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## **THE AMERICAN RECOVERY AND REINVESTMENT ACT: EXAMINING THE SPATIAL DISTRIBUTION OF FEDERAL STIMULUS FUNDS**

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**ABSTRACT:** *The American Recovery and Reinvestment Act of 2009 contained over \$840 billion in federal outlays as a means of stimulating the national economy. Unlike the annual federal budget, the recovery act is a short-term fiscal policy measure designed to address a failing economy and high unemployment. While previous studies on the spatial equity of federal spending have been conducted, there is little research examining the spatial distribution of federal stimulus funds. These prior studies present a contradictory set of results ranging from a growing equitable distribution, to core urban areas being disadvantaged in funding—areas not directly connected to need. Using GIS, this study seeks to identify the spatial distribution of federal funds between core and suburban areas as well as between areas of low and high need vis-à-vis unemployment rates. The results indicate that stimulus funds favored core urban areas over their suburban counterparts. Furthermore, and perhaps most alarmingly considering the goals of the act, over 42.6% of stimulus funds went to counties where the average unemployment rates were considerably lower than the national average and that of the most distressed counties in the nation.*

**Keywords:** *Stimulus, Spatial, Distribution, Geography, Economy*

### **INTRODUCTION**

Nearly twenty-eight days after President Barack Obama was sworn in, on February 17, 2009, Congress passed the American Recovery and Reinvestment Act of 2009, which contained over \$840 billion in federal outlays. The act had three interrelated goals: to create new jobs and save existing ones, spur economic activity and invest in long-term growth and to foster unprecedented levels of accountability and transparency in government spending. To those ends, the act provided \$288 billion in tax cuts and benefits for individuals and businesses, \$284 billion in increases to federal entitlement programs and \$274 billion for federal contracts, grants and loans.

The act was heralded as an effective tool for stimulating the economy in the short term by directing federal funds to “shovel ready projects.” In other words, the distribution of the funds would be prioritized based on the likelihood of how rapidly they could be implemented. Through these efforts it was expected that the national economy would begin to reverse its declining trajectory via the increased expenditures of the government and their subsequent multiplier effects of organizations receiving federal funds. Furthermore, the act was projected, to some extent, to address the related issue of unemployment vis-à-vis the hiring of the workers needed to put into action the newly funded projects.

Almost two and a half years later, very little is known about the distribution of the federal stimulus funds in terms of geography or need. What we do know is that geographers, political scientists and economists alike have examined the spatial distribution of federal spending extensively (Anton, 1983; Jung & Eom, 2004; Johnston 1978; Lowery et al., 1986; Lucke, 1982; Persky & Kurba, 2001; Rich, 1989). A prevailing view among scholars has been that the distribution of federal spending favored suburban areas over urban. This became especially true during the presidency of Richard Nixon where large numbers of categorical grants were converted to block grants that were more favorable to suburban and rural municipalities than the block grants had been (Savitch and Osgood, 2010). Persky & Kurba (2001) found empirical evidence to support this proposition in terms of federal outlays affecting the cost of residential investment. Jossart-Marcelli & Musso (2001) similarly found that while poorer cities receive larger amounts of anti-poverty funding, they are disadvantaged in all other types of federal expenditures when compared to their suburban counterparts. Recently a number of articles have presented evidence of a growing equalization in terms of the distribution of federal funds. Jung and Eom (2004) demonstrate a growing “dynamic spatial equity” of federal outlays from 1983 to 2001. Parker (1997) cautions that while there have been improvements in terms of the spatial distribution of grants, there are a growing set of federal funds that are not needs-based and they appear likely to favor suburbs over central cities.

Despite previous studies, none have examined the distribution of federal stimulus funds. To be sure, an argument can be made about the differences between annual federal spending and one-time appropriations for the purposes of economic stimulus. Where annual federal expenditures generally lack intentionality in terms of achieving a specific economic objective, federal stimulus funds are in keeping with Keynesian Economics where in the government engages in deficit spending to generate economic growth. Compounding the issue of intention is the uneven impact of the recent recession on metropolitan areas. For example, looking at only those metropolitan areas included in this study, the 2009 annual average unemployment rate ranged from a high of 15.1% in the Detroit-Warren-Livonia, MI MSA to a low of 5.9% in the Oklahoma City, OK MSA. In this way it becomes strikingly clear that the level of need for federal stimulus is uneven throughout the US' metropolitan areas. And, if we are to take seriously the ARRA's goal of creating new jobs and saving existing ones, it is not unreasonable to expect that federal stimulus funds would be directed towards those places with the greatest amounts of need.

It is in the hopes of better understanding the spatial variability in the allocation of federal stimulus dollars that we seek to answer the following questions:

- 1) What percentages of the federal stimulus funds were directed to core counties and the suburban counties of 48 of the largest MSAs in the United States?
- 2) What percentage of the federal stimulus funds were directed to counties with the greatest degree of need as measured by unemployment?

## **METHODS**

Data tracking the distribution of funds authorized by the ARRA of 2009 was retrieved from the U.S. government's official website [Recovery.gov](http://Recovery.gov). The data file (Cumulative National Summary) included the distribution of stimulus monies from February 17 2009 to September 30 2010 (the most current data available at the time of the study). Stimulus spending was divided into three categories including loans, grants and contracts. Grants constituted the bulk of the funding and accounted for roughly 79%, contracts were close to 20% and loans represented just 1% of the overall total. The measure of total stimulus funding allocated to specific geographies included all three categories: loans, grants and contracts. The data were then geocoded in ArcGIS using the business analyst extension geocoding tool. In total, 239,955 stimulus records were identified and geocoded. GIS shapefiles for counties and Metropolitan Statistical Areas (MSA) were available from the Environmental Systems Research Institute. MSAs with populations greater than one million and more than 1 county within the MSA were included in this analysis. A total of 48 MSAs met this criteria and were included in the study (refer to Table 1 for a list of the MSAs and their respective unemployment rates). Using GIS, the total stimulus funding for each MSA was individually calculated by aggregating all the geocoded stimulus points within each MSA. Subsequently, a similar process was utilized for the core county of the MSA. This value was then subtracted from the total for the MSA to estimate a total stimulus value for the suburban counties of the MSA. In calculating the percentage of funding allocated to core counties, the total funding for the core county was divided by the total funding for the MSA, which allowed for the determination of the percentage of stimulus funds that were directed towards both core and suburban areas.

## **RESULTS**

Overwhelmingly the results indicate that stimulus funding centered on the core counties of the nation's MSAs. In this way, federal stimulus funding disproportionately favored core urban areas over suburban counties. The 48 MSAs in this analysis consisted of roughly 162.6 million persons, or 52% of the overall population of the nation (Table 2). These 48 MSAs received close to \$122.5 billion of stimulus funding or approximately 49% of the overall stimulus funding. Thus, as a proportion of the nation's population, there appears to be some initial evenness in the spatial distribution of federal stimulus monies. However, measuring the distribution of funds as a function of the percentage of population does not provide the specificity needed to determine if the funds were allocated in a manner that meets the goals of the program. The core counties of these 48 MSAs consisted of roughly 68 million people, or 22% of the nation's population. These same core counties received approximately \$76 billion in stimulus funding or nearly 30% of the current total of the national stimulus. While there is less evenness in this particular comparison of percentages, it is still remarkable that the distribution is not more uneven given what previous research has documented in terms of the distribution of federal funds. However, a different picture begins to emerge when the percentage of funds directed to suburban counties is examined. Suburban counties, which account for over 94 million people and 30% of the nation's population, only received 19% of the current total of the national stimulus.

Table 1. List of 48 Metropolitan Statistical Areas Unemployment Rates

	<i>MSA</i>	<i>Rate*</i>		<i>MSA</i>	<i>Rate*</i>
1	New York-Northern New Jersey-Long Island, NY-NJ-PA MSA	8.8	25	Orlando-Kissimmee, FL	10.5
2	LA-Long Beach-Santa Ana, CA	10.9	26	San Antonio, TX	6.7
3	Chicago-Naperville-Joliet, IL-IN-WI	10.0	27	Cleveland-Elyria-Mentor, OH	9.1
4	Dallas-Fort Worth-Arlington, TX	7.8	28	Kansas City, MO-KS	8.6
5	Houston-Sugar Land-Baytown, TX	7.6	29	Columbus, OH	8.4
6	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	8.3	30	Charlotte-Gastonia-Concord, NC-SC	11.7
7	Atlanta-Sandy Springs-Marietta, GA	11.1	31	Austin-Round Rock, TX	6.9
8	Miami-Fort Lauderdale-Miami Beach, FL	10.2	32	Indianapolis-Carmel, IN	8.4
9	Washington-Arlington-Alexandria, DC-VA-MD-WV	6.0	33	Virginia Beach-Norfolk-Newport News, VA-NC	6.8
10	Boston-Cambridge-Quincy, MA-NH	7.8	34	Providence-New Bedford-Fall River,RI-MA	11.4
11	Detroit-Warren-Livonia, MI	15.1	35	Nashville-Davidson--Murfreesboro, TN	9.3
12	Phoenix-Mesa-Scottsdale, AZ	8.5	36	Milwaukee-Waukesha-West Allis, WI	8.7
13	San Francisco-Oakland-Fremont, CA	9.7	37	Jacksonville, FL	10.0
14	Riverside-San Bernardino-Ontario, CA	13.3	38	Memphis, TN-MS-AR	10.0
15	Seattle-Tacoma-Bellevue, WA	8.7	39	Louisville-Jefferson County, KY-IN	10.1
16	Minneapolis-St. Paul-Bloomington, MN-WI	7.8	40	Richmond, VA	7.5
17	St. Louis, MO-IL	9.9	41	Oklahoma City, OK	5.9
18	Tampa-St. Petersburg-Clearwater, FL	11.0	42	Hartford-West Hartford-East Hartford, CT	8.3
19	Baltimore-Towson, MD	7.4	43	New Orleans-Metairie-Kenner, LA	6.7
20	Denver-Aurora, CO	7.9	44	Raleigh-Cary, NC	8.8
21	Pittsburgh, PA	7.4	45	Salt Lake City UT	6.4
22	Portland-Vancouver-Beaverton, OR-WA	10.6	46	Birmingham-Hoover, AL	9.4
23	Cincinnati-Middletown, OH-KY-IN	9.3	47	Buffalo-Niagara Falls, NY	8.4
24	Sacramento-Arden-Arcade-Roseville, CA	11.2	48	Rochester, NY	8.1

\*Unemployment Rate

When limiting our analysis to the distribution of stimulus funding for the 48 MSAs examined in this study, the 48 core counties consisted of 42% of the study’s total population while the suburban counties were home to 58%. In our examination of these particular MSAs, we find that federal stimulus funding disproportionately favored core counties with 62% of the total current funding being directed towards core urban areas and only 38% going towards their respective suburban counties. On a per capita basis, the nation’s counties received an average of \$804 of stimulus funds per person. For the 48 core counties of the MSA in this study, the per capita average was approximately \$1115 and their suburban counties received a per capita average of \$493. This disparity suggests that a funding bias may exist in favor of the examined urban counties.

In general, larger MSA core counties received a greater proportion of the stimulus funding than their suburban counties. If we examine the ten largest MSAs included in the study, the core counties of these areas roughly received 57% of the funding that was allocated towards these MSAs, while the population of these 10 core counties only accounted for 36% of the population of the top ten MSAs. If we examine the smaller MSAs in this study, table 2 indicates that the core counties of MSA 41- 48 received 83% of all the funding that was allocated towards these particular MSA while only accounting for 68% of the population of these eight MSAs. The core counties of MSA 31-40 received 75% of the stimulus funding that was allocated towards these MSAs, while only accounting for 47% of the total population of those ten MSAs.

When the data is disaggregated at the MSA level several cities stand out as having a considerable percentage of the stimulus funding being allocated to the core county of the MSA in comparison to their respective suburbs. The core county of the New York – Northern New Jersey-Long Island, NY-NJ-PA (the largest MSA in the country with over 19 million people) received 43% of the stimulus funding for that MSA, while only accounting for 9% of the MSAs total population. Brooklyn, Queens, the Bronx and Staten Island fall outside of the core county of the MSA. There may be a number of potential reasons for this distribution that range from the significant concentration of financial institutions to the national security expenditures associated with the New York metropolitan area. The core counties of several other large MSAs received a much larger share of the stimulus

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funding when compared to their population size. For example, Fulton County in the Atlanta-Sandy Springs-Marietta, GA accounts for 14.5% of the population for that MSA but received close to 53% of the stimulus funding for that MSA.

Table 2. Stimulus Funding Distribution

<b>Region</b>	<b>Population</b>	<b>Stimulus</b>	<b>% of Population</b>	<b>% of Stimulus</b>	<b>% of National Population</b>	<b>% of National Stimulus</b>	<b>Per Capita Stimulus Funding</b>
Top 48 MSA	162,569,580	\$122,522,200,689			52%	49%	\$754
Top 48 Core Counties	68,204,710	\$76,025,229,448	42%	62%	22%	30%	\$1,115
Top 48 Suburbs	94,364,870	\$46,496,971,241	58%	38%	30%	19%	\$493
MSA 1 - 10	81,826,551	\$56,206,939,862			26%	22%	\$687
Core Counties 1 - 10	29,780,113	\$31,827,006,481	36%	57%	10%	13%	\$1,069
Suburbs 1- 10	52,046,438	\$24,379,933,381	64%	43%	17%	10%	\$468
MSA 11-20	35,269,620	\$27,215,003,759			11%	11%	\$772
Core Counties 11-20	13,937,060	\$14,231,294,195	40%	52%	4%	6%	\$1,021
Suburbs 11-20	21,332,560	\$12,983,709,564	60%	48%	7%	5%	\$609
MSA 21-30	20,994,220	\$16,915,690,098			7%	7%	\$806
Core Counties 21-30	11,098,365	\$12,643,448,211	53%	75%	4%	5%	\$1,139
Suburbs 21-30	9,895,855	\$4,272,241,888	47%	25%	3%	2%	\$432
MSA 31-40	15,226,279	\$13,765,946,414			5%	6%	\$904
Core Counties 31-40	7,134,011	\$10,346,825,593	47%	75%	2%	4%	\$1,450
Suburbs 31-40	8,092,268	\$3,419,120,821	53%	25%	3%	1%	\$423
MSA 41-48	9,252,910	\$8,418,620,556			3%	3%	\$910
Core Counties 41-48	6,255,161	\$6,976,654,969	68%	83%	2%	3%	\$1,115
Suburbs 41-48	2,997,749	\$1,441,965,587	32%	17%	1%	1%	\$481
USA	311,212,863	\$250,263,842,336					\$804.16

Other core counties where a significant inequity existed between population size and the proportion of the stimulus funding directed to the core county includes Baltimore City (Baltimore-Towson, MD), Denver County (Denver-Aurora, CO), Multnomah County (Portland-Vancouver-Beaverton, OR-WA), Marion County (Indianapolis-Carmel, IN), and Davidson County (Nashville-Davidson-Murfreesboro, TN). Out of the 48 MSAs included in this study, the Riverside-San Bernadino-Ontario, CA MSA was the only MSA where its' suburbs received a greater share of the stimulus funding than the core county. In this instance, the suburbs accounted for 49% of the population of that MSA and received 56.5% of the MSAs stimulus funding.

Figure 1 provides a map of the continental 48 States that indicates the per capita stimulus funding by county. At first glance it appears that larger rural counties in the Western U.S. received higher levels of per capita funding than other regions. Upon an examination of the underlying data, it becomes evident that the category with the highest per capita allocation of federal stimulus spending also represented the highest average area as a function of square miles. These data clearly support the map's inference that larger counties from the west received higher levels of per capita funding. However, when we examine other characteristics, specifically the average population

density and percentage of black residents, it becomes clear that in addition to the larger western counties, counties with higher population densities and higher concentrations of African Americans were also the recipients of higher per capita stimulus funding. One would expect higher densities and percentages of minorities to be associated with the core counties of MSAs. The data in table 3 indicate that areas with lower population densities received the lowest per capita stimulus funding, a finding that supports the proposition that urban areas were the disproportionate beneficiaries of federal stimulus spending.

Table 3. Characteristics of Counties

Per Capita Stimulus Funding	Average Area (Sq Miles)	Average Population Density	Population	% Black
0 - \$250	733	228	23,504,394	11.91%
\$250 - \$500	786	182	106,925,902	7.63%
\$500 - \$750	1010	194	84,094,617	11.15%
\$750 - \$1000	1257	184	44,085,417	13.45%
> \$1000	2260	310	52,763,721	15.94%

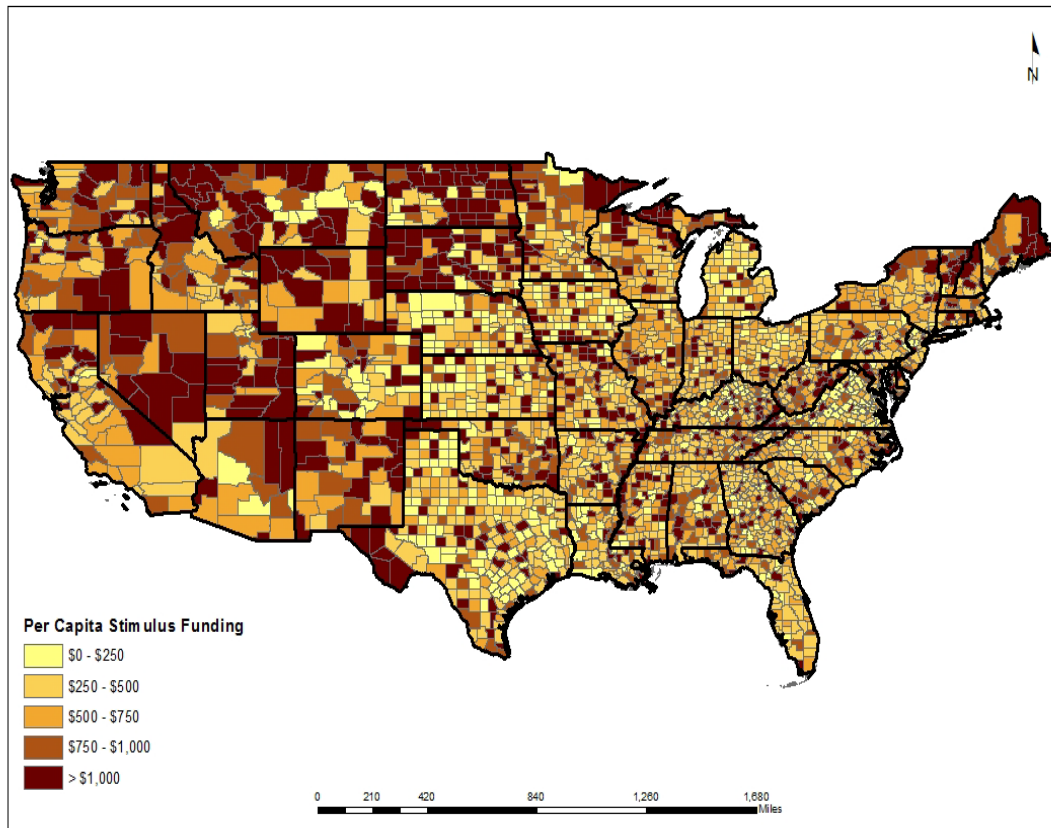


Figure 1. Per Capita Stimulus Funding at the County Level for 2009

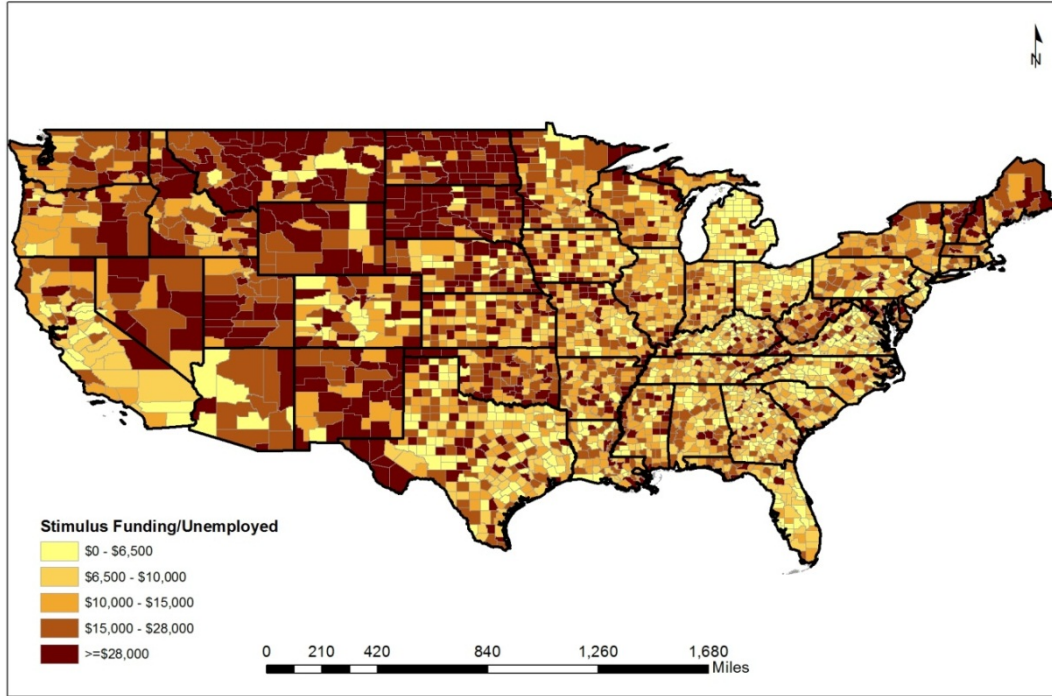


Figure 2 is a map that identifies the distribution of stimulus funding per unemployed persons.

Table 4 sets out five categories of per capita unemployed stimulus funding by using the quintile technique to distribute the percentage of MSAs equally across all categories. In this way, approximately 20 percent of MSAs fall within each per capita unemployed stimulus funding category. One would expect that higher levels of per capita unemployed federal stimulus funding would be associated with a higher average unemployment rate. What is obvious and striking is the highest proportion of the per capita unemployed stimulus funding went to areas with the lowest amount of need, based on unemployment rates. The highest category included those areas that received greater than \$28,000 of stimulus funding per unemployed persons. For this designation, close to 20.61% of all counties fell into this category; and, they received 42.6% of all the stimulus funding. The average unemployment rate for this subgroup was 7.31%. If we examine the lowest category of stimulus funding per unemployed person (\$0.00-\$6,500) they accounted for 18.41% of the counties and received 4.55% of the stimulus funding. With an average unemployment rate of 10.2%, this category of counties had the highest average unemployment rate. Figure 2. Per Capita Unemployed Stimulus Funding at the County Level for 2009

Table 4. Distribution of Federal Stimulus Based on Need

Per Capita Unemployed Stimulus Funding	Avg. Area (Sq Miles)	% of Stimulus Dollars	% of Counties	Avg. Pop Density	Total Unemployed	Avg Unemployment Rate	% Black
\$0 - \$6,500	718	4.55%	18.41%	249	2,297,874	10.20%	9.24%
\$6,500 - \$10,000	779	11.83%	19.97%	192	3,603,851	9.45%	8.27%
\$10,000 - \$15,000	903	19.42%	20.29%	182	3,845,775	9.12%	12.53%
\$15,000 - \$28,000	1275	21.60%	20.73%	170	2,719,100	8.40%	10.76%
>\$28,000	2254	42.60%	20.61%	310	1,889,019	7.31%	15.37%

## **DISCUSSION**

We set out to answer two primary questions related to the distribution of funds from the American Recovery and Reinvestment Act of 2009. The first question focused on the extent to which the funds from the act were distributed to core and urban counties of the largest MSAs in the nation. As a proportion of the population, these MSAs represented 52% of the nation and received 49% of the total stimulus dollars awarded to date. Thus, initially we believed there was some equity in the spatial distribution of federal stimulus monies. When we more closely examined the distribution of funds within MSAs, we found that the core counties included in this study received 30% of the stimulus funds and accounted for 22% of the nation's population. When looking at the percentage of funds directed to their respective suburban counties, we found that while they represented 30% of the nation's population, they only received 19% of the stimulus funds.

Once we restricted our analysis to the 48 MSAs, we found that the core counties of each represented 42% of the study's population while their suburban counties were home to 58%. The core counties, however, received over 62% of the stimulus dollars compared to the 38% that went to their respective suburban counties. In this way, we were able to determine that at a macro level there appeared to be a level of spatial equity. This finding, however, became tenuous given the examination of funds within MSAs. Despite previous research suggesting that urban areas have been disadvantaged in receiving federal funds, the American Recovery and Reinvestment Act of 2009 heavily favored urban areas. This distribution of funding may be related to the way in which the two variables are tied to different spatial units of analyses. In other words, the stimulus funding is tied to the place of work, or where the project actually occurred. Unemployment, however, is tied to the individual's place of residence. Without further examination of the types of funding (contracts, grants, loans) and their allocation to urban and suburban areas, we are unable to proffer hypotheses for the unevenness in the distribution of the federal stimulus dollars.

Next we turned our analysis to determining the extent to which the goals of the act were met by the distribution of stimulus dollars. Recall that the act had three interrelated goals: to create new jobs and save existing ones, spur economic activity and invest in long-term growth and to foster unprecedented levels of accountability and transparency in government spending. For our purposes, we focused on the first goal, which led us to question what percentage of the federal stimulus funds were directed to counties with the greatest degree of need as measured by unemployment? If in fact the goal was to create new jobs and save existing ones, it is not unreasonable to expect that the funds would be directed to areas of high unemployment or areas where there would be a significant population of unemployed persons looking for work.

Using the quintile technique to distribute the percentages of MSAs equally across five categories, we found that over 42% of the stimulus dollars were awarded to counties with an average unemployment rate of 7.31%. In fact, these particular counties were awarded, on average, over \$28,000 in stimulus funds per unemployed person. This is remarkable considering that counties with a 10.2% average unemployment rate (the highest of the five categories) received an average of less than \$6,500 per unemployed person. In light of these findings, one could logically question whether or not there was intentionality in the distribution of these funds that was in keeping with the goals of the act. As demonstrated in Table 1, the impact of the recession was uneven across the United States. Thus, we would expect that even with a mandate to save existing jobs, the federal government would seek to employ those workers who are still in the labor force but unable to secure employment. However, given the limited duration of the funding window and the immediacy of the economic crisis, it may be entirely possible that the government focused more on saving existing jobs than employing out of work individuals. In this way, our results would not be surprising that a significant portion of the recovery funds were expended in areas with lower unemployment rates.

While there are limitations to our study given the limited scope of our questions, the findings are a valuable first step in determining the extent to which the federal government's distribution of stimulus funds have been spatially equitable and targeted within the confines of the goals of the stimulus act. While we might not expect there to be a significant degree of intent present in the distribution of funds to areas of need in the normal federal budget, we certainly would expect there to be a high degree of intentionality in the allocation of funds from a stimulus bill. However, based on our findings, it is unlikely that the degree to which an area needed stimulus funds influenced the amount an area received under the act.



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