Market Power Within-Firm Inequality

Kazakis, Pantelis

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Market Power & Within-Firm Inequality*

Pantelis Kazakis †

University of Glasgow

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Abstract

Income inequality in the United States is on the rise. At the same time, firm market power has also increased. In this paper, I attempt to shed light on the relation between these two variables. Using data for U.S. firms I find a positive relation between market power and top executive pay. I also find that market power is positively associated with executive wage-to-employee wage ratios, potentially indicating that market power is a force that increases within-firm inequality.

JEL codes: J2, J31, J33, L1

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†pantelis.kazakis@glasgow.ac.uk; Adam Smith Business School, University of Glasgow, Gilbert Scott Building, West Quadrangle, Glasgow G12 8QQ, United Kingdom.

1. Introduction

Wage inequality in the United States has been on the rise for several decades (Acemoglu and Autor, 2011). Data show that a large portion of this type of inequality stems from within the firm. According to Song et al. (2019), from 1978 to 2013, at least one-third of this inequality can be traced back to the firm. They also show that talent gravitates toward high-paying jobs, and that high-paid workers are more likely to collaborate. More evidence suggests that the composition of workers within a firm has shifted dramatically. According to Kaplan and Zoch (2020), non-traditional labour activities (e.g., design, R&D, logistics, and marketing) have seen a larger wage increase than traditional activities. According to the aforementioned studies, some firms grow and become increasingly stronger in terms of the human capital they attract, among other things. This has become abundantly clear, particularly in the market for top executives (Gabaix and Landier, 2008).

Simultaneously, certain firms in the U.S. economy have gained market power. According to De Loecker et al. (2020), firm markups have increased threefold since 1980, with the effect being stronger in large and established firms. Because market power has the potential to affect firm profitability, it is expected that it will be linked to manager pay. To that end, Bao et al. (2022) develop a model that shows how market power and firm size increase firm profitability and, as a result, managers' pay.

According to Han and Pyun (2021), market power can increase profits that benefit business owners, corporate managers, and executives. They discover that market power is positively related to rising income inequality at the national level. I attempt to shed light on the relationship between market power and firm-level inequality in this paper. First, I show that market power is positively associated with CEO and executive salaries and negatively with employee costs. Importantly, I show that market power is positively associated with the ratio of CEO (executive) wages to employee wages, implying that market power may have played a significant role in the recent surge in income inequality in the United States.

2. Model and Data

Markup-level data at the firm level are from De Loecker et al. (2020). CEO and executive salaries are from Execucomp (item "tdc1"). To ideally measure within-firm inequality, one would need information about the employees salaries. Nonetheless, such information is sparsely populated in Compustat (see item "xlr"). To this end, I follow İmrohoroğlu and Tüzel (2014) to estimate employee salaries. Specifically, I utilize average weekly salaries at the state-industry-year level from the Quarterly Census of Employment and Salaries (QCEW) provided by the Bureau of Labor Statistics (BLS). From this data, I estimate annual salaries and complement the information in Compustat.[1] The rest of the control variables are from Compustat. I end up with a sample with information for the period 2001-2016. All continuous variables are winsorized at the top and bottom 1% level. Variable definitions are shown in Table 1 below.

[Table 1 about here]

The econometric model I use takes the following form:

$$DepVar_{i,t} = \beta_0 + \beta_1 \cdot Log(market\ power)_{i,t-1} + \boldsymbol{\beta}_2 \cdot \textbf{Firm controls}_{i,t-1} + \mu_f + \nu_t + \xi_{ind} + \varepsilon_{i,t}$$

The unit of observation is the firm, i, at time t. $DepVar$ is either the salaries of the CEO, the CEO and the rest of the executives, the rest of the executives only, or the employee's salary. Further, $DepVar$ is also the ratio of salaries between the different groups (i.e., executives vs. employees, CEO vs. other executives). The model contains standard control variables at the firm level, as well as being saturated with firm, year, and industry fixed effects. Albeit it is not possible to rule out any endogeneity issues—this paper does not claim any causality,—the use of a plethora of fixed effects at least provides some reassurance towards the robustness of the results.

1. To calculate annual employee salaries, I multiply the average weekly wage by thirty-seven, which is the average number of working weeks for U.S. citizens. The correlation between the calculated annual employee salaries and Compustat item "xlr" is 91%.

3. Results

Table 2 shows the findings regarding the relation between market power and wages. Column (1) shows that when market power increases by 10%, CEO wages increase by about 2.5%. This is consistent with the theoretical work cited above pointing to a positive relationship. Then I look at the salaries of the CEOs and the rest of the board of directors. Column (2) establishes the previously discovered positive relationship. Even though the coefficient is slightly smaller, it is still highly significant. Furthermore, to investigate whether market power is only associated with CEO wages, I examine what happens when I isolate only the wages of top executives other than the CEO. Column (3) contains the results, which are very similar to the previous ones. Finally, I examine the relation between market power and the estimated cost of employment in Column (4). I discover a negative and statistically significant coefficient indicating that a 10% increase in market power reduces wages by approximately 0.75 percent. These preliminary findings indicate that increases in market power have opposite effects on wages for those at the top echelons of a firm and the rest of the workforce.

My next step is to investigate whether market power is related to wage ratios between different types of employees. Table 3 displays the results. Column (1) demonstrates that the market power coefficient is positive and statistically significant. In economic terms, a one-standard-deviation increase in market power raises the CEO wage to employee wage ratio by about 0.03 percentage points. Given that the dependent variable's average is 0.046, this is a significant increase. In column (2), I show results where the numerator is the sum of the CEO's and the other board members' wages. The coefficient nearly doubles in this case. Next, in column (3), I examine whether the results hold if I keep only wages for non-CEO top executives. The coefficient is still significant in this case, albeit at a 10% level. Finally, in column (4), I examine whether market power raises CEO wages more than other top executives. I do not find such an outcome. I argue that this could imply that greater market power benefits all types of executives.

[Tables 2 & 3 about here]

4. Conclusion

This paper investigates empirically how market power is related to firm inequality, building on the growing theoretical literature on the subject. It discovers a positive relationship between market power and top executive pay. It also discovers that market power is positively associated with executive wage-to-employee wage ratios, potentially indicating that market power is a force that increases within-firm inequality.

Future research on within-firm inequality should consider the role of monopsony power. Recent research on labour market concentration indicates that monopsony power reduces wages (Azar et al., 2020, 2022), and it would be interesting to see if there are differential effects between top executives and the rest of the workforce.

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Table 1: Variable definitions

Variable	Definition
Dependent variables	
Wage1	Log (CEO wage) calculated from Execucomp item "tdc1".
Wage2	Log (CEO + rest of board members wages) calculated from Execucomp item "tdc1."
Wage3	Log (Board member wages without CEOs wage) calculated from Execucomp item "tdc1."
Wage4	The logarithm of the estimated cost of employment is calculated by multiplying the estimated wage of the average worker in a specific state, industry (NAICS), and year by the number of employees. See text for additional information.
Ratio1	= Wage1/Wage4
Ratio2	= Wage2/Wage4
Ratio3	= Wage3/Wage4
Ratio4	= Wage1/Wage2
Control variables	
Log (market power)	The market power index calculated based on De Loecker et al. (2020) replication toolkit. The data can be retrieved from QJEs site
Log (assets)	Firm assets (Compustat item AT) in logs.
Log (sales)	Firm sales (Compustat item SALE) in logs.
CAPEX	Capital expenditures over total assets (Compustat: CAPX/AT).
Cash	Cash and short-term investments. This variable is calculated as CHE/AT.
INTANG	Intangibles over total assets (Compustat: INTAN/AT).
Leverage	Firm leverage. This is calculated as (DLC + DLTT)/AT.
ROA	Earnings before interest and taxes divided by total assets. This variable is calculated as EBIT/AT.
PPENT	Net property, plant, and equipment (log in millions of dollars).
Net Profit Margin	This variable measures a firms net profit margin and is calculated as NI/SALE.
MB	This variable denotes the market-to-book ratio. It is calculated as CSHO*PRCC_F/CEQ.

Table 2: Results with wages

Dependent variable	Wage1	Wage2	Wage3	Wage4
	(1)	(2)	(3)	(4)
Log (market power)	0.250***	0.202***	0.203***	-0.075**
	(0.053)	(0.036)	(0.035)	(0.038)
Log (assets)	0.213***	0.208***	0.228***	0.294***
	(0.082)	(0.024)	(0.026)	(0.026)
Log (sales)	0.081	0.155***	0.145***	0.426***
	(0.077)	(0.027)	(0.031)	(0.030)
CAPEX	0.383	0.502***	0.511***	0.007
	(0.252)	(0.144)	(0.140)	(0.117)
Cash	-0.089	0.130*	0.059	-0.209***
	(0.286)	(0.076)	(0.077)	(0.075)
INTANG	-0.326	-0.136*	-0.124	-0.038
	(0.237)	(0.080)	(0.084)	(0.067)
Leverage	-0.326***	-0.235***	-0.186***	-0.092**
	(0.069)	(0.046)	(0.049)	(0.044)
ROA	0.397***	0.194***	0.149**	0.053
	(0.123)	(0.073)	(0.068)	(0.066)
PPENT	-0.593***	-0.281**	-0.213*	0.135
	(0.220)	(0.114)	(0.124)	(0.095)
Net Profit Margin	-0.028***	-0.026***	-0.029***	-0.023**
	(0.010)	(0.008)	(0.006)	(0.010)
MB	0.005***	0.004***	0.004***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Mean of dependent variable	*14.94*	*16*	*15.5*	*19.1*
Observations	20,252	20,358	20,345	20,272
Adjusted R^2	0.614	0.771	0.762	0.974
Cluster	Firm	Firm	Firm	Firm
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

NOTES: Standard errors, shown in parentheses, are robust and clustered at the firm level. Stars, ***, **, *, indicate statistical significance at the 1%, 5%, and 10%, respectively.

Table 3: Results with ratios

Dependent variable	Ratio1	Ratio2	Ratio3	Ratio4
	(1)	(2)	(3)	(4)
Log (market power)	0.073**	0.146***	0.081*	0.008
	(0.034)	(0.053)	(0.043)	(0.032)
Log (assets)	0.043*	0.087*	0.035	-0.062*
	(0.025)	(0.049)	(0.023)	(0.033)
Log (sales)	-0.069**	-0.169*	-0.097*	0.011
	(0.031)	(0.088)	(0.058)	(0.043)
CAPEX	0.078	0.153	0.035	0.039
	(0.065)	(0.163)	(0.149)	(0.319)
Cash	-0.065	-0.078	-0.012	0.265**
	(0.081)	(0.128)	(0.045)	(0.112)
INTANG	-0.121	-0.17	-0.04	0.102
	(0.090)	(0.143)	(0.051)	(0.090)
Leverage	-0.035	-0.106	-0.066	-0.165
	(0.034)	(0.088)	(0.057)	(0.105)
ROA	0.15	0.252	0.118	0.048
	(0.101)	(0.172)	(0.076)	(0.066)
PPENT	-0.165*	-0.391*	-0.253	-0.096
	(0.089)	(0.233)	(0.160)	(0.129)
Net Profit Margin	-0.038	-0.049	-0.02	-0.007
	(0.035)	(0.055)	(0.021)	(0.008)
MB	0.001	0.002*	0.001**	0.000
	(0.001)	(0.001)	(0.000)	(0.002)
Mean of dependent variable	*0.046*	*0.116*	*0.07*	*0.72*
Observations	20,178	20,272	20,240	20,273
Adjusted R^2	0.576	0.64	0.571	0.201
Cluster	Firm	Firm	Firm	Firm
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

NOTES: Standard errors, shown in parentheses, are robust and clustered at the firm level. Stars, ***, **, *, indicate statistical significance at the 1%, 5%, and 10%, respectively.