouse (if present). By design, 20% of family units fall in each quintile.

b. Items may not add to 100 percent due to rounding.

The distribution of unemployment insurance expenditures is similar to that for the MWP tax credit (though a bit more evenly distributed across income quintiles), as families in all income categories have experienced elevated rates of unemployment during this recession. By contrast, SNAP payments are heavily skewed toward the bottom of the income distribution, with over half going to families in the bottom income quintile.²⁸

The right-most column of Table 9 shows the overall distribution of tax credits and payments under the four programs. About one-eighth of tax credits and payments went to the lowest-income fifth of families, about seven times the share of total income accruing to these families. The second, third, and fourth quintiles—one definition of the middle-class—also each received larger shares of ARRA payments than their shares of aggregate income. The top income quintile received 22 percent of ARRA payments, less than half its share of income. Only 2.5 percent of ARRA payments went to families in the top 5 percent of the income distribution, less than one-tenth of this group's share of income.

Table 10 repeats the analysis to examine the distribution of payments across education groups. Not surprisingly, MWP tax credits are roughly evenly distributed across the top three education groups while those with less than a high school degree receive relatively less money from this program, reflecting their relatively lower employment rates and earnings. UI payments disproportionately flow to the middle education groups. Nutrition assistance flows primarily to the least-educated individuals, while payments to seniors are also somewhat skewed (though less

²⁸ Table 9 indicates that over three percent of SNAP payments went to families in the upper 40 percent of the income distribution. This may reflect higher-income families who fell on hard times and became eligible for SNAP for a portion of the year, or higher-income families sharing households with lower-income SNAP beneficiaries; we are unable to apportion SNAP benefits accurately across families in the same household.

so than SNAP) toward the lower end of the education distribution, reflecting the relatively lower education levels among older cohorts. Across the four programs, the distribution of payments quite closely mirrors the population distribution, with per capita payments only a bit higher in the middle education categories than at the top and the bottom.

Table 10. Distribution of ARRA Tax Relief and Income Support across Education Groups

	Population Percent of total ^a	Making Work Pay	Unemployment Insurance	Nutrition Assistance	Payments to seniors	Total for these programs
	Percent of ARRA budget impact in category through Dec. 31, 2009 ^a					
Less than high school	13.6	9.7	11.8	36.3	21.6	13.3
HS	31.8	30.3	38.8	37.9	36.9	34.6
Some college	26.4	28.4	30.2	22.2	22.4	28.0
BA +	28.2	31.6	19.3	3.7	19.1	24.1

Sources: CEA estimates based on data from the Current Population Survey, the Office of Tax Analysis, Agency Financial and Activity Reports to the Office of Management and Budget for December 31, 2009, and the Social Security Administration.

Note: a. Items may not add to 100 percent due to rounding.

Finally, Table 11 presents the distribution of tax cuts and income support payments across the fifty states plus the District of Columbia. The most important finding is that these benefits have been spread broadly. The table also shows several expected patterns. States with larger populations—for example, California, Texas, and New York—receive more funds than states with smaller populations. States with relatively elevated unemployment rates—for example, California, Michigan, and Nevada—receive relatively more money from the UI programs in the ARRA, while states with higher poverty rates—for example, Mississippi and Louisiana—receive more money from SNAP. And Florida, with its disproportionate number of retirees, receives relatively more money under the payments to seniors programs. Overall, the distribution of Recovery Act funds closely reflects the size and characteristics of the states.

Table 11. Distribution of ARRA Tax Relief and Income Support across States

	Making Work Pay	Unemployment Insurance	Nutrition Assistance	Payments to seniors	Total for these programs
Percent of ARRA budget impact in category through Dec. 31, 2009 ^a					
Alabama	1.6	0.8	1.9	1.9	1.4
Alaska	0.2	0.1	0.2	0.1	0.2
Arizona	1.9	1.3	2.5	2.0	1.7
Arkansas	0.9	0.8	1.1	1.2	0.9
California	11.3	14.9	8.8	10.1	12.4
Colorado	1.6	1.4	1.0	1.3	1.4
Connecticut	1.2	1.7	0.8	1.2	1.4
Delaware	0.4	0.3	0.3	0.3	0.3
District of Columbia	0.2	0.3	0.3	0.2	0.2
Florida	6.2	5.5	6.3	7.1	6.0
Georgia	3.0	3.5	3.9	2.7	3.2
Hawaii	0.5	0.3	0.5	0.4	0.4
Idaho	0.5	0.5	0.4	0.5	0.5
Illinois	4.2	5.4	4.5	3.9	4.6
Indiana	2.3	2.4	2.1	2.1	2.3
Iowa	1.1	0.6	0.8	1.1	0.9
Kansas	0.9	0.6	0.6	0.9	0.8
Kentucky	1.4	1.2	1.9	1.8	1.4
Louisiana	1.4	0.4	2.0	1.5	1.1
Maine	0.5	0.3	0.6	0.6	0.4
Maryland	1.9	1.1	1.3	1.6	1.6
Massachusetts	2.1	3.3	1.8	2.3	2.6
Michigan	3.4	5.3	4.2	3.6	4.1
Minnesota	1.9	1.9	1.0	1.6	1.8
Mississippi	0.9	0.4	1.4	1.1	0.8
Missouri	1.9	1.3	2.2	2.2	1.7
Montana	0.4	0.2	0.3	0.3	0.3
Nebraska	0.7	0.2	0.4	0.6	0.5
Nevada	0.9	1.6	0.6	0.7	1.1
New Hampshire	0.5	0.3	0.2	0.5	0.4
New Jersey	3.0	5.5	1.5	2.8	3.8
New Mexico	0.7	0.4	0.8	0.7	0.6
New York	6.0	7.7	7.8	6.6	6.8
North Carolina	3.0	3.2	3.3	3.2	3.1
North Dakota	0.2	0.0	0.2	0.2	0.1
Ohio	3.9	3.8	4.3	4.1	3.9
Oklahoma	1.2	0.6	1.4	1.3	1.0
Oregon	1.2	1.7	1.7	1.3	1.4
Pennsylvania	4.4	5.2	3.7	5.0	4.7
Rhode Island	0.4	0.5	0.4	0.4	0.4
South Carolina	1.4	1.4	2.0	1.7	1.5
South Dakota	0.4	0.0	0.2	0.3	0.2
Tennessee	2.1	1.6	3.2	2.3	2.0
Texas	7.4	4.3	8.3	6.5	6.2
Utah	0.9	0.4	0.6	0.6	0.6
Vermont	0.2	0.2	0.2	0.2	0.2
Virginia	2.6	1.2	1.9	2.4	2.0
Washington	2.3	2.0	2.1	2.0	2.1
West Virginia	0.5	0.3	0.8	0.9	0.5
Wisconsin	2.1	2.2	1.4	2.0	2.1
Wyoming	0.2	0.1	0.1	0.2	0.1

Sources: The Office of Tax Analysis: Agency Financial and Activity Reports to the Office of Management and Budget for December 31, 2009; Social Security Administration.

Note: a. Items may not add to 100 percent due to rounding.

D. Consumption Expenditure and ARRA Tax Relief and Payments to Individuals

Over the year ending in the last quarter of 2008, real personal consumption expenditures fell by more than in any comparable period for more than 50 years. After this terrible drop, household spending leveled off during the first half of 2009 and began to rebound during the last two quarters of the year. This is consistent with the timing of the tax relief and income support components of the Recovery Act, which largely took effect beginning in the second quarter of 2009. Here, we attempt to quantify the role of these components in halting the free-fall in household spending, and by doing so, contributing to the turnaround in GDP growth and employment.

The effects of the Act's tax relief and income support provisions came in two ways. First, as described above, it added about \$130 billion to aggregate household income in 2009; we refer to the household spending caused directly by this extra income as the "direct effect" of the income support provisions of the Act. Second, that extra spending translated into higher sales for some businesses, which were then able to avoid layoffs or increase hiring, adding to their employees' labor income and creating a virtuous feedback cycle. We refer to the increase in economic activity attributable to this feedback as the "induced" effect. This section of the report provides estimates of both the direct effect and the "total effect" (that is, the sum of the direct and induced effects).

CEA Model. This approach of calculating separately the direct, induced, and total effects differs from the approach taken in the CEA macroeconomic model described in Section III.C (and in previous CEA reports). The "CEA model" (as we will refer to the model of Section III.C) can be described, using our new terminology, as having assigned "total effect" coefficients (or a "total multiplier") to each of the different types of fiscal stimulus based on prior empirical estimates from the macroeconomic literature. For example, the model uses estimates of the total multiplier of permanent tax cuts as the total multiplier for the Making Work Pay tax credit (which, though only legislated for two years, was widely perceived to likely be permanent), and uses estimates of the total multipliers associated with temporary tax cuts to estimate the total effects of transfers to seniors. (Another total multiplier is used for transfers such as unemployment insurance payments and SNAP payments; for details, see CEA, 2009a, 2009b). Because of its focus on the overall effects, the CEA model only shows the total impact on GDP and employment; it does not provide estimates of the impact on spending.

Using these total multipliers along with the spending pattern for the categories shown in Table 8, the first column of Table 12 shows the CEA model's estimated effects on GDP and employment as of 2009:Q4.²⁹ The CEA model implies that the income components of the

²⁹ To maintain comparability with the discussion in Section III.C, this analysis uses the spending totals from Table 8, derived from the Agency Financial and Activity Reports submitted to the Office of Management and Budget. The

ARRA had raised GDP by 1.1 percent, and employment by nearly 900,000 jobs, relative to what would have happened without the Recovery Act. By 2010:Q1, the effect reached 1.3 percent of GDP and more than 1.1 million jobs. (Recall that these figures do NOT include the effects of other ARRA components; they represent only the effect of the individual tax relief and income support components of the Act.)

Table 12. Effects of the Tax Relief and Income Support Components of the ARRA

	2009:Q4		2010:Q1	
	CEA Model	Consumption Model	CEA Model	Consumption Model
GDP Level (percent)	+1.1	+1.3	+1.3	+1.7
Employment Level	+881,000	+1,052,000	+1,148,000	+1,434,000

Source: CEA calculations described in the text.

The CEA model was built to capture as simply as possible the overall effects of all of the components of the Recovery Act, which includes a wide variety of different programs; it therefore had to take a broad-brush approach, for instance by making simple assumptions about total multipliers on a few categories of tax cuts and income support programs without drilling down into their details or distinguishing separate direct, induced, and total effects. Our purpose here is to compare the results from the CEA model's broad-brush approach with what would be suggested by a more nuanced analysis that takes those details into account. Because the Recovery Act's tax relief and income support programs operate by directly affecting household income, we can draw on the large body of economic research that examines the impact of tax cuts and other income changes on household spending.

Consumption Model. That literature, in fact, provides compelling empirical evidence that household spending responds strongly and quickly to tax cuts and other income support measures like those in the Recovery Act.³⁰ While the existing estimates of this response are not very precise, several lessons from the research literature are clear:

- Household spending responds more strongly to income changes that are perceived to be permanent than to one-time payments.
- But the response to one-time payments is much larger than would be expected from

results are similar if we instead use the categories and amounts from the Bureau of Economic Analysis shown in Figure 5.

³⁰ See Parker, Souleles, Johnson, and McClelland (2010) or Jappelli and Pistaferri (2010) for recent surveys of the literature.

idealized models in which household spending depends only on very-long-run considerations (like lifetime income).

- Low-income households have a higher propensity to spend than high-income households.
- Low-asset households (especially those who might find it difficult to borrow) have a higher propensity to spend than households with more assets.

To distill this research into a form that can be used to estimate the Recovery Act's spending effects, we have assumed that the Act's tax relief and income support programs can be grouped into three categories: long-term changes (the Making Work Pay tax cut); one-time payments and temporary tax changes (the Economic Recovery Payments, the Government Retiree Credit, AMT relief, and the other tax relief provisions for individuals in Table 8); and income support payments targeted to those facing difficult economic circumstances (unemployment insurance payments, SNAP payments, COBRA, and TANF). We treat each of these categories differently.

Recent work by Parker, Souleles, Johnson, and McClelland (2010; hereafter, PSJM) estimates that on average, for each dollar of one-time stimulus payment received, households spend about 25 cents more on nondurable goods within one quarter of the date of receipt of the stimulus funds. In the next quarter, nondurable spending remains higher than it would have been (absent the stimulus payment) by about 15 cents.³¹ The paper does not provide an estimate of spending effects beyond the second quarter. Earlier work by Johnson, Parker, and Souleles (2006) found that about two-thirds of tax rebate payments in 2001 were spent within a year of receipt.

Because the literature has found that the timing of the spending effects is difficult to pin down statistically, our principal focus is on the effects on consumer spending over all of 2009. We assume that in response to a transitory stimulus payment of 1 dollar, the total additional spending in the quarter of receipt and the following three quarters is 50 cents.³² This is broadly consistent not only with the estimates in PSJM and Johnson, Parker, and Souleles (2006), but also with standard estimates from the macroeconomic literature (see, for example, Campbell and Mankiw, 1989, 1991). The full details of our assumptions are given in the Appendix.

³¹ PSJM also find that spending on durable goods (mostly new motor vehicles) may have increased by even more than spending on nondurable goods, though previous work by Johnson, Parker, and Souleles (2006) did not find a statistically significant effect of the 2001 stimulus on durable goods spending. To be cautious, we leave out any effect of the stimulus payments on durables purchases. Including such effects would of course further increase our estimates of the Recovery Act's impact on spending.

³² One important form of one-time payments was the Economic Recovery Payments received by Social Security beneficiaries. PSJM find that older households had a higher propensity to spend the 2008 stimulus payments than did younger households; since the ERP payments were mostly received by older households, this could lead us to underestimate the spending effect.

There are considerably fewer studies of the spending effects of long-term changes in taxes, partly because the data required to perform such studies (long-term changes in spending and taxes for individual households) are scarce. However, a substantial body of research has examined the response of spending to other kinds of permanent changes in income. That research has typically found that within a few years, spending seems to have more or less fully adjusted to changes to income (see Jappelli and Pistaferri, 2010, and the references therein). These results are roughly consistent with the theoretical literature that implies a one-year response of spending to permanent changes in income of 75 to 92 cents on the dollar (Carroll, 2009).

Other research, however, suggests that the response of spending to permanent shocks is not instantaneous (Campbell and Deaton, 1989; Carroll, Otsuka, and Slacalek, 2006). Consistent with these results, we assume that, for each \$1 of a long-term tax cut, spending over the subsequent 9 months will be higher by about 60 cents. (We are mainly interested in a nine month period because the first long-term ARRA tax cuts did not have much effect until the second quarter of 2009, and we wish to estimate the effect for 2009 as a whole; for details see the Appendix.)

The left-hand panel of Table 13 presents our estimates of the direct effects on consumption of each of the major income support components of the Recovery Act for 2009 as a whole, along with the size of the corresponding income change. All together, our method estimates that the direct effect of these provisions was to boost household spending by about \$86 billion dollars over the course of 2009.

Table 13. Direct Effect of ARRA Tax Relief and Income Support on Household Spending

	2009		2010:Q1 ^a	
	ARRA Income Support Provision	Estimated Spending Effect	ARRA Income Support Provision	Estimated Spending Effect
	(billions of dollars)			
Making Work Pay	36.9	22.8	27.5	17.4
Payments to Seniors	13.8	6.2	0.2	0.7
Other	79.1	57.1	45.0	28.7
Total	129.7	86.1	72.7	46.9

Source: CEA calculations detailed in the text.

a. These figures are for the quarter only (not at an annual rate).

This effect more than accounts for the recovery of consumption spending in 2009. Real consumption spending (in 2009 dollars) was \$44 billion higher in 2009 than its level (at an annual rate) in the last quarter of 2008. Given our estimate that the direct impact of the tax relief and income support in the Recovery Act on consumption was \$86 billion, it follows that without

the Act, consumption would not have rebounded.

Table 13 also shows our estimates for the first quarter of 2010. As discussed above, the Recovery Act made large contributions to household income in that quarter as families benefited from the tax credits in the Act. Together with the spending dynamics from the extra income in 2009, the \$73 billion in tax relief and income support in 2010:Q1 directly raised household spending by \$47 billion (not at an annual rate), according to the model.³³

The Differences between the Estimates. What accounts for the differences between the CEA model's estimates of the effects of the tax and income support provisions and those that we obtain by examining the impact of the programs directly? The estimates in Table 13 include only the direct consumption spending effects from the programs, and not the induced effects from the increase in aggregate demand that also contribute to the total multiplier. To construct an apples-to-apples comparison of the two estimates, we use the quarterly pattern of consumption increases implicit in Table 13, and assume that the multipliers associated with direct household spending match the total multipliers for direct government spending assumed in the CEA model.³⁴

The comparison for 2009:Q4 is given in the first two columns of Table 12 above. The table shows that the microeconomic assumptions discussed above (given in the column labeled "Consumption Model") imply that GDP was higher by 1.3 percent and employment was higher by nearly 1.1 million jobs relative to what would have happened absent the tax and income support provisions of the ARRA. These estimates are roughly 20 percent higher than those shown in column 1 for the CEA model. For 2010:Q1, the consumption model's assumptions suggest that GDP was higher by 1.7 percent and employment by 1.4 million jobs because of the Recovery Act's tax reductions and income support provisions, about one-quarter higher than those shown in column 3 for the CEA model. Given the degree of uncertainty surrounding all of these estimates, the results are reasonably close, but suggest that the CEA model may have been somewhat too conservative in estimating the effects of personal transfers and tax relief.

³³ The spending dynamics from the 2009 payments are the reason that the spending effect of the payments to seniors in 2010:Q1 are larger than the amount of payments in the quarter.

³⁴ The empirical literature on multipliers does not yield any robust conclusion about how the size of multipliers differs for government spending versus private consumption spending. In the absence of such evidence, the most transparent choice is to assume that the multipliers are the same. One concern with this assumption is that the import content of government purchases may differ from the import content of household consumption. In this case, the numbers for the consumption model in Table 12 should be multiplied by the ratio of the domestic content of household consumption to the domestic content of government purchases. An extreme lower bound for this ratio would be to assume that all government purchases occur domestically and all imports go into household consumption; this yields a ratio of 0.81 for 2009 (because total imports divided by consumption equals 0.19). This assumption would bring the estimates from the consumption model very close to those from the CEA model. However, more than half of all imports are intermediate goods, which would mean that less than 10 percent of consumption spending is on foreign final goods (implying a ratio of about 0.9). Further, some imports are investment goods and some final import spending is done by the government. For further information, see the BEA 2007 Import Matrix available at <http://www.bea.gov/industry/more.htm>.

V. CONCLUSION

This report continues the Council of Economic Advisers' assessment of the economic impact of the American Recovery and Reinvestment Act of 2009. It reflects our attempt to monitor the progress of the Act and the response of the economy as of the first quarter of 2010.

Our analysis indicates that the Recovery Act has played a key role in the turnaround of the economy that has been occurring over the past four quarters. Real GDP is growing again, in large part because of the tax cuts and spending increases included in the Act. Employment, after falling dramatically, has begun to grow again. Indeed, payroll employment growth has been positive for three of the past five months. As of the first quarter of 2010, we estimate that total employment is 2.2 to 2.8 million higher than it otherwise would have been. The tax cuts and income support payments of the Recovery Act account for roughly half of the jobs saved or created to date.

As we have emphasized, measuring what a policy action has contributed to growth and employment is inherently difficult because we do not observe what would have occurred without the policy. Therefore, it must be understood that our estimates are subject to substantial margins of error. The results, however, are strong enough and clear enough that we are confident that the basic conclusions are solid. That a wide range of private and government analysts concur with our estimates adds a reassuring check on our analysis.

APPENDIX

This appendix sets out the detailed assumptions used to estimate the spending effects that appear in the tables in Section IV.D.

We present first our assumptions about the average spending effects of one-time and long-term tax cuts.

Table A1. Average Spending Effects by Quarter

Quarter	Increment to Spending from One-Time Payment in Quarter 0	Increment to Spending from Long-Term Tax Cut in Quarter 0
0	0.25	0.50
1	0.15	0.60
2	0.05	0.70
3	0.05	0.80
4 and later	0.00	0.90

The table is interpreted as follows. The figure of 0.25 in the upper left corner indicates that in the quarter of a one-time tax change, the spending effect of a \$1 tax change is 25 cents. One quarter later (the next row down), spending would remain higher by 15 cents than it would have been absent the tax cut, and so on. Over the course of a year (quarters 0-3), the sum of these coefficients adds up to the 0.5 (or fifty percent) annual marginal propensity to consume mentioned in the text. We conservatively assume that there is no further spending effect beyond the first year (though in reality these consumers would be very likely to have some residual spending increase even after a year).

The next column gives the corresponding estimates for a long-term tax change. We assume that for a long-term change in taxes, spending rises by 50 percent of the amount of the tax change immediately. Empirical evidence from macroeconomic research suggests that the full effect of long-term changes to income does not show up in spending immediately; consistent with this evidence, we assume that spending ramps up over the course of a year; after that time, spending is higher by 90 cents for each dollar of long-term tax cut. (The evidence in Carroll, Otsuka, and Slacalek, 2006, suggests that the transition is probably somewhat more gradual than this, but theory indicates that the final effect on spending eventually reaches one-for-one; our 0.90 figure is therefore a compromise.)

Some of the effects of the Recovery Act on income are targeted to those most directly affected by the recession and are difficult to categorize as transitory or long-term. Extended

unemployment benefits and increased Supplemental Nutrition Assistance payments fall into this category. The available evidence suggests that the propensity to consume out of these kinds of payments is quite high, but precise estimates are not available (especially with respect to the time pattern of any spending effect). We have simply assumed that total spending increases by two-thirds of the payment amount in the quarter when the payments are received; the remaining one-third is spent with a one-quarter lag.

REFERENCES

- Blue Chip Economic Indicators. Aspen Publishers. Vol. 35, No. 4, April 10, 2010.
- Campbell, John Y., and Angus S. Deaton. "Why is Consumption So Smooth?" *Review of Economic Studies* 56 (July 1989): 357-373.
- Campbell, John Y., and N. Gregory Mankiw. "Consumption, Income, and Interest Rates: Reinterpreting the Time Series Evidence." *NBER Macroeconomics Annual* 4 (1989): 185-216.
- Campbell, John Y., and N. Gregory Mankiw. "The Response of Consumption to Income: A Cross-Country Investigation." *European Economic Review* 35 (1991): 723-767.
- Carroll, Christopher D. "Precautionary Saving and the Marginal Propensity to Consume out of Permanent Income." *Journal of Monetary Economics* 56 (September 2009): 780-790.
- Carroll, Christopher D., Misuzu Otsuka, and Jirka Slacalek. "How Large is the Housing Wealth Effect? A New Approach." NBER Working Paper No. 12746, December 2006.
- Center on Budget and Policy Priorities. LaDonna Pavetti, Director of Welfare Reform and Income Support, on the Safety Net's Response to the Recession. Testimony before the House Subcommittee on Income Security and Family Support. October 8, 2009.
- Congressional Budget Office. Letter to the Honorable Nancy Pelosi. February 13, 2009.
- Congressional Budget Office. "The Budget and Economic Outlook: Fiscal Years 2010 to 2020." January 2010a.
- Congressional Budget Office. "Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output from October 2009 Through December 2009." February 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 2010.
- Glassman, James. "Markets & the Economy / Quarterly Update." J.P.Morgan Chase & Co., January 4, 2010.

- Goldman Sachs Group, Inc. “Fiscal Stimulus: A Little Less in Q2, A Little More Later.” August 4, 2009.
- Jappelli, Tullio, and Luigi Pistaferri. “The Consumption Response to Income Changes.” CEPR Discussion Paper No. DP7680, February 2010.
- Johnson, David S., Jonathan A. Parker, and Nicholas S. Souleles. “Household Expenditure and the Income Tax Rebates of 2001.” *American Economic Review* 96 (December 2006): 1589-1610.
- Macroeconomic Advisers. “The US Economic Outlook: Is the Upturn Imminent? How Strong?” June 11, 2009a.
- Macroeconomic Advisers. “Outlook Commentary.” September 3, 2009b.
- Parker, Jonathan A., Nicholas S. Souleles, David S. Johnson, and Robert McClelland. “Consumer Spending and the Economic Stimulus Payments of 2008.” Unpublished paper, Northwestern University, February 2010.
- Tax Policy Center. “‘The American Recovery and Reinvestment Tax Act of 2009:’ AMT Patch, Conference Report, Distribution of Federal Tax Change by Cash Income Level, 2009.” Table No. T09-0118. February 23, 2009a.
- Tax Policy Center. “‘The American Recovery and Reinvestment Tax Act of 2009:’ AMT Patch, Conference Report, Distribution of Federal Tax Change by Cash Income Percentile, 2009.” Table No. T09-0119. February 23, 2009b.
- U.S. Department of Commerce. Bureau of Economic Analysis. “National Economic Accounts.” Accessed April 2010.
- U.S. Department of Labor. Bureau of Labor Statistics. “Current Employment Statistics Survey: National.” Accessed April 2010.
- U.S. Recovery Accountability and Transparency Board. Data from Recovery.gov website. <http://www.recovery.gov/>. Accessed April 2010.
- The White House, Office of the Vice President. “Vice President Biden Announces Recovery Act Putting More Money Back in Middle Class Taxpayers’ Pockets this Year.” March 22, 2010. Online at <http://www.whitehouse.gov/the-press-office/vice-president-biden-announces-recovery-act-putting-more-money-back-middle-class-ta>.
- Zandi, Mark. “The Causes and Current State of the Financial Crisis.” Testimony to the Financial Crisis Inquiry Commission, January 13, 2010.