

Has Affirmative Action Affected Minority or Female Leadership of Manufacturing Firms?

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Abstract

Over the last 55 years, the federal government has implemented legislation intended to increase minority and female involvement in the labor force. Despite efforts intended to fight discrimination, there are still only 21 female and 5 black CEOs among Fortune 500 firms. Affirmative Action legislation is enforced specifically on firms with government contracts. Utilizing firm level data from the National Establishment Time Series, I estimate the effect government contracts have on female or minority leadership of manufacturing firms via a linear probability model with a robust set of controls. Previous literature has found firms who have federal contracts have higher levels of female or minority representation in higher paying roles. My results have shown that government contracts have increased the likelihood of having a female CEO by 1.5 percentage points and have increased the likelihood of having a minority owner by 5 percentage points.

I. Introduction

The inclusion and advancement of minorities and women in the labor force has been a matter of debate in the United States for centuries. Since the 1960s, the government has taken steps to eliminate discrimination in the labor force and push for equality at all levels. In order to understand the importance of studying the effects of the laws and regulations put in place on government funded programs, it's necessary to understand the history of the multiple legislative pieces and executive orders signed to help the advancement of minorities and women.

President Kennedy signed Executive Order 10925 in 1961 which was the first push by the Federal Government to make firms who hold a government contract to take "affirmative action" in the hiring process. The executive order only protected those in terms of their race, skin color, national origin, and religion. In 1965, President Johnson expanded the protection of affirmative action to women with Executive Order 11246. In conjunction with expanding affirmative action, Johnson created an entirely new department in the Department of Labor to implement and enforce affirmative action. The Civil Rights Act of 1964, specifically with Title VII, which prohibited any discrimination in employment based on race, sex, skin color, religion, and national origin. The Civil Rights Act of 1991 contained Title II, also called the Glass Ceiling Act, which was an initiative to find ways to promote minorities and women in business and eliminate artificial barriers to entry blocking their advancement in firms. In 2009, the Lily Ledbetter Fair Pay Act was signed by President Obama which eliminated the restrictions on employees to file claims of pay discrimination.

According to the Department of Labor, the number of women who were in the civilian labor force in 1960 was 23,240,000 which was equivalent to 33.4% of the labor force. After the multiple executive orders and Civil Rights Acts passed, the number of women who were in the

labor force as of 2015 is 73,510,000 which is equivalent to 46.8% of the civilian labor force. Women have seen a 13.4 percentage point increase in the percentage of the labor force they represent, but the increase in the number of women who are in the civilian labor force is even more telling. From 1960-2015, women have seen roughly a 316% increase in the civilian labor force while men have only grown at 180%. In terms of Labor Force Participation Rates, women as a whole have seen much larger increases while men as a whole have seen huge decreases in their participation rates. In 1948, the Labor Force Participation Rate for men was 86.6% and for women was 32.7%. By 2015, men's Labor Force Participation Rate has fallen 17.5 percentage points to 69.1% and women's have grown by 24 percentage points to 56.7%.

While observing the effects on women in the labor force, it's equally important to observe the effects of this legislation on and other societal factors on minorities. The Department of Labor has observed and collected data on Labor Force Participation Rates for both men and women since 1948-2015. Asian men and Hispanic men have higher labor force participation rates than white men, black men have significantly lower participation rates compared to other groups. Black men's Labor Force Participation Rates in 2015 was 63.8% and while it is slowly on the rise, the next closest group, white men, has a Labor Force Participation Rate 5.9 percentage points higher. When observing minority women, black women have the highest participation in the labor force compared to any other group of women. All women have seen large increases in labor force participation, but black women and Hispanic women have seen the largest share of the growth in participating in the labor force.

The focus of the paper is to observe the effects of government contracts have on women and minority advancement in the manufacturing sector in America. Previous literature (see Kurtulus 2012, Leonard 1990, Carrington et. al 2000, and Chay 1998) have all shown minority

and women advancement in the labor force. My results have shown similar results to all the previous literature on the subject. When a firm holds a government contract and affirmative action laws and regulations can be enforced on the firm, both minority ownership and female leadership are positively affected.

The paper is organized into an additional six sections. Section II discusses previous literature on the subject and its continued research. Section III connects the topic to economic theory on regulation and explains the idea behind each side. Section IV defines the data set used in order to answer the question as well as discussing the variables used in the model by defining them and discussing their summary statistics. Section V explains the empirical approach used to answer the question and discusses the results generated from regression analysis. Section VI discusses the limitations of the model and the research. Lastly, Section VII states the conclusions derived from my results and offers ideas of future research on the subject.

II. Literature Review

Previous studies have approached the question in multiple ways and have significant evidence of affirmative action succeeding in incorporating minorities and women into the labor force (see Leonard 1984, Leonard 1990, Chay 1998, Carington et al 2000, and Kurtulus 2016), but also showing affirmative action has plenty of concerns to consider when evaluating the outcomes brought forth (see Leonard 1990, and Coate and Loury 1993). While there is research showing affirmative action working across all industries, there doesn't appear to be any studies which focus primarily on the manufacturing industry in America.

Multiple studies have shown the positive impact affirmative action has had on the incorporation of minorities and women into the labor market consisting of both small and large firms (Leonard 1984, Leonard 1990, Chay 1998, Carington et al 2000, and Kurtulus 2016). A

recent study done by Fidan Ana Kurtulus (2012) focused on the occupational advancement of minorities and women in firms which hold government contracts and firms which do not hold government contracts. Her research utilized EEO-1 Employer Information Reports for 1973 and 1978-2003 provided by the Equal Employment Opportunity Commission. While women and minorities have seen their share of occupational growth, her findings show the occupational advancement of minorities and women into high paying, skilled positions occurred more at firms which held a government contract than firms without a government contract. Specifically, Kurtulus has been able to show government involvement through proper and effective affirmative action legislation can increase women and minority growth and see a breaking of the infamous “Glass Ceiling”. Her findings support a previous study done by Jonathan S. Leonard (1984) which also supported effective affirmative action programs could increase the likelihood of women and minorities holding similar occupations as white men.

It’s equally important to list the concerns of affirmative action legislation which has been brought up in previous literature (see Leonard 1990, Coate and Loury 1993, Carrington et al 2000, and Kurtulus 2016). Leonard (1990) reported “affirmative action has helped promote employment of minorities and women...”, but he raised as a concern if affirmative action has effectively lessened levels of discrimination or if affirmative action has introduced reverse discrimination specifically for white males. He also noted the ways in which affirmative action have been implemented and what affirmative action targets needs necessary revision and improvement. Coate and Loury (1993) conducted a theoretical analysis on if affirmative action would eliminate stereotypes employers have on minorities and women. Through their study, they were able to conclude affirmative action would “necessarily eliminate negative stereotypes”; however, they went on to include how affirmative action laws may only strengthen preexisting

stereotypes and only making them worse. They feared affirmative action laws would become a necessity for minority and women growth in the labor market which would cause a sense of favoritism towards these groups.

III. Economic Theory

In theory, regulation, both private and public, is used to either correct a market failure which exist in the market or to correct a negative behavior in the market which is harming a group of individuals. Effectively targeted regulation which is put in place and properly monitored can lead to a correction in the perceived market failure; however, as economists, it's imperative for the field of study to not only focus on the effects of the regulation on the group the regulation is trying to make better, but to also consider the effects of the regulation on all other groups in the market. Policy makers often have good intentions when drafting legislation to help a group which is perceived as being harmed by the market they are participating in, but rarely do these policy makers study how everyone else in the market will be impacted (Hazlitt 1946).

When looking at affirmative action regulation, the first step is to study the group or groups which will benefit from the it. In this case, female and minority workers are the designated groups which are to receive the benefits of the regulation. As a policy maker, this is the end of my focus as I have drafted the legislation to improve these groups in the market and make them better off, but as an economist, I take what the policy maker has decreed and I look at the impact on every other group in the market (Hazlitt 1946). If minority and female workers are to be better off, which group am I taking away from? In observing this, if the regulation is not effective targeted and does not consider all the other groups, it could very well be the regulation will harm another group leading to potential reverse discrimination (Leonard 1990) or lead to

favoritism (Coate and Loury 1993). This goes back to the idea of Pareto Optimality where if the market is already in equilibrium, I cannot make one group better off without making someone else worse off.

IV. Data and Variable Definitions

The data I used to conduct my research comes from the National Establishment Time Series (NETS)¹, an unbalanced panel data set which covers the manufacturing industry in America and its territories. The data set covers the years from 1990-2013, and has over 1.4 million firm years which represent roughly 58,000 manufacturing firms in America². NETS includes a wide variety of industry identifiers, location characteristics, firm specific characteristics, and firm hierarchy. To properly use the data set, I had to destring variables of interest. To do so, I generated new variables within Stata with each one being a dummy variable. Any observations that were not filled within the variables of interest were dropped. Doing so left me with 201,536 firm years which represents roughly 8000 manufacturing firms.

Table 1 presents the summary statistics for the data collected.

Other than the independent employment variable, all other variables in the model, including the two dependent variables, are dummy variables with values equal to 0 or 1. To correctly understand the model, its importantly to identify the meaning behind each variable in the model. The first of the dependent variables, female CEO, is equal to 0 if the CEO is a male and is equal to 1 if the CEO is a female. In this model, the number of firm years which are represented by a female in the CEO position is just under 16.1%, which is roughly 1300 firms. The other dependent variable, minority owner, is equal to 0 if a minority does not have a minority owner

¹ The National Establishment Time Series data set is provided by Walls & Associates who partnered with Duns & Bradstreet to combine the data into one data set.

² Since not all firms have 24 years of data, a rough estimate is done to determine the number of firms in the data set.

and 1 if the firm does have a minority owner. Minority ownership represents 3.3% of the model, which is equivalent to roughly 270 firms.

There is a total of five independent variables I account for in my model. The key variable in the model is government contracts which is equal to 0 if the firm does not hold a government contract and 1 if the firm does hold a government contract. This is a key distinction in the model as the government is unable to enforce affirmative action laws on a firm unless it holds a government contract. Within the model, government contracts represent just under 3.6% of the firm years, which equals about 300 firms.

The next three independent variables measure how the firm is operated, as a subsidiary or public, and the size of the firm. Subsidiary is equal to 0 if the firm is not a subsidiary for another firm and is equal to 1 if the firm is a subsidiary of another firm. The number of firm years which are represented as a firm as a subsidiary is around 4%, which is around 330 firms. Public is a measure of whether the company is private or public, it is equal to 0 if the firm is private and 1 if the firm is public. The number of firm years in the model which are represented as being public is roughly equal to 4.5%, this is equivalent to around 370 firms. Lastly, employment serves as a proxy for the size of the firm. Since most the firms in the model have a relatively small number of employees, the variable has been logged to space of the firms with so few employees. This changes the way variable is defined. Unlike the dummy variables, the way to interpret the logged employment variable is a 100-percentage point increase will cause some percentage point value for the dependent variables. Since the NETS database observes changes in the firm on a yearly basis, the minimum value of the logged employment variable is 0 illustrating a firm with no employees and reaches a maximum of 9.2. The mean of the employment variable is 1.6 which illustrates most the firms being small firms with few employees.

The last independent variable in the model is the foreign ownership variable. Foreign ownership is equal to 0 if a foreign party does not have controlling interest in the firm and 1 if a foreign party does have controlling interest in the firm. Controlling interest is defined as an individual or party holding more than 50% of the shares in the company. This indicates once a firm has exactly one share more over the 50% threshold, they have controlling interest. In the model, foreign ownership represents 2.5% of the firm years in the model, which is roughly 200 firms.

The model also has a wide range of fixed effects which include state fixed effects, year fixed effects, and industry fixed effects. For state fixed effects, the omitted state is Alabama so all other states are measured in reference to Alabama. The state fixed effects serve to account for any changes at the state level in terms of state legislation and state business practices. Year fixed effects account for changes over the duration of the data set with 1990 being the omitted year. Lastly, the model has a large amount of industry fixed effects. The industry fixed effects are based on industry codes which represent the type of manufacturing firm. I used six digits of industry codes to have a wide variety of types of manufacturing firms, in this case 1582 different types of manufacturing firms, but I didn't move to the maximum of eight digits as I feared the industry codes would be too exact and may lead to extremely specific manufacturing firms which only have one firm in them which restricts variation in the model. The industry fixed effects are extremely important to the model as only certain types of manufacturing firms will even be considered for government contracts and in these firms, only specific characteristics will lead to a firm receiving a government contract over another firm.

V. Empirical Approach and Results

In order to estimate the effects government contracts have on leadership positions in manufacturing firms, I approached the question utilizing two separate Ordinary Least Square (OLS) regressions. The first regression measures the effects government contracts have on a female holding a leadership position in the firm while the other measures the effect on a minority having ownership of the firm. The two equations used are as follows and have a set of controls included with the key independent variable:

$$\text{female_CEO}_{it} = \beta_0 + \beta_1 \text{gov}_{it} + \Pi\Phi + \varepsilon_{it}$$

$$\text{minority_owned}_{it} = \beta_0 + \beta_1 \text{gov}_{it} + \Pi\Phi + \varepsilon_{it}$$

Both equations in the model share the same independent variables as described in the data section of the paper. The key independent variable in the model are government contracts which include affirmative action laws. The other controls include if the firm is a subsidiary for another firm, if the firm is a public, a proxy for the size of the firm in terms of employment numbers which is logged to spread out firms which only have a few employees, and if a foreign party has controlling interest in the firm.

The first regression, which has female CEO as the dependent variable, results are listed in below in Table 2.

For the female CEO regression, the adjusted R^2 value is equal to .2272 which indicates about 22.72% of the variation of female CEO can be explained in the model. The government contracts variable being the key independent variable is the variable of most interest in analyzing. For firms who hold a government contract, there is a 1.5 percentage point increase in the likelihood of having a female in a leadership position and this is statistically significant at the 99% level. This is a vital result as it illustrates affirmative action laws and regulations have had some impact on increasing the likelihood of a female being in a leadership position when the government can

enforce the legislation. Of the other four independent variables in the model, only public is not statistically significant at any of the traditional levels.

The other three variables illustrate how the firm is structured, how large the firm is in terms of the number of employees the firm has, and what party has controlling interest in the firm all have a significant effect on determining if a female is in a leadership position of the firm. Subsidiary is statistically significant at the 99% level and has a coefficient of $-.0407$. This indicates if the firm is listed as a subsidiary, there is a 4.07 percentage point decrease in the likelihood of there being a female in a leadership position. Firm size also plays an important role in determining leadership positions in the firm. The employment variable is a proxy for firm size and in the model, the variable has been logged to spread out the firms since a large amount of them have very few employees. Employment has a coefficient of $-.0295$ and is statistically significant at the 99% level. This means a 1 percent in employment size of a firm leads to a $.0295$ percentage point decrease in the likelihood of there being a female in a leadership position. However, this is the wrong way to observe this result as many firms in the model only have 3 employees meaning a 1% increase in employment would result in there now being 3.03 employees. Instead, a 100% increase in employment size leads to a 2.95 percentage point decrease in the likelihood of there being a female in a leadership position. The last variable controls for if a foreign party has a controlling interest in the firm. Foreign owned is statistically significant at the 95% level and has a coefficient of $.0114$. This results in a 1.14 percentage point increase in the likelihood of there being a female in a leadership position if a foreign party has controlling interest in the firm. For a female to have the best chance of being in a leadership position of a manufacturing firm, the firm needs to be private, not be a subsidiary for another firm, have very few employees, have a foreign party have controlling interest in the firm, and

there needs to be a government contract. In terms of female leadership though, affirmative action laws and regulation have shown a positive impact on increasing the likelihood of the firm having a female in a leadership position.

The second regression, which has the minority owned variable as the dependent variable, results are shown in Table 3.

The minority owned regression has an adjusted R^2 value of .1337 which indicates about 13.37% of the variation in the minority owned variable is explained by the model. For this model, all independent variables are statistically significant at the 99% level. Again, government contracts is the key independent variable in the model. For minority ownership, the coefficient on government contracts is equal to .0497 meaning if the firm has a government contract, there is a 4.97 percentage point increase in the likelihood of the firm having a minority owner. As before, this result being positive and significant is vital in determining if the laws and regulation have achieved the measures intended.

The remaining four independent variables are all statistically significant with multiple showing different effects on minority ownership as compared to female leadership. Once again, a firm which is a subsidiary to another firm has a negative coefficient and is statistically significant. The subsidiary variable has a coefficient of -.0166 which indicates the chances for a minority to be in an ownership position decreases by 1.66 percentage points when the firm is a subsidiary for another firm. Unlike the female CEO model, public is statistically significant in the likelihood of there being a minority owner. The public variable has a coefficient of -.0390 meaning a minority has a 3.90 percentage point decrease in the likelihood of being an owner if the firm is public instead of being private.

The last two variables give interesting results in terms of firm size and if a foreign party has controlling interest. As before, the employment variable will be observed in terms of a 100% increase in employment size rather than a 1% increase. Employment in this model has a coefficient of .0036 which means a 100% increase in employment size gives minorities a .36 percentage point increase in the likelihood of being an owner. While this coefficient is small. If a firm were to continuously double their employment size, minorities would experience a much larger likelihood of being an owner. A foreign party have controlling interest in the firm gives a differing result as compared to the female CEO model. Foreign ownership has a coefficient of -.034 which indicates a 3.40 percentage point decrease in the likelihood of there being a minority owner if a foreign party has controlling interest. All of these results indicate the best way for a minority to be the owner of the firm is to not be a subsidiary for another firm, be private, have larger employment numbers, have a domestic party with controlling interest, and the existence of a government contract.

While the both models do have a dummy dependent variable, the linear probability model was used instead of running the model in probit. While probit is used to bound any dummy variables from being outside of 0 to 1, the model has no variables which do so and since the model has a wide range of fixed effects, a probit model is not the best to run due to inconsistencies of fixed effects in probit regressions.

VI. Limitations

While the paper includes two regressions to account for female leadership and minority ownership, there is no regression in observing the effect of affirmative action laws and regulations of female minorities. Both female leadership and minority ownership are positively affected by these laws and regulations, the effects on female minorities is completely unknown.

Minorities are affected are a much higher percentage than females, but female minorities may be affected at a higher percentage point or a lower percentage point.

It's not so much limitation, but the effects of automation could illustrate interesting results for female leadership and minority ownership. Since firms that have a smaller number of employees benefit female leadership, if female lead manufacturing firms have a large amount of capital instead of labor, there could be an even larger impact on female leadership. Minority ownership would then be the opposite as firms with large amounts of labor benefit minority ownership more.

VII. Conclusion

The study performed supports previous studies and literature on the topics in showing affirmative action laws and executive orders have increased the likelihood of having a female in a leadership position and a minority in an ownership position. For female occupational advancement, the existence of a government contract at a firm increases the likelihood of having a female in a leadership position by 1.5 percentage points and is significant at the 99% level. Minority ownership has been positively impacted by government contracts with an increase of 5 percentage points in the likelihood of having a minority owner. My results have also shown the size of the firm to be statistically significant at the 99% level for the likelihood of having a female in a leadership position and for having a minority owner. Increasing the number of the employees at a firm by 100% causes the likelihood of having a female in a leadership position to decrease by 2.9 percentage points. The effects of firm size on minority ownership show the opposite. When increasing the number of employees at the firm by 100%, the likelihood of having a minority owner increases by .36 percentage points.

While this study only focusing on occupational advancement, future research would be interesting in study the effects of government contracts on labor market outcomes for female and minority workers. Expanding on this, seeing the effects on the manufacturing sector could potential show interesting results on labor market outcomes especially when considering automation.

Appendix

Table 1: Summary Statistics

Variable	Observations	Mean	Standard Deviation	Min	Max
Government Contracts	201536	.0359688	.1862127	0	1
Subsidiary Public	201536	.0395711	.1949498	0	1
Employment (logged)	201536	.0449399	.2071726	0	1
Foreign Owned	201536	1.646146	1.520719	0	9.21034
Female CEO	201536	.0253652	.1572321	0	1
Minority owner	201536	.1608596	.3674023	0	1
	201536	.0327832	.178062	0	1

Table 2. Regression Results (Dependent variable = female CEO)

Variable	Coefficient	Standard Error	t-stat	P-value
Government Contracts	.014835***	.0039477	3.76	0.000
Subsidiary Public	-.0406723***	.0034364	-11.84	0.000
Employment (logged)	-.0003189	.0037069	-.09	0.931
Foreign Owned	-.0294675***	.0005835	-50.50	0.000
	.011439**	.0050642	2.26	.024

***Significant at the 99% level, ** Significant at the 95% level

Table 3. Regression Results (Dependent Variable = minority owned)

Variable	Coefficient	Standard Error	t-stat	P-value
Government Contracts	.0497084***	.0033028	15.05	0.000
Subsidiary Public	-.016612***	.0018138	-9.16	0.000
Employment logged	-.0389929***	.0014095	-27.66	0.000
Foreign Owned	.0036276 ***	.0003057	11.87	0.000
	-.0340281	.0014362	-23.69	0.000

***Significant at the 99% level

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