Investing in Care:
A Strategy for Effective and Equitable Job Creation

by

Rania Antonopoulos

Kijong Kim

Thomas Masterson

Ajit Zacharias

Levy Economics Institute of Bard College

August 2010
Revised June 2011

The Levy Economics Institute Working Paper Collection presents research in progress by
Levy Institute scholars and conference participants. The purpose of the series is to
disseminate ideas to and elicit comments from academics and professionals.

ABSTRACT

Massive job losses in the USA, over 8 million since the onset of the "Great Recession," call for job creation measures through fiscal expansion. In this paper we analyze the job creation potential of social service delivery sectors–early childhood development and home based health care–as compared to other proposed alternatives in infrastructure construction and energy. Our microsimulation results suggest that investing in the care sector creates more jobs in total, at double the rate of infrastructure investment. The second finding is that these jobs are more effective in reaching disadvantaged workers: those from poor households and with lower levels of educational attainment. Job creation in these sectors can easily be rolled out. States already have mechanisms and implementation capacity in place. All that is required is policy recalibration to allow funds to be channeled into sectors that deliver jobs both more efficiently and more equitably.

Keywords: Social Care; Job Creation; Fiscal Expansion; Distribution; Infrastructure

JEL Classifications: D30, E62, J48

1. INTRODUCTION

As economic recovery in the U.S. is taking a baby step, a sovereign debt crisis in Greece and its potential spread to other euro member countries has fueled concerns about another global-scale setback. Though euro countries are stepping up their plans to rescue Greece and prevent crisis contagion to other member countries, the problem is going to slow down the region's recovery process. The U.S. economy may not be in the line of direct fire, but Europe's lower aggregate demand for American goods and services and spillovers through financial and trade linkages will certainly influence our path to recovery.[1] The modest momentum gained in recent months on payrolls, personal income, and industrial activities may fizzle out.

The domestic challenges for the job market are not just the result of weak demand from decreasing household asset values and job losses. There is a mixed message of premature optimism on growth and of pessimism on the federal deficit from some reputable institutions whose quantitative estimates and forecasts have influence in Washington, including the Congressional Budget Office (CBO).[2] James K. Galbraith, a senior scholar at Levy Economics Institute and professor at the University of Texas at Austin has criticized the CBO's economic projections as 'indefensible', "inconsistent", and 'economically impossible'[3]. Its bullish projection on unemployment and GDP all point upward in near future to the full recovery, while inflation would somehow remain low. Along with these rosy projections, the CBO has raised red flags about the increasing federal deficit and deepening public debt coming from rising health care costs and expansionary fiscal policies to counter the recession, among other causes. But these countercyclical policies are the under-appreciated, and often criticized, savior in recessions. Expansionary fiscal policy has rescued the economy from a complete collapse, assisted and prevented many families from job losses and bankruptcies–paths to long-term poverty, and saved the government from the financial burden of servicing more newly poor families. From this perspective, the current budget deficit should be considered as an *investment*

---

[1] Bayoumi and Bui (2010) estimate the degree of spillovers across regions. A spillover from Euro area appears to exert strong short-term impact on the U.S. GDP. Carare and Mody (2010) analyze spillovers through trade linkages.
[2] CBO's long-term budget outlook (June, 2010) projects unsustainable government debt growth unless a series of policy measures take place(http://www.cbo.gov/doc.cfm?index=11579) . On the contrary, CBO's relative optimism on economic growth is reflected on their forecast of over 4 percent GDP growth by year 2014. (http://www.cbo.gov/ftpdocs/110xx/doc11014/Testimony_Frontmatter_Senate.shtml).
[3] See his piece on the Washington Post, http://www.washingtonpost.com/wp-srv/special/opinions/outlook/spring-cleaning/congressional-budget-office.html (last accessed on May 10, 2010).
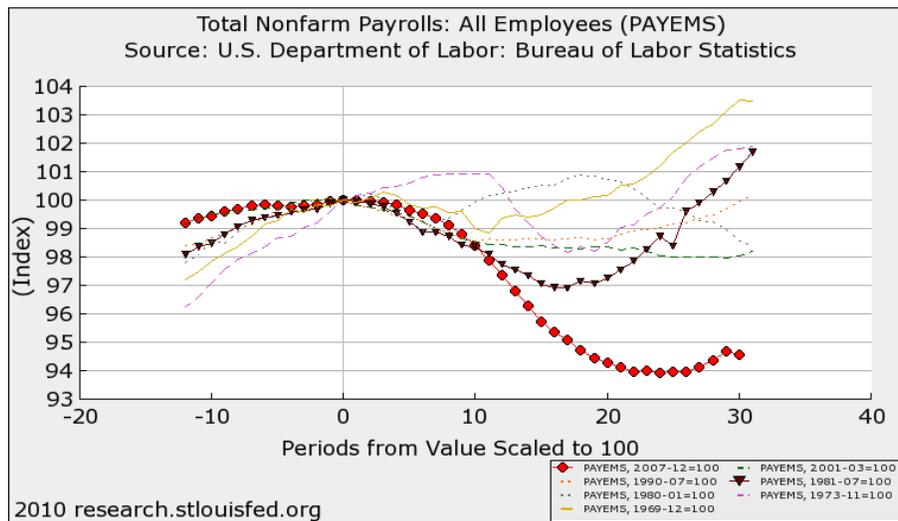
to hedge the risk of a double dip in the labor market and to carry the recovery momentum forward.

Investment for the recovery should focus on the most effective job creation path toward full employment, addressing the most imperative issue in this "Great Recession." As of June 2010, the official unemployment rate is 9.5 percent or 14.6 million people. An alternative measure of labor underutilization, U-6[4] in table A-15 of the Bureau of Labor Statistics' Employment Situation Report, reveals even more disheartening figures: those working part time but needing and wanting a full time job–that the market currently cannot provide–total 8.6 million persons; and another 2.6 million persons are marginally attached, including discouraged workers and others . Thus a total of 25.8 million people are without jobs or working only part-time jobs for economic reasons, meaning that a stunning 16.5 percent of the total labor force is currently unemployed or underemployed.

At the same time, the employment-to-population ratio has declined to 58.5 percent, the lowest it has been over the last 25 years. Figure 1 shows the trends of the duration and severity of employment losses of the seven recessions since 1969. For each spell of recession, a seasonally-adjusted nonfarm payroll employment level is indexed to be 100 at the start of the downturn and plotted to a period ranging 12 months before the onset to 30 months afterwards. The current recession–the line with red diamonds on the graph–started with a moderate impact on employment for the first 12 months, but unleashed its full destructive force thereafter. A painful further deterioration has eased in the December 2008 through June 2010 period but employment recovery to the pre-recession level seems remote as ever.

---

[4] The measure includes people who are not currently in the labor force but want and are available for work. The link to the table is http://www.bls.gov/news.release/empsit.t15.htm (last accessed on July 12, 2010).

Figure 1. Nonfarm Payroll Extended Job Loss Trend form the Last 7 Recessions (1969 - Current)

Total Nonfarm Payrolls: All Employees (PAYEMS)
Source: U.S. Department of Labor: Bureau of Labor Statistics

2010 research.stlouisfed.org

◆ PAYEMS, 2007-12=100	-·- PAYEMS, 2001-03=100
··· PAYEMS, 1990-07=100	▼ PAYEMS, 1981-07=100
··· PAYEMS, 1980-01=100	-·- PAYEMS, 1973-11=100
— PAYEMS, 1969-12=100	

Source: Current Employment Statistics (CES), Bureau of Labor Statistics, via Federal Reserve Economic Data (FRED2) by the Federal Reserve Bank of St. Louis.

Prolonged job losses imply a rough time for people trying to find work for extended periods of time. Figure 2 shows the historical trend of the shares of unemployed persons looking for a job but unable to find one for over 27 weeks since 1970. The share has now reached 45.5 percent (6.8 million), again a worrisome figure as compared to previous harsh economic times. Long spells of unemployment degrade workers' skills and may send negative signals to potential employers, making a return to work more difficult (Heckman and Borjas 1980; Acemoglu 1995). The grim labor market outlook may force workers to accept underemployment, discourage job searches, force people into inactivity, and lower their future wages. This large-scale failure of the private labor market requires public sector action to restore efficiency and equity (Acemoglu 1995).

Figure 2. Historical Trend of Long-Term Unemployment (01/1970-05/2010)

Unemployed persons, 27 weeks and over
(percent of total unemployed)

Source: Labor Force Statistics from the Current Population Survey. Bureau of Labor Statistics (BLS).

To address the massive unemployment, we propose investment in localized community-based *social care services*, in particular home-based health care and early childhood development. Investment in care is a more cost effective and equitable way to create jobs than investing in infrastructure construction or green energy development. Investment in social care generates more jobs per dollar than any other investment. The job creation potential of social care investment in the short run has been analyzed in several studies (Simonazzi 2009, Antonopoulos and Kim 2008, Warner and Liu 2006). Lessons learned from the Japanese experience with fiscal stimulus in 1990s indicate that social care investment can be an effective means for employment generation, as well as a sustainable growth strategy (Fackler 2009).

Though the care workers may not be well-paid, they can exit long-term unemployment, build their resume, and stimulate the economy by producing valuable services and spending their earned income. Investment in social care would address both the immediate concerns of the labor market and income protection for vulnerable and needy families, providing a cushioning safety net against deeper poverty. And increasing federal contributions to social care services would suffice as an effective and equitable job initiative.

In fact, the federal government has increased investment in care in the American Recovery and Reinvestment Act of 2009 (ARRA). The act allotted 3 billion dollars to Head Start and Early Head Start programs–early childhood development programs for low-income

families, though the intent was not job creation. State fiscal stabilization funds in the act have helped to maintain care coverage in the midst of state budget cuts. But these temporary measures are hardly enough to be a meaningful job creation strategy, or to meet the growing demand for care services driven by aging baby boomers and lacking early education programs. The situation calls for a large scaling up of social care sector spending.

To understand the degree of the effective and equitable job creation potential of social care sector, we first evaluate the job creation potential of social care vis-à-vis infrastructure investment. Then, we illustrate the distributive impacts by decomposing our estimation of earnings growth by the workers' socioeconomic characteristics. We find that social care spending generates twice as many jobs as infrastructure spending, and 50 percent more jobs than green energy development. Social care investment also yields more equitable outcomes for worker: care investment creates twice as many jobs for low-income households as the infrastructure construction does; and care investment improves the earnings of poor workers more than infrastructure spending does. It is our intention to inform interest groups and policy makers about social care investment's effective and equitable job creation, and to propose the expansion of social care services as a part of the government's job creation efforts.

This paper is organized as follows. The next section provides an overview of the social care sector, followed by an elaboration of current employment conditions within the sector. We introduce our policy simulation methodology–input-output analysis and microsimulation–in section 3. Our findings on job creation and earnings distribution are reported in section 4. Our conclusion follows in section 5.

2. SOCIAL CARE SECTOR: OVERVIEW AND EMPLOYMENT

2.1. Social Care Overview

Social care consists of a range of activities and for the purpose of this paper we will concentrate on early childhood development–preschool and formal child care–and home-based care for disabled and chronically ill patients. There is certainly room for additional federal contributions to care services.

Hidden demand for early childhood development services is larger than officially recognized. One way to estimate this demand is through counting the number of child care providers other than formal paid child care workers, including unpaid care by relatives: there are

1.9 non-parental, paid and unpaid care givers for every paid care workers captured in the official survey (Burton et.al. 2002; Warner 2009). According to the National Household Education Surveys Program of 2005, sixty percent of children under age 5 have at least one weekly non-parental care arrangement. Among those who have the arrangements, 60 percent participate in center-based care, 35 percent in relative care, and 22 percent in non-relative care (Iruka and Carver 2006).[5] A mere 21 percent of children from families below the federal poverty line participate in Head Start or Early Head Start programs. The financial burden of care is also distributed unequally: an average family below the poverty level spends 29.2 percent of their income, while a typical family above 200 percent of the poverty level spends only 8.3 percent on child care, according to the Survey of Income and Program Participation by the U.S. Census Bureau in 2006. Even with federal and state subsidies and grants, child care expenditure is a large financial burden to many families.

Demand for home-based care is increasing quickly as baby boomers are entering their aging and advanced medical technologies are extending the life expectancy of disabled and chronic patients. According to the National Home Health Aide Survey (NHHCS),[6] almost 1.5 million people were receiving care in 2007 and 7.2 million people had received care and been discharged in 2000.[7] Over 14,000 agencies are in the business of recruiting and training care givers and serving the patients.[8] Over $58 billion–or 2.76 percent of national health expenditure–was spent on home health service in 2006.[9] Medicare and Medicaid cover the bulk of total home health care service payments–37 and 19 percent respectively, according to National Association for Home Care and Hospice (NAHH 2008). Home health care accounts for 3.9 percent of Medicare spending in 2006 and 16.3 percent of Medicaid expenditures in 2004.[10] Nonetheless, it is individual effort that contributes the most to care: family, friends, and other volunteers cover 57 percent (36% by informal care and 21% by out-of-pocket payments) of

---

[5] The sum is greater than 100 percent, because some children have multiple care arrangements.

[6] The 2007 survey collected data on only current care recipients. The previous suveys from 1996, 1998, and 2000 show 7.2 to 7.7 million discharges. Given this trend, it is reasonable to assume 7 million discharges in 2007. Trend tables from the survey are available from the National Center for Health Statistics at http://www.cdc.gov/nchs/nhhcs/nhhcs_patient_trends.htm (last accessed on March 9, 2010)

[7] According to 1996, 1998, and 2000 survey, the annualized discharge numbers are between 7.2 to 7.7 million. It seems reasonable to assume that the discharge number in 2007 would be around 7 million.

[8] The number includes hospice care agencies that may or may not provide home health care in addition.

[9] In 2008, expenditure on home health care exceeded $65 billion, according to Centers for Medicare and Medicaid Services.

[10] See National Association for Home Care and Hospice (2008) for more information.

long-term care responsibilities for the elderly (CBO 2004). Medicare and Medicaid pick up 38 percent of total costs, followed by private insurance (3%) and other (2%).

Administration of investment in expanding social care does not require an equal expansion of government size, nor a novel approach to channel the funds through the system. The delivery systems are already organized and administered by local and state governments through Head Start/Early Head Start and various home-based care organizations that qualify for reimbursement from Medicare and Medicaid. Scaling up does not entail compromises on quality of care or skill mismatch of newly hired workers. Skill requirements and training time may not be as onerous as that for some construction-related jobs. A good deal of physical stamina and aptitude for care for others may be enough to begin with. Then, through on-the-job training with current child development associate degree and/or home health aide certification, concerns for high quality care could be addressed. With the expected budget shortfalls of about $350 billion for 2010 and 2011 (McNichol and Johnson 2009), state governments are already in dire need of federal transfers to fill the gap of immediate social care demand, just to provide the inadequate pre-recession level of social care. Scaling up service delivery would not overwhelm the system or require extra federal scrutiny. Concerns about fraud and abuse of funds for Medicaid and Medicare have already attracted the government's due diligence with successful enforcement under the newly enacted Affordable Care Act.

Aside from jobs and income growth, other economic and social benefits also justify the expansion of social care service. Kids who get early childhood development care tend to become productive members of society when they grow up.[11] Home-based care is more cost effective than care at hospital or nursing home for chronic illness. For instance, caring for a low birth-weight infant costs over $26,000 per month in a hospital setting, whereas home-based care costs only $330 (Casiro et.al. 1993). An oxygen dependent child may need over $12,000 per month for medical care in a hospital, but she can receive the same level of care at home for only 43 percent of the cost ($5,250; Field et.al. 1991).[12] Employees' care responsibilities cost more

---

[11] See Dickens, Sawhill, and Tebbs (2006) and Heckman and Masterov (2007) for macroeconomic impacts of the early education through productivity growth. Golin, Mitchell, and Gault (2004) provide a concise summary of literature review on a series of research on estimating benefits of a high-quality, intensive pilot projects- the Abecedarian project in North Carolina, HighScope Perry Preschool study, and Title I Chicago Child-Parent Centers. Additional reference includes Barnett et.al (2004, 2005).

[12] Recognizing these benefits of home-based long term care, the Centers for Medicare and Medicaid at the Department

than $33 billion a year to employers due to lost productivity (MetLife 2006). Scaling up of home-based care could save much of the cost. Any sensible cost-benefit analysis would favor social care expansion.

2.2. Employment in Social Care

The child care and early childhood development providers in the industry are mainly preschool teachers (35 percent of total wage and salary jobs in the industry), child care workers (30 percent), and preschool teacher assistants (14 percent) (BLS 2009a). The median age of the providers is 38 and 19 percent of them are 24 years or younger, whereas the median age of all workers in the economy is 45 and only 13 percent of them are 24 or younger. The age composition of the care providers suggests that the occupation may serve as one of the entry jobs for the young and low-skilled population. Education requirements vary by states and sources of funding of programs–state's own initiatives, federal Head Start and Early Head Start, and private fee-based programs–from a high school diploma with Child Development Associate (CDA) degree to a college degree in early childhood education. Family child care providers, in particular in small-scale, informal settings, are not under state or federal regulation. The average hourly wage in the industry is $11.32, lower than the overall private industry average of $18.08. Median annual wages range from $17,440 for child care workers, $22,120 for preschool teachers, up to $37,270 for preschool directors (BLS 2009c). The lower-than-average weekly earnings of $345, compared to $608 in overall private industry, imply that many providers work on a part-time basis. Overall, 25 percent of the workers (15 percent for preschool teachers and 30 percent for childcare workers) are from the families whose total income falls below 150 percent of the official poverty line, and 9.5 percent of them have received food stamps in year 2008.[13]

Low-skilled women have dominated the workforce-88 percent of total care workers-in home health care provision. The average age in the sector is 41 years old. Most are minority (52 percent), especially African American women (30 percent), while recent immigrants contribute

---

of Health and Human services have awarded $1.7 billion for a five-year demonstration project, called "Money Follows the Person", that assists states to transition about 34,000 individuals from institutional settings to home and community-based care services.

[13] The estimates are based on a preliminary analysis of 2009 Annual Social and Economic Supplement of the Current Population Survey (ASEC), compiled and harmonized by King et.al (2009) at the Minnesota Population Center.

21 percent of the workforce, and 43 percent of workers are employed part-time in a given year (PHI 2009). No education requirements exists for these jobs, although those who work for an agency receiving Medicare and Medicaid reimbursements are required to pass competency tests or state certification programs with a minimum of 75 hours of training. Fifty-eight percent of workers hold high school diplomas or less. The mean hourly wage of home health aides was $10.31 in May 2008 and $21,440 per year. Over 25 percent of the workers have incomes below 150 percent of the official poverty line and almost 16 percent of them received food stamps in 2008 (King et.al 2009). Low wage rates may contribute in part to the poor economic status of the workers, but it is also true that many workers come from poor households. Thus, it is hard to establish a causal relationship between low wages and poverty among the workers.

The expansion of service delivery would directly create demand for more teachers and care providers as the programs cover more children. In addition, the increased demand for material and services to expand ECE programs means more job opportunities indirectly in the rest of the economy. This short-term employment impact has been scrutinized by a research team at Cornell University, led by Dr. Warner. She and her collaborators (2004, 2006, 2007, and 2009a, b) analyze the economic linkages of the child care sector to the rest of the economy, through which job multiplier effects take place. They demonstrate that child care sector expansion generates more jobs-direct and indirect combined-than most of the other sectors in the economy. As a regional development strategy, the expansion of child care is effective, according to their studies. To the best of our knowledge, expansion of home-based health care has not been viewed in the context of employment generation. This paper attempts to fill the void.

Previous studies, assessing both long-term and short-term benefits of expanding social care, have not taken into account distributional impacts: who would receive jobs from the expansion and how much income they would receive from the jobs. Employment opportunities created directly and indirectly from the expansion may or may not reach the disadvantaged groups in the labor market, i.e. women, less-educated and poor households, depending on the occupations and industries in which these jobs are created. A job as an administrator in the health care industry is likely to be held by a highly-educated male worker from an affluent household, while a less-educated woman from middle class household would be more likely to take a job as a child care provider or preschool teacher. The individual characteristics of workers

determine their likelihood of employment and earnings vary across occupations and industries. We use a microsimulation approach combined with statistical matching techniques to analyze the distributional issues.

3. METHODOLOGY

To analyze the employment impact of our proposed intervention we combine two different quantitative methods; at the macro level we make use of input-output analysis and at the micro level, we employ a micro-simulation model. Input-output analysis allows for calculation of aggregate changes in employment, while the micro-simulation distributes these jobs by matching them to individuals who are most likely to occupy them based on nationally representative survey data.

The method we utilize captures multiplier effects through linkages of output growth between industries: as one sector of the economy experiences an increase in demand for its own output, it ends up demanding more goods and services from several other industries, which results in turn in direct but also indirect job creation downstream. To estimate the employment creation through industry linkages, we use the 2006 input-output (I-O) table. The I-O table is constructed by the Bureau for Economic Analysis (BEA), using various data sources, i.e. the Economic Census by the Census Bureau, administrative data from the Internal Revenue Services, Social Security Administration, and other federal authorities. It presents a full accounting of transactions-production and consumption-in the economy. The I-O table used in the analysis is re-compiled by the Bureau of Labor Statistics for their employment projection. It depicts the inter-industry linkages of 201 industries, from which one can calculate employment multipliers. We use the BLS table, rather than the original table from the Bureau for Economic Analysis (BEA). The most recent (2006) annual input-output table from the BEA was at a higher-level of industrial aggregation than the BLS table, especially for the service and government sectors. Ideally, we would have preferred to use a benchmark input-output table, which contains a very high level of disaggregation (over 400 industries). However, the most current table available is based on the Economic Census of 1997, and we felt that this may not sufficiently reflect the current economic structure. Consideration of the trade-off between the detail and timelines of data led us to use the 2006 BLS input-output table.

The employment matrix is a product of total requirement table–direct and indirect input requirements necessary to produce a unit of final output–and a vector of employment intensity by industry–a ratio of total number of workers to final output. The total requirement table is the inverse of the Leontief matrix, computed as $(I - A)^{-1}$ from the matrix of direct requirements table (A), which shows only the direct input requirements, or the technical coefficients of an industry. In input-output terminology, commodity output is given by $x = (I - A)^{-1} * y$, where x is the vector of industry output by commodity, I is the identity matrix, and y is the vector of final commodity demand. The total requirement table $(I - A)^{-1}$ has a layout of industry-by-commodity to construct the employment multipliers by industry. The employment multiplier matrix (E) is written as $E = w * (I - A)^{-1}$, where $w*$ is a diagonal matrix with jobs-to-industry output ratios along its principal diagonal. Therefore the employment multipliers are computed by industry, and thus interpreted as number of jobs created in each industry to produce one additional unit of commodity output. We multiply the matrix by a vector of spending on commodities demanded in our simulation to compute the number of direct and indirect jobs created by the spending.

The employment multiplier matrix captures the employment generation via inter-industry input supply and demand. We believe that input output analysis is an appropriate tool to assess employment effects of, in particular, industry-specific, ex-ante policy studies. We believe that the benefits of using the multiplier analysis framework outweigh the shortcomings implicit in a comparative static analysis for the task at hand. With the multiplier table in hand we move on to the next step.

In this stage, all of these jobs, direct and indirect, are now classified by industry and occupation, i.e., as preschool teachers and assistants, home health aides and administrative staff, all of which would be considered direct jobs; but in addition it provides similar information in all other industries (sectors) that produce the needed intermediate inputs. An economically meaningful treatment of any job in the analysis depends not only on the industry a person works in but also what tasks she performs. Responsibilities and corresponding earnings thus are accounted for. To do so, we include the occupational classification of employment and its distribution across industries by using the National Industry-Occupation Employment Matrix created by the Bureau of Labor Statistics. This provides a complete industry-occupation table that is subsequently made use of in the micro-simulation portion of our study. We turn to this next.

When new work opportunities become available, specific occupational positions in each industry will be filled in by workers from the existing pool of the available labor. The microsimulation exercise we employ is a tool that assigns jobs by matching workers' socioeconomic characteristics to the job openings. In other words, it provides us with a more accurate and sophisticated supply of labor response than aggregate macroeconomic models. We assume that the additional demand for labor created by each alternative scenario proposed in this study would be met by an increased supply of labor from the pool of "employable" individuals. The employable pool of potential workers consists of individuals (16 years and older) who are currently not working. This information is drawn from the latest issue of Annual Social and Economic Supplement of the Current Population Survey which is produced by the Census Bureau (that is, as of March 2009). We exclude individuals who did not work at all in 2008 and gave the reason for not working as being retired, disabled, taking care of family, or, for those less than twenty years of age, in school.

To assign jobs, we create a statistical ranking of occupations and industries for each individual by estimating the likelihood of being employed in each job category. The method was to estimate a multinomial probit regression for industry and occupation and then predict probabilities for each.[14] For each individual, industries and occupations were ranked based on highest propensity score. Then we estimated likelihood of being employed for each individual, using a probit regression and propensity score.[15] With these three sets of information for each individual, we assigned employment status to those in the employable pool using an iterative procedure, stepping through industry and occupation pairs, selecting those individuals most likely to be employed in that industry-occupation pair, in order of their likelihood to be employed, until all the available jobs were assigned. Once we assigned jobs, we allocated earnings to those individuals who received a new job. The method was imputation by hot-decking.[16]

Our simulation assumes an investment of $50 billion on projects that increase social care

---

[14]Independent variables for the industry and occupation multinomial logits were census division, metropolitan status, age, marital status, sex, educational attainment, and race.

[15] Independent variables for the employment probit were census division, metropolitan status, age, age squared, marital status, sex, educational attainment, and race.

[16] A three-stage Heckit model is used to predict imputed wage and usual hours for each individual in the pool, within age-sex cells. These, together with census division, metropolitan status, marital status, spouse's labor force status, industry and occupation of assigned job, dummies for age category of youngest child and the number of children were used in the imputation procedure.

provisioning. Divided equally between home-based health care and early childhood development for children under the age of 5, this amount is equivalent to one half of the total gross output of the two industries combined in 2006. In input-output analysis, the spending is interpreted as the increase in final demand of commodities by the amount. The increased final demand for child day care (North American Industry Classification System, NAICS 6244) and home health care services (NAICS 6216) leads to increasing labor demand in both industries directly as well as in other industries that supply intermediate inputs to them.

A recent national survey by the Department of Education[17]estimates on child care indicates that 40 percent of children under age 5 do not have any non-parental day care arrangements (Iruka and Carver 2006). Even for non-parental care cases,[18] the true work burden of child care is probably seriously underestimated as a half of child care workers are unpaid, unaccounted for in data gathering, and thus dropped from policy consideration. In addition, a report from Congressional Budget Office[19] on long term care for elderly indicates that over a third of the care burden falls onto informal care by family and other volunteers. The Bureau for Labor Statistics[20] predicts that home based direct care occupation will be one of the fastest growing occupations in the next decade as the population grows older and lives longer. Given the large, hidden current and future need for social care, we feel that $50 billion is not an exaggerated estimate to cover, at least partially, the need for care services in the U.S.

The policy framework-as well as the scale of the intervention-for our job creation proposal is that of the American Recovery and Reinvestment Act (ARRA) outlays and tax cuts, which was passed by the Obama administration last spring.[21] We find this framework to be compelling for the following reason. Although the employment impact of ARRA is still unfolding, the act has influenced and will continue to influence labor markets. This is the case because ARRA introduces a variety of employment options which would not have existed in its absence. For instance, a recent college graduate who would not have originally chosen to work in the construction industry may do so now, since the Act has raised demand for this sector's

---

[17] The survey title is 2005 National Household Education Survey on Early Childhood Program Participation.
[18] See Burton et.al. (2002). Estimating the Size and Compoments of the U.S. Child Care Workforce and Caregiving Population: Key Findings from the Child Care Workforce Estimate. Center for the Child Care Workforce, Washington, D.C.and Human Services Policy Center at the University of Washington, Seattle, Washington.
[19] Congressional Budget Office (2004). A CBO Paper: Financing Long-Term Care for the Elderly. Washington, D.C.
[20] See http://www.bls.gov/news.release/ecopro.t06.htm for the complete table of the 30 fastest-growing occupations, 2006-2016. (accessed December 2, 2009)
[21] See Zacharias, Masterson, and Kim (2009) for detailed information.

output and, hence, employment. Or the act may help an experienced worker who had been forced into an unskilled part-time job to move into a full time skilled job leaving her/his previously held position to a less experienced person, who had not participated in the labor market for a while due to the grim outlook of the economy. Hence in assigning jobs to individuals that are most likely to want them, the template we use to represent the economy must incorporate the labor supply responses that the ARRA is likely to elicit but have not been reflected in our microdata. The results reported in this paper however net out the ARRA impacts in order to highlight the impacts of social care investment.[22]

We do not construct a baseline to which our simulation results may be compared. The purpose of the study is primarily to demonstrate job creation potential and to identify beneficiaries of social care sector expansion relative to infrastructure construction. Thus, the results in this paper should not be translated in a dynamic framework in which one would discuss changes in labor market condition over time as a result of such investments. Furthermore it is not valid to use the framework for forecast purposes, since there are many macro variables to take into account that this study does not.

We assume that social care services are delivered through a mix of (a) direct purchases by consumers and (b) government subsidies to private-sector service providers. We make use of the private care industry assumption because it reflects the current mechanism of the bulk of service delivery. In other words, although centers that act as service providers must meet certain state-level criteria, these entities do not act as government contractors whose activities otherwise would have fallen into the government production category.[23]

---

[22] See Zacharias, Masterson, and Kim (2009) for detailed analysis on impacts of ARRA.

[23] A small exception to this convention is pre-K facilities under local school systems, which are counted as government   activities under the current industry account convention, and thus may not suit the industry assumption. However, dominance of private providers allows us to use the 'private' assumption in the study, even if care comes from 'social' provisioning.

4. FINDINGS

This section starts with the description of the size and types of jobs created from our simulations. Then we identify the beneficiaries of job creation in terms of the types of households that receive the jobs and the changes in household income due to job creation.

4.1. Direct and Indirect Employment Generation by Industry and Occupation

We compare the employment distribution by industry in table 1. $50 billion in Social care investment generates almost 1.2 million jobs, as opposed to 556,000 jobs in the case of a similar investment in infrastructure construction. Most jobs are concentrated within the respective industries in both cases, especially for social care. It is mainly due to high jobs-to-output ratio in the social sector that generates a relatively large within-sector employment multiplier. The results in table 1 confirm the pattern: 8 out of 10 new jobs are created in social care. Whereas infrastructure construction creates more indirect employment-4 out of 10 new jobs-in other industries as the sector requires more diverse inputs than social care does. On that basis alone, one might come to the conclusion that infrastructure construction is preferable. However, the opportunity cost of infrastructure construction spending is higher because it creates less than half the number of jobs for the same amount of spending as social care expansion.

Table 1. Total Employment Distribution Across Industries

Industry	Social Care	Infrastructure
Agriculture	2,928	1,969
Mining	520	2,463
Utilities	773	1,808
Construction	4,489	*345,955*
Manufacturing	16,797	46,402
Wholesale	7,139	11,421
Retail	4,432	36,628
Transportation and Warehousing	7,020	12,715
Information	4,989	4,312
Financial and Real Estate services	13,621	11,474
Professional and Business services	57,672	55,675
Education	688	719
Health Care and Social Assistance	21,046	675
Social Care	*956,082*	107
Leisure and Hospitality	15,650	6,509
Other services	3,113	5,009
Government	69,384	12,099
Total	**1,186,342**	*555,942*

Source: authors' calculations

The occupational composition of jobs in social care (see Table 2), shows that 76 percent of total job creation takes place in the high-end and low-end service occupations, i.e. teachers, child care providers, and home health aides. These are the jobs in which women have better chances of gaining employment. On the other hand, 61 percent of the jobs generated by infrastructure construction are in production occupations–factory and construction workers, farmers and truck drivers–that are traditionally more male-oriented. Although current public sentiment may favor reviving the American manufacturing sector–and indeed this may be slowly happening already–and creating construction jobs for the workers hit hardest by the Great Recession, expanding investment in social care is in fact a *more effective and efficient* way to create jobs than investment in physical infrastructure alone.

Table 2. Occupational Composition of Social Care and Infrastructure Construction, Number of Jobs and Shares (in percent)

Occupation	Social Care	Infrastructure
Manager	69,256 (5.8)	47,685 (8.6)
Professional	159,307 (13.4)	27,748 (5.0)
High End Service	448,077 (37.8)	7,273 (1.3)
Low End Service	450,660 (38.0)	133,462 (24.0)
Production	59,043 (5.0)	339,774 (61.1)
Total	1,186,342 (100.0)	555,942 (100.0)

Source: Authors' calculations

Note: "Managers" include "management, business, & financial" occupations. "Professionals" include "computer and mathematical science; architecture and engineering; life, physical, and social science; legal; and, healthcare practitioner and technical" occupations. "High-end" services include "community and social service; education, training and library; arts, design and entertainment; and, healthcare support" occupations. "Low-end" services include "protective service; food preparation and serving; building and grounds cleaning and maintenance; personal care and service; sales and related; and office and administrative support" occupations. "Production" include "farming, fishing, and forestry; construction and extraction; installation, maintenance, and repair; production; and, transportation and material moving" occupations.

4.2. Distribution of Jobs: Who Benefits?

In this subsection, we present the results from the microsimulation's assignment of jobs to individuals with different characteristics and analyze the distributional impacts of the simulated investments on social care versus infrastructure construction.
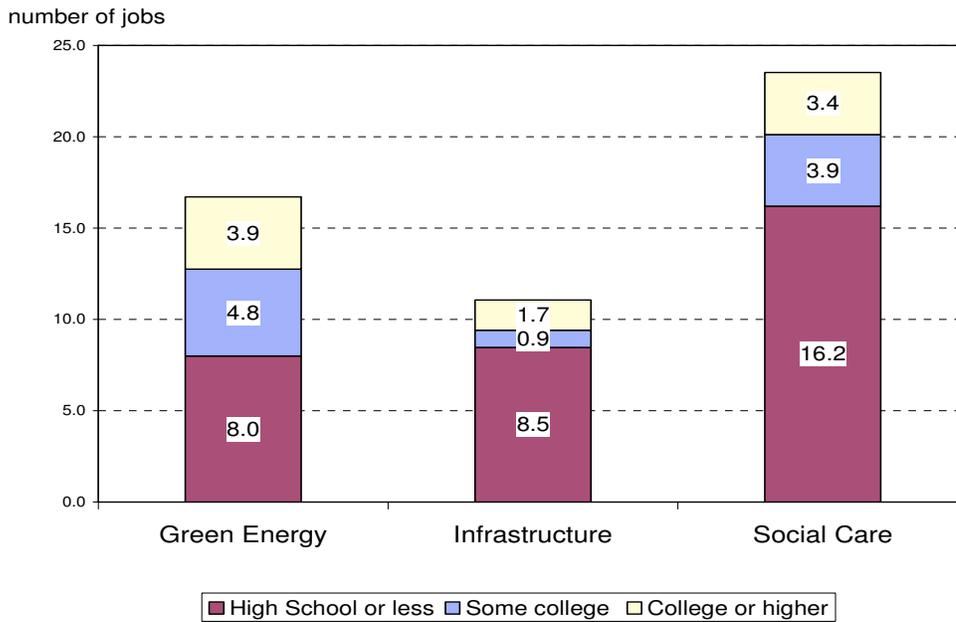
4.2.1. Job Distribution

To compare the employment generation potential of the two types of investment, we normalize the number of jobs per million dollars of spending on social care and infrastructure investment. In addition, we use findings from Pollin, Wicks-Lim, and Garrett-Peltier (2009) to analyze the job impacts of 'green energy' investment for workers with various levels of educational attainment. This study provides analysis on the new types of infrastructure investment that the current administration is promoting with regards to carbon emission reduction and future economic growth.

Figure 3 depicts our estimates of job creation for workers with different levels of educational attainment for the two sectors plus Pollin, et al.'s estimates for green energy investment. As we have indicated above, social care expansion is well suited to creating jobs for groups with lower levels of educational attainment. In particular, expansion in social care spending would benefit a very vulnerable part of the workforce–those with high school degrees or less–creating 16.2 jobs for this group per million dollars of spending, as compared to 8.5 in infrastructure. In absolute terms, the social sector also creates more jobs for the educated group than infrastructure construction: 7.3 jobs (3.4+3.9) per million dollars of spending are created from social care expansion whereas infrastructure generates merely 2.6 jobs (1.7+0.9) for those with at least some college education. Early childhood development workers are, in some cases, required to have at least an associate degree in early childhood education. This regulation in part explains why the more-educated group also receives more jobs than in the case of infrastructure. Green energy investment produces 8 jobs for the less educated workforce, indicative of

employment generation for home retrofitters, solar panel installers, and other construction related field workers, as discussed in Pollin et al. (2009). Green investment benefits the more-educated group slightly more than the less-educated one, creating 8.7 jobs versus 8.0 jobs for each group respectively. A significant number of the jobs created by green energy investment are for engineers and technicians who generally have higher education credentials.

Figure 3. Jobs by Education Per Million Dollars of Spending

number of jobs

Source: For Green Energy estimates, see Pollin, Wick-Lim, and Garrett-Peltier 2009; other estimates are from authors' calculations.
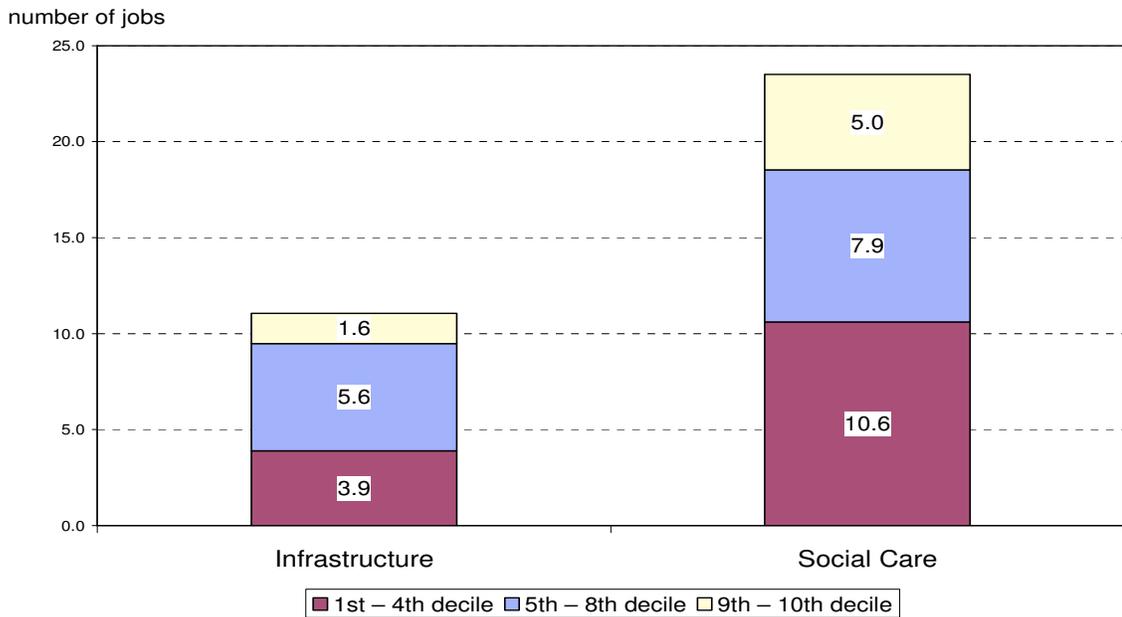
Figure 4 shows the number of jobs assigned by our microsimulation model to workers from different levels of annual (pre-assignment) household income by deciles grouped into three categories.[24] Social care expansion outperforms infrastructure in terms of job creation for lower-income households. Social care investment generates, for the bottom 40 percent of households in the income distribution, 10.6 jobs for per million dollars of spending, compared to 3.9 jobs from infrastructure construction. This result is consistent with the previous finding on job assignment by education, for income levels are highly correlated to the level of educational attainment of workers. Home health aides, one of the major occupation groups in social care, mainly consists of women from low-income households: 88 percent of the workers are women; 58 percent have high school diploma or less; and 45 percent of the workers are from households under 200 percent of the federal poverty line.[25] The social care expansion thus aids those workers specifically.

---

[24] The Green energy investment scenario is not included, since the original data was not available for micro-simulation analysis.
[25] The federal poverty line for a family of four was $20,650 in the 48 contiguous states and Washington, D.C. in 2007.

What is equally important to notice in these figures is that the care expansion generates more jobs for the middle income and top income groups–5 and 7.9 jobs each–as well, compared to infrastructure. This is in part because many care workers, in particular early education workers, are likely to come from dual-earner households whose combined incomes place them in higher income groups. Still, per million dollars spending, the social care scenario provides more jobs to the low-income workers, relative to the higher income groups, than infrastructure does.

Figure 4. Jobs by Household Income Per Million Dollars of Spending

number of jobs

Source*: Authors' calculations.

Table 3a and 3b depict the job distribution in absolute numbers and shares by various characteristics of workers hired in the two sectors. They show the net counts, excluding jobs created by ARRA.[26] It should be noted that total number of jobs from both cases are slightly smaller than the number of jobs generated from the input output framework, due to a small amount of non-assignment in the simulation.[27]

The gender composition of job assignment shows almost exactly inverse ratios between social care and construction. Over 90 percent of jobs go to women in social sector investment, as more than 80 percent of jobs are created within the sector. On the other hand, infrastructure construction generates over 88 percent of jobs for men as most jobs (almost 71 percent) are created in male dominant industries – construction and manufacturing. The racial composition shows more or less even distribution in the social care case, whereas infrastructure construction favors the white heavily. The white's majority in the employable pool and slightly higher employability of the group than others explain its dominance in the job assignment for the construction case. The even distribution of jobs in the case of social care is attributable to the fact 52 percent of home-based care workers are non-white.

---

[26] See Zacharias, Masterson, and Kim (2009)
[27] 0.7 percent of total jobs are not assigned. Most of the missed jobs are relatively small numbers of manager and professional positions in various industries. There may be too many of the employable workers in these categories in the data for our current ranking system to discern precisely the most likely workers out of the pool.

Table 3a. Job Assignment – Social Care

Social Care	Jobs assigned	
	number	percent
Gender		
Male	116,525	9.9
Female	1,059,401	90.1
Race		
White	459,368	39.1
Black	310,370	26.4
Hispanic	286,484	24.4
Other	119,704	10.2
Education		
Less than HS	500,959	42.6
HS Grad	308,810	26.3
Some College	196,407	16.7
College Grad	169,750	14.4
HH Income		
1st-4th decile	530,763	45.1
5th-8th decile	395,846	33.7
9th-10th decile	249,330	21.2
Total	1,175,939	100.0

Source: Authors' calculations

Table 3b. Job Assignment – Infrastructure

Infrastructure	Jobs assigned	
	number	percent
Gender		
Male	489,814	88.6
Female	63,051	11.4
Race		
White	409,708	74.1
Black	47,497	8.6
Hispanic	78,984	14.3
Other	16,675	3.0
Education		
Less than HS	77,482	14.0
HS Grad	345,897	62.6
Some College	46,609	8.4
College Grad	82,877	15.0
HH Income		
1st-4th decile	194,915	35.3
5th-8th decile	279,438	50.5
9th-10th decile	78,516	14.2
Total	552,869	100.0

Source*:* Authors' calculations

The decomposition of job assignment by educational attainment highlights the greater inclusiveness of social care investment. Over 42 percent of jobs generated by the latter go to people with less than a high school diploma, compared to only 14 percent of jobs created by the infrastructure investment for this most disadvantaged group in the labor market. For the infrastructure case, the majority of jobs (62.6 percent) are assigned to workers with high school diplomas. This fact is largely driven by the construction-related jobs typically held by men with high school diplomas. Although social care investment more highly favors the group with less than high school diploma, it also provides more opportunities to people with at least some higher education than infrastructure investment(31.1 to 23.4 percent respectively). This reflects the certificate requirement for preschool teachers and certain child care providers that are under state or federal regulations for reimbursement purposes. Infrastructure investment raises the demand for engineers and architects whose jobs are categorized in professional and business services industry (Architectural, engineering, and related services, NAICS 5413) and professional occupation (Architecture and engineering occupations, SOC 17), and typically require a completed college education for qualification. These requirements seem to explain the job assignment to higher-education groups.

The inclusive nature of social care investment is further reinforced by the job assignment by household annual income. Forty-five percent of jobs go to workers from households with income below 4th decile (approximately $39,000 a year). Home health aides, who comprise one of the major occupation groups in social care, are mainly women from low-income households: 45 percent of the workers are from households under 200 percent of the federal poverty line.[28] The social care expansion thus aids those workers specifically. The infrastructure case, on the other hands, provides one half of the jobs created to workers from the middle income group.

What is equally important to notice in these figures is that the care expansion generates more jobs for the top income group, compared to infrastructure spending. This is because some care workers, early-education workers in particular, are likely to come from dual-earner households whose combined income places them in higher income groups.

4.2.2. Changes in Earnings

First, we look at the changes in earnings of the workers assigned jobs by the micro-simulation in the social care and construction industries. These two industries account for the majority of the jobs created by the simulations. The overwhelming majority of workers – 93 to 97 percent of hired workers in social care and construction respectively –had jobs with earnings sometime during the year 2008. This allows us to make comparison of their earnings before and after the simulated investment, excluding individuals with zero earnings from the following impact analysis. One should note a certain selection bias. Many of these newly 'hired' workers were unemployed and/or may have had incomplete jobs during the survey period–full-year part-time, part-year full-time, and precarious jobs with very short-term contracts–which will push down their reported annual earnings during the survey period. Thus, the results should be interpreted with caution and analyses be confined to the selected sample.

Table 4a and 4b show the changes in individual median and mean earnings of those who are assigned jobs in social care and infrastructure construction. The comparison highlights the disparate distributional impacts of the two investments. It is noteworthy to mention that mean-to-median earnings ratio decreases as the level of educational attainment increases among workers. It is more so for workers in social care than in infrastructure construction, which is indicative of the stronger equalizing effect of social care investment.

---

[28] It is not clear whether low skill requirements of care work attracts unskilled workers from low income households or low wage rates of care work cause workers to be in low income households. It may be jointly determined, and thus a direction of causality is hard to establish.

Workers with less than a high school diploma tend to benefit the most in relative terms from both of the simulated investments compared to workers with higher levels of educational attainment. Their median and mean earnings increase the most among all the groups. Infrastructure construction turns out to raise earnings of the least educated workers more than social care investment does. The result is attributable to much higher hourly wage rates of construction workers, $21.87 dollars average within the industry (BLS 2009a). Even unskilled construction laborers earn over $14.30 per hour, significantly more than the $11.30 per hour that a preschool teacher earns on average. For the least educated workers in social care, their *ex-ante* median earnings ($3,120) are less than half of their mean earnings ($7,641), which suggest a highly-skewed distribution of the least educated workers along their earnings level. Thus, the likely outcome of the social care investment would be close to the median earnings change for the workers.

Table 4a. Changes in *Median* Earnings by Individual	Social Care			Infrastructure		
Education	Before	After	Change (%)	Before	After	Change (%)
Less than HS	3,120	7,000	124.4	7,000	17,000	142.9
HS Grad	15,000	26,500	76.7	18,000	30,000	66.7
Some College	14,000	30,000	114.3	15,000	30,002	100.0
College Grad	26,000	55,000	111.5	28,000	52,000	85.7
Income						
1st-4th decile	7,000	22,029	214.7	8,060	27,500	241.2
5th-8th decile	20,000	30,000	50.0	22,000	33,000	50.0
9th-10th decile	30,000	34,002	13.3	35,000	38,000	8.6

Source*: Authors' calculations.*

Table 4b. Changes in *Mean* Earnings by Individual	Social Care			Infrastructure		
Education	Before	After	Change (%)	Before	After	Change (%)
Less than HS	7,641	12,893	68.7	11,583	21,900	89.1
HS Grad	21,654	31,382	44.9	23,163	35,304	52.4
Some College	22,950	33,169	44.5	23,994	33,960	41.5
College Grad	44,475	67,694	52.2	45,693	69,284	51.6
Income						
1st-4th decile	9,940	29,862	200.4	10,863	33,787	211.0
5th-8th decile	23,503	40,183	71.0	25,227	43,875	73.9
9th-10th decile	50,810	46,903	-7.7	55,879	51,569	-7.7

Source*: Authors' calculations.*

For workers with higher educational attainment (some college or more), social care investment appears to raise median earnings relatively more than infrastructure construction investment does. The occupational composition of the jobs created by social care investment

may explain the difference: the sector hires more managers and professionals than infrastructure, and these jobs, unlike the lower-skilled occupations, usually offer wages comparable to similar jobs in the construction sector. Thus, social care investment appears to be more beneficial for highly educated workers than for those with the least education in terms of earnings. But one should note that social care investment generates many more jobs for workers with less than a high school diploma (500,959) than infrastructure construction (77,482).

Workers from the poorest households (1st-4th) definitely receive the largest jump in their earnings: a more than 200 percent increase in all measures from both types of investments. Very low initial earnings of the group attributes to the jump. Earnings for workers from the middle income households (5th-8th) increase more than 50 percent and the infrastructure investment seems to be a slightly better investment for that group. Workers from the high income households (9th-10th) show a moderate gain in median earnings but a moderate loss in mean earnings. This result implies that earnings from the new jobs are below the earnings from their previous jobs. It may be indicative of downward transition of some of the newly hired workers from the high income groups. Again, the infrastructure investment raises the earnings of all groups more than the social care, simply due to relatively higher wage rates in construction industries.

5. CONCLUSION

Unusual times call for innovative approaches; the hands-on approach of the current administration towards job creation–ARRA and the recent jobs bill, for instance–has renewed interest in direct job creation through expansionary fiscal policies. Most of the direct job creation measures in the bills focus on infrastructure investment on road, railways, and green-energy initiatives. The male-biased job losses, in particular, have implicitly justified physical infrastructure investment as a just scheme to provide employment opportunities. Expansion of social assistance and entitlements is unfortunately not considered a valid job creation measure. It is rather regarded as a part of the administration's education reform efforts or as a stop-gap measure to prevent affected households from falling into poverty. In this study, we attempt to break out of the gender-based dichotomy in the policy discussion that hinders our search for more effective job creation approaches.

We analyze social care investment–expansion of early childhood development and home-based health care–for its effectiveness and equity as a job creation measure. We find that investment in social care provision can generate twice as many jobs as infrastructure construction. At the same time, the jobs created by social care investments are more beneficial for the less-educated and the poor than those created by infrastructure investment: more jobs are likely to be taken by people from disadvantaged groups and the marginal impacts on earnings are highest for them as well. According to our estimates, more than 42 percent of the jobs created by social care investment are likely to be taken by people with less than a high school diploma, whereas only 14 percent of jobs in infrastructure construction go to these workers; workers from poorer households receive 45 percent of the jobs in the social care sector as compared to 35 percent in the case of infrastructure construction. Even within the poor households, the care sector is more likely to hire workers from the lower end of the income scale than the construction sector is, based on the ex-ante median and mean earnings data for the workers.

Thus, we show that social care sector investment is both effective–more jobs per dollar of spending–and equitable–more for the low skilled and poor–jobs creation measure. Social care investment would also be an effective policy to address the expected increase in household poverty through long-term unemployment and forced premature retirement from the 'Great' Recession.

We acknowledge that the low wage rates and high labor intensity characteristic of the care sector account at least partly for its superior performance in job creation *per se* and its inclusiveness towards the low skilled and poor workers. But it is this very fact that ensures that the investment is an effective and equitable job creation measure. Without these measures, would-be-workers may be left marginalized by the labor market, which will certainly negatively influence both their current earnings and their chances of future employment.

As we argued above, implementing increased social care investment can be done on very short notice. Governments–federal, state, and local–all have their organizational and administrative systems in place through Medicare, Medicaid, Head Start and Early Head Start, and the Child Care and Development Fund. Scaling up the federal funding to these programs would suffice to generate immediate employment opportunities to disadvantaged workers. These workers will be able to provide care for the ever-increasing demand from demographic

changes as well as from people who can no longer afford such services because the 'Great'
Recession has eliminated their jobs and undermined their financial security.

REFERENCES

Antonopoulos, Rania, and Kijong Kim, 2008. "Impact of Employment Guarantee Program on Gender Equality and Pro-Poor Economic Development in South Africa: Scaling up the Expanded Public Works Program." Research Project no. 34. Levy Economics Institute and the United Nations Development Programme. Available at: http://www.levy.org/pubs/UNDP-Levy/EGS.html.

Acemoglu, Daron. 1995. "Public Policy in a Model of Long-term Unemployment." *Economica* 62(246): 161-178.

Bartik, Timothy J. 2006. "Taking Preschool Education Seriously as an Economic Development Program: Effects of Jobs and Earnings of State Residents Compared to Traditional Economic Development Programs." W.E. Upjohn Institute for Employment Research (Funded by Committee for Economic Development through a grant from the Pew Charitable Trusts–Advancing Quality Pre-Kindergarten for All initiative). http://www.ced.org/images/library/reports/education/early_education/report_prek_bartik _2006report.pdf .

Barnett, W. Steven, Jason T. Hustedt, Kenneth B. Robin, and Karen L. Schulman. 2004. *The State of Preschool: 2004 State Preschool Yearbook*. New Brunswick, N.J.: National Institute for Early Education Research.

Barnett, W. Steven, Cynthia Lamy, and Kwanghee Jung. December 2005. *The Effects of State Prekindergarten Programs on Young Children's School Readiness in Five States*. New Brunswick, NJ: National Institute for Early Education Research.

Bayoumi, Tamin, and Trung Bui. 2010. "Deconstructing the International Business Cycle: Why Does a U.S. sneeze Give the Rest of the World a Cold?" forthcoming IMF Working Paper, International Monetary Fund. Washington, DC.

Blanchard, Olivier Jean, and Peter Diamond. 1994. "Ranking, Unemployment Duration, and Wages." *The Review of Economic Studies* 61(3): 417-434.

Bureau of Labor Statistics. 2009 a. *Career Guide to Industries, 2010-2011 Edition*. US Bureau of Labor Statistics Office of Occupational Statistics and Employment Projections**.** Washington, DC. http://www.bls.gov/oco/cg/.

Bureau of Labor Statistics. 2009 b. *Occupational Outlook Handbook, 2010-2011 Edition*. US Bureau of Labor Statistics Office of Occupational Statistics and Employment Projections. Washington, DC. http://www.bls.gov/OCO/.

Bureau of Labor Statistics. 2009 c. *Occupational Employment and Wages,* May 2008. US Bureau of Labor Statistics Office of Occupational Statistics and Employment Projections. Washington, DC. http://www.bls.gov/news.release/ocwage.toc.htm.

Burton, Alice, March Whitebook, Marci Young, Dan Bellm, and Claudia Wayne. 2002. *Estimating the Size and Components of the U.S. Child Care Workforce and Care giving Population: Key Findings from the Child Care Workforce Estimate (Preliminary Report).* Center for the Child Care Workforce, Washington, D.C. and Human Services Policy Center at the University of Washington, Seattle, Washington.

Carere, Alina and Ashoka Mody. 2010. "Spillovers of Domestic Shocks: Will They Counteract the "Great Moderation"?" IMF Working Paper 10/78. International Monetary Fund.

Casiro, O.G., McKenzie, M.E., McFayden, L., Shapiro, C., Seshia M.M.K., MacDonald, N., Moffat, M., and Cheang, M.S. 1993. "Earlier Discharge with Community-based Intervention for Low Birth Weight Infants: A Randomized Trial." *Pediatrics* 92(1): 128-134.

Committee for Economic Development 2006. *The Economic Promise of Investing in High-Quality Preschool: Using Early Education to Improve Economic Growth and the Fiscal Sustainability of States and the Nation.* Washington, DC.

Congressional Budget Office (CBO). 2004. "Financing Long-Term Care for the Elderly." CBO Paper. Washington, D.C.

Congressional Budget Office. 2009. *Estimated Macroeconomic Impacts of the American Recovery and Reinvestment Act of 2009.* Washington, DC. http://www.cbo.gov/doc.cfm?index=10008.

Congressional Budget Office. 2010a. *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output from October 2009 through December 2009.* February. Washington, DC. http://www.cbo.gov/doc.cfm?index=11044&zzz=40440.

Congressional Budget Office. 2010b. *Policies for Increasing Economic Growth and Employment in the Short Term.: Statement of Douglas W. Elmendorf.* Prepared for the Joint Economic Committee U.S. Congress. February. Washington, DC. http://www.cbo.gov/doc.cfm?index=11255&zzz=40433.

Council of Economic Advisors. 2009. *Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009. May.* http://www.whitehouse.gov/administration/eop/cea/Estimate-of-Job-Creation.

Dickens, William, Isabel Sawhill, and Jeffrey Tebbs. 2006. "The Effects of Investing in Early Education on Economic Growth." Brookings Institution Policy Brief no.153. The Brookings Institution, Washington DC.

Fackler, M. 2009. Japan's Big-works Stimulus Is Lesson for U.S. *The New York Times*, February 5.

Fields, A. I., et al. 1991. "Home Care Cost-effectiveness for Respiratory Technology–dependent Children." *American Journal of Diseases of Children* 145(7): 729-33.

Heckman, James J., and George J. Borjas. 1980. "Does Unemployment Cause Future Unemployment? Definitions, Questions and Answers from a Continuous Time Model of Heterogeneity and State Dependence." *Economica* 47(187). New Series (August): 247-283.

Heckman, James J. and Dimitriy V. Masterov. 2007. "The Productivity Argument for Investing in Young Children." *Review of Agricultural Economics* 29(3): 446–93.

Iruka, I. U., and Carver, P. R. 2006. *Initial Results From the 2005 NHES Early Childhood Program Participation Survey* (NCES 2006-075). US Department of Education. Washington, DC: National Center for Education Statistics.

King, Miriam, Steven Ruggles, Trent Alexander, Donna Leicach, and Matthew Sobek. 2009. *Integrated Public Use Microdata Series, Current Population Survey: Version 2.0.* [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor].

McNichol, Elizabeth and Nicholas Johnson. 2009. "Recession Continues to Batter State Budgets; State Responses Could Slow Recovery." Center on Budget and Policy Priorities. Washington, DC. http://www.cbpp.org/files/9-8-08sfp.pdf.

MetLife. 2006. "The MetLife Caregiving Cost Study: Productivity Losses to U.S. Business." Metropolitan Life Insurance Company and National Alliance for Caregiving. www.caregiving.org/data/Caregiver%20Cost%20Study.pdf.

National Institute for Child Health and Human Development (NICHD) Early Child Care Research Network. 2000. "The Relation of Child Care to Cognitive and Language Development." *Child Development* 71(4): 960–80.

National Association for Home Care and Hospice (NAHH). 2008. The Basic Statistics about Home Care: Updated 2008. Washington DC. http://www.nahc.org/facts/08HC_STATS.pdf.

Pollin, Robert, Wicks-Lim, and Heidi Garrett-Peltier. 2009. "The Economic Benefits of Investing in Clean Energy: How the economic stimulus program and new legislation can boost U.S. economic growth and employment." Department of Economics and Political Economy Research Institute (PERI), University of Massachusetts, Amherst. http://www.americanprogress.org/issues/2009/06/pdf/peri_report.pdf.

Rich, M.W., Beckham, V., Wittenberg, C., Leven, C., Freedland, K., and Carney, R.M. 1995. "A Multidisciplinary Intervention to Prevent the Readmission of Elderly Patients with Congestive Heart Failure. "*The New England Journal of Medicine* 333(18): 1190-1195.

Rolnick, Arthur, and Rob Grunewald. December 2003. "Early Childhood Development: Economic Development with a High Public Return." *The Region*. Federal Reserve Bank of Minneapolis.

Romer, Christina and Jared Bernstein. 2009. The Job Impact of the American Recovery and Reinvestment Plan. January. Obama Transition document. http://otrans.3cdn.net/45593e8ecbd339d074_l3m6bt1te.pdf.

Simonazzi, A. 2009. "Care regimes and national employment models." *Cambridge Journal of Economics.* 33(2): 211-232.

Turner, Anna. 2010. Job Crisis Fact Sheet. Economic Policy Institute, Washington DC. http://www.epi.org/publications/entry/jobs_crisis_fact_sheet (last revised on January 22, 2010).

Warner, M., Adriance, S., Barai, N., Hallas, J., Markeson, B., Morrissey, T. & Soref, W. 2004. *Economic Development Strategies to Promote Quality Child Care*, Cornell University. Ithaca, New York.

Warner, M.E. & Z. Liu 2006. "The Importance of Child Care in Economic Development: A Comparative Analysis of Regional Economic Linkage." *Economic Development Quarterly* 20(1): 97-103.

Warner, M. E., 2007. Child Care and Economic Development: Markets, Households and Public Policy.: *International Journal of Economic Development* 9(3): 111-121.

Warner, M.E. 2009 . *Recession, Stimulus and the Child Care Sector: Understanding Economic Dynamics, Calculating Impact.* Manuscript. Cornell University.

Warner, M.E. 2009 b. *Child Care Multipliers: Stimulus for the States*. Manuscript. Cornell University.

Zacharias, Ajit, Tom Masterson, and Kijong Kim. 2009. "Distributional Impact of the American Recovery and Reinvestment Act: A Microsimulation Approach." Working Paper No. 568. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College. http://www.levyinstitute.org/publications/?docid=1158.