The Size - Wage Premium

Exploring the Link between Firm Size and Wages

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Abstract

This paper investigates the impact of firm size on wages of the working population in the Current Population Survey (CPS) from 1988 to early 2023, controlling for work and employee heterogeneity. I test the relationship using linear regression models with and without state/year fixed effects, allowing for the interactions of age with work type, education and marital status. From the estimation results, I find that increased firm size has a statistically significant, positive impact on employees' wages, which existing literature has attributed to a range of factors - the "rent sharing" phenomenon, larger firms' discretionary wage policy or higher levels of productivity. An increase of firm size from "small" to "medium" and "small" to "large" both leads to increases in wages. However, there is not a pronounced difference between the magnitude of the "medium" and "large" firms coefficients, which means that large-firm workers experience only slightly higher wages than those at the moderately-sized companies. Additionally, employment in core services, specialized and highly-profitable industries are oftentimes associated with significant increases in wages, compared to other non-core sectors.

Keywords: Labor Economics, Firm Size, Wage

1 Introduction

Wage inequality in the United States is a persistent socioeconomic issue that has significantly increased over the past few decades (Mishel et al., 2012) [1]. A large body of research has primarily linked the growing gap in earnings to a range of market and institutional factors, such as globalization, technological advancements, declining unionization rates, or policy changes that favor capital over labor (Autor et al., 2018) [2]. Besides these well-known determinants, organization factors - such as differences in compensation practices across firms, corporate resources and investments, etc. - have also been highlighted as instrumental elements in shaping earnings disparity.

One critical factor that could affect wages is firm size. Prior studies have found a positive correlation between firm size and wages, suggesting that larger firms offer higher salaries to their employees compared to smaller firms, in addition to greater bonuses, better compensation/benefit packages including health insurance, retirement plans, etc. Several reasons have been suggested for this relationship, such as the rent-sharing phenomenon, the productivity hypothesis, or the fact that larger firms may have discretionary wage policies, allowing them to offer higher wages to attract and retain skilled workers.

This paper adds to the existing literature by examining the impact of firm size on wages using data from the Current Population Survey (CPS) from 1988 to 2022, controlling for employee heterogeneity such as education, age, gender, race, marital status, industry, work type and geographical location. The goal of this study is to determine whether larger firms offer higher wages to their employees compared to smaller firms, and to identify potential reasons for this relationship.

The findings of this paper can have crucial policy implications. For instance, higher wages can improve worker retention rates, as employees are less likely to job-hop when they are satisfied with their compensation. Additionally, motivating bonus packages and higher wages can lead to a more productive labor force, which can, in turn, drive higher GDP and benefit the broader economy through efficient allocation of resources. Policymakers can also provide support to encourage small business growth and invest in public education and training resources to help workers become more competent. By understanding the impact of firm size on wages, policymakers can develop strategies to reduce wage inequality and promote economic growth.

2 Literature Review

Throughout the years, there has been extensive research supporting the notion that larger firms tend to pay higher wages to their employees than smaller firms.

Moore (1911) [3] put forward a foundational way of understanding this relationship - as the size of the establishment increases, the condition of the laborer improves in all directions, including higher wages, more generous fringe benefits, better overall compensation packages and working environments, as well as greater job security. This is because larger firms are better able to weather economic downturns, market fluctuations and are much less likely to downsize or close altogether.

Using data from the US Bureau of Labor Statistics, Brown and Medoff (1989) [4] reported in their employer size-wage effect study that employees in larger firms are paid

more than those with comparable skill sets but working at smaller organizations. To account for this, Oi and Idson (1999) [5] proposed a productivity hypothesis, suggesting that large firms set a higher performance standard that raises labor productivity, which has to be supported by implementation of a discretionary wage policy, whereby firms pay higher wages when they can afford to, as well as to reward and retain high-performing employees. This policy may also be used to create a fair wage distribution within the company and to mitigate the risk of losing valuable employees to other firms.

Adding to the literature, Gerlach and Schmidt (2007) [6] found a positive relationship between firm size and wages, after controlling for variables such as labor quality, working conditions, employment tenure, fringe benefits, employee heterogeneity, monopoly power, and ability to pay. They attributed this phenomenon of higher wages in larger firms to "rent sharing", whereby firms share profits with employees to prevent shirking and labor turnover.

Cobb and Linn (2017) [7] brought an interesting perspective to the literature: large firms have been a prominent labor-market institution that contribute to a reduction in wage inequality. Not only do these firms offer more comprehensive employee benefit packages, but they also make an effort to better allocate raises by compensating low- and middle-wage employees with a greater premium than their higher-wage counterparts. This was in line with their findings that wage inequality is highest in the smallest firms and decreases as firm size increases.

3 Data

3.1 Source

To investigate the relationship between firm size and wages, I employ data from the Current Population Survey (CPS), a monthly survey of approximately 60,000 households - a representative sample of the US labor force - conducted by the United States Census Bureau and the Bureau of Labor Statistics. The original micro-level dataset obtained from IPUMS CPS is available from 1962 to 2023. However, this paper only uses the subset of working population (17 - 65 years old) from 1988 to 2023, for which firm size variable is populated. The final sample of survey respondents has a total of 11,014,865 observations.

3.2 Variables

The dependent variable used for this study is the natural logarithm (log) of wage, which is measured by the variable "incwage" in the CPS data. This variable represents the total earnings from all jobs in the reference week, including overtime pay, tips, bonuses, and other forms of compensation.

My main independent variables of interest are medium and large firm size - with small-sized firm being the reference category for the regression, which are coded as dummy variables taking values of 0 or 1. To define the size of the employer at which the survey respondents work, I divide the original nine firm size categories into three main size classes: small, medium and large. The small size class includes firms with

fewer than 500 employees. The medium size class consists of firms with 500 to 999 employees, and the large size class with 1000 or more employees.

To account for potential confounding factors, I include two groups of control variables corresponding to the two main agents of interest - work-related and employee heterogeneity. The first group, as the name suggests, includes variables relevant to an employee's working conditions, such as firm size (medium or large), NAICS-classified industry and fulltime status (yes or no). The second group takes into account employee characteristics factors such as race, gender, age, education level, marital status or geographical locations, which allow for a more accurate estimation of the relationship between firm size and wages. Table 1 shows the summary statistics of the aforementioned variables.

Table 1 Summary Statistics of Variables in Regression

	Mean	SD	Min	Max	N
I. Work-related					
Log Wage	9.502203	1.45057	0	18.42068	4373601
Medium Firm	.0211926	.1440259	0	1	7665090
Large Firm	.1547438	.3616603	0	1	7665090
II. Employee Heterogeneity					
Female	.5169474	.4997127	0	1	7665090
Black	.1137208	.3174719	0	1	7146221
Age	39.54457	13.75755	17	65	7665090
Fulltime	.4633982	.4986585	0	1	7665090
Grad	.0670402	.2500916	0	1	7665090
Married	.576681	.4940851	0	1	7665090
Central/Metro	.4808703	.499634	0	1	7665090

A range of 14 sectors categorized according to the 2-digit North American Industry Classification System (NAICS) codes are also included in the work-related control group. Table 2 displays the industry share in the Current Population Survey, with a total sample size of 5,524,866 respondents. The most common industry is Professional and Related Services, which accounts for 25.08-percent of the sample, followed by Retail Trade at 16.60-percent and Manufacturing at 14.44-percent. The least represented industry is Active Duty Military, with a frequency of 45,510, accounting for only 0.82-percent of the survey respondents. Workers in other industries such as Agriculture, Business and Repair Services, Construction, Finance, Insurance, and Real Estate, Mining, Personal Services, Public Administration, Transportation, Communications, and Other Public Utilities, and Wholesale Trade account for varying shares of the population, ranging from 2.93-percent to 7.01-percent.

4 Empirical Analysis

4.1 Exploratory Analysis

Table 3 shows that employees in larger firms tend to pay higher wages on average compared to those in small firms. This result is consistent with previous research

Table 2 Industry Share in Current Population Survey (sorted by percent)

	Freq.	Percent
Professional and Related Services	1,385,639	25.08
Retail Trade	917,347	16.60
Manufacturing	797,669	14.44
Construction	387,826	7.02
Transportation, Communications, and Other Public Utilities	387,149	7.01
Finance, Insurance, and Real Estate	339,289	6.14
Public Administration	267,757	4.85
Personal Services	193,986	3.51
Wholesale Trade	166,222	3.01
Agriculture	161,628	2.93
Business and Repair Services	342,134	6.19
Entertainment and Recreation Services	92,260	1.67
Active Duty Military	45,510	0.82
Mining	40,450	0.73
Total	5,524,866	100.00

by Haltiwanger, Lane, and Spletzer (1999) [8] that identified a positive correlation between firm size and employee compensation, which may be due to economies of scale, higher levels of productivity, or greater bargaining power. However, it is worth noting that there is minimal discrepancy in the median salary between medium and large enterprises. Moreover, the degree of disparity in salaries across the three business sizes is fairly comparable, with small firms exhibiting marginally greater deviations in wages than the other two. This points to the presence of a broader range of occupations and expertise levels in these smaller establishments, although the magnitude of this difference is not substantial.

Table 3 Log Wage Summary Statistics by Firm Size

	Sum	Mean	SD	Min	Max	Count
Small	14,800,000	9.846	1.244	0	14.557	1,506,620
Medium	1,642,695	10.132	1.108	0	14.457	162,131
Large	12,100,000	10.176	1.158	0	14.509	1,184,252
Total	28,500,000	9.999	1.212	0	14.557	2,853,003

Over time, there has been a consistent linear increase in log wages across all firm sizes. Figure 1 illustrates that medium and large firms have consistently paid higher wages than small firms, with a difference of approximately 0.4-0.5. However, it is worth noting that since the late 1990s, the gap between medium and large firms has remained relatively narrow. Moreover, the variance of the pay gap has decreased, leading to two closely-related trendlines.

Figure 2 shows that on average, industries with higher profit margins such as Mining, Finance, Public Administration, and Transportation pay significantly higher wages to their workers than low-earning industries like Agriculture, Retail, and Personal Services. This finding aligns with previous research that has identified a

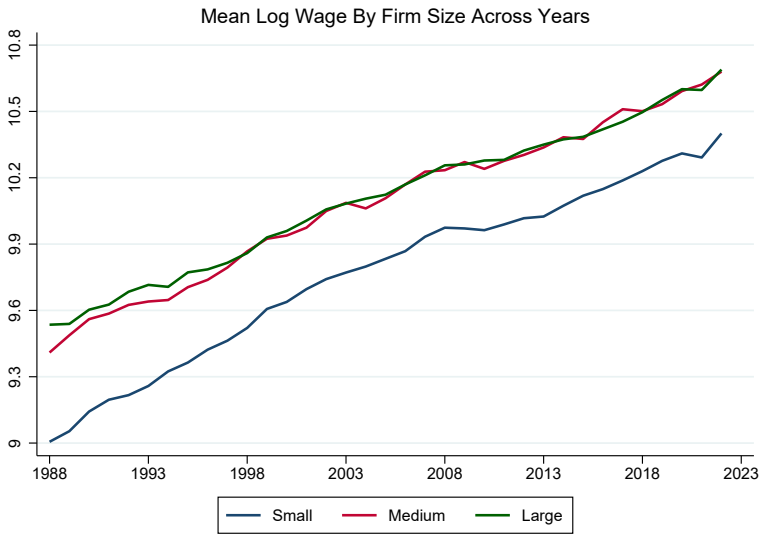

Fig. 1 Firm size data available from 1988 to 2022.

similar pattern of higher wages in the aforementioned industries, which are generally more technologically advanced, knowledge- and skill-intensive. (Autor, D., 2014 [9]; Hanushek and Woessmann, 2012 [10]). These wage differentials may be explained by a variety of factors: differences in skill requirements, levels of competition, and bargaining power between employers and employees. However, middle-range wages in industries like Manufacturing, Professional Services, and Constructions are not subjected to any significant pay penalty in comparison to the top-earning sectors.

Breaking down the wage analysis to a industry and firm-size level, the industry-wide wage trends discussed above remain consistent. Figure 3 demonstrates that larger-sized firms tend to pay their employees more than smaller-sized firms, especially in low-paying industries such as Agriculture, Personal Services, and Entertainment. Although this is less pronounced in higher-paying industries, the overall medium-large and large-small pay trends discussed earlier still hold for the most part.

4.2 Regression Analysis

To test the effect of increased firm size on wage, I construct two main regressions, with and without state/year fixed effects:

$$Wage_{it} = \gamma_1' X_{it} + \gamma_2' Z_t + \epsilon_{it} \tag{1}$$

In equation 1, $Wage_{it}$ denotes the log wage of individual i at time t, X_{it} and Z_t are $(k_1 \times 1)$ and $(k_2 \times 1)$ vectors of work-related and employee heterogeneity variables, respectively, and γ_1 and γ_2 are $(k_1 \times 1)$ and $(k_2 \times 1)$ vectors of coefficients, respectively. Finally, ϵ_{it} is the error term.

$$Wage_{ist} = \gamma_1' X_{ist} + \gamma_2' Z_{st} + \alpha_i + \lambda_t + \epsilon_{ist} \tag{2}$$

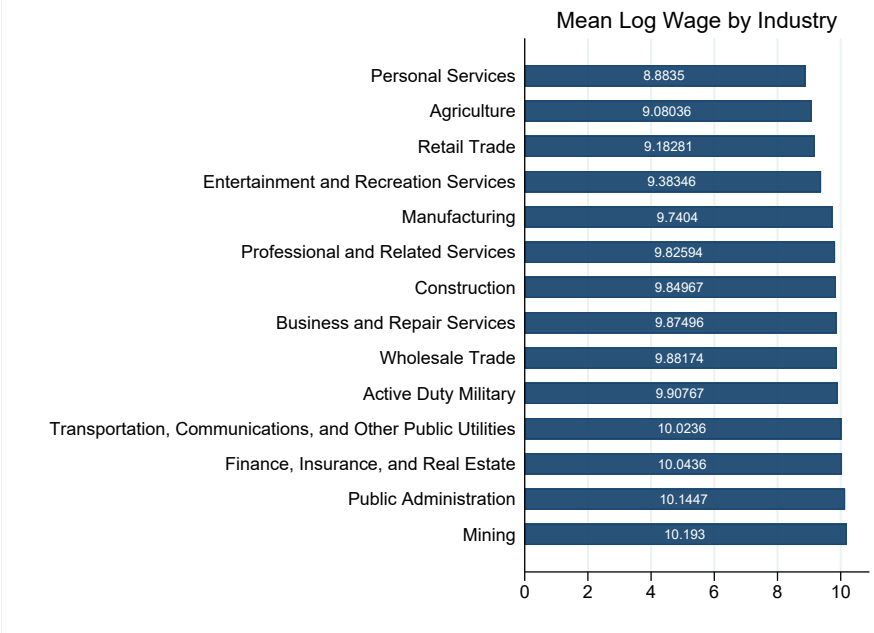

Fig. 2 Industry categories retrieved from 2-digit NAICS codes.

Equation 2 includes added fixed effects. The term α_i represents the state fixed effect, which is the average deviation in log wage across all individuals in state i. Similarly, the term λ_t represents the year fixed effect, which is the average deviation in log wage across all individuals in year t. These fixed effects are captured by the dummy variables D_{ist} and D_{st}, respectively.

Table 4 shows the results of the aforementioned regressions which estimate the effect of (medium and large) firm size on log wage, with small-sized firm being the reference category, controlling for various work-related and employee heterogeneity variables. As stated above, the two main regressions are 1) with and 2) without fixed effects, each of which branches out to two sub-categories. Column (a) is the interaction-free regression assessing the independent effect of each predictor on wages. Column (b) is an extended version of the first, which includes additional interaction terms to account for changes in effect of certain controls (grad school attendance, fulltime employment, marital status) on wages for different values of age.

4.2.1 Without Fixed Effects

The regression results in column (a) show that there is a positive correlation between medium and large firm sizes and log of wage, with coefficients of 0.54 and 0.614. This means that a one-unit increase in the size of medium and large firms results in a wage increase of 54 percent and 61.4 percent, respectively. The difference between the magnitudes of the coefficients for medium and large firms is 7.4 percent, indicating that the base pay for workers in these two types of firms is quite similar. This means

Table 4 Regression of Log Wage on Work/Employee Variables

	No Fixed Effects		Fixed Effects	
	(a)	(b)	(a)	(b)
	No Interactions	Interactions	No Interactions	Interactions
I. Work-related				
Medium Firm	0.540***	0.543***	0.151***	0.152***
	(0.002)	(0.002)	(0.002)	(0.002)
Large Firm	0.614***	0.617***	0.201***	0.203***
	(0.001)	(0.001)	(0.002)	(0.002)
Fulltime	0.873***	0.986***	0.708***	0.928***
	(0.001)	(0.004)	(0.005)	(0.007)
Military	1.487***	1.478***	1.511***	1.485***
	(0.004)	(0.004)	(0.008)	(0.008)
Mining	1.178***	1.175***	1.254***	1.242***
	(0.005)	(0.005)	(0.010)	(0.010)
Finance	1.152***	1.151***	1.155***	1.146***
	(0.003)	(0.003)	(0.010)	(0.010)
Public Admin	1.000***	1.000***	1.096***	1.090***
	(0.003)	(0.003)	(0.010)	(0.010)
Construction	1.061***	1.058***	0.925***	0.912***
	(0.003)	(0.003)	(0.009)	(0.009)
Business	1.037***	1.035***	0.871***	0.859***
	(0.003)	(0.003)	(0.009)	(0.009)
Transportation	1.010***	1.010***	1.065***	1.058***
	(0.003)	(0.003)	(0.010)	(0.010)
Professional	0.987***	0.988***	0.965***	0.959***
	(0.003)	(0.003)	(0.009)	(0.009)
Wholesale	0.992***	0.990***	1.033***	1.023***
	(0.004)	(0.004)	(0.010)	(0.010)
Manufacturing	0.876***	0.874***	1.022***	1.013***
	(0.003)	(0.003)	(0.011)	(0.011)
Entertainment	0.859***	0.863***	0.691***	0.691***
	(0.005)	(0.005)	(0.010)	(0.010)
Retail	0.739***	0.742***	0.688***	0.686***
	(0.003)	(0.003)	(0.008)	(0.008)
Agriculture	0.504***	0.503***	0.403***	0.392***
	(0.005)	(0.005)	(0.010)	(0.010)
Personal	0.485***	0.482***	0.478***	0.465***
	(0.004)	(0.004)	(0.008)	(0.007)
II. Employee Heterogeneity				
Female	-0.440***	-0.445***	-0.462***	-0.473***
	(0.001)	(0.001)	(0.005)	(0.005)
Black	-0.135***	-0.136***	-0.177***	-0.179***
	(0.002)	(0.002)	(0.004)	(0.004)
Age	0.139***	0.137***	0.122***	0.118***
	(0.000)	(0.000)	(0.001)	(0.001)
Age^2	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Grad School	0.800***	0.692***	0.514***	0.317***
	(0.002)	(0.009)	(0.003)	(0.010)
Married	0.024***	0.192***	0.152***	0.477***
	(0.001)	(0.004)	(0.002)	(0.007)
Central/Metro	-0.164***	-0.166***	-0.085***	-0.088***
	(0.001)	(0.001)	(0.002)	(0.002)
III. Interaction Terms				
Fulltime=1 × Age		-0.003***		-0.006***
		(0.000)		(0.000)
Grad=1 × Age		0.003***		0.005***
		(0.000)		(0.000)
Married=1 × Age		-0.004***		-0.008***
		(0.000)		(0.000)
Constant	5.424***	5.405***	5.814***	5.782***
	(0.189)	(0.189)	(0.012)	(0.012)
R2	0.493	0.494	0.466	0.465

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

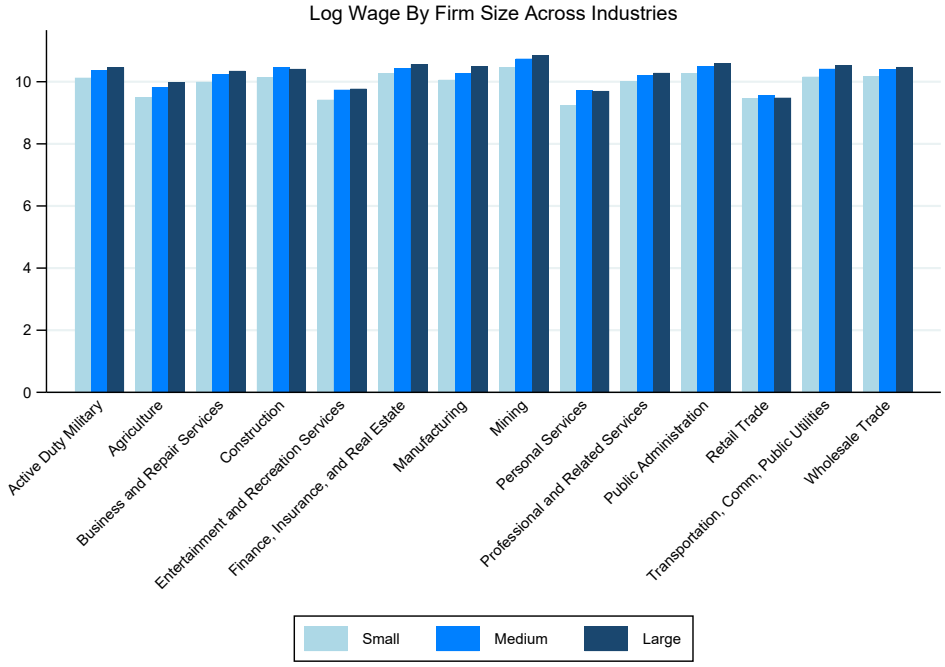

Fig. 3 Sector grouping according to North American Industry Classification System (NAICS).

that working for a large firm does not significantly increase wages more than working for a medium firm when wages at small firms are used as a benchmark.

Regarding the first group of work-related control variables, employment type has a significant, positive impact on wages, with full-time workers experiencing an 80-percent wage premium compared to those working on a part-time basis. This finding is also reflected in table 9, where employees hired on a fulltime basis consistently earn higher wages than part-timers on average, and also experience less volatility in earnings. A range of 14 NAICS-defined sectors are also included to control for the differential impact of industry on wages. In line with exploratory findings from section 4.1, working in highly-profitable industries such as Mining, Finance, Insurance, Real Estate, Business Services, Construction, Transportation and Public Administration - whose services are critical and require specialized skill sets, is associated with greater than 100-percent increase in wages. Especially, employment in active-duty military is found to have the highest positive wage-effect, boosting pretax income by a pronounced 149-percent. At the lower end of the spectrum, employees in sectors such as Agriculture, Manufacturing, Wholesale, Retail, Personal and Professional Services, Entertainment earn only half to a third of what those in other industries make.

The second control group accounts for employee heterogeneity. Graduate school attendance (graph 4), age and marital status (table 8) are all independently, positively associated with the log of wage, each increasing wage by 80 percent, 13.9 percent,

and 2.4 percent, respectively. On the other hand, being female (table 7), black (table 6), and working in a central/metro location (table 10) decreases estimated wage by 44-percent, 13.5-percent, and 16.4-percent, respectively.

Column (b) includes additional interactions terms between age and intuitively related variables such as employment status, graduate degree and marital status. These interaction effects an interesting dimension to the story, as it shows how the impact of certain factors on wage change as age increases. Specifically, the coefficient for the grad-school-age interaction term is positive and significant, indicating that the effect of attending graduate school on log wage increases with age. In contrast, the effect of being in a full-time occupation and/or a current marriage has a decreasing impact on wages as age increases. It should also be noted that the addition of these interactions terms does not change the direction of the existing coefficients, and has minimal impact on their magnitude. In this extended-interaction regression without fixed effects, the gap between medium and large- firm wages strictly remains 7.4-percent.

4.2.2 With Fixed Effects

In the interaction-free regression represented by column (a), we observe the most significant change in the magnitude of the medium- and large-firm coefficients. With state and year fixed effects in place, working for a medium-sized company is now associated with a 15.1-percent increase in wage, while working for a large corporation is associated with a 20.1-percent jump. The medium-large firm pay gap has tightened to 5-percent, further highlighting the fact that employees generally do not experience a very great pay increase changing from a medium to large firm. Findings from the non-fixed-effects regression of the other work-related and employee-heterogeneity variables largely remain true. Profitable sectors - Mining, Military, Finance and Public Administration - pay a higher wage premium to workers than those in other industries. Discriminatory trends in compensation practices still exist, as reflected by the negative impact of female/black identification and the positive effect of a graduate degree and marriage on wages.

Column (b) stores the most "refined" and comprehensive regression with both state/year fixed effects and interaction terms. Again, similar to what has been found in the non-fixed effects version, adding interaction terms does not alter the direction of coefficients, and only slightly modify their magnitude. Compared to those hired at small firms, employees at medium to large companies are paid 15 to 20-percent more on average. The medium-large firm pay gap remains tight at the 5-percent level. On the employee-characteristics side, as age increases, the impact of full-time employment and marital status on wages decreases, while the opposite is true for graduate-degree holders.

4.2.3 Robustness Check

To test the robustness of the OLS models, I narrowed the fixed-effects regressions down to specific time periods corresponding to major crises which have affected the global economy in recent history: The Dotcom Bubble (1995-2000), Financial Crisis (2007-2009) and COVID Pandemic (2020-2022). Findings from corresponding regressions in Table 5 indicate that, across all three crises, employees earn a wage premium of 14 to

22-percent working for medium to large firms compared to what they would make at a small firm.

The Dotcom Bubble was a period of rapid growth and speculation in the technology sector, driven by the rise of the internet and the proliferation of online businesses. The bubble reached its peak in early 2000, after which many internet companies experienced a dramatic decline in value. This led to a contraction in the tech sector and a wider economic slowdown. As shown in column (1), during this period, the gap in pay range between medium-large companies is most pronounced - a 5.4-percent difference. One possible explanation for this could be that the technology sector, which was at the center of the bubble, was dominated by larger firms. These firms may have had a competitive advantage in terms of access to capital, expertise, and other resources, which allowed them to pay their employees more than their smaller counterparts. In addition, the hype around the tech sector during the bubble period may have made it easier for larger firms to attract and retain top talent, which could have further contributed to the pay gap.

The Covid Pandemic, which began in early 2020, has also had a wide-ranging impact on the global economy. The pandemic led to widespread disruption in supply chains, decreased consumer demand, and significant government interventions to support struggling businesses. Column (2) results indicate that during this pandemic, the medium-large wage gap decreased to 4.1-percent. This can be explained by the fact that businesses of all sizes were affected, and the economic downturn has made it more difficult for companies to maintain high profit margins, particularly those in the travel, hospitality, and retail sectors. Larger firms may have been more resilient in weathering the economic storm due to their greater resources and access to government support, but their ability to maintain significantly higher wage premiums than medium firms were likely limited by the overall unstable economic conditions.

Lastly, the Financial Crisis of 2008 went down in history with an unprecedented housing market collapse, leading to widespread financial instability and a global economic downturn. During this period, workers experience the lowest wage premium of 3.8-percent if changing from a medium to large-sized company. Such a low wage differential is likely a result of the profound systemic shock to corporate profit margins across small, medium, and large firms. Regardless of sizes, businesses, particularly those in the financial sector, experienced significant losses and struggled to maintain profitability, many of which were forced to cut costs and lay off employees.

All of these crises have had a significant impact on corporate profit margins and wages. During such periods of economic uncertainty, businesses of all sizes are often forced to reduce labor costs, leading to lower wages for employees. This was reflected by an overall decrease in coefficient magnitude for the independent firm-size variables, when compared to table 4 results. Still, medium-to-large corporations have fared better than small businesses during these crises, as they have greater financial cushions, stronger brand reputation, as well as established relationships with suppliers/customers, leading to greater bargaining power which helps with cost reduction and profitability.

Table 5 Fixed-Effects Regression of Log Wage During Crises

	(1) Dotcom Bubble 1995-2000	(2) Financial Crisis 2007-2009	(3) Covid Pandemic 2020-2022
I. Work-related			
Medium Firm	0.168***	0.146***	0.153***
	(0.006)	(0.007)	(0.009)
Large Firm	0.222***	0.184***	0.194***
	(0.005)	(0.005)	(0.006)
Fulltime	0.669***	0.644***	0.640***
	(0.006)	(0.006)	(0.009)
Military	1.447***	1.501***	1.266***
	(0.018)	(0.023)	(0.026)
Mining	1.201***	1.238***	0.954***
	(0.023)	(0.034)	(0.031)
Finance	1.097***	1.112***	0.984***
	(0.013)	(0.018)	(0.022)
Public Admin	1.032***	1.004***	0.820***
	(0.015)	(0.015)	(0.024)
Transportation	1.023***	0.938***	0.732***
	(0.016)	(0.020)	(0.023)
Wholesale	0.998***	0.969***	0.767***
	(0.015)	(0.023)	(0.025)
Manufacturing	0.964***	0.921***	0.767***
	(0.015)	(0.021)	(0.022)
Construction	0.921***	0.895***	0.730***
	(0.015)	(0.022)	(0.023)
Business	0.836***	0.853***	0.774***
	(0.015)	(0.019)	(0.021)
Professional	0.890***	0.851***	0.720***
	(0.014)	(0.017)	(0.019)
Retail	0.640***	0.610***	0.456***
	(0.014)	(0.017)	(0.020)
Agricultural	0.471***	0.532***	0.448***
	(0.022)	(0.031)	(0.035)
Entertainment	0.694***	0.625***	0.522***
	(0.022)	(0.019)	(0.028)
Personal	0.509***	0.571***	0.411***
	(0.017)	(0.027)	(0.027)
II. Employee Heterogeneity			
Female	-0.368***	-0.332***	-0.282***
	(0.004)	(0.005)	(0.006)
Black	-0.154***	-0.117***	-0.130***
	(0.007)	(0.009)	(0.010)
Age	0.124***	0.126***	0.100***
	(0.001)	(0.001)	(0.002)
Age^2	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Grad School	0.536***	0.548***	0.495***
	(0.008)	(0.009)	(0.009)
Married	0.119***	0.159***	0.192***
	(0.004)	(0.005)	(0.005)
Central/Metro	-0.102***	-0.069***	-0.036***
	(0.005)	(0.006)	(0.007)
Constant	5.918***	6.219***	7.092***
	(0.021)	(0.032)	(0.036)
R2	0.431	0.437	0.389

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5 Conclusion

5.1 Main Findings

In this paper, the impact of firm size on wages was investigated using data from the Current Population Survey (CPS) from 1980 to early 2023, controlling for employee heterogeneity such as employment status, industry, education, age, gender, race, marital status, and geographical location. The results of the linear regression models with and without state/year fixed effects both show that increased firm size has a statistically significant, positive impact on employees' wages. This positive correlation between firm size and wages can be attributed to factors such as rent-sharing, better compensation packages, and working conditions. The regression results also indicate that a change of firm size category from both "small" to "medium" and "small" to "large" leads to increases in wages, but there is not much difference in wages between working at a medium firm and a large firm. Additionally, industry plays a significant role on pretax income, with careers in industries such as Mining, Finance and Military paying a wage premium of up to 100-percent compared to Agriculture, Retail or Personal Services. Findings related to individual characteristics are intuitive: age, full-time employment, and grad school attendance are all positively associated with estimated wages, while being female, black, and working in a central/metro location bear a negative effect. Furthermore, the effect of a graduate degree on wages increases with age, while the opposite is true for that of marriage and full-time employment.

5.2 Limitations

Despite the insights obtained from this paper, it is important to note its limitations - one of which is potential endogeneity, whereby there are unmeasured variables that affect both firm size and wages. For instance, it is possible that high-performing employees may be more likely to seek out employment in larger firms, which could explain why employees at larger firms earn higher wages. There is also not a standard measure for an employee's work ethics, productivity or their innate ability. On the other end of the spectrum, larger firms may be more likely to offer higher wages because they have access to better technology, more resources, and more skilled workers. These potential employee and firm characteristics are all valid factors that are likely to confound the firm size - wage relationship, yet are out of the scope of CPS data and thus cannot be controlled for. Therefore, it is important to acknowledge how this limitation could be influencing the results of this study. Future research could explore alternative datasets or employ alternative methods to address endogeneity issues and better isolate the causal relationship between firm size and wages.

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6 Appendix

Table 6 Means, Standard Deviations and Frequencies of Log Wage by Race and Firm Size

Firm Size	White	Black	Total
Small	9.8574289	9.6846273	9.8421138
	1.2463565	1.198794	1.2431847
	1273865	123879	1397744
Medium	10.155924	9.9105112	10.125544
	1.1034377	1.0828819	1.1038733
	131732	18611	150343
Large	10.192708	10.001365	10.16585
	1.154527	1.1355556	1.1537984
	934069	152518	1086587
Total	10.008089	9.8626294	9.9918019
	1.2139489	1.1693994	1.2099118
	2339666	295008	2634674

Table 7 Means, Standard Deviations and Frequencies of Log Wage by Gender and Firm Size

Firm Size	Male	Female	Total
Small	10.089846	9.5682652	9.8467199
	1.1885323	1.2472948	1.2437957
	804334	702286	1506620
Medium	10.360767	9.9228855	10.131902
	1.0598795	1.1092237	1.1077528
	77391	84740	162131
Large	10.408581	9.9451282	10.175783
	1.0983304	1.1687593	1.1576823
	589388	594864	1184252
Total	10.231797	9.7522399	9.999517
	1.1572205	1.2202922	1.2121173
	1471113	1381890	2853003

Table 8 Means, Standard Deviations and Frequencies of Log Wage by Marital Status and Firm Size

Firm Size	Not Currently Married	Currently Married	Total
Small	9.5121438	10.103747	9.8467199
	1.2831549	1.1482881	1.2437957
	654564	852056	1506620
Medium	9.8130882	10.349861	10.131902
	1.1904124	.9900823	1.1077528
	65834	96297	162131
Large	9.8028858	10.450739	10.175783
	1.2455935	1.0031529	1.1576823
	502609	681643	1184252
Total	9.6478273	10.263394	9.999517
	1.2713398	1.0938197	1.2121173
	1223007	1629996	2853003

Table 9 Means, Standard Deviations and Frequencies of Log Wage by Employment Status and Firm Size

Firm Size	Not-Fulltime	Fulltime	Total
Small	9.0715236	10.256095	9.8467199
	1.4060622	.91379615	1.2437957
	520672	985948	1506620
Medium	9.3617745	10.436934	10.131902
	1.3509884	.81381278	1.1077528
	45998	116133	162131
Large	9.406031	10.52007	10.175783
	1.3942851	.82862369	1.1576823
	365986	818266	1184252
Total	9.2171035	10.379512	9.999517
	1.408349	.88191745	1.2121173
	932656	1920347	2853003

Table 10 Means, Standard Deviations and Frequencies of Log Wage by Location and Firm Size

Firm Size	Non-Central	Central/Metro	Total
Small	9.9251406	9.754174	9.8467199
	1.2424675	1.2389935	1.2437957
	815548	691072	1506620
Medium	10.191394	10.053603	10.131902
	1.1099468	1.0999731	1.1077528
	92130	70001	162131
Large	10.23343	10.095414	10.175783
	1.156315	1.1547942	1.1576823
	689613	494639	1184252
Total	10.073598	9.9052842	9.999517
	1.2081398	1.2106254	1.2121173
	1597291	1255712	2853003

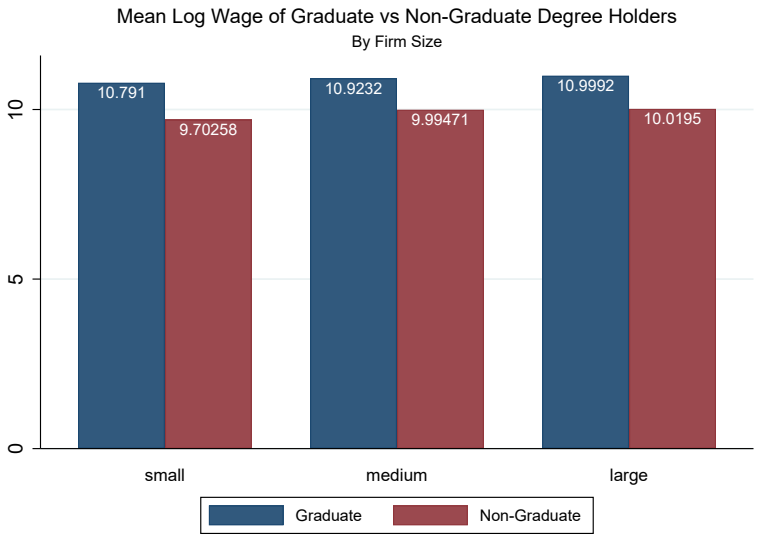

Fig. 4 Graduate-level degree includes Master's, Associates, and PhD.