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Demographic Analysis of Recovery Act Supported Jobs in Massachusetts, Quarters 1 and 2, 2010

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FINAL REPORT | DECEMBER 2010

*A Study Conducted by the Center for Women in Politics and Public Policy
and the Edward J. Collins, Jr., Center for Public Management*

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OF POLICY AND GLOBAL STUDIES**

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EXECUTIVE SUMMARY

The American Recovery and Reinvestment Act (ARRA)

In February 2009, in order to avoid another Great Depression, the U.S. Congress passed the American Recovery and Reinvestment Act (ARRA), which included an allocation of \$787 billion for tax cuts and spending measures intended to spur economic growth.

Analysts have sought to assess ARRA's impact on the economy – particularly in terms of employment effects. The Congressional Budget Office estimates that ARRA funding has been used to save or create between 1.4 and 3.3 million jobs in the United States between February 2009 and the second quarter of 2010. The country has experienced an overall shift from widespread job loss in 2009 to job gains in 2010. In the case of Massachusetts, state-level data suggest that ARRA has played an influential role in the Commonwealth's own economic recovery – with an estimated 79,000 more jobs in the second quarter of 2010 than there would have been without ARRA funds.¹

About This Report

Massachusetts policy makers decided to go beyond existing federal reporting requirements and collect additional data in order to gauge the effectiveness of ARRA's fiscal policy by counting the number of individuals who have received an ARRA-funded paycheck. In addition, policy makers wanted to look at some of the demographic characteristics of this population. Such detailed reporting requirements are an innovative approach to improving government transparency and raising overall efficiency. The Massachusetts Recovery and Reinvestment Office (MassRRO) provides much of these data on their website (www.mass.gov/recovery), and, for each quarter, MassRRO highlights the impact of ARRA funding in the Commonwealth.

¹ Executive Office of the President, Council of Economic Advisors (2010, July 14). *The Economic Impact of the American Recovery and Reinvestment Act of 2009, Fourth Quarterly Report*. Retrieved September 3, 2010, from http://www.whitehouse.gov/files/documents/cea_4th_arra_report.pdf

This report provides an in-depth analysis of the data that the MassRRO collected during the first and second quarters of 2010, with a particular focus on job creation and retention by race, ethnicity, gender, disability status, and geographic location. The reader should keep in mind that jobs data for each of these quarters is independent of the other quarter. Each quarter is a “snapshot” in time of the number of jobs created or retained in that quarter only. Where possible, MassRRO data are compared to relevant populations in Massachusetts using additional data sources from the Center for Economic Policy Research, the U.S. Census, and others. This analysis of the employment effects of ARRA spending in Massachusetts is timely, as the findings presented here may be used to influence policy decisions regarding the expenditure of ARRA or other state or federal funds in the future. It is important to note that there are several data limitations in regard to the consistency of reporting across contractors. The report provides recommendations on how to refine future data-collection methods in order to increase the usefulness of the data.

Key Findings

Job Creation and Retention by Race, Ethnicity, and Gender

Overall, data on ARRA spending suggests that employment effects are representative of the state population. In other words, those for whom jobs were created or retained through ARRA funding reflected statewide populations.

- For both quarters, however, blacks and Hispanics constituted a larger proportion of ARRA job holders than among those employed in the labor force during the same time period.
- Hispanics made up 6.7% and 6.4% of ARRA job holders during the first and second quarters, respectively, while constituting 5.5% of the statewide labor force.
- Similarly, blacks made up 7.2% and 6.1% of ARRA job holders during the first and second quarters, respectively, while constituting just 4.7% of those employed in the state labor force.
- In comparison, Asians, who made up 5.8% of the statewide labor force, were just 3.4% of ARRA job holders in Quarter 1 and 2.7% in Quarter 2.
- In Quarter 1, ARRA-funded workers were more likely to be women than men (55.3% to 44.7%). This pattern was reversed in the second quarter (51% male to 49% female). Statewide, both women and men make up about 50% of those employed in the labor force. This finding suggests that women may have benefited more during the first quarter in comparison to the second quarter.

Distribution of Jobs by Funding Category, Race, and Ethnicity

- Overall, people of color constituted more than 10% of the Mass-ARRA job holders in both the first and second quarters of 2010.
- Across both quarters, however, whites held over 90% of jobs created or retained through funding for Education, Clean Energy and Environment, and Transportation.
- Asians held close to a third (30.4%) of ARRA-funded positions in Technology and Research and 8.4% of positions funded through Accountability during the first quarter. In the second quarter, their percentage of Technology and Research funded positions remained about the same but rose to 10.2% of Accountability positions in the second quarter.
- Blacks held close to 20% of Housing-funded positions in the first quarter and 14.1% in the second. Similarly, they held 16.1% of Safety Net positions and over 10% of positions in the Workforce category.

Distribution of Jobs by Funding Category and Gender

- Women were about two-thirds of ARRA job holders funded by Workforce, Safety Net, and Education categories across both quarters. Women held the majority of Housing positions in the first quarter at 67.6%, but reversed to just 32.7% of these positions in the second quarter.
- Women held less than 15% of Clean Energy and Environment positions across both quarters and less than 4% of Transportation-funded positions.

Impact on Persons with Disabilities in the Workforce

- Persons with disabilities make up about 5% of the Massachusetts labor force – a share that is higher than the national average (3.1%).
- During Quarter 1, they held a share of Mass-ARRA positions that matched their share of the labor force; the major reason was that a relatively high number worked in Public Safety/Homeland Security funded programs.
- In the second quarter, their share dropped substantially to 1.7%, as the result of a drop within that funding category down to less than 1%.

Geographical Analysis: Where Mass-ARRA Job Holders Live

- For most of the counties, the share of job holders living in each county was very close to the percent of the state's labor force in that county, suggesting that Mass-ARRA job creation and retention benefited the state in a wide-ranging way.

- The two counties with apparently lower shares of Mass-ARRA funded job holders compared to the share of residents in the labor force were Middlesex and Suffolk Counties.
- Almost one-quarter of the Massachusetts labor force lives in Middlesex County, but that county saw a relatively smaller share of Mass-ARRA job holders: 16.1% in Quarter 1 and 17% in Quarter 2.
- Suffolk County – home to the City of Boston, as well as Chelsea, Winthrop, and Revere – had 13.4% of the state’s labor force, but only 9% of the Mass-ARRA funded job holders in both quarters.
- People working in ARRA-funded positions live in over 90% of the cities and towns across the Commonwealth.
- The number of Mass-ARRA positions in the City of Boston almost doubled between the first and second quarters: from 1,117 in Quarter 1 to 2,029 in Quarter 2.
- Neighborhood analysis of the City of Boston showed that certain Boston neighborhoods – especially those with considerable racial/ethnic diversity – had a greater share of Mass-ARRA job holders than others. In Quarter 1, for example, 27.1% of Boston residents with ARRA-funded jobs lived in Dorchester; 15.7% in Jamaica Plain; and 13.2% in Roxbury.
- In Quarter 2, while the *number* of job holders increased in Dorchester to 412, Dorchester’s share declined slightly to 20.3%, because the overall number of job holders rose to more than 2,000. Quarter 2 shows, however, a very substantial increase in Roxbury over Quarter 1– both in total number (573) and percent of the total (31.1%).

ARRA and Jobs Quality

The jobs that have been created or retained by ARRA fall into two broad categories. The jobs that have been directly created or retained among public and private government contractors tend to be disproportionately good jobs that pay wages at or above the private sector average, and include health insurance and pension benefits, or both.

Furthermore, an assessment of the quality of jobs that are created by a massive policy intervention, such as ARRA, can substantially determine policy makers’ and the public’s assessment of the policy’s success. Future data-collection efforts in connection with specific policies should consider the inclusion of data on job quality, especially on wage rates, health insurance, and pension coverage.

Conclusion and Recommendations

In conclusion, while certain groups benefited slightly more than others in certain funding categories, the population of job holders who benefited from ARRA's direct spending did not systematically differ from the labor market at large. This implies that there was no group that benefited disproportionately in a systematic way from the direct spending parts of this fiscal policy effort.

The data collection in association with ARRA is a critical step in improving the performance of fiscal policy. Policy makers should be commended for their desire to improve transparency and accountability with an eye to increasing the efficiency of public policy.

The authors of this report were tasked with making recommendations on how to improve data collection. Their recommendations in this area include the following:

- Data analysis should assure that all relevant data categories – race, ethnicity, disability status, location, and industry – match those of other publicly available data sets.
- In particular, the data collection on race and ethnicity should follow the Census method of asking for Hispanic status and then for race; that is, race and Hispanic origin should not be mutually exclusive.
- Agencies that are tasked with collecting data on the jobs effects of ARRA should develop concise, clearly articulated reporting guidelines and offer the necessary assistance to contractors to ensure consistent and complete information.
- Reasonable efforts should be undertaken to ensure completeness of the observations. We recommend that MassRRO or other agencies follow up on contractor self-reports with their own surveys.

Introduction

The federal government passed the American Recovery and Reinvestment Act (ARRA) in February 2009, when faced with the prospect of the country sliding into another Great Depression. Congress dedicated a total of \$787 billion to tax cuts and spending measures to stimulate economic growth after the economy had shrunk for three quarters in a row. Spending measures under ARRA comprised both increased transfer payments, such as temporarily higher and longer unemployment insurance benefits and modifications to Social Security benefits, and spending on projects, such as roads, schools, weatherization, and green technology. ARRA, for instance, dedicated a total of \$117.2 billion to green investments – energy efficiency and alternative energy sources.¹ Economists generally credit ARRA with helping to jump start the economy by the middle of 2009, although there is some disagreement about the extent to which ARRA contributed to this economic growth.²

It is critical for the design of future policies to gather as much relevant information on the impact of current policy efforts as possible.

Jobs estimates based on macroeconomic models, for instance, provide one crucial data point regarding the employment impact of such a massive economic policy effort as ARRA. ARRA has helped to retain or create between 1.4 and 3.3 million jobs from February 2009 to the second quarter of 2010, according to the Congressional Budget Office.³ These job effects have been strong enough to help turn the corner

Box 1. What the Massachusetts Recovery and Reinvestment Office (MassRRO) Reports

On its website*:

- Number of awards
- Funding categories
- FTEs (full-time-equivalent positions) paid by ARRA by county, and city/town within each county (quarterly) for all 4 quarters
- Created/Retained FTEs and Created/Retained Headcount by funding category including subdivisions within each funding category
- Headcount paid by ARRA by county and city within each county (quarterly) for all 4 quarters
- Dollars awarded and expended by county, by city within each county
- Dollars awarded, expended, and quarterly activities for each funding category and the subdivisions within each funding category

In its quarterly *Citizens' Updates***:

- How money was spent for each category (“project description highlights”)
- Cumulative spending by funding category
- FTEs for reporting requirements and those not required by the federal government
- Aggregate data on who benefits from the awards

* *Source:* www.mass.gov/recovery

** *Source:* “Recovery Act Impact on Massachusetts,” *MassRRO, Citizens' Update III*, 30 June 2010.

¹ Bernard, S., et al. (2009, March 2). The greenest bail-out? *Financial Times*. Retrieved September 1, 2010, from <http://www.ft.com/home/uk>

² Executive Office of the President, Council of Economic Advisors. (2010, July 14). *The Economic Impact of the American Recovery and Reinvestment Act of 2009, Fourth Quarterly Report*. Retrieved September 3, 2010, from http://www.whitehouse.gov/files/documents/cea_4th_arra_report.pdf

³ Congressional Budget Office. (2010, August). *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output from April 2010 through June 2010*. Retrieved September 3, 2010, from <http://www.cbo.gov/doc.cfm?index=11706&zcz=41190>

from massive U.S. job losses throughout 2009 to eventual job gains in 2010.⁴ State-level estimates show that Massachusetts has indeed gained much-needed economic momentum due to ARRA. The Council of Economic Advisors estimates that Massachusetts had 79,000 more jobs in the second quarter of 2010 than it would have had without ARRA.⁵

Policymakers undertook additional measurement efforts to improve the effectiveness of fiscal policy in the case of ARRA. Underlying this effort is an attempt to actually count the number of people who have received an ARRA-funded paycheck that has been created by ARRA spending, where possible. Contractors that receive ARRA funds had to initially report on the number of hours paid for with recovery funds, and since 2009 the federal government has required the reporting of FTEs for the current quarter, not cumulatively as was originally planned.⁶ This reporting effort is a novel approach to increasing the transparency of government actions through better performance measures with the ultimate goal of improving the efficiency of public policies.

The Commonwealth of Massachusetts decided to go above and beyond what was mandated by the federal government and collected more detailed and nuanced information. The Massachusetts Recovery and Reinvestment Office (MassRRO) provides a considerable amount of data and other information on their website (See Box 1 and www.mass.gov/recovery) as part of their fulfillment of federal ARRA reporting requirements for transparency and a directive from Governor Patrick to collect data that will help policymakers better understand the employment impact. MassRRO also provides a summary of the impact of the Recovery Act funding each quarter.

This analysis summarizes the available data for Massachusetts ARRA contractors from the first and second quarters of 2010 and pays particular attention to the breakdowns of retained or created jobs by location (counties and zip codes), race, ethnicity, gender, and disability status. We compare these summary data on ARRA's employment effects to the relevant populations in Massachusetts whenever possible. This approach is complementary to using standard models to estimate the effectiveness of an economic stimulus, particularly in the case of a massive policy intervention, such as ARRA. Standard macroeconomic models assume that past economic relationships will hold in the instance of ARRA spending. It is, however, entirely possible that the sheer size of the stimulus has altered some of the economic relations that govern the economy, for example by emphasizing green investments over other spending. Accounting for the jobs effects of direct spending efforts can thus show more accurately in which industries and in which localities the jobs may have been retained or created than may be the case with model

⁴ U.S. Bureau of Labor Statistics. (2010). *Current Employment Statistics*. Washington, DC: U.S. Government Printing Office.

⁵ These employment figures are larger than the numbers in Table 1 since the total jobs effect includes indirectly impacted jobs, because of the additional spending of ARRA contractors, the additional transfer benefits funded through ARRA, and the tax cuts enacted under ARRA. Executive Office of the President, Council of Economic Advisors (2010, July 14). *The Economic Impact of the American Recovery and Reinvestment Act of 2009, Fourth Quarterly Report*. Retrieved September 3, 2010, from http://www.whitehouse.gov/files/documents/cea_4th_arra_report.pdf

⁶ Recovery Accountability and Transparency Board. (2010, January 15). *How Jobs Are Calculated*. Retrieved September 3, 2010, from <http://www.recovery.gov/News/featured/Pages/Calculator.aspx>

estimates. We find, for instance, that the demographics of the employment impact of ARRA's direct spending measures reflect the population at large in Massachusetts. There do not seem to be disproportionate job gainers in the aggregate.

The data-collection effort related to jobs retained or created with direct ARRA spending offers another advantage. We can use the data to calculate a breakdown of the jobs impact of ARRA by location, by industry, and by demographic characteristics, specifically race, ethnicity, gender, and disability status. MassRRO has made a concerted effort to collect this information in connection with the job counts from its contractors. We find that there are isolated pockets of spending, from which some population groups have particularly benefited. These instances could guide future research to shed light on the effectiveness of existing programs and policy efforts to target particularly vulnerable populations in a recession.

The data collected on the jobs impact of ARRA's direct spending are also very timely, which has the potential to inform the design of next phase(s) of recovery efforts. ARRA spending is still ongoing and will remain in effect for some time. The data collected so far could thus be useful in guiding policymakers who are interested in fine-tuning fiscal policy measures to aid particularly vulnerable populations.

While there are, as we discuss below, clear limitations to the data, it is also clear that this innovative data-collection effort has the potential to improve future policymaking, based on the lessons learned from a thorough data analysis.

Using ARRA Data for Jobs Analysis

The MassRRO data, like any similar information on the direct jobs effect of ARRA, provide several key data points. We can use the data, for instance, to compare the job impact by relevant characteristics, such as location, industry, race, ethnicity, gender, and disability status. We can then compare the breakdown of the MassRRO with other publicly available data sources to see if and how the job impact of direct ARRA spending differs from the Massachusetts labor market. Any difference would suggest that some population groups have particularly benefited from ARRA's direct spending efforts. Such differences could consequently guide future research efforts to identify the causes of these variations. We can also compare trends across time by examining job holder characteristics, funding patterns, and other features of the 2010 data for Quarter 1 (January – March) and Quarter 2 (April – June).

Naturally, there are questions about the quality of the data, since this is the first such data-collection effort with respect to a countercyclical fiscal policy measure. The data rely on contractors to self-report the jobs that have been created or retained, or the hours of work paid for by ARRA funds. Confusion with this novel reporting effort is expected, especially since policy makers are eager to collect the relevant information rather quickly. Speed and

completeness, for instance, may have created an unavoidable trade-off. Also, there may be systematic biases in self-reporting among contractors. Smaller contractors, for instance, may be less familiar with handling the details associated with government reporting than larger contractors. Subsequent research will have to analyze ARRA's data collection effort for such systematic biases to inform ways to improve future data collection.

The data for contractors and subcontractors of ARRA funds in Massachusetts are reported by the contractors. The data show aggregates for, for example, how many white workers, how many Asian workers, how many women, and how many men have received funding at a particular funding site. We cannot match demographic characteristics, funding category, and location with specific individuals, such as, for example, to identify a 60-year-old Asian woman. This prevents the use of standard statistical techniques to see, for instance, if observed differences are statistically significant and if observed differences still hold after we account for a range of other relevant individual characteristics.

The data cover only the direct spending effort of ARRA. The information only covers jobs that have been retained or created by direct ARRA spending. The data set includes money spent on road construction, new schools, weatherization, and other green investments, among other projects and activities, and the estimated jobs effects of these spending measures. The data, however, cannot include the employment effects of tax cuts and transfer payments – higher unemployment insurance and Social Security benefits. Our analysis consequently only describes a slice, albeit a crucial one, of ARRA's impact on the Massachusetts labor market. It uses Massachusetts ARRA data from the first and second quarters of 2010. While spending data are cumulative, jobs data only capture the jobs resulting from hours worked in each respective quarter, and thus the data reported here offer a snapshot in time of the effectiveness of ARRA's direct spending efforts. The data exclude funds that have been committed but not spent. The data also do not include the effect of ARRA funds that have not been committed yet. ARRA funds, after all, are expected to last into 2011, with some programs, such as Race to the Top, continuing into 2014.

Our analysis is a thorough research effort of an unprecedented data-collection exercise directly related to a major policy intervention. Researchers and policy makers alike should use this analysis to identify ways to improve future policy-relevant data collection. More and better information directly related to specific policy measures will ultimately allow policy makers to better target policy efforts and thus make fiscal policy more efficient – allowing for more economic “bang for the buck.”⁷

⁷ Due to the nature of the MassRRO data, all analyses presented in this report are descriptive in nature (cross-tabulations). For a discussion of analytical and statistical issues, please see Appendix: Data Sources.

Race and Gender Impacts of ARRA on Jobs Retained and Created

One goal of ARRA was to revive the economy by stabilizing the labor market. The Recovery Act was primarily intended to help those who either already had lost their jobs or were about to lose their jobs – the labor force. The government consequently collected data on the jobs saved or created through parts of ARRA to gain a sense of the employment effect of the law. We compare these numbers to the labor force to see how the effect of ARRA’s direct spending measures on employment compares to the target audience in Massachusetts. We now turn to the central question of this report: How do people who got or retained jobs through ARRA in Massachusetts compare to the labor force as a whole?

Race	Quarter 1 % (N)	Quarter 2 % (N)
White	87.9 (N=12,580)	89.3 (N=21,661)
Black	7.2 (N=1,036)	6.1 (N=1,470)
Asian	3.4 (N=483)	2.7 (N=660)
Other	1.5 (N=219)	2.0 (N=479)
Hispanic	6.7 (N=1,123)	6.4 (N=1,720)
Gender	55.3	49.0
Female	(N=9,198)	(N=13,064)
Male	44.7 (N=7,435)	51.0 (N=13,591)

Source: MassRRO Data, 1st and 2nd quarters, 2010.
Note: “Race” does not include Hispanics or those for whom race was not reported. The N for race calculations was 14,318 in Quarter 1 and 24,270 in Quarter 2. Hispanics may be of any race, and the N for Hispanic calculations was 16,790 in Quarter 1 and 27,045 in Quarter 2. The Asian category includes Hawaiians; “Other” includes those reported as “two or more races,” and American Indians/Native Americans. The N for gender calculations was 16,642 in Quarter 1 and 26,655 in Quarter 2.

The answer, as seen in Table 1 and Box 2, is that ARRA spending in Massachusetts created or retained jobs in rough proportion to those employed in the labor force as a whole. Further, those facing the highest unemployment rates benefit the most when compared to their share of those employed in the labor force. In comparing the effects of ARRA spending in Massachusetts to the labor force in the Commonwealth, we used 2009 data from the Center for Economic Policy Research (see note in Box 2). One might raise the question whether an earlier year than 2009 would be a better benchmark against which to compare ARRA effects because it might represent a more “normal” economic state. ARRA was meant to deal with an abnormal situation, but it was not expected to bring things back to normal. The idea is to see if ARRA retained or created jobs proportional to the labor market at the time; the implicit question is whether ARRA disproportionately benefited government workers.

The labor market in 2006 and 2007 is not really a “normal” baseline. The labor market in 2006 and 2007 was already in crisis – construction employment started to decline in early 2006. Financial services, though, were still high (mortgage bankers were among the big winners of the boom and among the big losers of the crisis). The point is that ARRA was not meant to restore

the labor market composition to the height of the boom. It is hard to determine when the last “normal” period would have been – possibly 2004. This would mean a five-year lag, which makes the comparison not all that reliable. We believe, therefore, that 2009 is a valid benchmark for the purposes of this analysis.

Box 2. Comparison of ARRA-Funded Job Holders with Those Employed in the Labor Force in Massachusetts

In general, the initial impact of Mass-ARRA is that the spending created or retained jobs roughly in proportion to those populations with the highest unemployment rates in the Commonwealth. In both quarters, blacks and Hispanics, who have unemployment rates higher than those of whites and Asians, make up higher percentages of ARRA job holders than they do among those employed in the labor force.*

- Whereas Hispanics made up 5.5% of those employed in the labor force, they made up 6.7% of ARRA job holders in Quarter 1 and 6.4% in Quarter 2.
- The impact on blacks is even greater: While in 2009 they made up just 4.7% of those employed in the labor force, 7.2% of ARRA job holders in Quarter 1 were black, as were 6.7% in Quarter 2.
- Asians, who comprise 5.8% of those employed in the labor force, made up 3.4% of ARRA job holders in Quarter 1 and 2.7% in Quarter 2.
- ARRA-funded workers were substantially more likely to be female than male (55.3% to 44.7%) in Quarter 1, but there was a slight reversal in this breakdown in Quarter 2 – to 51.0% male and 49.0% female. In general, women and men comprise about 50% each of those employed in the labor force in the Commonwealth; it would appear that women may have benefited more during the first quarter compared to the second.

***Source of labor force data:** Center for Economic and Policy Research. 2009. CPS ORG Uniform Extracts, Version 1.5. Washington, DC. All data presented are for the Commonwealth of Massachusetts. **Note:** The percentages for non-whites and Hispanics in the labor force should be viewed with some caution, as their numbers in the CEPR sample are quite small.

ARRA Spending Trends and the Distribution of Positions by Race and Gender

According to data provided by MassRRO,⁸ by the end of Quarter 2 (i.e., June 30, 2010), over \$5.6 billion had been awarded to state agencies in the Commonwealth for job creation and retention and direct benefit programs such as Unemployment Insurance, the Supplemental Nutrition Assistance Program, Medicaid, and other Safety Net Programs.⁹ Of this amount, about \$4.1 billion had been expended, thus far. In order to analyze the percentages of persons of color

⁸ Commonwealth of Massachusetts. (2010). *Recovery Act Spending in Massachusetts*. (Reporting Period 2010 – Q2: Apr 1, 2010 to Jun 30, 2010 [sic]). Retrieved October 15, 2010, from <http://arraprweb1.itd.state.ma.us/mapapp/money.html>

⁹ Over \$3.1 billion had been awarded to preserving safety net services.

and women who benefited from job retention/creation through ARRA, we ask: What is the distribution by race¹⁰ and gender of the positions created or retained through ARRA funding? Tables 2 and 3 provide a breakdown by funding categories of per-quarter spending, FTEs, the percentage and number of positions (“headcount”) held by each of the racial groups (i.e., whites, blacks, Asians, and “others”), as well as the percentage and number of positions for Hispanics (who may be of any race). Highlights from these tables may be found in Box 3.

Box 3. Trends in ARRA-Funded Spending, Number of Positions, and Distribution by Race, Ethnicity, and Gender, Quarter 1 to Quarter 2

From Quarter 1 to Quarter 2:

- MassARRA spending per quarter increased from \$827.5 million to \$908.8 million over the six months covered by this report.
- The total number of full-time-equivalent positions (FTEs) also increased: from 6,654.2 to 10,432.8 over the same period.
- The total number of people employed (i.e., “headcount”) increased by 70%: from 14,318 to 24,270.

Overall, people of color made up more than 10% of the Mass-ARRA job holders in both quarters. However, certain patterns emerge by race and funding category. For example, as seen in Tables 2 and 3:

- Whites held over 90% of positions in the funding categories of Education, Clean Energy/Environment, and Transportation in both Quarter 1 and Quarter 2.
- Blacks held almost 20% of positions in the Housing funding category in Quarter 1 and 14.1% in Quarter 2, around 16% of Safety Net positions and over 1 in 10 of Workforce positions in both quarters.
- Asians held almost a third (30.4%) of positions in the Technology/Research category and 8.4% in Accountability in Quarter 1; they held similar percentages in Quarter 2 (29.3% of Technology/Research and 10.2% of Accountability positions).

Tables 2 and 3 also offer analysis for Hispanics, who may be of any race, as a percentage of all job holders and by funding category for Quarter 1 and Quarter 2. We see that:

- Hispanics made up between 6% and 7% of Mass-ARRA job holders in both quarters.
- Hispanics and blacks tended to hold jobs in similar funding categories. Hispanics, in other words, were more likely to have higher shares of positions in Housing and Workforce categories than in Accountability (where less than 1% of the positions were held by Hispanics), Technology/Research (where just 2.2% of the positions were held by Hispanics), and Education (Hispanics held less than 5% of positions in this category).
- A different pattern emerges in the Public Safety/Homeland Security category. In Quarter 1 Hispanics held 14.3% of these positions compared to about 86% of non-Hispanics; blacks in this quarter held 13.8% of the jobs compared to 76.4% of whites and 4% of Asians. However, in Quarter 2 Hispanics continued to hold over 1 in 10 (11.6%) of jobs in this category, but blacks held just 5.4%.

¹⁰ Because Hispanics may be of any race, we present the analysis for race/ethnicity for whites, blacks, Asians, and “other” races separate from that for Hispanics. “Asian” includes anyone included in the categories “Asian” and “Hawaiian”; the term “Other” includes American Indians or those included under “two or more races.” Those for whom race was not reported were not included in the analysis by race.

Table 2. Spending, Headcount, and Race/Hispanic by Mass-ARRA Funding Category, Quarter 1

	Quarter Spending*	Total Headcount	Race Percent (N)				Hispanic Percent (N)
			White	Black	Asian	Other	
Total for All Funding Categories	\$827,474,780	14,318	87.9 (N=12,580)	7.2 (N=1,036)	3.4 (N=483)	1.5 (N=219)	6.7 (N=1,123)
By Category							
Accountability	\$1,435,845	83	88.0 (N=73)	3.6 (N=3)	8.4 (N=7)	0 (N=0)	0.8 (N=1)
Clean Energy/Environment	\$21,991,568	916	90.2 (N=826)	3.5 (N=32)	3.5 (N=32)	2.8 (N=26)	5.4 (N=64)
Education	\$127,061,601	9,805	91.4 (N=8,959)	5.4 (N=531)	2.5 (N=245)	0.7 (N=70)	4.9 (N=549)
Housing	\$16,632,143	564	75.2 (N=424)	19.3 (N=109)	2.3 (N=13)	3.2 (N=18)	15.0 (N=118)
Public Safety/Homeland Security	\$3,015,511	954	76.4 (N=729)	13.8 (N=132)	4.0 (N=38)	5.8 (N=55)	14.3 (N=179)
Safety Net	\$627,455,830	394	80.2 (N=316)	16.0 (N=63)	3.6 (N=14)	0.3 (N=1)	9.2 (N=42)
Technology/Research	\$11,819,919	319	66.8 (N=213)	2.5 (N=8)	30.4 (N=97)	0.3 (N=1)	2.2 (N=9)
Transportation	\$11,931,508	291	92.1 (N=268)	6.2 (N=18)	1.4 (N=4)	0.3 (N=1)	5.8 (N=18)
Workforce	\$6,130,854	992	77.8 (N=772)	14.1 (N=140)	3.3 (N=33)	4.7 (N=47)	12.2 (N=143)
<p>Source: MassRRO Data, 1st quarter, 2010; N for race calculations (See top row for "All Races") = 14,318 (not including Hispanics or those for whom race was not reported). Hispanics, who may be of any race, are analyzed separately; the N for Hispanic calculations was 16,790 in Quarter 1.</p> <p>*Quarter spending data were retrieved on October 28, 2010, from the "Recovery Act Spending in Massachusetts, (through State Agencies), Reporting Period 2010 – Q1: Jan 1, 2010 to March 31, 2010." Retrieved October 28, 2010, from http://arraprweb1.itd.state.ma.us/mapapp/money.html</p> <p>Note: For Tables 2 and 3, the totals in the first row for "Quarter Spending" and "Total Headcount" are the sums of the columns below. The totals in the first row for each race are the percents and total numbers of job holders for each race across the funding category. The data for Hispanics, who may be of any race, may be found in the far right column for each of these tables and should be read as follows: Where the percent Hispanic is, for example, 6.7% in Quarter 1 across all funding categories, this means that 93.3% of the positions are held by non-Hispanics. The number of individuals who reported in each category (N) is included because, in some of the funding categories, the numbers are quite small, which may affect the apparent variation by race/ethnicity and funding category.</p>							

Table 3. Spending, Headcount, and Race/Hispanic by Mass-ARRA Funding Category, Quarter 2

	Quarter Spending*	Total Headcount	Race Percent (N)				Hispanic Percent (N)
			White	Black	Asian	Other	
Total for All Funding Categories	\$908,846,279	24,270	89.3 (N=21,661)	6.1 (N=1,470)	2.7 (N=660)	2.0 (N=479)	6.4 (N=1,720)
By Category							
Accountability	\$1,536,487	98	82.7 (N=81)	5.1 (N=5)	10.2 (N=10)	2.0 (N=2)	1.6 (N=2)
Clean Energy/ Environment	\$20,949,508	1,335	91.4 (N=1,220)	2.8 (N=37)	3.3 (N=44)	2.5 (N=34)	4.3 (N=81)
Education	\$286,943,928	15,574	90.9 (N=14,156)	4.9 (N=767)	2.4 (N=367)	1.8 (N=284)	4.6 (N=741)
Housing	\$41,280,201	1,918	80.3 (N=1,541)	14.1 (N=271)	1.8 (N=34)	3.8 (N=72)	13.1 (N=368)
Public Safety/ Homeland Security	\$9,936,472	889	89.4 (N=795)	5.4 (N=48)	2.6 (N=23)	2.6 (N=23)	11.6 (N=131)
Safety Net	\$485,469,009	611	78.2 (N=478)	16.7 (N=102)	4.6 (N=28)	0.5 (N=3)	11.4 (N=80)
Technology/Research	\$9,052,453	416	66.6 (N=277)	2.6 (N=11)	29.3 (N=122)	1.4 (N=6)	3.5 (N=18)
Transportation	\$45,699,351	2,287	94.6 (N=2,164)	4.6 (N=106)	0.5 (N=11)	0.3 (N=6)	7.5 (N=185)
Workforce	\$7,978,872	1,142	83.1 (N=949)	10.8 (N=123)	1.8 (N=21)	4.3 (N=49)	8.9 (N=114)
<p>Source: MassRRO Data, 2nd quarter, 2010; N for race calculations=24,270 (not including Hispanics or those for whom race was not reported). Hispanics, who may be of any race, are analyzed separately; the N for Hispanic calculations was 27,045 in Quarter 2.</p> <p>*Quarter spending data were retrieved on October 28, 2010, from the "Recovery Act Spending in Massachusetts, (through State Agencies), Reporting Period 2010 – Q2: Apr 1, 2010 to Jun 30, 2010." Retrieved October 28, 2010, from http://arraprweb1.itd.state.ma.us/mapapp/money.html</p>							

Women’s Employment: The Role of ARRA

As noted earlier and here in Table 4, women made up a higher percentage of all Mass-ARRA job holders in Quarter 1 (55.3% women to 47.7% men) than Quarter 2 (49% women to 51% men).

Table 4. Gender of Mass-ARRA Job Holders by Funding Category, Quarter 1 and Quarter 2

	Quarter 1		Quarter 2	
	Female Percent (N)	Male Percent (N)	Female Percent (N)	Male Percent (N)
Total for All Funding Categories	55.3 (N=9,198)	44.7 (N=7,435)	49.0 (N=13,064)	51.0 (N=13,591)
By Funding Category*				
Accountability	31.7	68.3	36.8	63.2
Clean Energy/Environment	14.9	85.1	13.5	86.5
Education	60.9	39.1	62.0	38.0
Housing	67.6	32.4	32.7	67.3
Public Safety/Homeland Security	41.9	58.1	26.5	73.5
Safety Net	66.7	33.3	68.3	31.7
Technology/Research	50.0	50.0	47.4	52.6
Transportation	3.2	96.8	2.9	97.1
Workforce	62.7	37.3	67.9	32.1
Source: MassRRO Data, 1st and 2nd quarters, 2010. The N for gender calculations were 16,663 for Quarter 1 and 26,655 for Quarter 2.				
* Because the overall numbers are relatively large in all categories by gender, we did not include the Ns for each by gender in funding category as we did in Tables 2 and 3.				

Highlights of the gender analysis of these positions by funding category include:

- Certain types of Mass-ARRA-funded jobs are predominantly – and in the case of Transportation almost exclusively – male. Men are also much more likely to hold jobs in the Clean Energy and Environment category (85.1% in Quarter 1 and 86.5% in Quarter 2) than women (14.9% in the first and 13.5% in the second quarter).
- Women and men each make up about half of the Technology and Research jobs, but women are disproportionately represented in the Safety Net and Workforce categories for both quarters.
- In both quarters women make up a higher percentage than men in the Safety Net Category. Given that many of these programs are in the health and human services fields, sectors where more women than men are traditionally employed, this does not come as a surprise.

- Women tend to have a significant presence in the Education funding category in both quarters: they make up six out of ten Mass-ARRA job holders in this category compared to about four in ten held by men (see Table 4). Furthermore, while not shown in this table, we found that in Quarter 2 over three-quarters of women were in Education compared to less than half of men. Since 66% of all Mass-ARRA jobs in Quarter 1 and 61% in Quarter 2 are in Education, this gender concentration is significant and merits analysis about the financial impact on women. However, as discussed in Box 4, this pattern is similar for women in the Massachusetts labor force in general.
- There is one funding category in which there was a reversal of gender distribution from Quarter 1 to Quarter 2: In Housing, women made up two-thirds (67.6%) of positions in Quarter 1 and men one-third. In Quarter 2, the percentages were almost exactly the

Box 4. Gender and Employment Patterns by Mass-ARRA Funding Categories and State Industry Sectors

While data on employment by gender, race, and industry sectors for the labor force as a whole in Massachusetts are very limited in their usefulness for comparison to Mass-ARRA funding categories, it is possible to use 2009 Center for Economic Policy Research (CEPR) data described earlier to explore a few gender patterns highlighted above:

- Women in the Massachusetts labor force in general were more likely than men to be employed in educational services: 68% to 32% – reflecting similar percentages in this funding category in Table 4.
- Men were more likely to work in transportation occupations than women, but not to the extent seen in the Mass-ARRA data: in the Massachusetts labor force, 75% of those working in transportation (U.S. Census Occupation Codes 9000-9750) are men, whereas among Mass-ARRA job holders, over 95% in both quarters were male.
- Among those employed in the CEPR classified industry “service,” 48% were male and 52% were female. This suggests that service industry workers in Massachusetts tended to be female and manufacturing workers tended to be majority male (since 64.8% of those employed in manufacturing were men). However, there are no ARRA funding categories that match these with enough precision to allow comparisons.

Data from CEPR show that, in the Massachusetts labor force as a whole, more minority women are employed than men of color. Whereas 49.5% of whites who were employed in 2009 were women, 50.5% were men.

- 55.7% of blacks who were employed were women
- 59.8% of Hispanics/Latinos who were employed were women
- 52% of Asians who were employed were women

Because Massachusetts ARRA data do not permit analysis by race and gender combined, it is not possible, to know the impact of ARRA funding on women of color in this state.

opposite: 32.7% were women and 67.3% were men.

- Finally, whereas in Quarter 1 women and men were spread somewhat evenly in the Public Safety/Homeland Security category (41.9% female, 58.1% male), in Quarter 2 the positions in this category became predominantly male: 73.5% male compared to 26.5% female.

A policy brief released earlier this year, *Women in the Down Economy: Impacts of the Recession and the Stimulus in Massachusetts* documented how Massachusetts women’s employment opportunities have been impacted by ARRA in large part due to gendered occupational segregation in which certain industries are predominantly male or female.¹¹ The brief noted several different impacts of ARRA on women’s employment opportunities, including spending on physical infrastructure and energy and environment (“Green Economy” development). Physical infrastructure projects include transportation and construction and “those trained for or already employed in the construction industry will be the primary beneficiaries of these funds.”¹² Given that in Massachusetts women comprise just less than 8% of all workers in the construction industry and make up only 2.2% of all construction workers,¹³ it is not surprising that the ARRA jobs analysis presented here demonstrates that few women benefited from jobs created and/or retained in Transportation and Clean Energy/Environment categories.

ARRA’s Impact on Persons with Disabilities in the Workforce

The U.S. Bureau of Labor Statistics reported that, in October 2009, people with disabilities aged 16-64 who were employed made up 3.1% of the labor force in the United States.¹⁴ Exact figures for the same time period for the Commonwealth of Massachusetts are not available, but estimates from 2008 suggest that people with disabilities comprised about 5.2% of those in the Massachusetts labor force.¹⁵

- As seen in Table 5, people with disabilities in ARRA-funded positions made up 5.2% of all job holders in Quarter 1 – a share that matches precisely the estimate of their share in the labor force as a whole (see Table 5).

¹¹ Albelda, R., Kelleher, C., with Parekh, J., & Salas, D. (2010, March). *Women in the Down Economy: Impacts of the Recession and the Stimulus in Massachusetts*. University of Massachusetts Boston, McCormack Graduate School of Policy Studies, Center for Women in Politics & Public Policy. Retrieved on November 10, 2010, from http://www.mccormack.umb.edu/centers/cwppp/documents/CWPPPWomenDownEconomyMarch2010_001.pdf

¹² *Ibid.*

¹³ Note: the percentage of women in the construction industry is higher than that of female construction workers because the former includes those in clerical, managerial, administrative, and other non-construction-work positions.

¹⁴ U.S. Bureau of Labor Statistics. (2010). *Table A-6. Employment status of the civilian population by sex, age, and disability status, not seasonally adjusted*. Retrieved October 2, 2010, from <http://www.bls.gov/news.release/empsit.t06.htm>

¹⁵ Cornell University, Employment and Disability Institute (2010). *Employment of non-institutionalized working-age people by disability status in Massachusetts in 2008*. Retrieved October 2, 2010, from <http://www.ilr.cornell.edu/edi/disabilitystatistics/reports/acs.cfm?statistic=2>.

- However, the percentage of people with disabilities among ARRA-funded job holders appears to have dropped substantially to 1.7% in Quarter 2. The explanation for the higher percentage in Quarter 1 seems clear. A relatively large number of people with disabilities held jobs created or retained in the “Public Safety/ Homeland Security” category during Quarter 1 (N=285), and as Table 5 shows, people with disabilities held 3% of all Mass-ARRA jobs in that category during Quarter 1. Because the number of people with disabilities holding Public Safety/Homeland Security positions declined to 133 in Quarter 2, their share in that category shrank from 3% to less than 1% – and the overall total

Table 5. Disabled Workers as Percent of All Mass-ARRA Job Holders, and by Funding Categories, Quarter 1 and Quarter 2

	Quarter 1 % (N)	Quarter 2 % (N)
Among All Job Holders	5.2 (N=493)	1.7 (N=318)
By Funding Category		
Accountability	0.01 (N=1)	0 (N=0)
Clean Energy/ Environment	0.14 (N=13)	0.04 (N=7)
Education	0.32 (N=30)	0.19 (N=35)
Housing	0.19 (N=18)	0.03 (N=6)
Public Safety/ Homeland Security	3.0 (N=285)	0.71 (N=133)
Safety Net	.56 (N=53)	0.33 (N=62)
Technology/Research	0 (N=0)	0 (N=0)
Transportation	0 (N=0)	0 (N=0)
Workforce	.98 (N=93)	0.40 (N=75)
Source: MassRRO data, 1st and 2 nd quarters, 2010; the N for disabled calculations was 9,481 in Quarter 1 and 18,749 in Quarter 2.		

by about the same number of percentage points, from 5.2% to 1.7%. Further research is needed to determine whether this is a trend that continues in subsequent quarters. (Note that we include the numbers in each funding category because, as may be seen in Table 5, not only are the overall numbers small, but some funding categories, e.g., Accountability, Technology/Research, and Transportation, have no ARRA-funded workers. These percentages, therefore, should be viewed with some caution.)

Geographical Analysis: Where Do Mass-ARRA Job Holders Live?

We began the discussion of the Mass-ARRA data by posing the question: How do people who got or retained jobs through ARRA in this state compare to the labor force as a whole? Now it is time to ask another key question: Which communities across the Commonwealth have benefited from the ARRA funding? In order to answer this question, we examined the number of Mass-ARRA job holders by zip code and county.

Over 90% of Commonwealth cities and towns are home to people in ARRA-created or -retained jobs.

Analysis by Zip Code and County

The Commonwealth of Massachusetts has 351 cities and towns and has 694 zip codes. The United States Post Office indicates that a zip code may be for a postal entity, neighborhood, or community. That said, in Quarter 1, when we analyzed where ARRA-funded job holders lived, we found that about eight in ten of all Massachusetts zip codes had at least someone whose job was created or retained through Mass-ARRA funding. Seventy-nine percent (545 of the 694 in total) of zip codes were among the places where people lived in Quarter 1. In Quarter 2, the percentage was even higher: 82% (566) of zip codes were represented among ARRA jobholders.

Table 6 shows the distribution of Mass-ARRA job holders by county for both quarters – i.e., what percent of the workers lived in the various counties of the Commonwealth. It also offers the opportunity to assess the extent to which the distribution of ARRA job holders reflects the distribution of the Massachusetts labor force for 12 of the 14 counties. Most counties have shares of Mass-ARRA job holders that are

Table 6. Distribution of Mass-ARRA Job Holders by County, Quarter 1 and Quarter 2, Compared to Percent Labor Force

County	Labor Force in County % of Total	Quarter 1 % of Total	Quarter 2 % of Total
Barnstable	2.8	2.7	2.3
Berkshire	1.7	2.6	2.8
Bristol	7.5	11.7	14.5
Dukes	n/a	0.1	0.2
Essex	12.7	14.7	13.4
Franklin	1.0	1.7	1.4
Hampden	7.3	10.6	10.5
Hampshire	2.1	3.9	3.6
Middlesex	23.5	16.1	17.0
Norfolk	9.4	7.8	6.8
Plymouth	6.8	8.6	8.4
Suffolk	13.4	9.1	9.3
Worcester	11.7	10.5	9.8
Total	100	100	100

Source for labor force by county: U.S. Census, American Fact Finder, 2006-2008 American Community Survey 3-Year Estimates data. **Note:**

Percentages shown are for Mass-ARRA job holders in each county as a percent of all Mass-ARRA job holders per quarter. The N for all counties in Quarter 1 was 15,822 in Quarter 1 and 24,790 in Quarter 2. We did not include Nantucket County because there were no job holders there; we report the job holders for Dukes County (Martha's Vineyard), but the US Census does not provide labor force data for counties with fewer than 20,000 residents.

similar to the county's share of the state's labor force. The counties where the job holders made up more than a couple of points lower share were Middlesex and Suffolk; Norfolk was also slightly lower. The counties that had a higher share included Bristol, Essex, and Hampden, but, again, the percentage point differences are relatively small. Comparing the maps for Quarter 1 and Quarter 2 we see that, in the latter, there are fewer zip codes with no shading; this means that, as the number of job holders went up from about 16,000 in Quarter 1 to over 27,000 in Quarter 2, the reach of the stimulus funds expanded more widely across the state. In Quarter 2, one also sees more communities with deeper shading, indicating that more people per zip code held jobs created or retained by Mass-ARRA funding. This is particularly noticeable in Southeastern Massachusetts, but it is also evident in Essex, Worcester, and Hampden counties. Box 5 highlights key findings by county.

Maps 1 and 2 provide a visual display of the statewide impact of Mass-ARRA on the communities of the Commonwealth. Map 1 shows the distribution of Mass-ARRA job holders by zip code for Quarter 1, and Map 2 for Quarter 2. The light gray lines are zip code boundaries, and the heavy black lines are county boundaries.

Analysis by Cities/Towns

Keep in mind that zip codes often represent smaller towns or sections/neighborhoods of a larger city and in both quarters over 90% of Commonwealth cities and towns are home to people in ARRA-created or -retained jobs. City/town boundaries are not included because the map would have been difficult to read; for ease of relating the zip code data with specific cities and towns, we have included Map 3, which shows city/town and county boundaries.¹⁶

Box 5. Comparison of Mass-ARRA Job Holders with Those Employed in the Labor Force by County

Using U.S. Census data, we were able to determine that, across almost all counties, the share of job holders living in each county was very close to the percent of the state's labor force in that county, suggesting that Mass-ARRA job creation and retention benefited the state in a wide-ranging way. (See Table 6.)

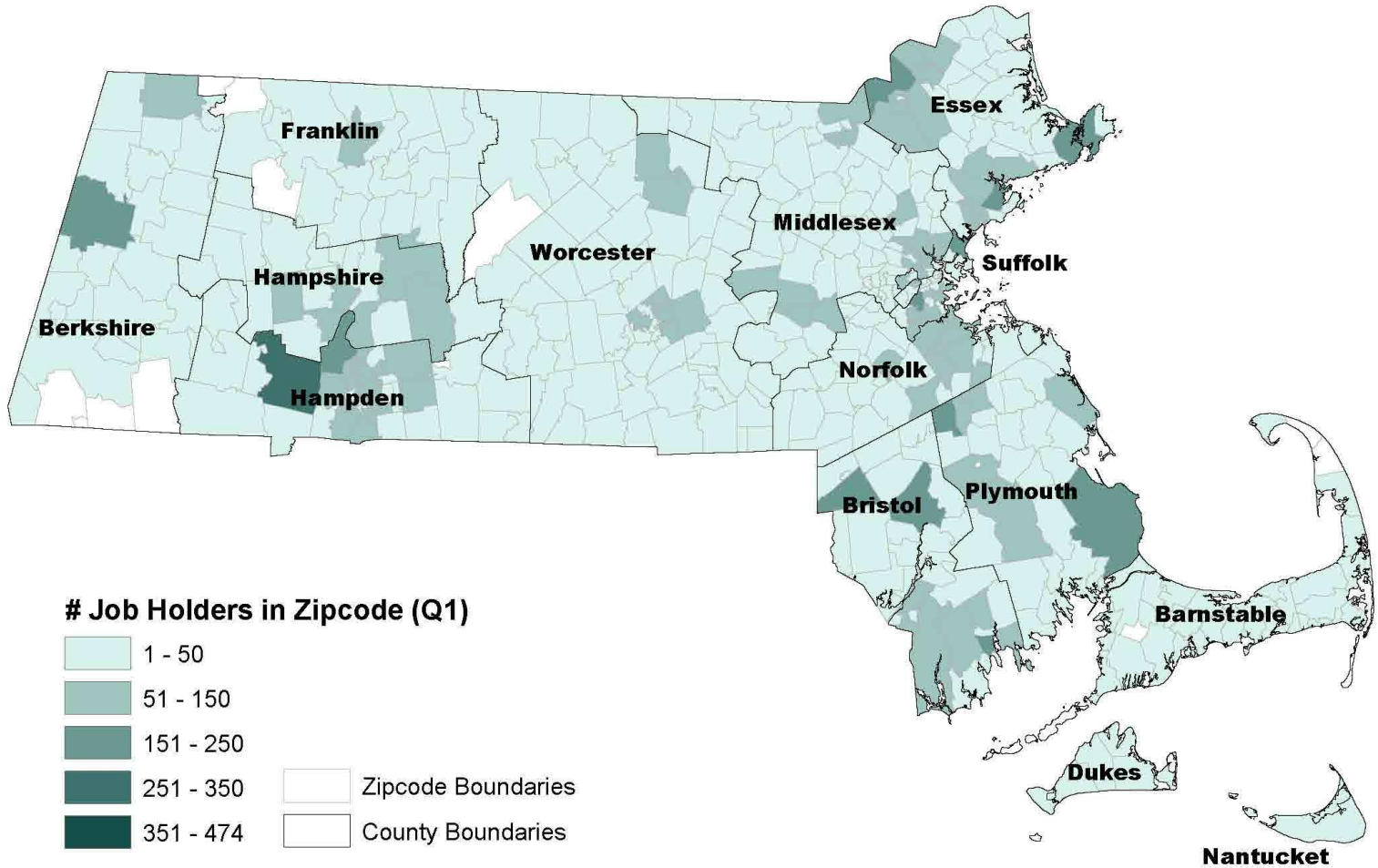
The two counties with apparently lower shares of Mass-ARRA funded job holders compared to the share of residents in the labor force were Middlesex and Suffolk Counties.

- Almost one-quarter of the Massachusetts labor force lives in Middlesex County, but that county saw a relatively smaller share of Mass-ARRA job holders: 16.1% in Quarter 1 and 17% in Quarter 2.
- Suffolk County – home to the City of Boston, as well as Chelsea, Winthrop, and Revere – had 13.4% of the state's labor force, but only 9% of the Mass-ARRA funded job holders in both quarters.

***Source of labor force data:** U.S. Census, American Fact Finder, 2006-2008 American Community Survey 3-Year Estimates data.

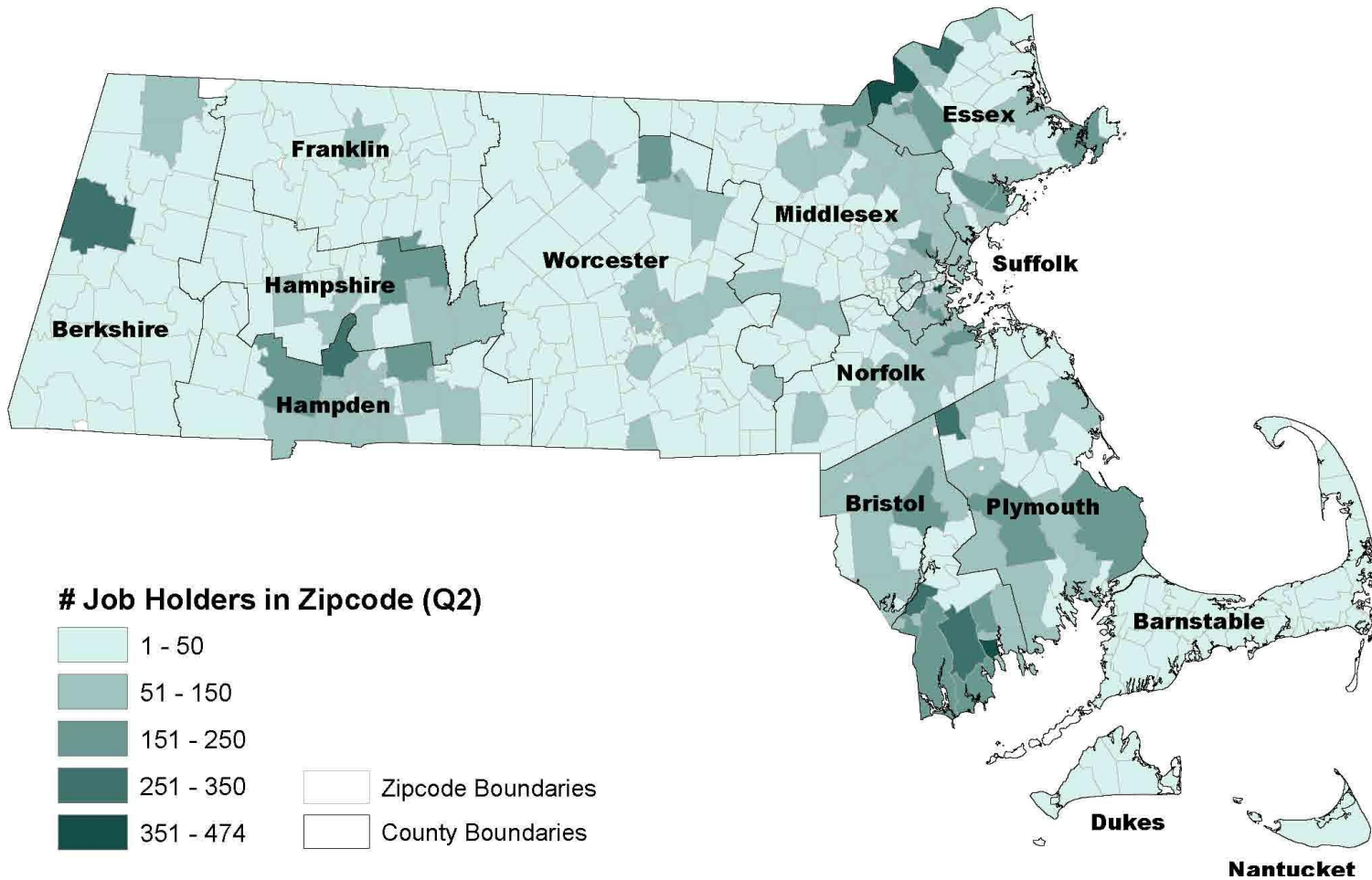
¹⁶ Commonwealth of Massachusetts. (2010). *Massachusetts Counties*. Retrieved on November 2, 2010, from http://www.sec.state.ma.us/cis/cispdf/ma_counties.pdf

Map 1. Mass-ARRA Job Holders by Zip Codes, Quarter 1



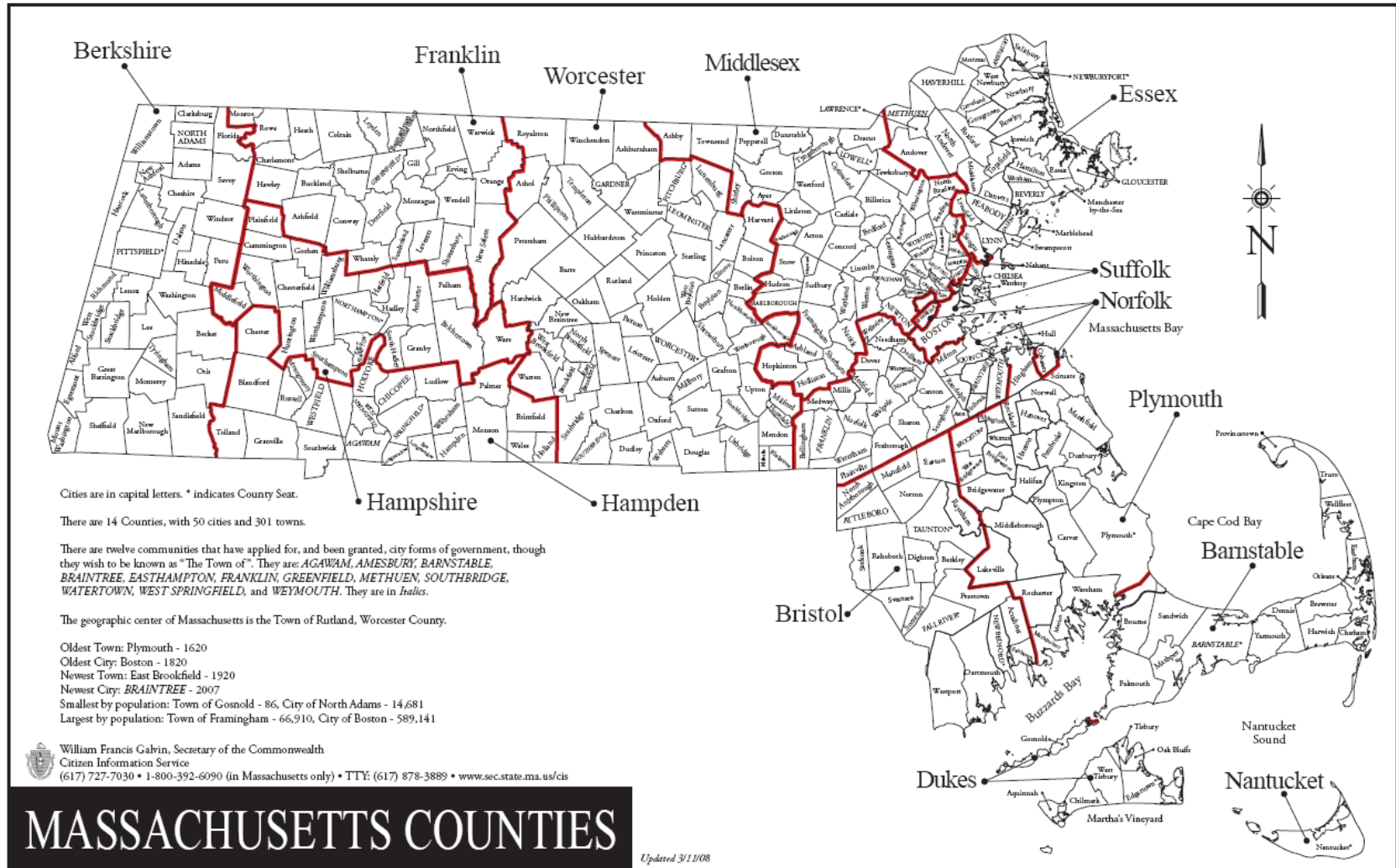
Source: Produced using ESRI software (ArcGIS version 9.3) for the Center for Women in Politics & Public Policy and the Collins Center, McCormack Graduate School, University of Massachusetts Boston, 2010. N=15,822.

Map 2. Mass-ARRA Job Holders by Zip Codes, Quarter 2



Source: Produced using ESRI software (ArcGIS version 9.3) for the Center for Women in Politics & Public Policy and the Collins Center, McCormack Graduate School, University of Massachusetts Boston, 2010. N=24,787.

Map 3. Massachusetts Cities, Towns, and Counties



Neighborhood Analysis: The City of Boston

We continue the discussion begun on page 13 above about how Mass-ARRA positions have had an impact on virtually all the cities and towns of the Commonwealth. While it would be ideal to look closely at the neighborhood impact for a number of communities, we are limited here to examining the distribution of the job holders for the neighborhoods that make up the City of Boston. As the capital of the state and the largest city, Boston also is well known for its distinctive neighborhood identities, with distinctive racial/ethnic residential patterns.

Analysis of city neighborhoods is somewhat challenging in that the City of Boston has, for example, many zip codes, whose boundaries only roughly coincide with the neighborhood boundaries of Dorchester, Roxbury, West Roxbury, Allston/Brighton, South Boston, East Boston, Jamaica Plain, Back Bay, etc. (See, for example, “City of Boston: Various Boundaries,” which provides visual displays of districts, zip codes, Public Works districts, wards and precincts, districts of the Office of Neighborhood Services, and Police Districts. This document demonstrates that “communities” and “neighborhoods” do not necessarily coincide precisely with zip codes or other boundaries.¹⁷)

Table 7 reveals that certain Boston neighborhoods – and especially those with considerable racial/ethnic diversity – had a greater share of Mass-ARRA job holders than others. In Quarter 1, for example, 301 (27.1%) of the 1,117 Mass-ARRA job holders in the City of Boston lived in Dorchester; 15.7% in Jamaica Plain; and 13.2% in Roxbury.

In Quarter 2, the number of job holders increased in Dorchester to 412, but, with the overall number of job holders rising to more than 2,000, Dorchester’s share declined slightly to 20.3%. However, Quarter 2 shows a very substantial increase in Roxbury – both in total number (573) and percent of the total (31.1%).

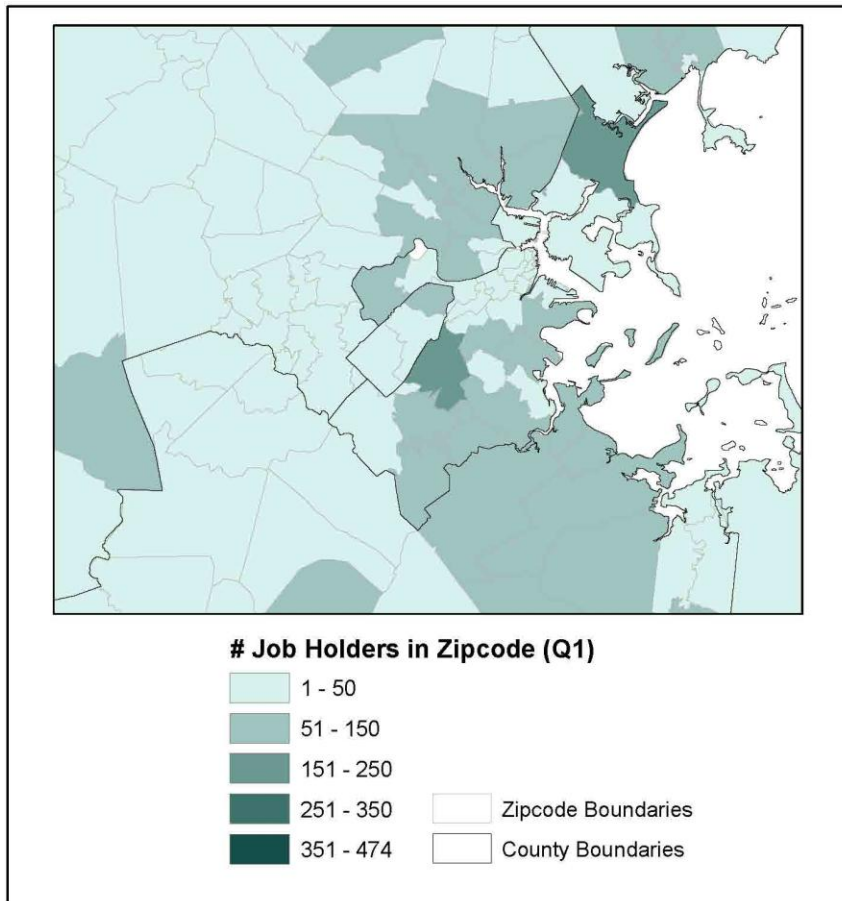
¹⁷ Commonwealth of Massachusetts. (2010). *City of Boston: Various Boundaries*. Retrieved October 17, 2010, from <http://hubmaps1.cityofboston.gov/datahub/GalleryDocuments/Boundaries.pdf>

Table 7. Distribution of Mass-ARRA Job Holders by Selected Neighborhoods for the City of Boston, Quarter 1 and Quarter 2

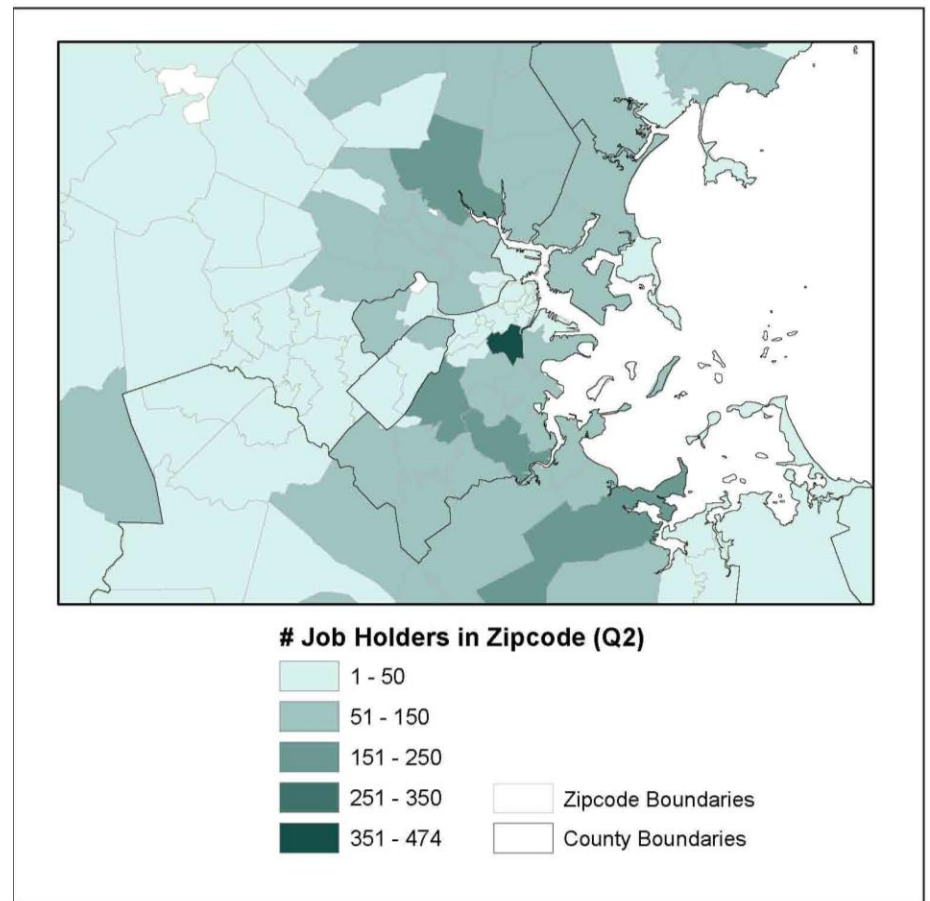
Neighborhood	As % of Boston Population**	Quarter 1 % (N)	Quarter 2 % (N)
Allston/Brighton	11.8	6.7 (N=74)	5.7 (N=116)
Back Bay/Beacon Hill	4.5	0.5 (N=6)	1.4 (N=28)
Central Boston (includes Chinatown)	4.3	4.8 (N=58)	3.5 (N=71)
Charlestown	2.6	1.8 (N=20)	1.7 (N=35)
Dorchester	16.8	27.1 (N=301)	20.3 (N=412)
East Boston	6.5	2.5 (N=28)	3.3 (N=66)
Hyde Park (includes Readville)	5.4	5.3 (N=59)	5.2 (N=106)
Jamaica Plain	6.5	15.7 (N=175)	10.0 (N=202)
Fenway/Kenmore	6.1	2.9 (N=32)	2.2 (N=45)
Mattapan	6.3	4.7 (N=52)	4.0 (N=82)
Roslindale	5.9	4.9 (N=54)	4.2 (N=86)
Roxbury	9.4	13.2 (N=147)	31.1 (N=632)
South Boston	5.1	5.8 (N=65)	4.1 (N=84)
West Roxbury	4.9	4.1 (N=46)	3.2 (N=64)
Total	96.1**	100 (N=1,117)	100 (N=2,029)
<p>Source: MassRRO Data, 1st and 2nd quarters, 2010. N was 1,117 for Quarter 1 and 2,029 for Quarter 2. Note: Data did not always provide consistent place names linked to zip codes, and time did not permit recoding of all zip codes to precise neighborhoods; these numbers should be considered estimates. *Source: The Boston Indicators Project, based on U.S. Census, 2000. Retrieved November 1, 2010, from http://www.tbf.org/Indicators2006/GeographyAtAGlance/Default.aspx?id=2310 ** Does not add up to 100 because some zip codes could not be coded into a neighborhood.</p>			

Maps 4 and 5 on the next page provide a visual illustration of both the greater spread of Mass-ARRA job holders in the Greater Boston area (shown by darker shading in more zip codes) from Quarter 1 to Quarter 2, especially north and south of the city. The maps also illustrate how the zip codes that include the neighborhoods of Dorchester and Roxbury, home to the greatest concentration of people of color, gained a substantial infusion of jobs as part of the Mass-ARRA spending in Quarter 2. The darkest shading in the center of Map 5 marks those neighborhoods.

Map 4. Mass-ARRA Job Holders, Greater Boston, Quarter 1



Map 5. Mass-ARRA Job Holders, Greater Boston, Quarter 2



Source: Produced using ESRI software (ArcGIS version 9.3) for the Center for Women in Politics & Public Policy and the Collins Center, McCormack Graduate School, University of Massachusetts Boston, 2010. N for City of Boston Neighborhoods was 1,115 in Quarter 1 and 2,029 in Quarter 2.

ARRA and Job Quality

Counting jobs is only one aspect of the labor market performance that matters for people and for the economy. Job quality is another aspect.¹⁸ Good-paying jobs that offer health insurance and retirement benefits will boost households' income and their spending power more than jobs that pay little and offer few benefits. People will have a harder time and the economic recovery will take longer, since people have less money to spend if the bulk of jobs that are currently created are not good jobs.

The data analyzed for this report do not include any information on the wages or benefits of the jobs that were retained or created through ARRA. However, we can offer some – even if limited – analysis of the job-quality that likely characterize these jobs. There is sufficient evidence on the job quality of different types of jobs in the United States to offer a general assessment of the job quality impact of ARRA, even without looking at data on the exact wages and benefits of the jobs that were retained or created.

We need to distinguish several types of jobs that were retained or created through ARRA to arrive at a general assessment of ARRA's job-quality impact. The first wave of jobs that were created or retained were state/public employees whose agencies received ARRA funding. The next wave was private sector contractors and subcontractors who created or retained jobs due to ARRA contracts, either with government agencies directly or with other subrecipients.

The third segment of jobs that ARRA has retained or created includes those known as “indirect jobs” that wouldn't exist if the initial contractors and subcontractors had not gotten jobs and spent their wages. Economic models can only estimate the number and types of these jobs, as does the Congressional Budget Office. It is impossible to identify the exact jobs that have been retained or created because people spent more money. There are, however, some estimates of the number and types of jobs that have been retained or created by the type of spending that ARRA created to arrive at some general assessment of the potential quality impact of ARRA on the indirectly created jobs.

The breakdown into the three types of jobs that have been retained or created by ARRA offers an approach to gain a general sense of the quality of these jobs. We discuss each subsection separately and bring as much of the available evidence to bear as possible. First, there are the jobs created directly through ARRA contracts. School districts, water districts, police departments, and other public entities have contracted with the federal government to spend ARRA money for particular projects. Many of these jobs will be local and state government jobs. This implies that, at least for this part of the job-creation effort, jobs that were created or retained

¹⁸ Job quality has many facets. It includes but is not limited to the wage rate per hour, employer sponsorship of benefits – health insurance, pensions, time off, among others – job stability, career advancement opportunities, and flexible work arrangements. Many of these aspects are hard to quantify. John Schmitt (2007) offers one of the most comprehensive assessments of job quality in the United States by focusing on wages, health insurance, and pensions offered through the employer. The discussion here focuses primarily on wages, health insurance, and pension benefits, where possible. See Schmitt, J. (2007). *The Good, the Bad, and the Ugly: Job Quality in the United States over the Three Most Recent Business Cycles*. Washington, DC: Center for Economic and Policy Research.

by ARRA paid above average wages, compared to the average in the private sector. This is simply a reflection of the characteristics of the public sector workforce, which tends to be better educated than the rest of the labor force, among other characteristics. Public sector workers, however, tend to be paid less than their private sector counterparts, once these individual characteristics are taken into account.¹⁹ This wage differential is explained in part by greater health insurance and pension coverage in the public sector than in the private sector.²⁰ The bottom line, then, is that public sector jobs that have been directly retained or created by ARRA are likely to be good jobs.

Other directly retained or created jobs are those of private sector government contractors. They include the employees of a construction company that receives a contract to rebuild a road, repair a school, or weatherize a government office building, among other projects. These jobs are governed by federal and state regulations that are intended to prevent contractors from winning bids by undercutting wages and benefits in a particular market. Federal regulations include the Service Contract Act of 1965 for service jobs, which is also referred to as prevailing wage law, Walsh Healey Public Contracts Act of 1936 for private sector contractors of the federal government, and the Davis Bacon Act of 1931 for construction jobs. Massachusetts has its own prevailing wage law that governs state contracts in construction-related jobs. Private contractors and subcontractors on state contracts will have to be paid the wage that is prevailing for the same work in the private sector. These laws remain in place and ARRA actually broadened the scope of the existing prevailing wage laws for construction-related jobs to encompass more projects and a wider array of contractors.²¹ This suggests that the wages of contractors and subcontractors for ARRA-funded projects reflect those paid in the private sector.

Now we just need to know in which industries the jobs of contractors and subcontractors have been created to get a sense of the average wages of the jobs that have been created or retained. This poses a particular challenge. The industry categories used to categorize ARRA jobs do not match standard industry classifications by the Bureau of Labor Statistics (BLS). ARRA classifies jobs into accountability, clean energy, education, housing, public safety, safety net, technology/research, transportation, and workforce. Education and transportation find rough counterparts in BLS categories with education and health services and transportation and warehousing. Also, jobs in security systems services are comparatively close to public safety, jobs in scientific research and development services are relatively close to ARRA's technology/research category, and jobs in social assistance are sufficiently close to ARRA's

¹⁹ Bender, K. & Heywood, J. (2010, April). *Out of Balance? Comparing Public and Private Sector Compensation over 20 Years*. Washington, DC: Center for State and Local Government Excellence and National Institute on Retirement Income Security; Schmitt, J. (2010). *The Benefits of State and Local Government Employees*. Washington, DC: Center for Economic and Policy Research.

²⁰ *Ibid.*

²¹ U.S. Department of Labor, Wage and Hour Division. (2009, June). *Prevailing Wage Requirements Expand Under ARRA, Stimulus Priority Alert* [Video file]. Retrieved September 2, 2010, from <http://www.dol.gov/whd/recovery/index.htm#DBConferences>; U.S. Department of Labor, Wage and Hour Division. (2009). *WHD Information Related to the American Recovery and Reinvestment Act of 2009* [Video file]. Retrieved on September 2, 2010 from <http://www.dol.gov/whd/recovery/index.htm#DBConference>

safety net category. We further assume that clean energy comprises jobs in construction and durable goods manufacturing, split evenly between the two. We cannot make reasonable assumptions about ARRA’s remaining categories, accountability, housing, and workforce, to find comparable wage data from the BLS. There are no direct comparables for accountability and workforce, while housing comprises too many subcategories to allow us to make reasonable assumptions.

Table 8 summarizes the relevant wage data from the BLS for the comparable industry categories, based on our assumptions. The data reflect national data, since detailed industry categories are unavailable in the BLS’s public data files.

Table 8. Private Sector Wage Data for ARRA-Comparable Sectors

Mass-ARRA Funding Category	BLS Category	Average Hourly Wage June 2010
Accountability	N.A.	N.A.
Clean Energy	Construction (50%) and durable goods manufacturing (50%)	\$24.73*
Education	Education and health services	\$22.74
Housing	N.A.	N.A.
Public Safety	Security systems services	\$24.20
Safety Net	Social assistance	\$14.56
Technology/Research	Scientific research and development services	\$41.14
Transportation	Transportation and warehousing	\$21.03
Workforce	N.A.	N.A.
*Calculated as: $0.5 \times 24.92 + 0.5 \times 24.53$		
Source: U.S. Bureau of Labor Statistics, 2010, Current Employment Statistics, Washington, DC: BLS. All figures are in dollars. All data are non-seasonally adjusted average hourly earnings.		

The wage data for the BLS categories refer to wages paid in the private sector. By comparing the average hourly wages in each category (see third column in Table 8) against the average hourly wage of \$22.34 for the private sector as a whole, Table 8 provides a sense of the job quality of private sector contractor and subcontractor jobs retained or created by ARRA. The wage rates in Table 8 show that, with one exception, all of the categories for which we can find comparable industry classifications pay on average wages that are close to or higher than the private sector average. The exception consists of jobs in social assistance with an average wage of \$14.56 per hour in June 2010, which is 34.8% below the private sector average hourly wage of \$22.34.

This leaves us with finding a way to assess the quality of the jobs that have been indirectly retained or created due to additional spending by public and private government contractors. Model estimates of the quality of jobs that are created by stimulus spending are rare. One example is a joint report by the Center for American Progress in Washington, DC, and the Political Economy Research Institute at the University of Massachusetts Amherst. The report

analyzed the job-creation potential by skill and earnings level that followed from investments in green technologies, compared to investments in fossil fuels. Their estimate shows that \$1 million in spending could create 16.7 jobs in green technologies compared to only 5.3 jobs through investments in fossil fuels.²² The differences are larger for lower-skilled and lower-paid jobs. These data suggest that the benefits of ARRA, which dedicated over \$100 billion nationally to green investments,²³ are more likely than traditional spending to flow to lower-skilled and thus lower-paid workers. These calculations are based on national totals. All indications are that Massachusetts received a proportional share of clean-energy spending from ARRA. There is no reason to believe that the employment impact differences of green technology spending relative to investments in fossil fuels will be qualitatively different in Massachusetts than for the national average. This is only one data point that addresses only one aspect of ARRA, but it gives a sense of the potential job quality of the broad range of jobs that have been retained or created by ARRA.

The bottom line of this very general assessment is that the jobs that have been retained or created by ARRA fall into two large categories. The jobs that have been directly created or retained for public sector jobs and private sector government contractors tend to be disproportionately good jobs that pay wages at or above the private sector average and include health insurance and pension benefits, or both. However, the jobs that are indirectly created by additional spending of contractors and cover the entire income spectrum may in fact be disproportionately lower-paid jobs.

This discussion shows that an assessment of the quality of jobs that are created by a massive policy intervention, such as ARRA, can substantially determine policy makers' and the public's assessment of the policy's success. Future data-collection efforts in connection with specific policies should consider the inclusion of data on job quality, especially on wage rates, health insurance, and pension coverage.

Conclusion and Recommendations

We analyzed data from the Massachusetts Recovery and Reinvestment Office (MassRRO) to get a sense of the demographics of the jobs impact of the American Recovery and Reinvestment Act of 2009 (ARRA). The state collects information from state agencies and vendors on the jobs that have been created or retained with ARRA's direct spending. This unprecedented and timely data-collection effort is particularly promising in Massachusetts since MassRRO has asked recipients of ARRA funds to report the demographics of the job holders, such as race, ethnicity, gender, and disability status in addition to industry and geographic location.

²² Heintz, J., Pollin, R., & Garrett-Peltier, H. (2009). *The Economic Benefits of Investing in Clean Energy*. Retrieved on September 3, 2010, from http://www.americanprogress.org/issues/2009/06/clean_energy.html.

²³ The amount for Massachusetts was \$233 million when counting the "Clean Energy" category as a "green investment" and \$244 million when including all energy and environment jobs.

A thorough analysis of these innovative and current data can help to accomplish four goals. We can gain a general sense of the demographics of the effect of a massive public policy intervention, such as ARRA. Second, we can identify ways to improve future data collection efforts by illustrating the limits of the currently available data. Third, researchers may be able to create a feedback loop to policy makers while the policy is still in place. The data are collected with a very short lag time, while ARRA's direct spending still remains in place. Analyses of these data could thus help to fine-tune existing policies. Fourth, we can point to a direction for future research that could help further improve public policy performance measures by building on this current, novel approach to data collection.

Our data analysis indeed offers a general sense of demographic impact of ARRA in Massachusetts. We find that the population of job holders who benefited from ARRA's direct spending did not systematically differ from the labor market at large. This implies that there was no group that benefited disproportionately from the direct spending parts of this fiscal policy effort in a systematic way.

We do find, however, some indication that some groups were overrepresented in specific areas. Our analysis, for instance, shows that African-Americans and Hispanics benefited particularly from spending in housing. It is unclear, though, if this is a reflection of the actual policy impact or of possible biases in reports by contractors who received funding under ARRA's housing category.

Therefore, this innovative data-collection effort has the potential to improve future policy making, based on the lessons learned from a thorough data analysis. The data, though, show clear limitations. There is, for instance, uneven and incomplete reporting by contractors, which may reflect some uncertainty on what the necessary reporting included. Furthermore, the inability to analyze the data at an individual level limits our ability to conduct a quantitative analysis. Shortcomings such as these can inform future data collection efforts.²⁴

Other information, such as data on wages, health insurance, and pension coverage, were not collected as part of this undertaking. We thus can only gain a very rough sense of the quality of the jobs that were created by ARRA's direct spending, by comparing, where possible, ARRA's jobs categories with other data sets that contain wage and benefits information for these categories. This effort, though, is limited since ARRA's spending categories do not match established industry codes. A comparison between data collected for recipients of ARRA's direct spending categories and other data sets requires substantial assumptions on the part of the researcher and is, in some instances, impossible. We cannot, for instance, find a comparable data set that contains wage information for ARRA's category of "accountability." Our conclusions on the quality of those jobs created by ARRA consequently apply only in a very general sense -

²⁴ Our research suggests, for example, while almost all vendors submitted data, zeros for specific demographic categories such as race, ethnicity, or gender, even where the contractors employed relatively large numbers of people funded by ARRA. It is thus unclear if the zeros reflect missing observations or if the contractor had not filled in the respective categories.

good jobs as compared to bad jobs - but cannot offer specifics on the wage levels and health insurance and pension coverage of particular jobs or job categories.

The data-collection effort that has started with ARRA is a valuable undertaking that could help to inform future policies and their efficiency. It gathers relevant and timely information. There are a few steps that could be taken to improve the value of the data collected in association with such a policy effort. We make a number of recommendations based on our analysis of Massachusetts data to increase data quality, improve the performance measures of government spending, and raise the efficiency of public policy.

There are a number of ways to improve the data collection. First, data analysis could be aided by ensuring that all relevant data categories – race, ethnicity, disability status, location, and industry – match those of other publicly available data sets. Second, reasonable efforts should be undertaken to ensure completeness of the observations. We recommend that MassRRO or other agencies, tasked with administering a policy, follow up on contractor self-reports with their own surveys. This does not have to be done for all contractors, since a universal follow-up is costly and time-consuming. Follow-ups instead should focus on the largest contractors and include additionally randomized follow-up calls to smaller contractors. The agency in charge can thus help to clarify the data that were initially provided without a large, costly, and possibly unproductive mandate for contractors to provide all of the necessary information. A legislative requirement on contractors to collect demographic information on their employees would likely put many employers between a rock and a hard place. Compliance with reporting regulations would require reporting on race, ethnicity, and gender, while employers may not routinely ask for and employees may not regularly report this information to their employers.²⁵

Agencies that are tasked with administering a particular policy and with collecting the desired information on the policy, in this case MassRRO's role in collecting data on the jobs effects of ARRA, should develop concise, clearly articulated reporting guidelines, and offer the necessary assistance to contractors in reporting the required information. This is a novel and virtually contemporaneous data-collection approach that is necessarily in flux, as the change in the required job information from “jobs retained or created” to “hours paid for” shows. Policy administrators should make every effort to communicate such changes clearly and implement

²⁵ Another alternative – surveys of a sample of contractors – seems also inferior to the current approach of requirement contractors to report on the jobs that ARRA's direct spending funded. A survey requires a thorough understanding of the entire population that will be sampled. Each contractor, for instance, who would be interviewed in a survey is assumed to reflect the views of many others. Such an approach of choosing a representative sample is common in economic analyses, when the population is known. The Bureau of Labor Statistics' uses its monthly Current Population Survey of a nationally representative sample of households to calculate the unemployment rate. The challenge is that the population of contractors who will receive ARRA funding is not known a priori. Not all contractors in the United States, who existed at the start of ARRA, were eligible since funds are limited to particular purposes, since the funding purposes change with time (some projects can be funded more quickly than others), since contractors have to comply with specific national and local regulations, and since contractors have to be in business when they receive the funds – a big condition given the severity of the current crisis. A survey of a sample of contractors would consequently have to fly blind. Analysts conducting such a survey would not know how many other, similar contractors each respondent in such a survey would represent. We actually won't know the population of contractors who received ARRA funding until ARRA is completed. A survey of a sample of contractors who received funding would be feasible at that point, but the information would be less timely than the information that is currently available.

ways to make the collected information comparable over time, for example by stating that a specific amount of time is equal to a job retained or created. Clarity on what the data show and what the data do not show will ensure that data analyses by researchers are consistent, regardless of location and time studied. It is very important that the data collection on race and ethnicity follow the Census method of asking for Hispanic status and then for race as a separate question. Race and Hispanic origin should not be mutually exclusive, as is now common practice in many large data sets, and the inclusion of “Hispanic” among the various races in the way the question is currently worded is problematic.

We recommend that data collection be expanded to collect data at the individual level to allow for a more robust analysis. Researchers will always clamor for more information, and we are mindful of important trade-offs including, for example, privacy concerns. Additional data collection also comes at a cost to the contractor and the administrator, and it can delay the dissemination of crucial information. We thus indicate some of the data that should gain a high priority if its collection is possible with relative ease in a cost-effective manner. Data on whether a job is covered by health insurance and eligible for an employer’s retirement plan would be useful, but may increase the cost of data collection substantially.

Our analysis also suggests that future data-collection efforts related to public policy interventions could be aided by additional research. Future research, for example, could first focus on the places that we identified as having disproportionate population representations, either by race, ethnicity, gender, disability status, locality, or sectors. Researchers could follow up in these instances to see if our data reflect differences in reporting across categories or differences in spending categories. Differences in spending categories may reflect differences in government programs or in the administration of such programs. Second, our analysis covers data that have been spent through the second quarter of 2010. This naturally excludes money that will likely be spent for the remainder of the temporary recovery effort. Additional research could be conducted once complete information on ARRA’s direct spending measures is available. Third, we benchmark the job-creation efforts of ARRA’s direct spending in Massachusetts against those who have a job, while the Recovery Act is intended to support those who are unemployed or at risk of becoming unemployed. It would thus be a useful extension of our analysis to benchmark the job-creation efforts against the unemployed population. Future research to analyze the hourly wage rate paid for by ARRA funds would also allow researchers to directly assess the quality of the jobs that have been affected by ARRA’s direct spending.

The data collection in association with ARRA is a critical step in improving the performance of fiscal policy. We didn’t know what we didn’t know about the potential effect of such a massive policy-stabilization effort before the data were collected and analyzed. Policy makers should be commended for their desire to improve transparency and accountability with an eye to increasing the efficiency of public policy. We hope that this will serve as a crucial first step toward more such policy-relevant data-collection efforts.

Appendix: Data Sources and Issues

Data Sources

1. Data files were provided by MassRRO for the 1st and 2nd quarters, 2010. Analysis of 2nd quarter data includes a total of 2,038 entities: 255 Prime Recipients, 1,071; Sub-Recipients; 567 Sub Vendors; and 145 Prime Vendors. The total headcount for this quarter is 27,045. Since reporting by race and gender is not mandatory, data available for analysis by race and gender and other factors varies considerably and is noted in each table.
2. In order to compare Massachusetts Recovery and Reinvestment Office data to the statewide labor force, we included analysis of Massachusetts data provided by the Center for Economic Policy Research (CEPR). The Center for Economic and Policy Research (CEPR) provides an online database of sets of variables extracted from the U.S. Census Bureau's Community Population Survey and Survey of Income and Program Participation. The data, which is a composite of data extracted by CEPR from the American Community Survey in 2009, include workforce status, population demographics, and reasons for unemployment and absence from the labor force. Data used in this project were from their basic monthly collection of data, specifically, the CEPR_CPS_2009 data file. The data include labor force participation information from a sample of individuals from all fifty states. For the purposes of this project, Massachusetts respondents were selected and created into a subset (with 7 missing excluded, N=4,917). In order to compare the CEPR data with those from MassRRO, a smaller subset was created using respondents' labor force status (N=3,240), including 2,979 employed and 261 unemployed residents). Our analysis focused on the 3,240 individuals in the dataset who were in the labor force). This is a representative weighted sample; the numbers of non-whites are small relative to the number of whites in the sample: 4,000 whites, 273 blacks, 318 Hispanics, and 295 Asians.
3. In order to conduct our geographical analysis by county, we turned to the U.S. Census Bureau for labor force status and employment by race and gender for 12 counties in the Commonwealth. We used the American Fact Finder 2006-2008 American Community Survey 3-Year Estimates data. This survey is sent to a sample of the population in the United States and details the average characteristics of the sample over 3 years. The Census Bureau indicates that the response rate for Massachusetts for all 3 years was over 96%. These data are collected from people who live in geographic areas with a population of 20,000 or more. Because of this, Dukes and Nantucket counties were not included in the data collection. Custom tables were developed using the population in each county by race and gender, labor force participation rates by race and gender, and employment of those in the labor force by race and gender.

Data Analysis and Statistical Issues

A variety of issues affected the kinds of analysis that could be carried out with the Mass-ARRA data. First, as mentioned above, we were limited to descriptive analysis and could only report findings as cross-tabulations rather than more sophisticated multivariate analysis such as regressions. Second, even with the cross-tabulations, tests of statistical significance were not possible. The reason for these analytical limitations is that the reporting by Mass-ARRA entities is done in the aggregate. It is therefore impossible to match individuals with the various characteristics of interest, including those of race, ethnicity, gender, and disability status.

Finally, we had to make certain assumptions with the data as to race and Hispanic origin. Because of the way the data were obtained from the vendors and subrecipients, it was not possible to create mutually exclusive racial/ethnicity categories. Part of the problem is that, as mentioned above, reporting is done in the aggregate. But there is also considerable ambiguity in the instructions to entities on how to enter headcounts by race. In the “Hispanic (any race)” field, for example, entities are instructed that “Employees reported as Hispanic should also be reported by another racial category.” However, because the other racial categories are shown as “White *alone*,” “Black or African American *alone*,” and so forth, it is highly possible that respondents may have been confused or disregarded the instructions. In addition, we do not know how respondents utilized the “two or more races” category and if employees who are, for example, white and Hispanic were put in this category. Because of these issues, we have no precise way of gauging the accuracy of these counts. By analyzing Hispanic as a separate category, we ensured that no employee with Hispanic ethnicity was left out of the analysis while maintaining an accurate counting of the other ethnic groups.