Do Skilled Workers Work More Than Unskilled Workers?

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Abstract

Workers sometimes choose to work longer hours and other times are required to, but what causes differences in hours worked between workers? This paper looks at different models in previous literature and uses them to estimate the differences in hours worked by skilled workers and unskilled workers. Using the dummy variable, skilled worker,as the main focus independent variable this paper runs a multiple OLS regression on 67,768 observations collected from the 2017 ASEC. Education is another focus variable while sex, race, and experience are also used to see differences in core demographics and statistically control for them. The research finds evidence that skilled workers tend to work more hours per week on average, compared to non skilled workers.

Introduction

Occupational differences have been shown to have an effect on income for workers in several studies, with results consistently suggesting that workers get paid more in certain types of occupations, especially those occupations that require skilled workers. However, relatively less research has been done on how different occupations affect hours worked. United States workers work longer hours than most countries in the world and lead the pack in the world's largest economies by working an average of 34.4 hours per week (Isidore & Luhby, 2015). About 40% of Americans work more than 40 hours a week, while about 10% work more than 50 hours a week (CBC,2013). These numbers demonstrate the strong work ethic American workers possess but it raises the question of who is working harder. Research on the topic of hours worked and its determinants has been conducted extensively, especially on effects of differences in core demographics. Research on occupational effects on hours worked has increased over the past two decades and mostly focuses on how specific occupations impact hours worked. Occupations have different characteristics that define them, such as doctors who require medical degrees or web developers who require coding skills, and these characteristics could cause a difference in hours worked for different occupational groups. Researches have used different terms to separate workers into groups in order to see how certain types of workers work more than others. Some of the terms used to describe different types of workers in literature have been “professional workers”, “technical workers”, “skilled workers”, “white collar workers”, “knowledge workers” etc.

but for the purpose of this paper I will categorize workers as “skilled” and “unskilled”. For this research paper, skilled workers will be my primary focus independent variable, regressed on usual hours worked per week along with other independent variables education, race, sex, and experience.

Literature Review

There is a large volume of literature on how work hours are affected by various factors, however researchers have mostly focused on how core demographics such as sex, race, marital status etc. cause variations in hours worked per week. The income effect on hours worked per week is also a historically popular topic amongst researchers However, more focused and detailed literature on hours worked has been produced within the last 15 years, focusing on changes caused by less conventional variables. The effect of one’s occupation on hours worked is another topic that has been explored more recently but most research focuses on several specific occupations. However, there is relatively little research on how being classified as a skilled worker impacts hours worked. This empirical paper aims to use different pieces of literature in order to estimate whether skilled workers work more hours.

Hecker (1998) explores the trend in hours worked based on different occupational groups and finds that skilled workers work more than unskilled workers. He also finds that individuals that worked more than 40 hours per week belonged to skilled occupations despite unskilled workers usually getting overtime pay. Overtime pay incentives workers to work longer hours but this is more relevant to non-professional workers (who are more likely to get paid for overtime). According to

Hecker (1998), skilled workers rarely receive income for overtime work because they have an agreed upon weekly or yearly salary and, in most cases, it is understood that they will be required to work overtime as part of their job. He says despite not receiving additional income for their 'extra' work, there are several other reasons skilled workers work more hours than unskilled workers. Occupations with skilled labor are more demanding in general, so completing jobs and meeting deadlines can cause workers to work longer. He also explains how hours worked is an indication of labor productivity, which causes skilled workers to work harder for promotions and to be seen as more valuable.

Hecker (1998) tries to explain how some workers might work more to increase their perceived value to their employers for promotions and job security. Akerlof (1976) was the first person to come up with an empirical study to findthe effect of the 'rat race theory'. He states that some workers say they are willing to work more hours than they actually want in order to increase their value, which in turn causes employers to further increase work hours in order to differentiate a short-hour employee from a long-hour employee.–Other literature showing adverse selection includes Landers et al. (1996), which focuses on labor hours in two law firms. The study finds that employees work significantly more hours than the mean hours per week worked for other occupations, especially younger associates in these firms, despite a majority claiming they'd work less hours for a lower income if they could. The study also finds that hours worked is an indicator of success, especially in law firms, since lawyers usually get paid and promoted through their *billable hours.* This shows us the rat race theory in effect; these

lawyers are working extremely long hours in order to get ahead of their peers despite not necessarily being incentivized by income. Rosenthal and Strange (2008) build on this research by Akerlof and Landers et al. by looking at the relationship between hours worked for professional workers (defined as technical workers who have a masters degree or higher) and non-professionals workers (all non-technical workers who have less than a bachelor's degree). The paper categorizes professional and non-professional workers into two subcategories based on their age group: workers aged 30-40 and workers aged 41-50. They justify this decision by arguing that the decision to work is more exogenous for workers in their thirties and forties (since they may be in school during their twenties or may change their work habits when approaching retirement in their fifties) and that most professional workers try to establish themselves in their occupation in their thirties. The paper conducts its research using multiple cities, in order to see the effect of agglomeration. This paper has two big take aways; increased density of occupation makes professional workers more likely to choose longer hours to prove their value and makes non-professional workers work less due to the theory of work spreading. The paper also finds that the effect for professional workers is magnified for workers aged between 30-40, who tend to work even longer hours to establish themselves in their occupations.

Skilled workers have been estimated using different methods in literature but a common theme in most studies that categorize workers by their occupational group is education. Richards and Solie (1996) find that knowledge workers (those workers that require the use of knowledge in their occupations) are significantly more educated than

manual workers (those workers whose occupations require some sort of manual work). Castro and Coen-Pirani (2008) define skilled workers as those workers who have a college degree or higher for data from 1979-1983, and as workers that have a masters degree for data from 1984-2004. This is done because the number of workers who attended college grew by about 12% between those two time periods and their definition of skilled lost its value. They find that skilled workers have worked more hours, even after adopting a more restrictive definition for “skilled workers”. The paper also looks at the proportion of skilled workers to unskilled workers for various occupations, and shows a very high ratio of skilled workers to unskilled workers in occupations categorized as “professional and technical workers” by the Current Population Survey variable *occupation, 1950 basis.*

Theory

In the rat race model, Landers et al (1996) finds that workers show their value by working long hours, since employers use hours worked as an indication of current and future productivity, especially for “professional” workers. Workers in this paper are categorized into two groups, mainly skilled and unskilled workers. Skilled workers in this study are defined as workers whose occupations: require technical or professional skills and/or are knowledge based and/or require decisions/judgements based on information and/or require mental work rather than physical work and/or are classified as “white-collar” workers. Skilled workers generally have higher human capital, which causes them to have a higher demand and lower supply. These labor market conditions

make wages for skilled workers higher than those for unskilled workers, as seen in Hecker (1998). Income is not included in this variable for the same reason; Rosenthal and Strange (2008) exclude it, “Because of concerns about endogeneity: wage affects an individual’s willingness to supply labor but wage rates themselves are sensitive to the individuals skilled and attributes.” Human capital differences can also be seen by education levels of workers; with a high level of education corresponding to a higher level of human capital. This is primarily because higher levels of education provide more knowledge and technical skills. The role of education in explaining differences for skilled and unskilled workers can also be observed in the literature review. Another reason why skilled workers might work longer is to compensate for time spent getting their education. Workers who stay in school for longer have a smaller work life span, which might cause them to work harder to establish themselves at the same pace as workers who started working earlier. They may also work harder to achieve a promotion and obtain a higher salary in order to pay off education debts.This is mentioned by Finegan (1962), who says that workers with higher education are reimbursed for these costs by companies when considering their wages in order to incentivize workers to acquire more human capital. Despite not usually getting paid for overtime, trends in the literature review show that skilled workers generally work more. As seen in the literature review above, Hecker (1998), summarizes several reasons why skilled workers could want to work more, which is consistent with what we’ve said so far: their work is so extensive that it simply requires them to work overtime, they work overtime to signal

productivity in order to seek promotions, or they simply have a preference to work over other activities.

Unskilled workers usually work in industries where they get paid overtime or work menial jobs, and where unions ensure they don't get underpaid. A large portion of unskilled workers are covered by the Fair Labor Standards Act, which ensures that these workers are paid an amount equal to or greater than one and half times their regular pay (Department of Labor, 2017). These laws and unions incentivize workers to work longer hours than their actual workweek, since they will receive a higher income if they do. While unions can provide incentives to its members to work more hours, they can also have a negative effect on hours worked. A higher wage rate demanded by unions usually requires a reduction in the number of union members or reductions in hours worked per employee (Hunt and Katz, 1998). This phenomenon, known as work sharing, is more prominent for unskilled workers than skilled workers. Proof of this can be seen in Rosenthal and Strange (2008), which finds that non-professionals work less when clustered in a more dense area of workers with the same occupation, while the opposite is shown to be true for professional workers in the study.

Empirical Strategy

Data

The sample used in this work is extracted from the Current Population Survey (MARCH, 2017 ASEC). The CPS is a wide database for household and individual information on different variables ranging from demographics to quantitative information

like wages. The following variables were downloaded from CPS: Age (*age*), Sex (*sex*), Race (*race*), Educational Attainment Recode (*educ*), Occupation (*occ*) and Hours Usually Worked per Week at Main Job (*uhrswork1*).

Some of the variables were used to obtain new variables and several variables were restricted by certain requirements in order to improve the data and find a suitable sample. *Usual hours worked per week at main job* was set as the dependent variable, and was transformed into log form. Observations of *usual hours worked per week at main job* with value 999 were deleted because they were considered "Not In Universe" and observations with values of 0 were deleted to obtain a sample with only people who worked. *Sex* was changed into the dummy variable *male,* which denoted the value '1' to men and '0' to females in the sample. The *educational attainment code* was used to create the variable education years (*educyears),* by assigning numeric values to the qualitative values. All observations with educational levels below grade 9 in the educational attainment recode variable were assigned to value '9' in *educyears*. In order to capture the working age group, *age* was restricted to years 22-64. *Age*, along with *educyears,* is used to calculate the variables *experience* and *experience square.*Experience is calculated through the equation $exp = age - educyears - 6$ and *experience square* is just the square of the experience variable, as the name suggests. Values of experience less than zero were deleted to only account for people who had a difference of 6 years or more between their age and education years. *Experience square* is incorporated to account for the concaverelationship between experience and

hours worked, since workers may not work overtime the first few years or when they are in their fifties. This relationship can be seen in figure 1 below:

Figure 1

The skilled worker variable is my main focus variable, and is a dummy variable with '1' representing skilled workers and '0' representing unskilled workers. In order to come up with this variable, I used the occupation (*occ*) variable on CPS. The occupation variable code on CPS shows a list of occupations associated with a numerical value. Using definitions of skilled, professional, technical, white-collar, and knowledge workers obtained online and with my own personal judgement, I categorized these occupations as "skilled" and "unskilled" . The variable *Occupation, 1950 basis*, which is available on CPS, categorizes occupations based on groups such as "professional", "technical", "managers" etc. and was also used as a guide to construct the skilled worker variable.

Variable	Obs	Mean	Std. Dev.	Min	Max
uhrswork1	67,768	39.96101	9.869641	1	99
educyears	67,768	14.12605	2.538639	9	20
male	67,768	.5175747	.4996947	0	1
skilledworker	67,768	.4591695	.4983338	0	1
exp	67,768	21.46212	11.34281	0	47
expsq	67,768	589.2801	514.7857	0	2209
lnhours	67,768	3.646282	.3302172	0	4.59512

Figure 2

Figure 2 shows us the variables used and their summary statistics. The average worker has about 14 years of education, which is understandable due to a high number of observations either being high school graduates (12 years of education) or college graduates (16 years of education) as seen in figure 3a. Figure 3a also shows education levels of skilled and unskilled workers, where we can see that unskilled workers have a higher count till about 14 years of education. For 16 years of education and higher, skilled workers greatly out number unskilled workers. Figure 3b shows the average hours worked given different education years for skilled and unskilled workers. It shows us that average hours worked per week generally increase for higher education years, for both skilled and unskilled workers. It also shows us that skilled workers have a higher average hours per week than non-skilled worker. Figures 3a and 3b go along with our research in the literature review, showing a high correlation between higher education years and skilled workers, and that skilled workers generally work more hours per week for any given level of education.

Count of educyears	Column Labels		
Education Years	Unskilled worker	Skilled Worker	Grand Total
9	2920	237	3157
10	613	68	681
11	778	107	885
12	13899	3476	17375
13	7668	3819	11487
14	4267	3512	7779
16	5454	11346	16800
18	939	6179	7118
19	59	1041	1100
20	65	1361	1426
Grand Total	**36662**	**31146**	**67808**

Average of uhrswork1	Column Labels		
Row Labels	Unskilled Worker	Skilled Workers	Grand Total
9	38.65513699	41.43459916	38.86379474
10	38.43556281	41.47058824	38.73861968
11	38.99614396	41.55140187	39.30508475
12	39.48499892	40.60701956	39.70946763
13	38.48356808	39.78188007	38.9152085
14	39.24701195	39.50626424	39.36405708
16	39.5546388	40.82866208	40.41505952
18	39.74014909	41.25182068	41.05240236
19	39.03389831	45.27089337	44.93636364
20	39.56923077	43.68993387	43.50210379
Grand Total	**39.17014893**	**40.89240994**	**39.96122876**

Figure 3a and 3b

The summary statistics in figure 2 also show us that there are more males in the sample than females and more unskilled than skilled workers. Figure 4a and 4b displays the counts for variables *skilled workers* and *male*, respectively.

Row Labels	Count of skilledworkers
Unskilled Workers	36662
Skilled Workers	31146
Grand Total	**67808**

Row Labels	Count of male
Female	32719
Male	35089
Grand Total	**67808**

Figure 4a and 4b

Figure 2 does not show statistics for race, since it is a qualitative variable and would not give any useful information in the summary statistics table. Figures 5a and 5b are created to see the differences for unskilled and skilled workers for various races. Only races with a count of 200 or higher were shown in figures 5a and 5b because races with small samples might make the *average of hours worked* results biased. Figure 5a indicates that white workers represent a large number of observations in the data, with about 46% white workers being classified as skilled and about 54% of white workers being classified as unskilled. The figure also indicates that Asian workers and White-Asian workers are the only race with a higher count of skilled workers than unskilled workers. Figure 5b shows us that White workers typically work the longest

hours in a week, especially skilled white workers. It also shows us that White-Asians have the lowest average hours worked per week, mostly due to a relatively large difference in average hours worked for unskilled and skilled workers.

Count of race	Column Labels		
Race	Unskilled Workers	Skilled Workers	Grand Total
american	533	295	828
asian/pacific islander	2032	2666	4698
black/negro	4517	3006	7523
hawaiian	254	120	374
white	28645	24546	53191
white-american indian	281	170	451
white-asian	116	129	245
white-black	160	146	306
Grand Total	**36538**	**31078**	**67616**

Average of uhrswork1	Column Labels		
Race	Unskilled Workers	Skilled Workers	Grand Total
american	38.52345216	40.65762712	39.28381643
asian/pacific islander	38.2101378	40.69804951	39.62196679
black/negro	38.72548151	40.19993347	39.31463512
hawaiian	39.71259843	40.03333333	39.81550802
white	39.33600977	41.0204514	40.11332744
white-american indian	38.61565836	40.33529412	39.26385809
white-asian	36.92241379	39.39534884	38.2244898
white-black	39.06875	40.39726027	39.70261438
Grand Total	**39.17431168**	**40.89275372**	**39.9641505**

Figure 5a and 5b

The average hours worked per week is about 40 hours per week, according to Figure 2. This is mainly because 40 hours per week is a typical work week and a lot of workers pick this value as their estimate. This may make the results slightly biased and can not be fixed without affecting results and is a limitation of this study (despite literature on hours worked showing that these observations only have a small effect on results). Figures 6a looks at the counts for usual hours worked reported for skilled and unskilled workers. We can see that there is a significantly higher count of unskilled workers that report their usual hours worked per week as 40 compared to skilled workers. This could be due to previously discussed points such as work sharing in several occupations that don't allow unskilled workers to work as longer hours or the willingness and requirement for a lot of skilled workers to work more than a typical work week. Figure 6b is a product of 6a, focusing on workers who work more than 40 hours a week with counts of less than 600. This figure shows that skilled workers have a higher concentration than unskilled workers for usual hours worked per week of greater than 40 hours.

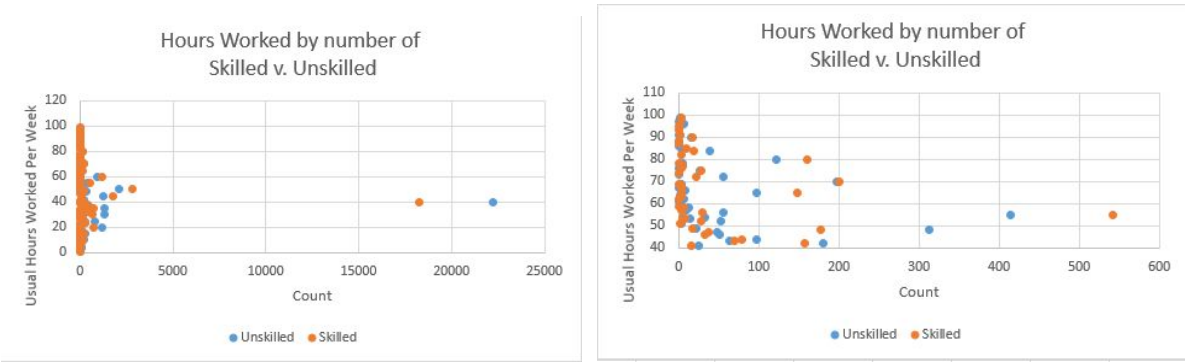

Figure 6a and 6b

Figure 7a confirms this by looking at the pivot table for usual hours worked per week of greater than 40 hours for skilled and unskilled workers. The figure shows that skilled workers have a higher count of workers that work more than 40 hours per day (despite having a lower overall count than unskilled workers in the sample). The trend can be seen in eight of the eleven hours worked groups. Figure 7b is another compressed function that tries to see the relationship between hours worked and skilled workers. It finds that skilled workers will generally work more hours per week (about 1.5 more) than unskilled workers.

Count of uhrswork1	Column Labels		
Hours Worked	Unskilled	Skilled	Grand Total
41-45	1607	2100	3707
46-50	2558	3077	5635
51-55	516	585	1101
56-60	1022	1249	2271
61-65	110	155	265
66-70	214	209	423
71-75	83	51	134
76-80	133	170	303
81-85	41	30	71
86-90	18	19	37
91-95	3	4	7
Grand Total	6305	7649	13954

Worker Type	Average of usual hours worked
Unskilled	39.17014893
Skilled	40.89240994
Grand Total	39.96122876

Figure 7a and 7b

While several of the figures above imply that skilled workers will work more hours per week than unskilled on average, these are raw results that can be used to observe trends but can not be relied upon completely. In order to find more concrete results, we move on to our regression analysis.

Empirical Results

	(1) lnhours	(2) lnhours	(3) lnhours	(4) lnhours
skilledworker	0.0492***	0.0376***	0.0486***	0.0477***
	(0.00254)	(0.00296)	(0.00289)	(0.00350)
educyears		0.00442***	0.00680***	0.00723***
		(0.000581)	(0.000582)	(0.000712)
male			0.142***	0.130***
			(0.00248)	(0.00295)
exp			0.00874***	0.00865***
			(0.000447)	(0.000564)
expsq			-0.000163***	-0.000164***
			(0.00000988)	(0.0000123)
Black/Negro			0.00687	0.000248
			(0.00395)	(0.00410)
American Indian			-0.000509	-0.00778
			(0.0113)	(0.0144)
Asian			-0.0168***	-0.0143**
			(0.00491)	(0.00506)
Hawaiian			0.0192	0.0234
			(0.0166)	(0.0171)
White-Black			0.0186	0.000661
			(0.0198)	(0.0206)
White-Americann			-0.0230	-0.00840
			(0.0153)	(0.0163)
White-Asian			-0.0736***	-0.0775
			(0.0218)	(0.0532)
_cons	3.624***	3.567***	3.364***	3.369***
	(0.00172)	(0.00770)	(0.00920)	(0.0116)
N	67768	67768	67768	67768

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Figure 8

Figure 8 shows the main results of the multiple linear model of the semi-log functional form of usual hours worked per week using Ordinary Least Squares (OLS), with each

coefficient reflecting the percentage change in usual hours worked per week holding all other included variables constant.

There are 4 regression models observed in Figure 8: the first model shows the raw regression of hours worked on skilled workers, second model adds education years to the regression, third model includes several core demographics, and the fourth model takes weightage of the observations into account. Model 1 gives a positive relationship of the log of hours worked and skilled workers. The coefficient for *skilledworker* in model 1 implies that if a worker is considered skilled, they work about 4.9 percentage points more than unskilled workers on average. This coefficient has an estimated deviation of about ± 0.254 percentage points.

Model 2 includes education years in the regression, and finds a positive relationship between hours worked and education years. The coefficient of *educyears* in model 2 implies that every additional year of education by worker causes their usual hours worked to increase by about 0.44 percentage points on average, holding the variable *skilledworker* constant. This coefficient has a bounce of about ± 0.0581 percentage points. The coefficient for *skilledworker* has gone down in model 2, with the new coefficient saying that if a worker is skilled, they will work about 3.76 percentage points more than unskilled workers, holding *educyears* constant. This decrease of approximately 1.2 percentage points of the coefficient for skilled workers from model 1 to model 2 might suggest that it may have been over-credited in model 1 because *educyears* is correlated with *skilledworker.*

Model 3 includes a few core demographics, with variables *male*, *experience*, *black*, *hawaiian*, and *white-black* showing a positive relationship. The coefficient for male implies that if a worker is male, he will work about 14.2 percentage points(± 0.248 percentage points) more than a female on average, holding all other included variables in model 3 constant. The coefficient on *experience* can not be interpreted directly, since *experience square* is also in the equation. The positive value for *experience* and negative value for *experience square* are expected since we saw a concave relationship in figure 1. We can find the derivative of *experience* (which then acts as an intercept shifter) and *experience square (*which then acts as experience), and then interpret the variables. All the race variables in model 3 are interpreted with white as the base case, so if your race is black, you will work about 0.687 percentage points (± 0.395 percentage points) more than white workers on average, holding all other included variables in model 3 constant. Other race coefficients can be interpreted similarly. The coefficient of skilled worker in model 3 increases compared to model 2, with skilled workers working about 1.1 percentage points more in model 3. This rise in the coefficient could be due to the coefficient in model 2 being under credited due to omitted demographics. The coefficient on *educyears* also increases in model 3 compared to model 2, which could mean that this coefficient was also being under credited due to omitted demographics in model 2.

Model 4 in figure 8 runs through the regression in model 3 again but this time we take into account the unequal probability of selection by including the weights for observations given by CPS. This is done because the classical econometric model is

not the data generating process for the CPS (because the X's are not fixed in repeated sampling) and simply using OLS on it will cause the coefficients to be biased and estimated standard error to be broken. While the problem of broken estimated SEs is an issue, it is considerably better to have a broken estimated SE than a biased coefficient estimate. Model 4 attempts to fix this issue. Coefficients for *male*, *Asian*, *Hawaiian*, and *White-american* all increased in model 4 while the coefficients for all other variables decreased. The coefficient for skilled worker decreased in model 4, with skilled workers working about 0.1 percentage points less than they did in model 3. They coefficient has a higher standard error now, implying that the deviation around the coefficient is about ± 0.355 percentage points (about a 0.07 percentage point increase from the SE of model 3's skilled worker coefficient). The coefficient of *educyears* increases by about 6% from model 3 to model 4, with the estimated SE for this coefficient increasing by about 22%!

All of the variables except certain cases in race are shown to be highly statistically significant. This implies that all those coefficient estimates of variables are explained by more than just chance generation. However, do our highly statistically significant variables have any economic importance? Samples with large sizes often produce results that are statistically significant but those results may not mean a lot in reality. Coefficients for *skilledworker* and *male* certainly seem to have economic importance. A skilled worker works about 4.7 percentage points more hours per week than an unskilled worker on average, holding other included variables constant (model 4). This seems to be an important indicator of how different types of workers work

different hours, with a 4.7 percentage point difference seeming significant. Male workers are going to work about an average of 13 percentage points more than female workers, holding other included variables constant (model 4). This result shows an extremely high gender gap in hours worked,which suggests evidence of gender inequality in labor markets. The coefficient on *educyears* in model 4 suggests that every additional year of education will increase the hours worked per week by about 0.7 percentage points on average. So, on average the difference between a high school graduate and college graduate in hours worked per week would be about 2.8 percentage points.

Statistics in figure 9 help further explain our regression results and arrive to conclusions. The low R^2 value indicates that the model (model 3) is a poor indicator of the variability in the data. A major factor for this could be caused by confounding. Figure 9 also gives us a 95% confidence interval and t-stats. The 95% confidence interval means that we are 95 percent confident that the intervals given in figure 9 will cover the true, but unknown, parameter values for the respective variable. We can also check our results by using the hypothesis test on the t-values in figure 9. If we assume that the null hypothesis, H_o , represents that there is no relationship between the independent variable and dependent variable then we can write:

$$H_o = \beta_i = 0$$

$$H_a = \beta_i \neq 0$$

Where H_a is the alternative hypothesis, and i is the variable index. The t-statistics for all the variables, except black, american-indian, hawaiian, white-black, and white-asian, are either higher than 1.96 or lower than 1.96. So we can fail to reject the null for

variables with magnitudes higher than 1.96. We can also see results for the joint hypothesis test, the F-statistic, in figure 9. The figure shows that we can reject the null for the F-statistics, which shows that the model 3's variables have significance.

Source	SS	df	MS	Number of obs	=	67,768
Model	446.436117	26	17.1706199	F(26, 67741)	=	167.53
Residual	6943.10576	67,741	.102494881	Prob > F	=	0.0000
				R-squared	=	0.0604
				Adj R-squared	=	0.0601
Total	7389.54188	67,767	.109043367	Root MSE	=	.32015

lnhours	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
skilledworker	.0486377	.002893	16.81	0.000	.0429673	.0543081
educyears	.0067962	.000582	11.68	0.000	.0056556	.0079368
male	.1421695	.0024836	57.24	0.000	.1373015	.1470374
exp	.0087362	.0004472	19.53	0.000	.0078596	.0096127
expsq	-.0001634	9.88e-06	-16.54	0.000	-.0001827	-.000144
race						
black/negro	.0068735	.003954	1.74	0.082	-.0006764	.0146234
american indian/aleut/eskimo	-.0005095	.0112601	-0.05	0.964	-.0225792	.0215603
asian only	-.0168064	.0049065	-3.43	0.001	-.0264252	-.0071917
hawaiian/pacific islander only	.0191984	.0166221	1.15	0.248	-.0133809	.0517778
white-black	.0186139	.0198419	0.94	0.348	-.0202762	.057504
white-american indian	-.0229826	.0152943	-1.50	0.133	-.0529595	.0069942
white-asian	-.0736326	.0217908	-3.38	0.001	-.1163426	-.0309226
_cons	3.363882	.0091981	365.72	0.000	3.345853	3.38191

Figure 9

Many of the findings in the empirical results have been consistent with what previous literature on related topics have found. There is a positive and statistically significant coefficient for skilled workers on hours worked, which Akerlof (1976), Landers et. al (1996), Hecker (1998), Rosenthal and Strange (2008), and other studies find. The coefficient for education is also positive and shows a significant relationship with hours worked. This positive relationship of education is seen in several hours worked studies, such as Colemen and Pencavel (1993), Weinberg et. al (2004) whose coefficient magnitudes are very similar to the coefficient values in figure 8 of this study, Rosenthal and Strange (2008), and Castro and Coen-Pirani (2008). Coleman and Pencavel (1993) find that male workers work more than female workers, and that white male

workers work longer hours than black male workers. The result for male workers is consistent with what we found in our analysis, but the effect is the opposite for black workers. This could be because their study only compare black and white male workers, which is a different DGP than the one we used. However, Bell (1998) and Finegan (1962) also find a negative relationship for black workers and hours worked. This was the only variable that was inconsistent with previous literature, and might be explained by the decreasing race inequality in labor markets (Bureau of Labor Statistics, 2017).

Conclusion

Researchers have categorized workers in different ways in past studies relating to different types of workers and their effect on hours worked. Despite studies having slightly different characteristics, they show a consistent trend for more skilled and educated workers working longer hours on average compared to unskilled workers. This research built on previous studies and used the dummy variable *skilledworker* as an estimate for other what other studies may have referred to as “professional workers”, or “technical workers”, or “knowledge workers”, or “white-collar workers”, or even “skilled workers” in some cases. The paper finds that skilled workers are more likely to work longer hours per week on average, and that the coefficient for skilled workers is highly statistically significant and also has economic importance. The same is true for our other focus variable, *educyears*. Other variables, except certain races, were also found to have a positive and significant relationship on hours worked. The only variable that was found to have a different relationship than previous literature was *black,* which may

be because of the relatively older literature available on hours worked for *black* workers. The empirical data seems to provide an answer for the research question that is consistent with studies.

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