

The Effect of an Occupation's Detailed Characteristics on its Hourly Wage Rate: Gender Discrimination in the Labor Market

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Introduction:

In recent research, some economists have suggested that most of the remaining gap in wages between men and women in the U.S. can be explained by the fact that women have more family obligations than men—especially for child-care and elder-care—and therefore choose more time-flexible jobs. However, these jobs pay less than other similar jobs because workers are less productive in jobs with greater time flexibility. So, women are voluntarily sorting in to these lower-paying jobs. Their overall lower pay is not caused by any type of gender discrimination. In this view, there may be no further need for equal pay and affirmative action public policies in regards to gender. We combine data sets from the Current Population Survey (CPS) and the Occupational Information Network (O*Net) to analyze this. This combined data set includes more than 830,000 full-time full-year workers with extensive information on their wages and work characteristics along with 407 characteristics of their occupations. We address one major question: does the data support this new contention? We analyze the data using a variety of statistical techniques, and find only weak support for this theory.

Time Flexibility Hypothesis

The view that much of the current gender wage gap in the U.S. is caused by women voluntarily choosing jobs that offer significant time flexibility at the expense of lower hourly wages.

Two Data Sets Used

Annual Demographic Data from March Current Population Surveys (CPS) covering 2003 through 2015. Data on 407 Detailed Characteristics of approximately 950 Occupations from the Occupational Information Network (O*Net) developed by the U.S. Department of Labor, Employment and Training Administration. The six characteristics used to measure Time Inflexibility are shown in Table 3.

Combining the Data Sets

We aggregated the approximately 950 occupation categories used in the O*Net data to the approximately 450 used in the CPS surveys.

Methodology

- Estimate log-wage equations based on human capital and compensating differential assumptions.
- Use OLS regression and then quantile regression at both the 50th percentile wage and the 80th percentile wage.

Do women choose jobs in more time-flexible occupations?

- The time-flexibility hypothesis suggests that on average women would choose jobs with lower values for the time inflexibility variables.
- The numbers in Table 4 indicate that the time flexibility hypothesis does not fare well. For four of the six inflexibility variables, women have higher mean values than men.
- In all cases, the differences are rather small.

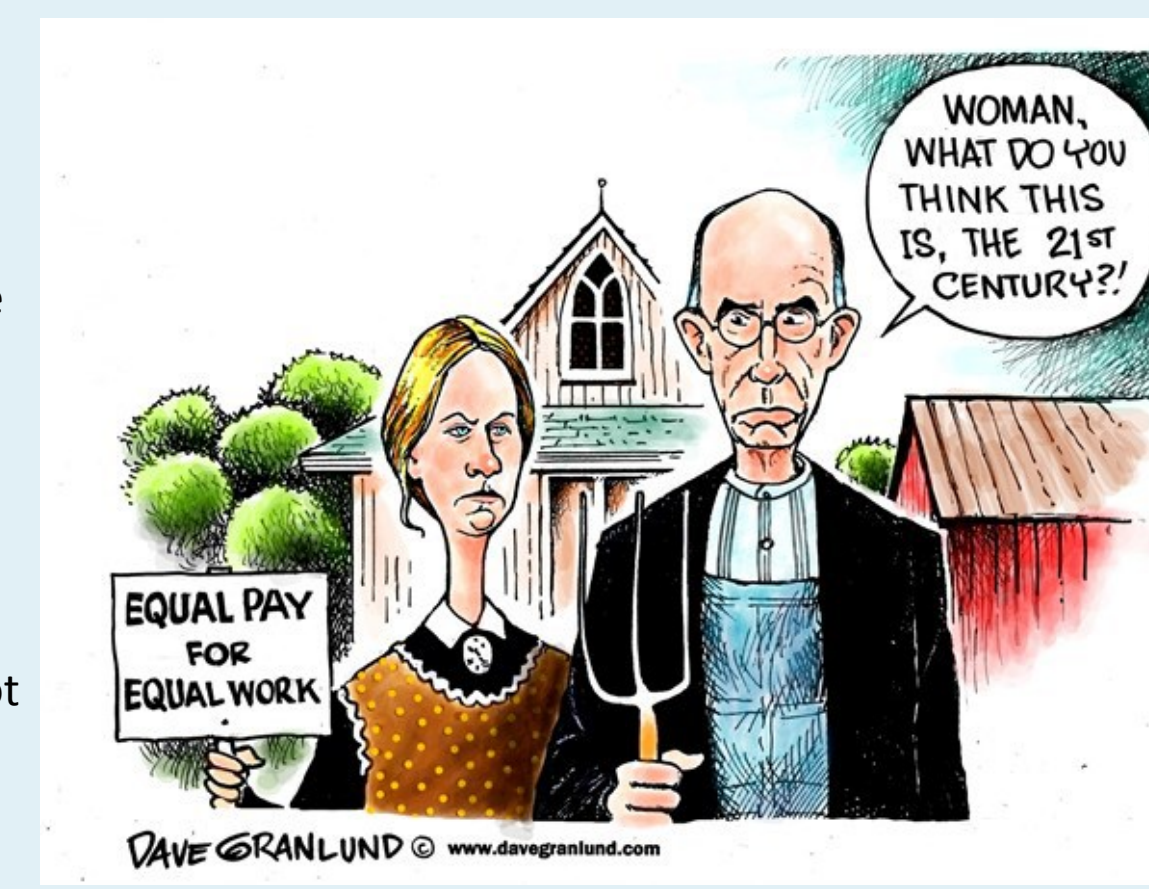


Table 3: Time Inflexibility Variables
Goldin Wording

1. Time pressure: How often does this job require the worker to meet strict deadlines? Lower pressure means worker does not have to be around at particular times.

2. Contact with others: How much does this job require the worker to be in contact with others (face-to-face, by telephone, or otherwise) in order to perform it? Less contact means greater flexibility.

3. Establishing and maintaining interpersonal relationships: Developing constructive and cooperative working relationships with others, and maintaining them over time. The more working relationships, the more workers and clients the employee must be around.

4. Structured versus unstructured work: To what extent is this job structured for the worker, rather than allowing the worker to determine tasks, priorities, and goals? If the job is highly structured to the worker, there would be a lower chance that the worker would have close substitutes.

5. Freedom to make decisions: How much decision making freedom, without supervision, does the job offer. Generally means that the worker determines what each client should receive, rather than being given a specific project, and thus workers are poorer substitutes for each other the greater are these freedoms.

O*Net Survey Wording

54. How often does your current job require you to meet strict deadlines?
Never (1) Once a year or more but not every month (2) Once a month or more but not every week (3) Once a week or more but not every day (4) Every day (5)

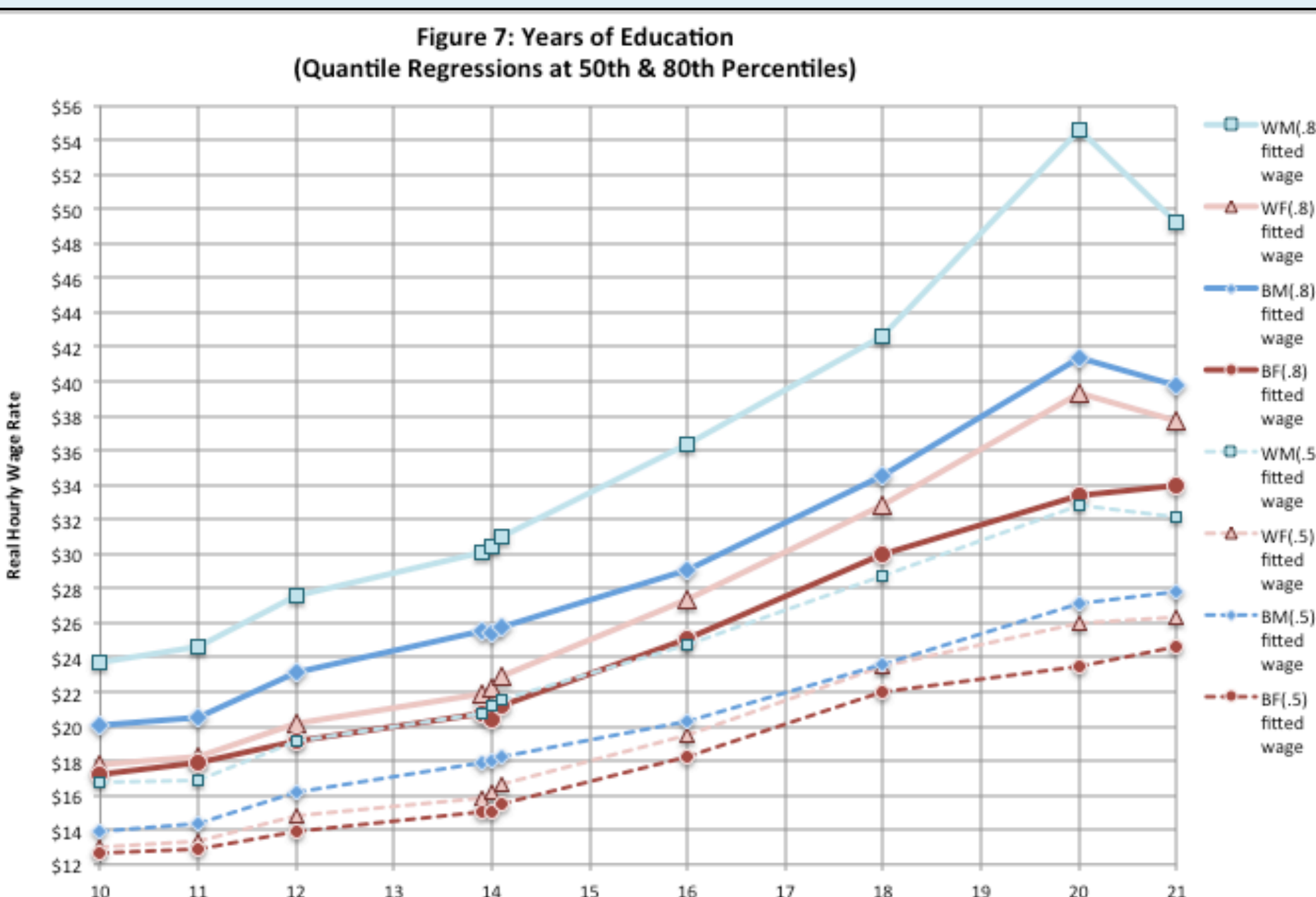
6. How much contact with others (by telephone, face-to-face, or otherwise) is required to perform your current job?
No contact with others (1) Occasional contact with others (2) Contact with others about half the time (3) Contact with others most of the time (4) Constant contact with others (5)

28. Establishing and Maintaining Interpersonal Relationships
A. How important is ESTABLISHING AND MAINTAINING INTERPERSONAL RELATIONSHIPS to the performance of your current job?
Not important (1) Somewhat important (2) Important (3) Very important (4) Extremely important (5)
* If you marked Not important, skip LEVEL 1 below and go to the next activity.

B. What level of ESTABLISHING AND MAINTAINING INTERPERSONAL RELATIONSHIPS is needed to perform your current job?
Exchange greetings with coworkers (1) Maintain good working relationships with almost all coworkers and clients (2) Gain cooperation from a culturally diverse group of coworkers/clients to your company (3) Highest Level (4) (5) (6) (7)

52. How much freedom do you have to determine the tasks, priorities, or goals of your current job?
No freedom (1) Very little freedom (2) Limited freedom (3) Some freedom (4) A lot of freedom (5)

48. In your current job, how much freedom do you have to make decisions without supervision?
No freedom (1) Very little freedom (2) Limited freedom (3) Some freedom (4) A lot of freedom (5)



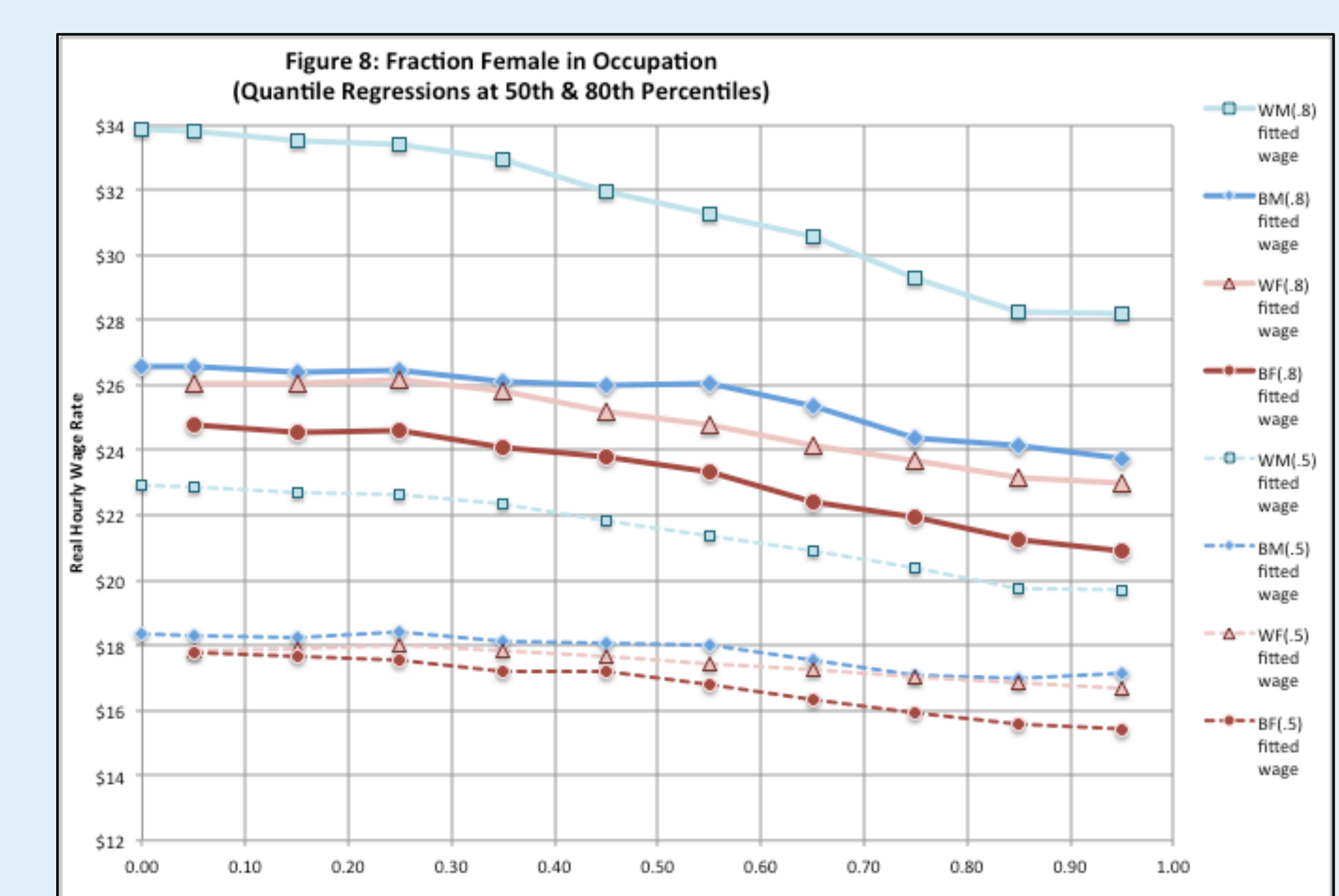
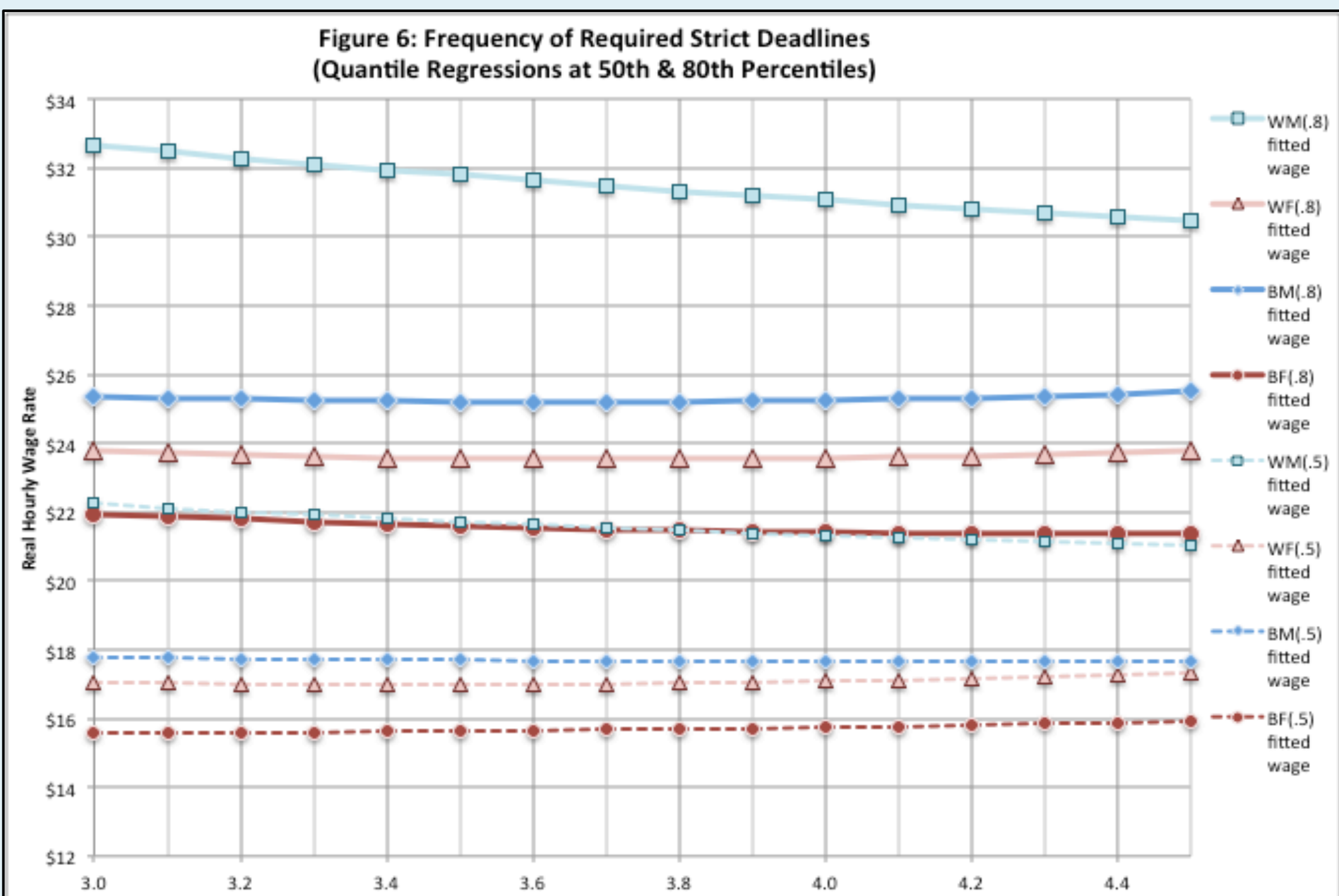
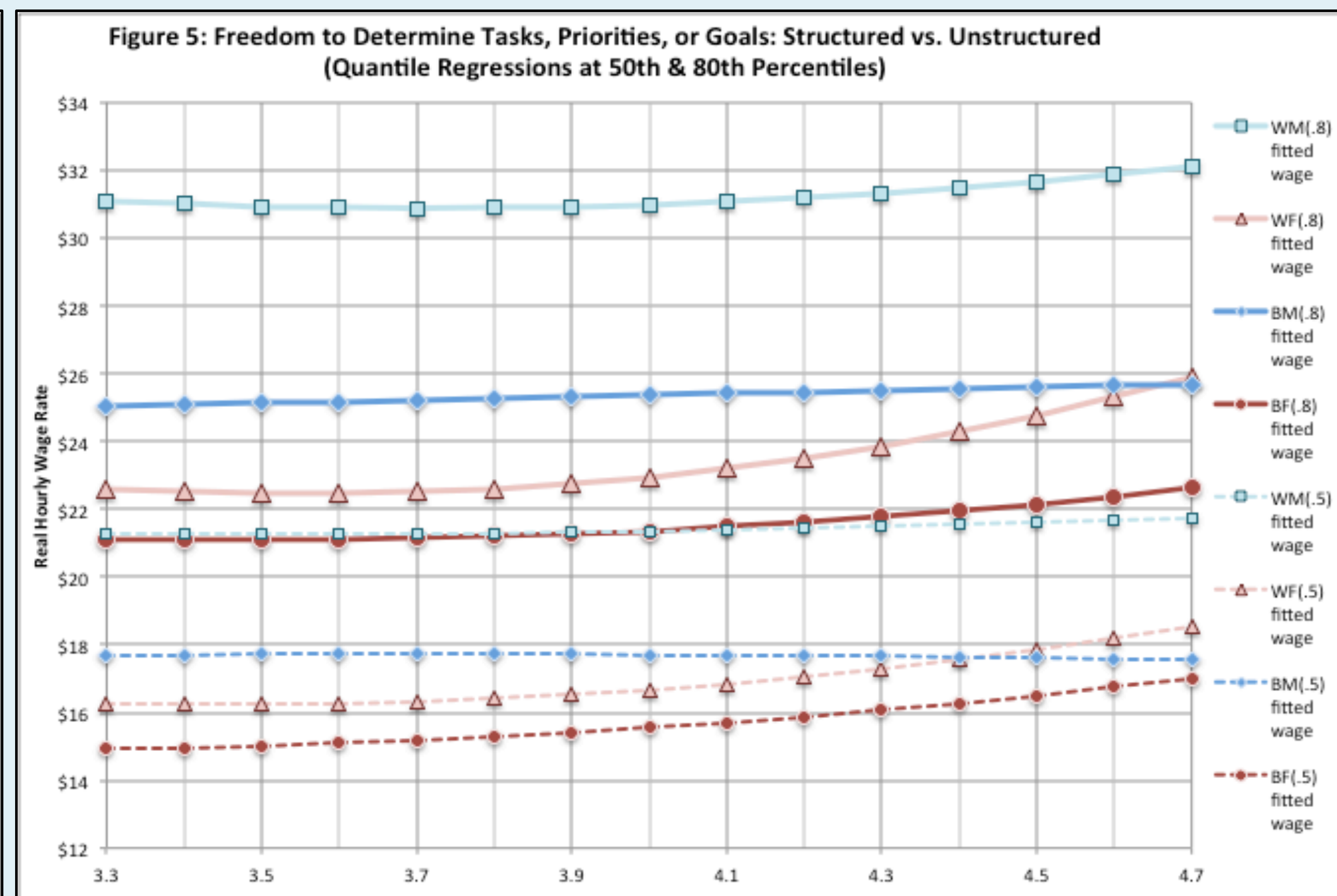
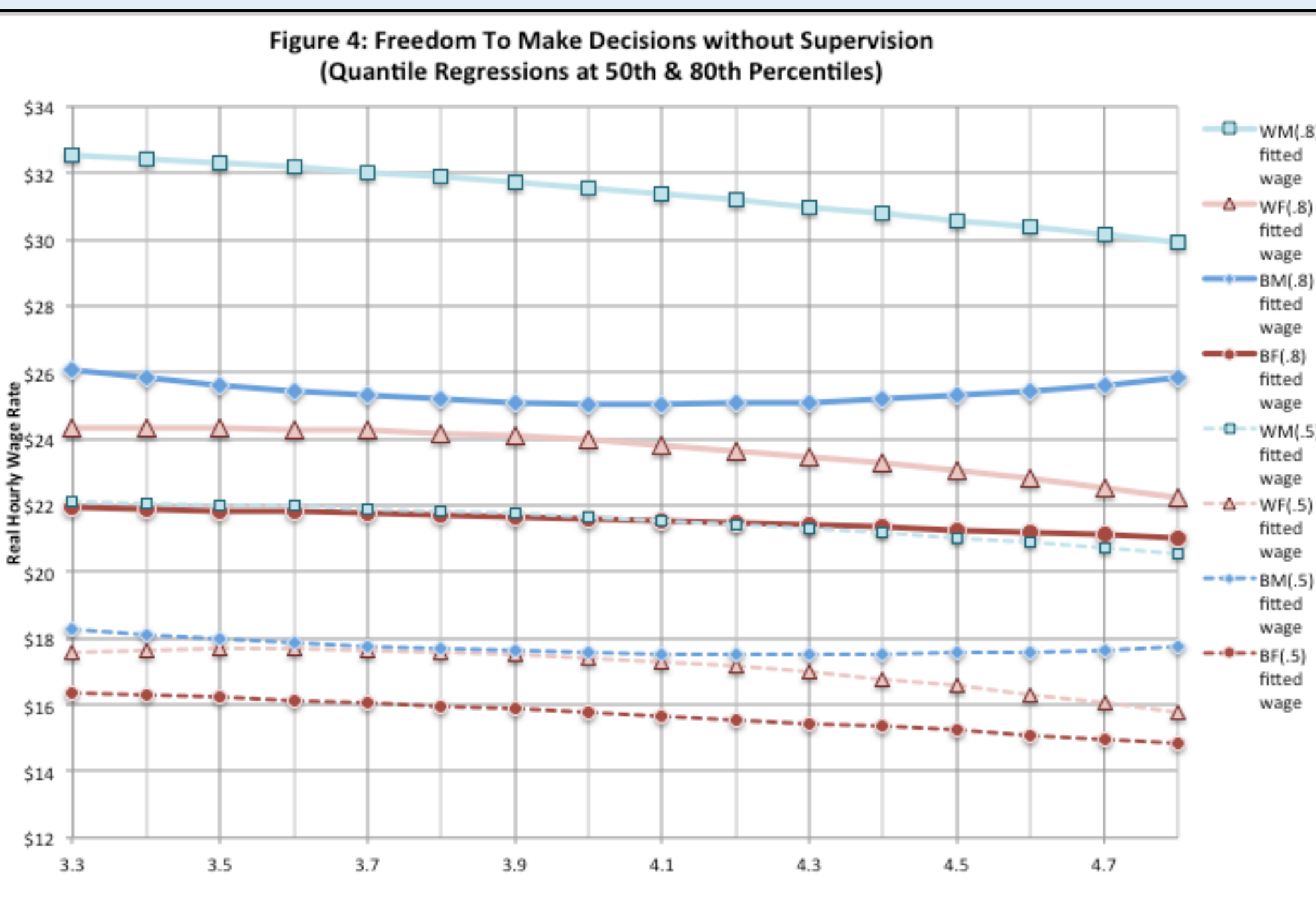
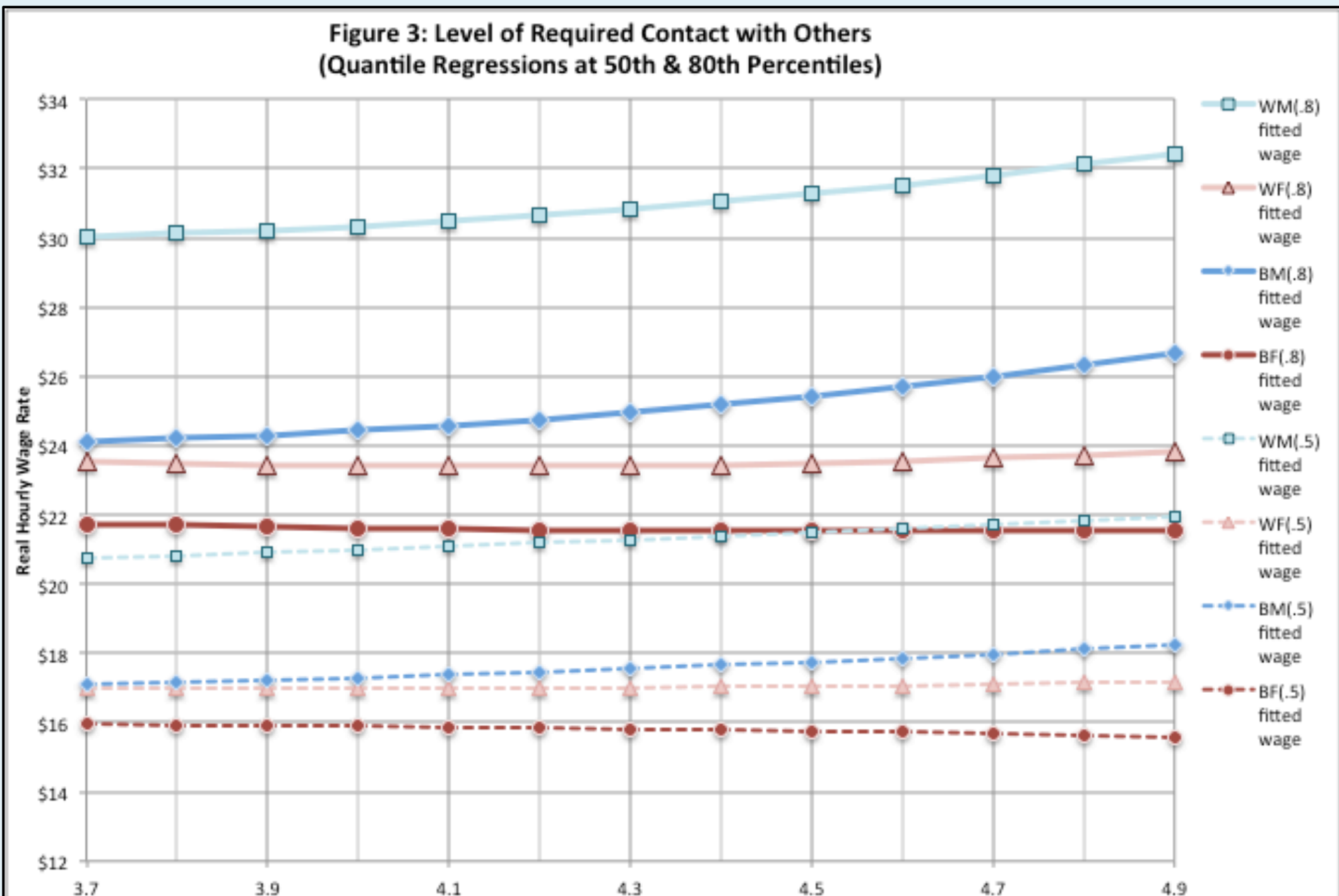
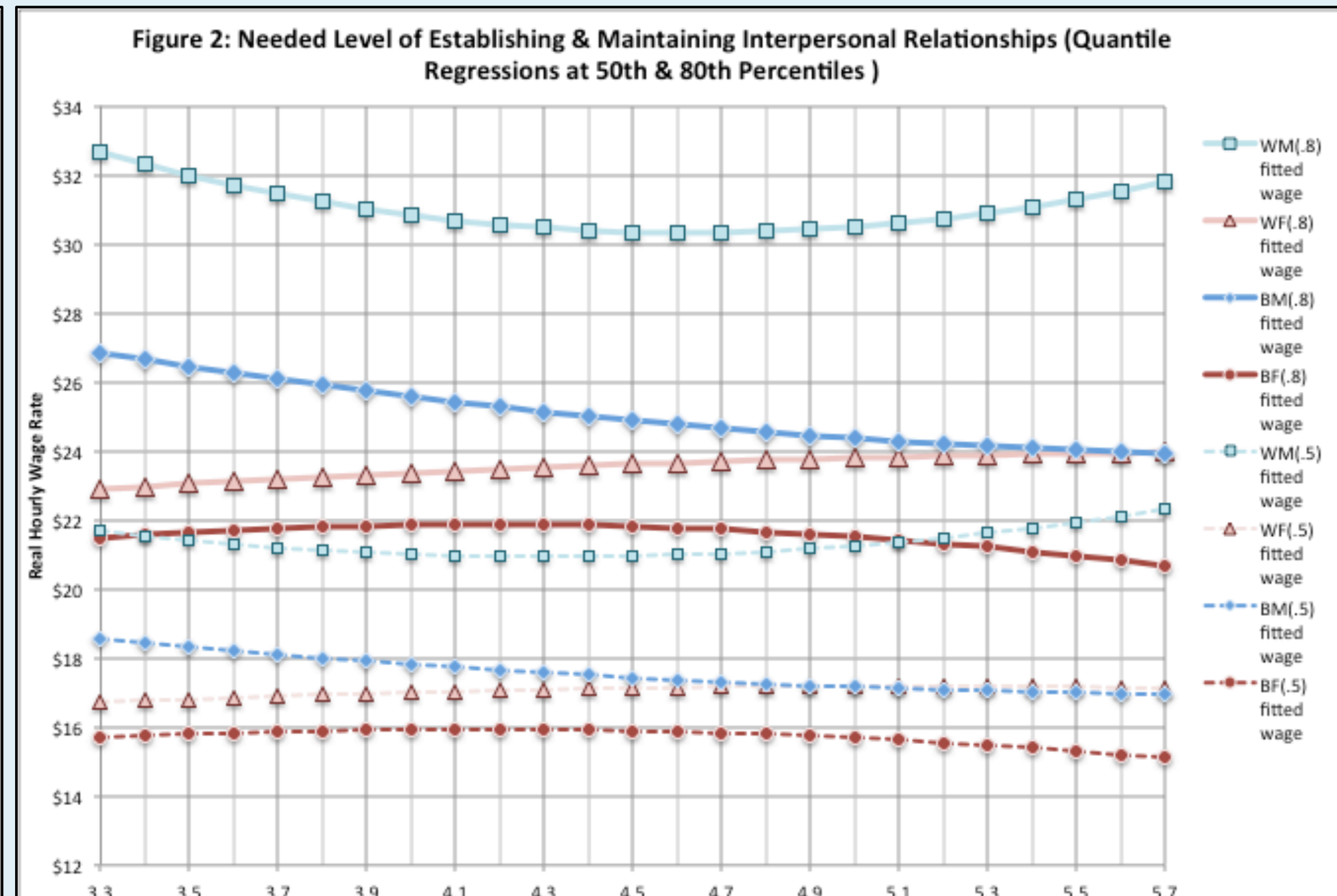
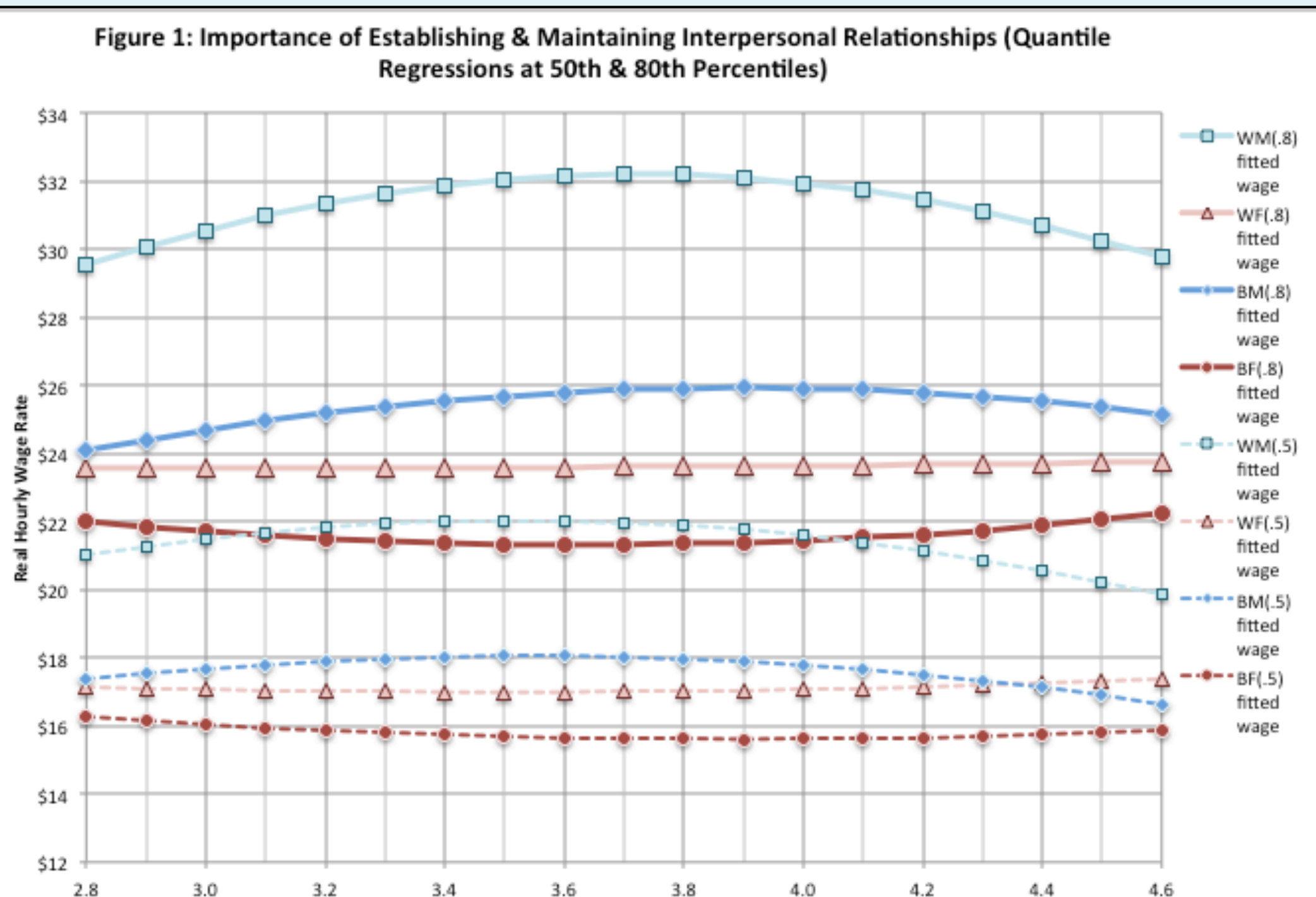
Measuring the Gender Wage Gap

Figure 7 takes the results from our quantile regressions, and shows the fitted hourly wage rate for full-time full-year whites and blacks, men and women, over all the possible levels of education, after controlling for dozens of other factors

- The gender wage gap at the median wage varies from \$3.50 to \$6.80 for whites and from \$1.80 to \$4.50 for blacks, depending on the level of education. It is \$5.27 (21%) for whites with a bachelor's degree.
- The gender wage gap at the 80th percentile wage varies from \$5.90 to \$15.30 for whites and from \$2.70 to \$8.00 for blacks, depending on the level of education. It is \$9.07 (25%) for whites with a bachelor's degree.

Possible Explanations for Gender Wage Gap in Hourly Wage Rate

- Wage Discrimination
- Occupation Segregation by Gender
- Glass Ceiling Effect
- Voluntary Choice by Women of Jobs in Time-Flexible Occupations
- Voluntary Choice by Women of Time-Flexible Jobs within Occupations



Gender Discrimination

- Consider Figure 7 again. This shows that after controlling for dozens of factors that may affect wage rates, the fitted wages for men and women, at all levels of education, are significantly different. If only a small amount of this wage gap can be explained by the Time Flexibility hypothesis, discrimination may explain the rest.
- The most obvious types of discrimination are straightforward wage discrimination and occupation segregation by gender.
- To get a better understanding of occupation segregation by gender we created a new variable that we call "occcracfem." It consists of the fraction of workers in each detailed occupation that are female.
- Figure 8 shows that there is a strong negative correlation between "occcracfem" and the log of the hourly wage rate, for both men and women, white and black, at both the 50th and 80th percentile levels of the wage rate. This strongly supports the existence of significant occupation segregation by gender.
- Any remaining gender wage gap may be due to direct wage discrimination. In other words, paying a man and a woman with the same education in the same occupation a different wage.

Table 4: Mean Values of the Time Inflexibility variables

	wm	wf	white (w) vs. black (b) male (m) vs. female (f)
	bm	bf	
mean values	4.4	4.58	blue = 2 smallest values tan = 2 largest values
	4.39	4.56	
	4.15	4.09	how much contact with others is required to perform your job?
	4.06	4	
	4.02	4.11	in your job, how much freedom do you have to make decisions without supervision?
	3.91	4.02	
	3.92	3.82	how much freedom do you have to determine the tasks, priorities, or goals of your job?
	3.9	3.77	
	3.65	3.89	how often does your job require you to meet strict deadlines?
	3.57	3.85	
	4.46	4.68	how important is establishing and maintaining interpersonal relationships to the performance of your job?
	4.31	4.58	
	4.46	4.68	what level of establishing and maintaining interpersonal relationships is needed to perform your job?
	4.31	4.58	

Table 5: Quantile regressions at 50th percentile

	WM	WF	BM	BF	Time Inflexibility variable
top number = initial movement bottom number = secondary movement					blue = support hypothesis tan = contradict hypothesis white = neutral
	\$1.02	-\$0.17	-\$2.17	\$0.39	how important is establishing and maintaining interpersonal relationships to the performance of your job?
	\$0.70	-\$0.65	-\$1.41	\$0.26	
	-\$0.75	\$0.47	-\$1.39	-\$0.05	what level of establishing and maintaining interpersonal relationships is needed to perform your job?
	-\$1.59	\$0.25	\$0.00	-\$0.83	
	\$0.96	-\$0.01	\$0.00	\$0.13	how much contact with others is required to perform your job?
	\$0.89	-\$0.27	\$0.00	\$0.00	
	-\$1.56	\$0.08	\$0.00	-\$1.88	in your job, how much freedom do you have to make decisions without supervision?
	-\$0.73	-\$1.52	\$0.21	\$0.00	
	\$0.00	-\$0.02	\$0.47	\$2.30	how much freedom do you have to determine the tasks, priorities, or goals of your job?
	\$0.03	\$2.09	-\$0.17	\$0.00	
	-\$1.20	-\$0.06	\$0.00	\$0.32	how often does your job require you to meet strict deadlines?
	-\$0.11	\$0.34	\$0.01	\$0.00	

Table 6: Quantile regressions at 80th percentile

	WM	WF	BM	BF	Time Inflexibility variable
top number = initial movement bottom number = secondary movement					blue = support hypothesis tan = contradict hypothesis white = neutral
	-\$2.67	\$0.19	-\$2.45	\$0.00	how important is establishing and maintaining interpersonal relationships to the performance of your job?
	\$1.84	-\$0.68	-\$0.77	\$0.91	
	-\$2.34	\$1.06	-\$1.47	\$0.00	what level of establishing and maintaining interpersonal relationships is needed to perform your job?
	-\$2.91	\$0.39	\$0.00	-\$1.19	
	\$1.77	-\$0.16	\$0.00	\$0.24	how much contact with others is required to perform your job?
	\$1.87	-\$0.22	\$0.00	\$0.00	
	-\$2.66	\$0.02	\$0.00	-\$2.09	in your job, how much freedom do you have to make decisions without supervision?
	-\$1.04	-\$0.88	\$0.81	\$0.00	
	-\$0.21	-\$0.16	-\$1.22	\$3.45	how much freedom do you have to determine the tasks, priorities, or goals of your job?
	\$0.66	-\$0.04	\$0.00	\$1.54	
	-\$2.19	-\$0.23	\$0.00	\$0.24	how often does your job require you to meet strict deadlines?
	-\$0.18	-\$0.58	\$0.31	\$0.01	

Oaxaca Decompositions

One additional way to evaluate the importance of discrimination is to decompose the wage gap into the part explained by differences in variables (the characteristics of each group), and the part explained by differences in coefficients (the rate of return to each characteristic).

We use the original OLS regressions, which include all of the O*Net occupation characteristics variables separately. The results are in Table 7. The decomposition results for white men versus white women show that 2/3 of the gap can be explained by differences in coefficients. This part of the wage gap is usually attributed to discrimination.

The largest contributors to the total wage gap, in order, are education, major industry, and fraction female in occupation. With education and major industry, most of the gap comes from differences in coefficients. With fraction female, most of the gap comes from differences in mean values.

Conclusions

We have found little support for the time-flexibility hypothesis.

We have found strong support for the existence of direct wage discrimination and occupation segregation by gender.

Table 7: Oaxaca Decompositions

	column 1 difference in mean values	column 2 difference in coefficients	column 3 total difference
White Males vs. White Females			
Education	-0.022	0.126	0.104
Potential experience	0.006	0.026	0.032
All of the O*Net occupation characteristics except the inflexibility variables	0.028	0.469	0.497
Class of Job	-0.005	-0.008	-0.013
Marital status	0.010	-0.042	-0.031
Fraction female in occupation	0.035	0.011	0.046
Inflexibility variables	-0.004	-0.473	-0.476
Major industry category	0.018	0.040	0.058
Health status	0.001	-0.005	-0.004
Size of metropolitan area	0.001	-0.019	-0.018
Number of children 5 and under	0.001	-0.002	-0.002
Major occupation group - Goldin version	0.002	0.020	0.022
Year	0.000	0.012	0.012
Total difference in the logwages	0.072	0.155	0.227
Education & Potential experience	-0.016	0.152	0.136
All of the O*Net occupation characteristics except the inflexibility variables	0.028	0.469	0.497
Inflexibility variables (6)	-0.004	-0.473	-0.476
All other variables	0.063	0.006	0.070
Total difference in the logwages	0.072	0.155	0.227
All of the O*Net occupation characteristics including the inflexibility variables	0.024	-0.003	0.021
All non-O*Net variables	0.047	0.159	0.206
Total difference in the logwages	0.072	0.155	0.227