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A Stimulus for Affirmative Action? The Impact of the American Recovery and Reinvestment Act on Women and Minority Workers in Construction

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PREFACE

This working paper is one of a collection of papers, most of which were prepared for and presented at a festschrift conference to honor the life's work of Professor Thomas Weisskopf of the University of Michigan, Ann Arbor. The conference took place on September 30 - October 1, 2011 at the Political Economy Research Institute, University of Massachusetts, Amherst. The full collection of papers will be published by Elgar Edward Publishing in February 2013 as a festschrift volume titled, *Capitalism on Trial: Explorations in the Tradition of Thomas E. Weisskopf*. The volume's editors are Jeannette Wicks-Lim and Robert Pollin of PERI.

Since the early 1970s, Tom Weisskopf has been challenging the foundations of mainstream economics and, still more fundamentally, the nature and logic of capitalism. That is, Weisskopf began putting capitalism on trial over 40 years ago. He rapidly established himself as a major contributor within the newly emerging field of radical economics and has remained a giant in the field ever since. The hallmarks of his work are his powerful commitments to both egalitarianism as a moral imperative and rigorous research standards as a means.

We chose the themes and contributors for this working paper series, and the upcoming festschrift, to reflect the main areas of work on which Tom Weisskopf has focused, with the aim of extending research in these areas in productive new directions. The series is divided into eight sections, including closing reflections by our honoree himself, Professor Weisskopf. Each section except for the last includes comments by discussants as well as the papers themselves.

The eight sections are as follows:

1. Reflections on Thomas Weisskopf's Contributions to Political Economy
2. Issues in Developing Economies
3. Power Dynamics in Capitalism
4. Trends in U.S. Labor Markets
5. Discrimination and the Role of Affirmative Action Policies
6. Macroeconomic Issues in the United States
7. Applications of Marxist Economic Theory
8. Reflections by Thomas Weisskopf

This working paper is 3 of 6 included in Section 5.

- Jeannette Wicks-Lim and Robert Pollin

A Stimulus for Affirmative Action?

THE IMPACT OF THE AMERICAN RECOVERY AND REINVESTMENT ACT ON WOMEN AND MINORITY WORKERS IN CONSTRUCTION

Jeannette Wicks-Lim

INTRODUCTION[1]

The Obama administration's $840 billion stimulus plan to lift the U.S. economy out of the Great Recession, passed February 2009, provoked early rebuke by feminists. Why? Infrastructure spending, a focal point of the federal spending plan, would pour federal dollars into the construction industry—an industry with a history of discriminating against women and minority workers.

This criticism understandably focuses on the immediate economic turmoil caused by the ongoing jobs crisis. But there is a longer-term challenge: How do we get women and people of color into these jobs? The reality is that the U.S. economy has clear and pressing needs for continued federal spending on construction activities. The nation's infrastructure urgently needs a massive level of repair, on the order of $1 trillion over the next decade.[2] And, the nation needs to significantly reduce its green-house gas emissions. To retrofit the country's building stock to be more energy efficient would require roughly $800 billion.[3] In other words, to marshal sufficient resources to address two critical challenges that the nation faces, the federal government may well need to inject a significant level of spending into the construction industry, now and into the next decade. Policymakers need to figure out how to diversify construction jobs.

Can today's federal affirmative action policies, designed to address exactly this problem, help diversify construction employment? To answer this question, I examine the impact of two nearly simultaneous actions by the Obama administration that sharply increased the role of federal affirmative action policies in the construction industry. First, the American Recovery and Reinvestment Act (ARRA) sharply raised the proportion of the construction sector covered by Executive Order 11246 --the law that requires federal construction contractors to take affirmative action in hiring women and minority workers. It did this by pouring federal dollars into the construction sector as private spending collapsed. By 2010, public dollars came to fund nearly two-fifths (38 percent) of all construction spending – a historic high.

At the same time, President Obama appointed Hilda Solis to head the Department of Labor (DOL). Labor secretary Solis and her staff shifted the agenda of the DOL towards strengthening federal affirmative action policies and the DOL regulatory agency that enforces them, the Office of Federal Contract Compliance Program (OFCCP). This was made easier by the appointment of Patricia Shiu as the Director of this office who had a quarter century of experience working on employment discrimination cases. The work of the OFCCP became more urgent with the passage of the ARRA: the OFCCP projected that 80 percent of ARRA contracts would be in construction. In other words, these actions of the Obama administration invigorated the OFCCP, and at the same time, substantially increased the share of construction firms this agency would regulate.

I find evidence that the increased the role of affirmative action policies in the construction sector due to the ARRA and the greater level of OFCCP activities can be linked to measureable improvements in the share of construction jobs held by women and minorities since 2009. Women experienced a one-half to one percentage point gain in their share of construction jobs after the passage of the ARRA, up from only 2.4 percent of construction jobs. The evidence of any impact for black workers is similar, but less robust.

Latinos gain nearly three-percentage points in their share of construction jobs with the passage of the ARRA, but only in states with the highest concentration of ARRA dollars. This group of workers holds an interesting position in the construction. Latinos appear to have plenty of access to the industry—they are highly over-represented in construction jobs. However, these workers do not appear to hold the same privileged position as white men.[4] Similar to African Americans and women, Latino workers appear to be more vulnerable to layoffs during downturns in construction employment than are their white male counterparts. In this context, the impact of the federal affirmative action may be understood as lessening the degree to which Latinos shoulder a disproportionate share of job loss. Finally, as would be expected, the experience of white male workers are mirror-opposite of these other groups—their share of construction jobs falls after implementation of the ARRA, and most particularly in the states with a high concentration of ARRA spending.

In sum, recent evidence suggests that federal affirmative action policies do create an impetus among employers to change the demographic composition of their construction workforce. This is an important lesson for today. To meet the nation's needs for infrastructure improvements and clean energy projects will require major federal spending in the construction activities. Effective affirmative action policies will help insure that women and minority workers are among the beneficiaries of this federal spending. Such spending could, if unintentionally, serve as a policy tool to help *reduce* discrimination against women and minorities.

EXECUTIVE ORDER 11246 AND AFFIRMATIVE ACTION

In 1965, President Lyndon Johnson enacted Executive Order 11246 that instructs employers to "act affirmatively" to reduce discrimination and established the federal agency to enforcement this policy, the Office of Federal Contract Compliance Programs (OFCCP). Eminent affirmative action scholar Jonathan Leonard provides this useful explanation of the meaning behind these two words:

> This language [of affirmative action] imposes two obligations: first, not to discriminate; second, whether or not there is any evidence of discrimination, to take affirmative action not to discriminate. Thus federal contractors are required to develop affirmative action plans (AAPs), including goals and timetables, for good-faith efforts to correct deficiencies in minority and female employment.[5]

The OFCCP treats non-construction contractors and construction contractors differently. Non-construction contractors and first-tier subcontractors with contracts valued at $50,000 or more and that employs 50 workers or more must produce written affirmative action plans.[6] Due to the "fluid and temporary nature of the construction workforce" the OFCCP does not require construction contractors to develop written affirmative action programs. Instead, OFCCP has established utilization goals based on civilian labor force participation rates, and has outlined in the regulations good faith steps for construction contractors to follow.[7] For minority workers, these utilization goals are based on the characteristics of the local labor market. The goal

for women, originally established in 1978, is fixed indefinitely at 6.9 percent of work hours. Federal construction contractors and federally-assisted[8] construction contractors with contracts of $10,000 or more are covered by the Executive Order.

The OFCCP conducts compliance reviews for selected firms during which contractors need to demonstrate their good faith efforts or face sanctions. Sanctions include disqualification from the federal contract bidding process (debarment), cancelation of contracts, and possible further legal action by the Equal Employment Opportunity Commission (EEOC).

In 2009, the OFCCP put in place a "Recovery Act Plan" that outlines what resources the OFCCP will commit to accommodate the higher number of federal contracts that the ARRA would generate. The Recovery Plan identifies construction contracts as a major source of this new activity:

> The emphasis on infrastructure spending under the Recovery Act is expected to increase construction contracts. These types of contracts may represent roughly 80% of all Federal contracts under the Recovery Act. To best ensure the EEO compliance, OFCCP will target the construction industry. [9]

The OFCCP Recovery Plan includes an increase in construction compliance evaluations by more than 75 percent, from 204 in fiscal year 2008 to 360 in fiscal year 2009. Other major activities of the OFCCP's Recovery Act Plan include outreach efforts to educate Recovery Act contractors about their Equal Employment Opportunity (EEO) obligations in order to increase compliance, as well as to provide technical assistance, and the appointment of a Recovery Act coordinator to oversee all such activities.

The ARRA specifically allocated more staff and funds to the OFCC --equal to a nine percent expansion. For FY2010, the Recovery Act increased the OFCCP funding by $7.2 million, up from $82.1 million. This enabled the agency to add 50 more full-time staff to its previous level of 585.[10]

Past research has found that federal contractor affirmative action policies most consistently improve the representation of black males at workplaces (see, for example, Ashenfelter and Heckman 1976, Heckman and Wolpin 1976, Leonard 1984a; Rodgers and Spriggs 1996, Heckman and Payner 1989). Evidence has been less consistent for women. Several studies find either no evidence of an impact or at best, mixed evidence for women (Heckman and Wolpin 1976; Goldstein and Smith 1976; Leonard 1984a). While other studies (Beller 1982, Leonard 1984b and Osterman 1982) found some evidence that affirmative action policies improve the employment situation for women.

Several key factors make affirmative action policies more effective. First, the level of enforcement activity is a key factor. Finally, some studies found that affirmative action policies have a stronger impact among growing firms (Leonard 1984b, Heckman and Wolpin 1976). In other words, affirmative action policies are more likely diversify its workforce by adding workers, rather than displacing current workers.

TRENDS IN CONSTRUCTION SPENDING

The recent collapse of the housing market dramatically increased the role of public spending in the construction industry. Clearly two factors are at play here. First, the private construction sector underwent a severe contraction: falling from $911 billion in spending in 2006 to $588 billion in 2009, a fall off of more than one-

third or $320 billion. Public spending, on the other hand, climbed steadily despite the onset of the recession of 2008-09 from $255 to $309 billion and then up to $315 billion in 2009.

The ARRA directly contributed to breaking the construction industry's freefall. As of March 2011, about $34 billion federal dollars, paid out in the form of grants, contracts and loans have funded construction projects. By the time that the ARRA spending winds down, the construction sector can expect to receive a total of $50 billion.

The reach of these federal dollars extends beyond the fraction of total spending that $34 billion represents. The OFCCP's jurisdiction includes projects partially-funded by federal funds and many projects combine local, state, and federal money. Though it is difficult to say how far such joint projects extend the influence of these federal dollars, one way to gauge this is to look at combination of federal, local and state construction spending.

For more than a decade, from 1993 to 2005, public spending in construction as a proportion of total construction spending hovered around or below 25 percent. As the housing bubble reached its peak in 2006-2007 and private spending escalated, public spending fell to nearly 20 percent of total spending. With the crash of the housing market that followed, however, the fraction of construction spending that came from the public sector rose to its highest level in seventeen years: 38 percent in 2010. Clearly, the role of the public sector in the construction industry is dramatically larger today. This rise in public spending in the construction industry signals a corresponding substantial widening in the coverage of EO 11246 .

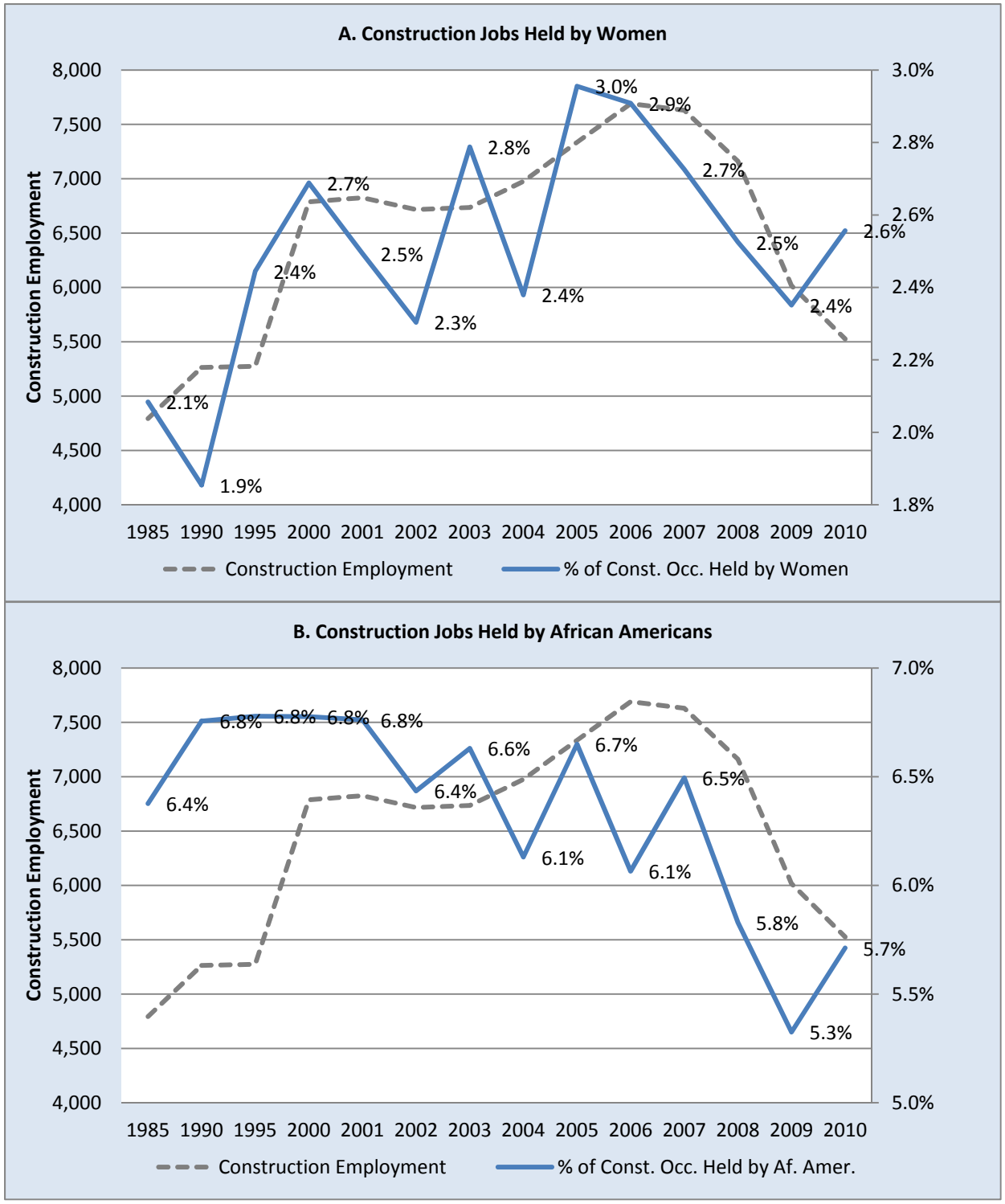
THE IMPACT OF THE EXPANDED FEDERAL ROLE IN CONSTRUCTION ON WOMEN AND MINORITY WORKERS: A FIRST LOOK

If federal affirmative action policies have their intended effect, the passage of the ARRA should cause a relative rise in the proportion of women and minority construction workers, and conversely, a fall in the proportion of white male construction workers.

Figure 1 provides a first look at whether these trends coincide with any noticeable improvement in the diversity of construction occupations. Panel A of Figure 1 presents the proportion of construction jobs held by women from 1985 to 2010.[11] For context, the figure also presents the trend in construction employment to indicate the overall health of the industry.

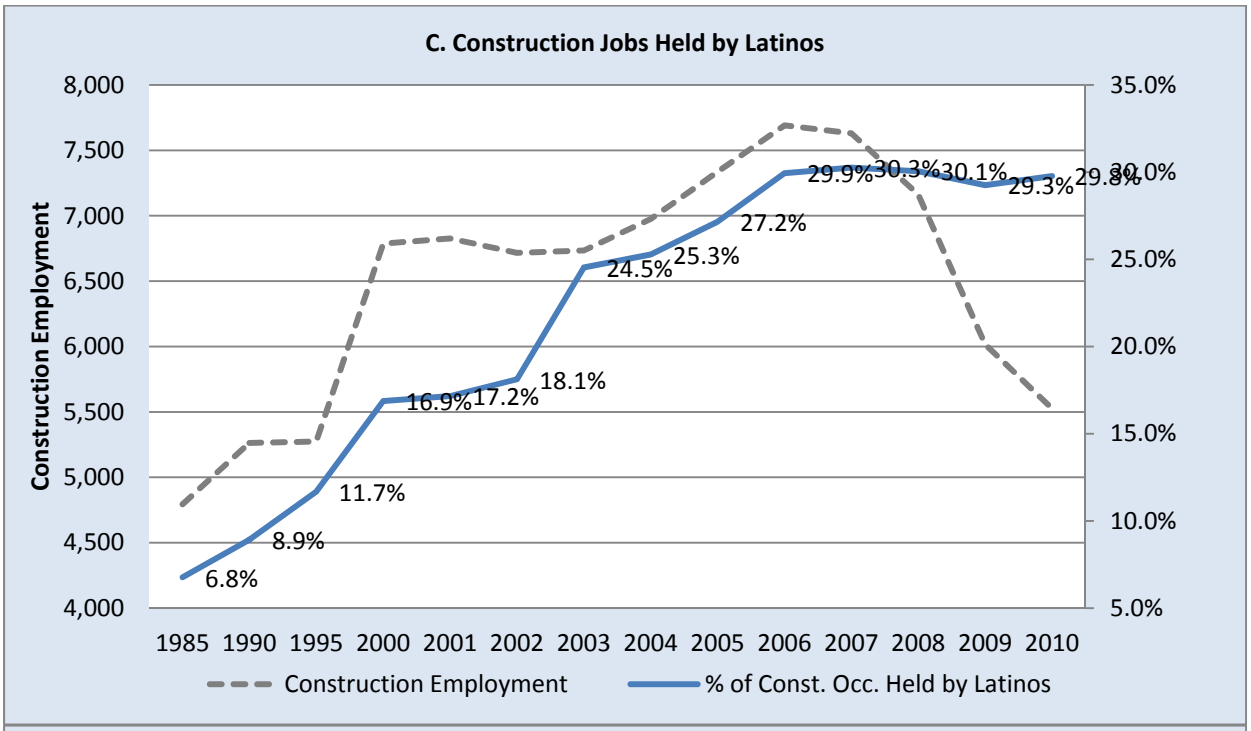
Two observations immediately jump out from this figure. First, over the past quarter century, women have only achieved a one-percentage point gain in their representation among construction occupations—an astonishingly small degree of achievement. This despite the fact that as of 2010, women made up 46.7 percent of the U.S. labor force.

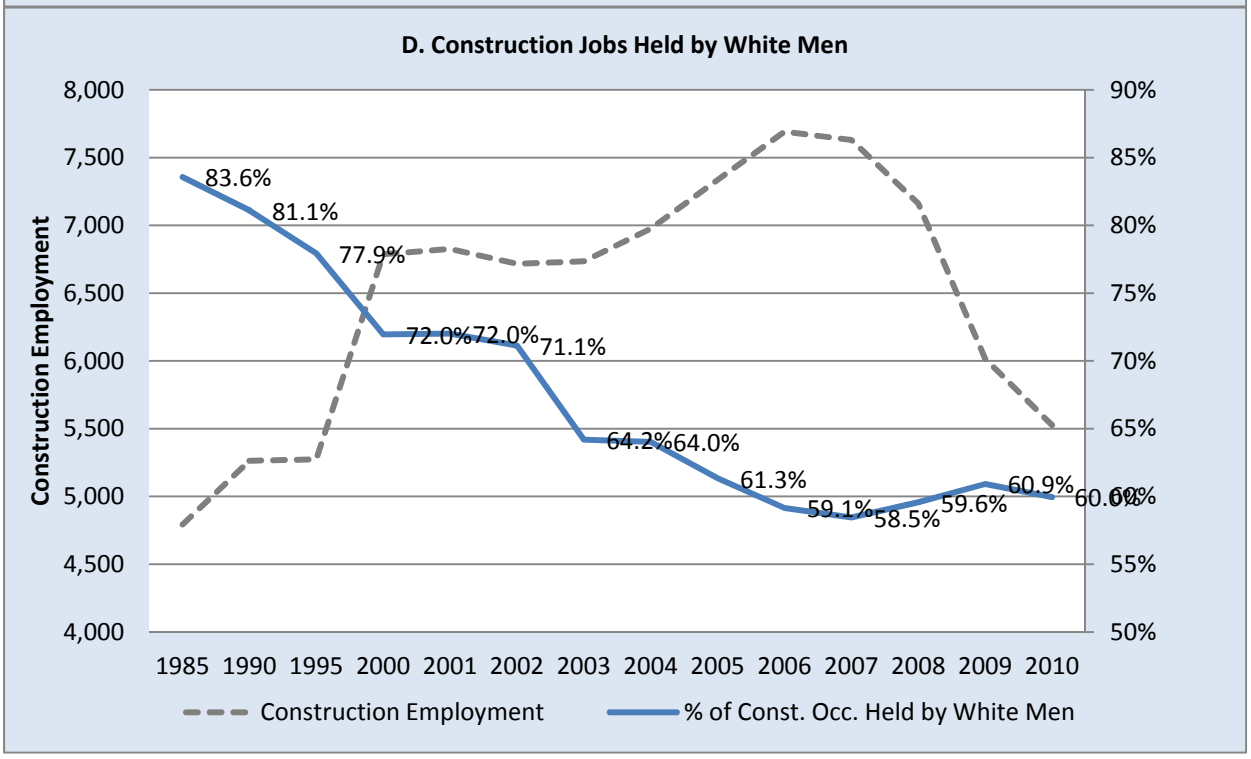
Figure 16.1. Trends in the Diversity of Construction Occupations, 1985-2010



(continued on next page)

Figure 16.1. Trends in the Diversity of Construction Occupations, 1985-2010 (continued)





Second, the trend in the proportion of women in construction occupations tracks the level of construction employment. This link suggests that the challenge of getting women into construction jobs may be difficult, but not impossible. The fact is that as the housing market heated up, employers figured out ways to find, hire, and train female workers.

These gains, however, fell away as the construction sector imploded between 2006 and 2009. The beginnings of a reversal appear by 2009 and 2010, the years that coincide with the passage and implementation of the ARRA. During these last two years, the proportion of women in construction occupations regained some of this lost ground.

The proportion of black construction workers (Figure 1, panel B) does not track construction employment in the same way as the proportion of female construction workers, with the exception of the period after 2006. After 2006, the proportion of black construction workers slides downward to levels even lower than in 1985. In 2010, African American workers held 5.7 percent of construction jobs, markedly lower than their 11.6 percent share of the labor force. An uptick from 2009 to 2010, as with the women workers, suggests that the downward trend may be slowing.

The fraction of Latino workers in construction has been, for the most part, rising rapidly since 1985 (Figure 1, panel C). By 2000, their share of construction jobs surpassed their share of the labor force. As a result, from 2000 onward, Latinos are *over*-represented in the construction work. This rise comes to a halt after 2006, and then dips slightly with the onset of the recession. In other words, even this group of workers that has seen its share of construction jobs quadruple from 7 percent in 1985 to 30 percent in 2006 has been affected by the contraction of the construction industry. For this group, as with women and African Americans, the downward trend appears to reverse in 2010.

Panel D of Figure 1 presents the trends for the proportion of white males in construction occupations—the demographic group historically over-represented among construction workers. The proportion of white male workers has been falling consistently with the exception of the years following the collapse of the housing market and bottoms out at 58 percent in 2007. Even at this level, these men are over-represented in these occupations. In the same year, white men made up 44.5 percent of the all workers. The proportion of white male construction workers then rises a few percentage points as construction employment plummeted through 2009. In 2010, though the number of construction jobs continued to fall, the proportion of white male construction workers declines.

Broadly speaking then, the construction employment opportunities for women and minority workers appear to rise and fall with the employment levels of the construction industry. A break in this pattern appears around the years that coincide with the implementation of the ARRA, 2009 and 2010. During those years, both women and minority workers appear to regain some of the ground they lost during the collapse of the housing market.[12] The pattern for white males is the mirror-opposite. These trends provide preliminary evidence that federal affirmative action policies strengthened by the ARRA succeeded in increasing the diversity of the construction workforce.

CAN THE EXPANDED FEDERAL ROLE IN CONSTRUCTION BE LINKED TO GREATER DIVERSITY IN CONSTRUCTION?

How strong is the apparent link between construction employment trends, the diversity of the construction workforce, and the greater coverage and activity of the OFCCP associated with the passage of the ARRA? A couple of simple empirical exercises can help answer this question.

Research Approach

First, I compare the trends in the gender and racial/ethnic diversity of two different sets of occupations—construction and production occupations. These two sets of jobs share several important qualities: both require similar levels of educational credentials, both have a predominance of white males, both have a relatively high--if declining--level of unionization, and both suffered significant employment losses since the 2007. The crucial difference between these two sets of occupations--for the purposes of this study—is that only construction occupations should have experienced a substantial increase in EO 11246 coverage and enforcement activities.

Prior to this 2009, I would expect the trends across the two occupations to be roughly similar.[13] If the passage of the 2009 ARRA sharply increased the share of construction workers under the coverage of a more rigorously enforced EO 11246 then representation of women and minority workers should rise after 2009. This increase should occur among construction occupations only. If both construction and production occupations experience a similar rise in the proportion of women or minority workers after 2009, this would cast doubt on the possibility that OFCCP affirmative action policies are behind any increase in the diversity of the construction workforce, since production occupations did not undergo a similar set of increased OFCCP coverage and enforcement.

I use regression analysis to isolate the impact of the passage of the ARRA while also taking account of the important influence of employment growth.[14]

This approach has a couple advantages. First, this investigation focuses on the impact of affirmative action policies specifically during a downturn in the economy. Past research has focused on the question of whether affirmative action policies are more effective when firms expand. Leonard (1984b), for example, finds evidence that when federal contractors are expanding, these employers increase their proportion of black workers in their workforce faster. But this also implies that federal contractors decrease their proportions of black workers faster than other employers when their firms are shrinking. This raises an important policy concern: in order for affirmative action policies to succeed, they need to protect women and minority workers during downturns.

Second, this approach avoids mistaking a simple shift of employers with a more diverse workforce into federal contracts with a rise in the overall diversity of construction workers. Such a shift would occur if construction employers with a more diverse staff succeed in their bids for federal contracts at a higher rate than employers with a less diverse staff. This would increase the diversity of the federal contractor workforce but also decrease the diversity of the non-federal contractor workforce. I can avoid this selection bias problem by looking at the diversity of workers across all construction jobs, regardless of contractor status.

Results and Discussion

In Table 1, I present the basic findings from this first difference-in-difference analysis (see columns 1 and 2). I first present estimates of how the fall off in construction employment affects each group of workers in order to put the impact of the ARRA into context.

The figures in the first column show how the proportion of each group of workers responds to a substantial ten percent fall off in employment—an amount roughly equal to the average annual rate of job loss in con-

struction since 2007. The employment share of white men rises by nearly two percentage points for every ten percent fall in employment. In other words, white male construction workers disproportionately avoid layoffs as construction activity declines. These results match the pattern displayed in the descriptive figure above – the share of construction jobs held by white men rose as overall construction employment dipped.

Two of the three other groups--women and Latinos—lost their jobs at a faster rate than other workers during a downturn. This suggests that Latinos do not hold the same privileged position as white male workers, despite their high over-representation.[15] The estimated impact of changes in construction employment, however, for these workers as well as African American workers is too imprecisely estimated to be statistically significant.

Table 16.1. Changes in the Diversity of Construction Occupations

Change in % of:	**Estimates of the Impact of ARRA on Construction Occupations**		**Estimates of the Impact of ARRA on Construction Occupations by Spending Level**		
	(1) Impact of 10% fall in construction employment	(2)Impact of ARRA	(3) Impact of 10% fall in construction employment	(4) Impact of ARRA in states that received low levels of ARRA funds	(5) **Additional** impact of ARRA in states that received high levels of ARRA funds
White males	+1.7%*	-0.7%	+1.6%*	-1.7%	-2.4%*
Females	-0.1%	+0.8%*	-0.3%	+0.3%	+0.6%
African Americans	+0.1%	+0.5%	-0.9%*	+1.0%*	-0.4%
Latinos	-0.7%	-0.7%	-0.6%	+0.2%	+2.8%*

** statistically significant at 0.10 level. See Technical Appendix for regression model coefficients and standard errors.*

In the second column of Table 1, I show the estimated impact of the passage of ARRA on the composition of construction workers. The estimate for both white male workers and Latinos indicates that their share of jobs shrunk slightly—by 0.7 percentage points—after the passage of ARRA and the increase in OFCCP activities. On the one hand, the small magnitude of these estimates makes them statistically indistinguishable from zero. On the other hand, their losses appear to be women's (and possibly African American's) gain.

The passage of the ARRA appears to boost the share of construction jobs held by women +0.8 percentage points.[16] For women, a gain of this size is more than enough to make up for the roughly -0.3 percentage-point estimated loss in construction jobs from the recent downturn. A net gain of this size—+0.5 percentage points—is dramatic for women. This is equal to about a 20-percent improvement in their average share of construction jobs over the entire 1985-2010 period. Black workers also appear to experience a similar gain in their proportion of construction jobs after the ARRA, but this estimate is only suggestive.

Overall then, the ARRA and the associated greater affirmative action coverage and enforcement, appears to help women in particular. This change, however, is not large enough to create a measurable impact on white male construction workers who appear to be better protected than other workers from layoffs when con-

struction activity falls. The estimates for the other two groups of workers who could also potentially gain from the passage of ARRA, blacks and Latinos, are too inconsistent to draw any strong conclusions.

Does the Impact of the ARRA Depend on How Much ARRA Funds States Receive?

In this second exercise, I focus on construction workers exclusively and compare the employment trends in among workers in states that received a relatively high level of ARRA construction dollars, relative to the size of their March 2009 construction workforce, to trends among workers in all other states.

The basic idea here is that the relative concentration of ARRA dollars should reflect the relative increase in the scope of EO 11246 coverage and application. And, if greater levels of EO 11246 activities more effectively diversify the construction workforce, there should be an observably higher level of impact of the ARRA among such "high-ARRA impact" states.[17] I therefore test whether the *difference* in the proportion of women and minority construction workers in "high ARRA-impact" states before and after the passage of the 2009 ARRA is substantively and statistically *different* from workers in other states. I present the basic results in Table 1, columns 3-5.

In line with my earlier findings, the figures in the third column of Table 1 suggest that poor labor market conditions erode the share of construction jobs held by women and Latino workers. This time, however, the estimate for black workers indicates that they too experience a faster rate of construction job loss when overall construction employment falls. As before, white male workers are more insulated from these jobs losses—their share construction jobs rises by 1.6 percentage points when construction employment falls by 10 percent.

In columns 4 and 5 of Table 1, I show the estimated impacts of the ARRA on construction jobs in "low to moderate" ARRA states (row 2) and "high" ARRA states (row 3). There is strong evidence that the proportion of white male construction workers shrinks primarily in states with high ARRA spending levels. Their proportion of construction jobs fell by over two percent in these states—enough to offset half the share of construction jobs that these workers can be expected to have preserved for themselves when construction employment fell by roughly 30-percent.

The results for women are less clear. The estimates for female workers suggest that more ARRA spending leads to greater gains in construction jobs for women, however, these estimates are too imprecise to draw strong conclusions.

African American workers, in contrast, appear to gain in construction jobs across all states regardless of ARRA spending level. But this result only weakly supports the possibility that the ARRA benefited African American workers. On the one hand, a possible explanation for these results is that employers in high ARRA-spending states face a relatively bigger hurdle in getting and training black workers. This is because these states have a smaller of proportion of black workers generally (8 percent versus 12 percent), and an even smaller proportion of black construction workers (4 percent versus 7 percent).[18] Therefore, in more ARRA dollars produce the same results in high ARRA spending states as in low-to-moderate ARRA spending states. On the other hand, a positive impact across *all* states may just reflect general labor market trends rather than an ARRA policy-specific effect. Recall that this exercise identifies the impact of the ARRA policy by detecting a *greater* impact in high ARRA-impact states compared to low ARRA-impact states.

This is, in fact, what I observe for Latino workers. The figures in Table 1 show that among high ARRA-impact states, Latino workers gain nearly three-percentage points in their share of construction jobs after the ARRA—more than enough to offset their losses caused by the overall decline in construction employment.[19]

CONCLUSION

Recent events linked to the American Recovery and Reinvestment Act of 2009 breathed new life into federal affirmative action policies. By March 2011, $32 billion ARRA dollars substantially expanded the proportion of construction activities that would fall under EO 11246 affirmative action regulations. Newly appointed Labor Secretary Hilda Solis, who has expressed firm support for affirmative action policies, would oversee the affirmative action enforcement agency, the OFCCP, made stronger by the ARRA. I use this set of events to investigate the effectiveness of federal affirmative action policies.

Overall the evidence reported here links the passage of ARRA most strongly to reducing the extent to which white men were able to hold onto a disproportionate share of construction jobs in the wake of a dramatically shrinking construction sector. This result is matched by measureable improvements in the representation of women and Latino workers among construction workers. The picture for African American workers is less clear.

Though Latinos are over-represented among construction workers, similar to white men, their gains may not be an affirmative action failure. Similar to women and African Americans, Latinos appear to be more vulnerable to layoffs during downturns in construction employment than their white male counterparts. In effect, Latinos' affirmative action gains reduce their disproportionate share of job loss. Still, a more successful affirmative action policy should result in stronger gains for African Americans in particular.

Two other observations come out of this study. First, black workers, and possibly also women, gain access to white-male dominated jobs when times are good. This is further evidence that when employers have sufficient incentive to do so--in this case, a growing need for workers--they can and do find women and minority workers to hire. Second, these workers need affirmative action policies to protect them from *losing* ground when times are bad. The absence of such protections will prevent these workers from making progress over time.

The U.S. economy has clear and pressing needs for continued federal spending on construction activities. Strong affirmative action policies coupled with such spending could represent a rare *opportunity* to increase the diversity of the construction workforce.

TECHNICAL APPENDIX

Data

For data on the demographic profile of construction and production occupations I use the Current Population Survey (CPS), 2003-2010. ARRA spending per state data are published at www.recovery.gov. I used state-level construction employment to adjust state-level ARRA spending for the size of each state's construction sector. Estimates of state-level construction employment for the March 2009 are published by Quarterly Census of Employment and Wages program of the BLS which publishes a quarterly count of employment and wages reported by employers covering 98 percent of U.S. jobs.

Model 1:

To focus in on occupation-specific changes, I use summary measures of the workforce in each occupational group as my unit of observation. In order for the data to be sensitive to the changes that occurred right before and after ARRA passed in Feb. 2009, I use bi-annual observations. As a consequence of these two priorities, my level of observation must be aggregated above the state-level. Therefore, my sample has a small number of observations (28) which limits the number of controls I can use. I use Leonard (1984b) as a guide for the most essential controls for this type of analysis. Finally, note that my post-ARRA control can be thought of as what Kennedy (1998) refers to as a "period-specific" dummy: There are exactly three "post-ARRA" observations for construction workers and three "post-ARRA" observations for production workers.

The first regression analysis is based on the model:

$$\textit{Change in \% of jobs held by women}_{t,o} =$$

$$a + B1\ (\textit{Construction Occupation}_o) + B2\ (\textit{Post-ARRA}_t) + B3\ (\textit{Construction Occupation}_o) \times (\textit{Post ARRA}_t) + B4\ \ (\textit{\%Change in Employment Level}_t)\ + B5\ (\textit{\%Change in Employment Level}_t) \times (\textit{Construction Occupation}_o)\ + B6(\textit{Half}_t) + B7(\textit{Change in \% union members}_{t,o}) + B8(\textit{Change in \% of Jobs in the Northeast}_{t,o}) + B9(\textit{Change in \% of Jobs in the Midwest}_{t,o}) + B10(\textit{Change in \% of Jobs in the South}_{t,o}) + e_{t,o}$$

where t indexes the time period and o indexes the occupational group. The variables *Construction Occupation*, *Post-ARRA*, and *Half*, are indicator variables. The time period studied is between 2003 and 2010. Each time period is six months, January-June (Half=1) and July-December (Half=0). Therefore, each year has two observations. Change measures however are over one year to control for seasonal fluctuations in employment (e.g., change from Jan.-June 2003 to Jan.-June 2004). Therefore, the total number of observations in this analysis is 28 (14 biannual observations per occupational group). The indicator variable "Post-ARRA" equals 1 for: July-Dec. 2009, Jan – June 2010, and July – Dec. 2010. I use linear regression with panel-corrected standard errors to estimate this model and assume panel-specific first-order auto-correlation and heteroskedastic errors.

I estimate this model separately for three other dependent variables: "Change in % of Jobs Held by African Americans," "Change in % of Jobs Held by Latinos" and "Change in % of Jobs Held by White (Non-Latino) Men." The full set of results is presented in Table A.1.

Table A.16.1: Regression results

Independent variables:	Model 1		Model 2	
	Coefficient	**Std. Error.**	**Coefficient**	**Std. Error.**
A. Dependent Variable: Change in % of jobs held by women				
Construction Occupations	0.002	0.002		
% Change in Employment	0.072	0.025	0.031	0.020
% Change in Employment x Const. Occ.	-0.060	0.033		
Post ARRA	-0.005	0.003	0.003	0.003
Const. Occ. x Post ARRA	0.008	0.005		
High ARRA			0.000	0.002
High ARRA x Post ARRA			0.006	0.004
Half	-0.001	0.002	0.000	0.002
Change in % Union	0.059	0.081	-0.042	0.051
Change in % Northeast	-0.239	0.162	-0.027	0.150
Change in % Midwest	-0.006	0.161	-0.023	0.076
Change in % South	-0.105	0.117	-0.127	0.078
Constant	-0.002	0.002	-0.001	0.002
Linear combination of: % Change in Employment + % Change in Employment x Const. Occ.	0.012	0.025		
B. Dependent Variable: Change in % of jobs held by African Americans				
Construction Occupations	-0.001	0.002		
% Change in Employment	0.046	0.028	0.088	0.045
% Change in Employment x Const. Occ.	-0.057	0.038		
Post ARRA	0.000	0.003	0.010	0.006
Const. Occ. x Post ARRA	0.005	0.006		
High ARRA			0.002	0.004
High ARRA x Post ARRA			-0.004	0.009
Half	0.000	0.003	0.000	0.004
Change in % Union	0.014	0.107	0.062	0.118
Change in % Northeast	-0.541	0.184	-0.046	0.338
Change in % Midwest	-0.208	0.191	0.152	0.177
Change in % South	-0.306	0.140	0.054	0.182
Constant	0.000	0.002	-0.002	0.003
Linear combination of: % Change in Employment + % Change in Employment x Const. Occ.	-0.011	0.030		

(continued on next page)

Table A.16.1: Regression results, continued

Independent variables:	Model 1		Model 2	
	Coefficient	Std. Error.	Coefficient	Std. Error.
C. Dependent Variable: Change in % of jobs held by Latinos				
Construction Occupations	0.012	0.004		
% Change in Employment	-0.106	0.032	0.057	0.038
% Change in Employment x Const. Occ.	0.177	0.051		
Post ARRA	0.004	0.004	0.002	0.008
Const. Occ. x Post ARRA	-0.007	0.008		
High ARRA			-0.012	0.005
High ARRA x Post ARRA			0.028	0.010
Half	-0.001	0.003	0.001	0.003
Change in % Union	-0.098	0.134	0.220	0.081
Change in % Northeast	-0.332	0.247	-0.223	0.332
Change in % Midwest	-0.073	0.231	-0.614	0.125
Change in % South	0.013	0.199	0.146	0.135
Constant	-0.001	0.002	0.006	0.004
Linear combination of: % Change in Employment + % Change in Employment x Const. Occ.	0.071	0.045		
D. Dependent Variable: Change in % of jobs held by white men				
Construction Occupations	-0.011	0.005		
% Change in Employment	-0.020	0.041	-0.161	0.049
% Change in Employment x Const. Occ.	-0.152	0.063		
Post ARRA	-0.003	0.005	-0.017	0.008
Const. Occ. x Post ARRA	-0.007	0.010		
High ARRA			0.010	0.005
High ARRA x Post ARRA			-0.024	0.013
Half	0.000	0.003	-0.002	0.004
Change in % Union	0.024	0.154	-0.283	0.118
Change in % Northeast	0.175	0.306	0.386	0.417
Change in % Midwest	0.078	0.278	0.748	0.175
Change in % South	0.293	0.236	0.051	0.189
Constant			-0.003	0.004
Linear combination of: % Change in Employment + % Change in Employment x Const. Occ.	-0.172	0.055		

N: 28.

Model 2:

The second model is analogous to the first model and is estimated using the same assumptions as above:

$$\textit{Change in \% of jobs held by women}_{t,s} =$$

$$a + B1\ (\textit{High ARRA}_{s}) + B2\ (\textit{Post-ARRA}_{t}) + B3\ (\textit{High ARRA}_{s}) \times (\textit{Post ARRA}_{t}) +$$
$$B4\ \%\ (\textit{Change in Employment Level of Construction Occupations}_{t,s}) + B5(\textit{Half}_{t}). +$$
$$B6(\textit{Change in \% union members}_{t,s}) + B7(\textit{Change in \% of Const. Jobs in the Northeast}_{t,s}) +$$
$$B7(\textit{Change in \% of Const. Jobs in the Midwest}_{t,s}) + B7(\textit{Change in \% of Const. Jobs in the South}_{t,s}) + e_{t,s}$$

where t indexes the time period and s indexes the ARRA-spending level area. The variables *High ARRA*, *Post-ARRA*, and *Half* are indicator variables. High ARRA spending level area the total level of ARRA funds received for construction activities in each state through March 2011 divided by each state's total number of construction jobs as of March 2009 (as published by the BLS QCEW program). The spending level therefore is scaled according to the size of each state's construction sector at the time that the ARRA began implementation. The High ARRA spending area includes all states that have an above-average value for this measure (greater than the 75th percentile). All other states make up the "Other ARRA spending" area. Note that the interquartile range for the spending level in the High-ARRA spending areas is $10,300 - $16,500. The interquartile range for Low ARRA spending areas is $4,500 to $6,300. The total number of observations in this analysis is 28 (14 biannual observations for each of the two ARRA spending level groups).

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[1] This paper benefited from the comments on an earlier draft by Randy Albelda and Thomas Weisskopf.

[2] See Heintz, Pollin, and Garrett-Peltier (2009).

[3] See Pollin, Heintz, and Garrett-Peltier (2009).

[4] Here and throughout this paper "white men" refers to white, *non-Latino*, men.

[5] Leonard (1990).

[6] Note that employer establish goals, not rigid quotas. Such quota are not allowed except when court-ordered as part of a lawsuit.

[7] See Department of Labor OFCCP regulations for construction contractors: < http://www.dol.gov/ofccp/TAguides/consttag.pdf >

[8] Federally-assisted contracts include construction work which is, "…paid for in whole or in part with funds obtained from the Government or borrowed on the credit of the Government pursuant to any Federal program involving a grant, contract, loan, insurance or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance or guarantee, or any application of modification thereof approved by the Government for a grant, contract, loan, insurance or guarantee under which the applicant itself participates in the construction work." (See: http://edocket.access.gpo.gov/cfr_2009/julqtr/41cfr60-1.3.htm)

[9] For more details, see: http://www.dol.gov/ofccp/OFCCPRecoveryActPlan.htm.

[10] See U.S. Department of Labor "Budget in Brief" (< www.dol.gov/dol/budget/2010/PDF/bib.pdf >).

[11] To focus attention on the years leading up to the ARRA, I show figures for every five years between 1985 and 2000, and then for every year thereafter.

[12] Could the rule of "last hired, first fired" explain the slower pace of job loss among women and minority construction workers after 2009? This almost certainly contributed to the greater pace of job loss among these groups as construction jobs disappeared from 2006 to 2008. However, the extremely small proportions of the construction workforce taken up by women and African Americans make seniority rules an implausible explanation for why they held onto to their jobs better after 2009. Even if only high seniority women and minority workers remained after 2009, one would expect that there would nearly always be a white male worker with at least as much as, if not more, seniority. Therefore, on the basis of seniority rules, any jobs saved after 2009 can be expected to be those held by white males. This seniority explanation is more plausible in the case of Latinos, given their large share of construction jobs. However, the fact that all three groups show signs of improvement after 2009 points to an alternative explanation.

[13] However, in the model--discussed in more detail in the Appendix--I do allow the demographic measures to change at different rates with changes in construction or production occupation employment.

[14] I also allow for construction and production employment growth to affect the changes in the proportion of women (or other group) at different rates. The regression controls include regional shifts in employment, changes in unionization rate, seasonality, and time invariant occupation-group characteristics. See the technical appendix for the model and full set of results.

[15] Note that they are *not* over-represented in the top ten highest-paying construction occupations as identified by the DOL's May 2010 National Occupation Employment and Wage Estimates <http://www.bls.gov/oes/current/oes_nat.htm#47-0000>.

[16] Interestingly, the magnitude of the 0.8 estimate is in line with those estimated by Beller (1982). Beller's estimates imply that a ten percent increase in the share of an industry's output going to the federal government would raise the probability that a woman would hold a male-dominated job by 1.7 percent. This is about the same size in the gain in the share of construction occupations that I estimate women gain when the share of public spending in construction rose about 10 percent over 2009 and 2010. To see this, consider that 1.7 percent of employed women in about equal 0.8 percent of all workers. If these women are distributed across male-dominated

occupations in proportion to each occupation's share of total employment, then each occupation would see an increase in their share of women by 0.8 percent.

[17] These states include Maine, Vermont, Rhode Island, Michigan, Minnesota, North Dakota, South Dakota, Arkansas, Montana, Idaho, New Mexico and Alaska. See technical appendix for spending levels.

[18] This is not the case with regard to women. Women make up similar proportions of the total workforce (50 percent), and the construction workforce specifically (3 percent), in both high and low ARRA-impact states.

[19] In results not presented here, I also tested whether the composition of the top ten highest paying construction occupations changed with the ARRA by using the same model but changing the dependent variable to the % of high-paying construction jobs held by each group. I found no evidence that Latinos made gains, with the ARRA, in these occupations or that white men reduced their share. Sample sizes are insufficient to do the same analysis for women or black workers. I identified the top ten occupations as noted in footnote 15. In other words, ARRA appears to have helped diversify mainly the lower paying occupations.