Pay Inequality and Firm Performance

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Abstract

The rising pay inequality between CEO and rank and file employees has attracted considerable attention from the public, activists, regulators, and academic researchers. High CEO pay may incentivize employees to work hard for promotions and/or can help a firm attract talented CEO. Alternatively, high CEO pay may lead to inequity aversion and decrease employees' work effort and/or signal rent extraction. We employ an advanced DuPont return on assets (ROA) decomposition to empirically test the predictions of these competing theories about the effects of pay inequality on firm performance. Using a sample of 1,321 Indian firms during 2017-2019 period, we find that pay inequality leads to better future performance as measured by the ROA, providing prima facie support for tournaments and talent assignment. However, an analysis of drivers of ROA reveals that the source of ROA improvement is better asset utilization (ATO). Further decomposition of ATO reveals that pay inequality leads to a significant decrease in labor productivity consistent with inequity aversion. Labor intensity increases significantly and is the sole driver of gains in asset utilization that in turn leads to ROA improvement. In other words, the observed improvements in ROA are simply the result of hiring more employees. Although it makes sense to hire more employees in an economy with low labor costs, it is hard to see as a reflection of executive talent.

1. INTRODUCTION

Income inequality across the globe has led to an increased focus on CEO pay. The CEO pay ratio (CEO compensation divided by median worker compensation) has an intuitive appeal as a summary statistic to capture the income inequality between the CEO and rank-and-file workers. By this metric, CEO compensation has become very high relative to a typical worker. The average CEO in the United States of America (US) earned 399 times the pay of an average worker in 2019 compared to 121 times in 1995 and just 21 times in 1965. The growth in CEO pay has also far outstripped the growth in compensation of an average worker. From 1978 to 2021, CEO compensation rose by 1,460%, far above the growth in S&P index (1,063%). In contrast, average worker compensation grew by a meagre 18% during this period (Bivens and Kandra, 2021).

This rising gap between the CEO's and others' compensation has sparked an intense debate among academicians, economists, and regulators. Several countries have passed legislation requiring companies to disclose data on CEO pay ratio, with the belief that this would force companies to rethink the pay disparity. In the US, Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, directed SEC to require publicly traded companies to disclose the total annual compensation of a median employee and the ratio of CEO's total annual compensation to median employee compensation. In 2015, the SEC issued the final rule mandating disclosure of the CEO pay ratio. The rule became effective in 2018.

In the United Kingdom (UK), the Department of Business, Energy, and Industrial Strategy (BEIS) issued new reporting regulations in 2018 under section 172 of the Companies Act of 2006, requiring UK companies to publish the ratio of their CEO's total remuneration to the median, 25th and 75th percentile total remuneration of their full-time UK employees. The companies are also required to explain the reasons for changes in the ratio and whether the median ratio is consistent with employee pay, reward and progression. The regulations apply to companies with more than 250 UK employees and take effect from January 1, 2019.

In India, Section 197(12) and Rule 5 of the Companies (Appointment and Remuneration of Managerial Personnel) Rules, 2014 requires Board's Report of publicly listed companies to disclose the ratio of the remuneration of each director to the median remuneration of the employees of the company for the financial year along with the percentage increase in remuneration of employees, directors, and managers (Vinayak, 2019). The Board should also provide justification for the increase in managerial remuneration and affirm that remuneration is consistent with company policies.

It is noteworthy that none of these government regulations seek to directly constrain CEO pay. Rather, they shine a bright light on pay-inequality so that stakeholders and social activists can exert pressure on boards to rein in the CEO pay or increase the pay of rank and file workers.

Although compensation differential between executives and workers and have attracted considerable attention from academia in several disciplines such as economics, social psychology, and organization behavior, a clear understanding of their causes and consequences from an economic standpoint remains elusive (Connelly et al., 2016).

This study, following prior literature, uses return on assets (ROA) as a primary measure of firm performance. We investigate how does pay multiple influence subsequent firm operating performance. If a high pay multiple provide employees with strong incentives to work hard to win the promotion prize or if high the CEO pay is a reward for the talent and ability of CEO (talent assignment), we expect high pay multiple to lead to a better firm performance. By contrast, if a high pay multiple generates worker dissatisfaction or if it reflects rent extraction, we expect worse subsequent firm performance.

Consistent with prior literature, we find that pay inequality leads to better future performance as measured by ROA. Taken at face value, this supports competition for promotion and talent assignment hypotheses. When we then take a deeper look at the drivers of firm performance by exploiting the advanced DuPont decomposition of ROA, a more nuanced picture emerges. The DuPont decomposition expresses ROA as a product of profit margin (PM) and asset turnover (ATO). What we find is that pay inequality has no impact on profit margin. This seems puzzling as one would expect a talented CEO to reduce costs and/or sell high margin products. However, pay inequality is significantly and positively related to asset turnover. In other words, the source of ROA improvement appears to be better asset utilization. The supporters of talent assignment would argue that this is an indication of CEO talent and ability. To generate insights into drivers of asset utilization, we further decompose ATO into two components- labor productivity (PROD) and labor intensity (INT) (See Appendix 2). We find that pay inequality has a negative effect on labor productivity. It appears that high pay inequality causes low morale and leads employees to withhold efforts (inequity aversion). Surprisingly, pay inequality is positively and significantly related to labor intensity. Thus, hiring more employees leads to better asset utilization. Even though it results in higher personnel costs, higher ROA implies that the gains in asset utilization offset any increase in cost (that reflects in profit margin). One reason CEOs may be tempted to hire more employees is that labor costs are relatively low in India. Regardless of the motivation, hiring more employees is scarcely an act of talent.

Mueller et al. (2017) argue that in case talent assignment is the key channel for improved ROA, the results should be more pronounced for firms in competitive industries since there is more demand and competition for managerial talent resulting in higher CEO pay. Similarly, the link between pay inequality and ROA should be stronger for firms that are better governed. The reason is that better governed firms will pay more only if the CEO has high talent and ability and can deliver better firm performance. To see whether product market competition and corporate governance mediate the pay ratio and firm performance relation, we divide firms into four groups based on their scores on competition and governance. We find that pay inequality is associated with better performance only in firms that face intense product market competition and have better governance. These results are consistent with talent assignment. There is no association between pay inequality and ROA for firms with low competition and poor corporate governance. This is consistent with rent extraction. Further, pay inequality has a significant and negative impact on productivity in this group indicating severe inequity aversion. This can be expected if employees perceive that high CEO pay is incommensurate with his contributions.

Ours study is the first to focus on India. Previous studies have analyzed pay ratios in different country settings, for example, Korea (Shin et al., 2014), China (Banker et al., 2016), the UK (Mueller et al., 2017), and the US (Rouen, 2022). Interestingly, Burns et al. (2015) suggest that the incentive effects of tournaments are influenced by cultural values of participants. Culture also influences the employees' acceptance of workplace hierarchy and the perception of income inequality as a reward for hard work and talent. That means results based on the country specific studies may not extend to India. Although, over the years, Indian government has embraced market based economic system, the social and ethical norms shaped by its long history, and the vast cultural, ethnic, and religious diversity make it unique setting to study pay ratio. Our sample consists of a recent period in which Indian firms are required to disclose median employee compensation. This increases the generalizability of the findings as it doesn't rely on surveys or proprietary databases used in early studies when the mandatory disclosure regime did not exist.

The rest of the paper is organized as follows. Next section describes factors affecting the relationship between pay inequality and firm performance and literature review. Section 3 describes research design. Sample selection procedure and descriptive statistics appear in Section 4. Results are presented in section 5. Concluding remarks appear in the last section.

2. CEO PAY RATIO AND FIRM PERFORMANCE

Based on prior literature, the impact of compensation inequality on firm productivity at the worker level is shaped by two forces- inequity aversion and competition for promotion. Likewise, the impact on compensation inequality on firm performance at the CEO level depends on whether high compensation is caused by talent assignment or rent extraction. Below we briefly describe these factors and their implications for firm performance.

Inequity Aversion

Individuals in a social exchange expect rewards to be commensurate with their contributions (Adams, 1965). Thus, employees compare their contributions (efforts, skills, talent etc.) to the firm with the rewards (pay, working conditions, recognition etc.) they receive from the firm. According to fair wage-effort hypothesis (Akerlof and Yellen, 1990), employees have a conception of a fair wage (w*). When the actual wage (w) is less than the fair wage, employees will supply a corresponding fraction (w/w*) of normal effort. Relative deprivation theory states that employees' conception of fair wage, given their efforts, is based on comparisons with salient others. They evaluate their inputs and the outcome (monetary and non-monetary rewards) they receive from the firm vis-à-vis the input-outcome balance of a reference group. The relative deprivation theory offers little guide as to which reference groups are salient. Kulik and Ambrose (1992) show that individuals use a variety of referent groups including employees at different levels of their organization with scant regard to differences in individual efforts, abilities, and inputs (Martin, 1993). Wade et al. (2006) find evidence suggesting that the CEOs of their own company, whose compensation is publicly available, serve as a key reference point for employees in determining whether their own wages are “fair”. A rising pay ratio worsens relative deprivation. The fair wage-effort hypothesis implies that this will cause employees to reduce their effort and contributions to the firm. A rising pay ratio also engenders feelings of deprivation, resentment, and negative tension. To cope with it, employees may exhibit dysfunctional behavior such as shirking of duties, absenteeism, lack of initiative, quiet quitting, and in extreme cases even sabotage and strike. Identification and solidarity at the group level compounds the problem even further (Rost and Weibel, 2013). The result is lower individual and team productivity. This has a negative impact on firm performance.

Competition for Promotion

The tournament theory (Lazear and Rosen, 1981) views organization’s hierarchy as a multi-stage tournament. The pay differential between two successive levels is the magnitude of prize awarded to the best relative performer at one level below upon promotion with the CEO pay gap representing the ultimate prize. It postulates that large pay gaps lead to higher productivity as they provide strong motivation to lower level employees to exert effort and strive to win the promotion tournament.

Talent Assignment

A high pay differential between workers and top management also enables a firm to recruit talented executives with high ability. Firms often include generous stock options in lieu of cash in the compensation package of CEOs. Since both the likelihood of option exercise and firm value in the event of exercise are tied to managerial ability, only a talented manager takes such a gamble and accepts the CEO position (Arya and Mittendorf, 2005). Cheng et al. (2017) find that

CEO pay ratios are positively associated with both firm value and performance. They also find that high industry-adjusted CEO pay ratios are associated with higher quality acquisitions and stronger CEO turnover-performance sensitivity.

Rent Extraction

Critics argue that CEOs due to their entrenched position or poor corporate governance power are able to extract rent in the form of high pay. Rank-and-file workers cannot do so because they are easily replaceable and have little bargaining power (Bebchuk et al., 2011). High CEO pay will lead to a high CEO pay ratio. However, in these cases, unlike talent assignment, higher pay, while reducing profits, does not buy higher talent and ability to improve firm performance. From an empirical perspective, a subpar firm performance combined with high CEO pay is considered a symptom of rent extraction. The underlying reasoning is that if a firm's performance is subpar then the high CEO pay is less likely to be due to talent and ability of the CEO and is more likely a symptom of poor corporate governance. Rent extraction implies a negative correlation between CEO pay ratio and firm performance.

To summarize, inequity aversion and rent extraction predict a negative association between CEO pay ratio and performance whereas tournament and talent assignment predict a positive association between the two. These predictions are summarized in Figure 1.

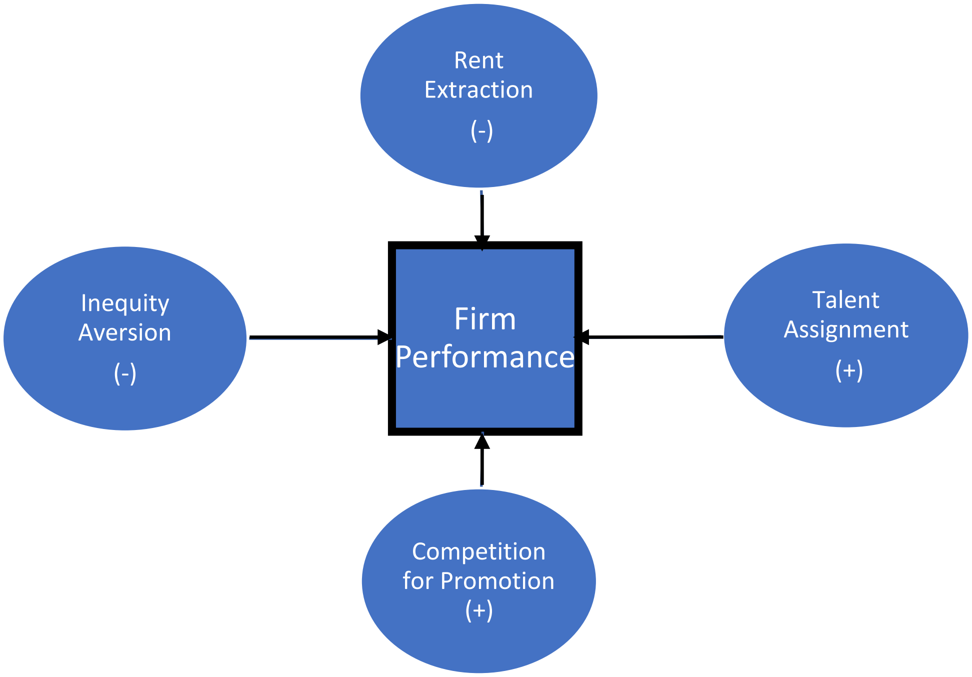

Figure - 1

Literature Review

Pay disparity in an organization takes two forms- vertical and horizontal. Vertical pay disparity refers to variations in pay of people at different levels of hierarchy. Horizontal pay disparity refers to variations in pay of people at the same level of hierarchy. Since the focus of this study is the CEO pay ratio, a form of vertical disparity, we restrict our literature review to studies related to vertical pay disparity.

The empirical evidence related to the effects of inequity aversion, competition for promotion, talent assignment, and rent extraction (See Figure 1) has been inconclusive. Some behavioral studies document instances of undesirable employee behavior and outcomes predicted by inequity aversion. Breza et al. (2018), in a month-long experiment involving Indian manufacturing workers, find that for a given absolute wage, pay inequality reduces output, attendance, and their ability to cooperate in their own self-interest. However, when workers can clearly perceive that their higher-paid peers are more productive than themselves, pay disparity has no discernible effect on output, attendance, or group cohesion. Cornelissen et al. (2011), using data from the German Socioeconomic Panel (GSOEP) survey, report that those respondents who believed that the income of a manager on the board of directors of a large company had an 'unjust relation to the job demands' displayed significantly higher levels of absenteeism from work. Pfeffer and Langton(1993), using a large sample of faculty, show that the greater the degree of wage dispersion, the lower is the individual faculty member's satisfaction and research productivity and the lesser is the likelihood that faculty members will collaborate on research.

Empirical studies related to the impact of high pay ratios on firm performance have reported mixed results. Krishnan and Tanyi (2021) analyze the CEO pay ratio data from the US during the period 2018-19 when the mandate for pay-ratio disclosure first became effective. They find that the high CEO pay ratio is negatively associated with employee productivity. Investors are also more likely to vote 'no' in 'Say on Pay' (SOP) when the CEO pay ratio is high. Faleye et al. (2013), using a dataset of 450 US firms during 1993-2006 period fail to uncover any significant relationship between relative pay and employee productivity regardless of how the productivity or relative pay is measured. They also find that CEO relative pay increases with variables associated with enhancing the bargaining power of CEO such as firm size, risk, and CEO-chairman duality. These findings are consistent with rent extraction. Mueller et al. (2017), using a proprietary dataset of UK firms during 2004-2013 period, report that firms with high relative wage differentials between top- and bottom-level jobs have stronger operating performance and higher valuations. Similarly, Cheng et al. (2017) using a proprietary dataset of 817 US firms for year 2011, find that industry-adjusted CEO pay ratios are positively associated with both firm value and performance. They also find that high CEO pay ratios lead to higher quality acquisitions and stronger CEO turnover-performance sensitivity. Banker et al. (2016) find that in Chinese firms wage premiums for talented executives, which increases pay gap, are the drivers of firm performance. Wage premiums for employees, on the other hand, have no impact on firm performance. These findings are consistent with talent assignment.

The above-mentioned studies assume a linear relation between pay ratio and firm performance. Some scholars posit that there exists an optimal pay ratio which promotes productivity. A deviation from the optimal pay ratio generates a feeling of unfairness or dissatisfaction among workers causing a deterioration in firm performance. Shin et al. (2015), using a unique dataset during 2000-2009 period from Korea, where all publicly listed firms are required to disclose, estimate expected pay ratio based on economic and political determinants. They find that both positive and negative deviations from the expected pay leads to worse operating performance and stock returns. Bao et al. (2020) find that a CEO pay ratio predicted by a regression based on firm and employee level factors is associated with better company performance while the residual pay ratio, which authors attribute to non-economic factors, is associated with poorer company performance. Consistent with the rent extraction theory, they also find that the negative impact of pay ratio due to non-economic factors, is more pronounced for firms with entrenched CEOs. Przychodzen and Gómez-Bezares (2021), using a dataset of 751 US firms during 1992-2016 period, report that a rising pay ratio adversely affects productivity when it is both too low as well as too high. Upon further investigation, they find that firms with high average salaries and more employees have positive productivity gains even in the presence of a high pay gap. On the other hand, firms with lower average salaries and lower capital intensity experienced negative effect of wage dispersion on productivity. However, Dai et al.

(2017), using a large sample of Chinese firms during 2003-2011 period, find that productivity is an inverted-U function of pay gap. Initially, a rising pay gap motivates employees to work hard to achieve promotion. However, beyond a certain point, increasing pay gap engenders feelings of unfairness and has a negative effect on firm performance. Their productivity measure is based Cobb-Douglas production function. Rouen (2020), using a sample of 931 firms during 2006-2013 period, finds no statistically significant relation between the ratio of CEO pay ratio and performance. However, when the pay ratio is decomposed into the portion explained by a regression of a vector of firm, establishment, industry, and macroeconomic determinants (explained pay ratio or 'EPR') and the residuals from the regression (unexplained pay ratio or 'UPR'), he finds that while EPR is associated with positive future firm performance, UPR is associated with negative future firm performance. One limitation of these studies is that since we know very little about economic, social, or political determinants of optimal pay ratio, it is not clear whether the residuals from the regression represent pay inequity. Further, since the residuals are derived from cross-sectional regression, their sum is forced to be equal to zero.

3. RESEARCH DESIGN

To begin with, we regress one year ahead return on assets (ROA_{t+1}) on the logarithm of pay inequality (LOG_PI_t), and estimate the following model:

$$ROA_{i,t+1} = ß_0 + ß_1 LOG\_PI_{i,t} + ß_2 SIZE_{i,t} + ß_3 MTB_{i,t} + ß_4 ADJ\_RETURN_{,t} + ß_5 OP\_\_MARGIN_{i,t} + ß_6 IND\_CONCENTRATION_{i,t} + ß_7 R\&D\_INTENSITY_{i,t} + ß_8 CAPITAL\_INTENSITY_{i,t} + ß_9 LEVERAGE_{i,t} + \Sigma YEAR + \varepsilon_{i,t} \quad (1)$$

The control variables are based on prior literature (See Appendix I for a definition of variables). Competition for promotion and talent assignment hypotheses predict a positive coefficient on PI. On the other hand, inequity aversion and rent extraction hypotheses predict a negative coefficient on PI. To assess whether these factors differentially affect components of ROA, we employ advanced DuPont decomposition (See Appendix II) and replace the dependent variable in model (1) with components of ROA, namely PM, ATO, PROD, and INT, and estimate the following model-

$$PM/ATO/PROD/INT_{i,t+1} = ß_0 + ß_1 LOG\_PI_{i,t} + ß_2 SIZE_{i,t} + ß_3 MTB_{i,t} + ß_4 ADJ\_RETURN_{,t} + ß_5 OP\_\_MARGIN_{i,t} + ß_6 IND\_CONCENTRATION_{i,t} + ß_7 R\&D\_INTENSITY_{i,t} + ß_8 CAPITAL\_INTENSITY_{i,t} + ß_9 LEVERAGE_{i,t} + \Sigma YEAR + \varepsilon_{i,t} \quad (2)$$

Mueller et al. (2017) argue that if talent assignment is the key channel for ROA improvement, we should see stronger association between ROA and LOG_PI in more competitive industries, since there is more demand for executive talent. In a similar vein, better governed firms are likely to hire better managerial talent and less susceptible to rent extraction, resulting in a stronger association between ROA and LOG_PI. To see whether competition and corporate governance mediate the relation between pay inequality and ROA, we split the sample along competition and governance dimensions.

For sample partition, we use three measures of product market competition- Herfindahl-Hirschmann index (HHI), Lerner Index (LI) and Top 5 concentration ratio (TOP5). We first compute tercile ranks for each variable which are then added to form a composite rank. We also partition the sample along governance dimension using tercile ranking of percentage of independent directors (IND_PER), our proxy of good governance. We exclude middle tercile and use extreme tercile ranks (1 and 3) to form four subsamples- (A) High Competition-Good Governance, (B) Low Competition-Good Governance, (C) High Competition-Poor Governance, and (D) Low Competition-Poor Governance. We then run regression models (1) and (2) separately for each of the four subsamples.

4. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

The accounting and stock price data for our sample are drawn from Prowess – a database of Centre for Monitoring Indian Economy. Prowess is a comprehensive database of accounting and financial information on Indian firms and has been used in previous studies (e.g., Khanna and Palepu 2000; Gopalan et al. 2007). The data on pay inequality is taken from Indian Boards – a database of National Stock Exchange of India (NSE) and Prime Database Group. The sample period starts from 2017 since this is the first year when pay inequity data became available. The sample data on pay inequality is from 2017-2019 fiscal years. We need a year ahead data for firm performance and other accounting variables, so we collect data for these variables for 2017-2020 fiscal years. After removing the observations with missing values, the final sample consists of 3,247 firm-year observations (1,321 firms).

Table 1 presents descriptive statistics. The mean (median) value of pay gap ratio (PI) is approximately 92 (42) times. The ratio is comparable to the ratios reported elsewhere[1] and quite low as compared to that for the firms in the United States. The mean return on assets (ROA) for the firms in our sample is about 3.4%. The average profit margin (PM) is about 31.6% but the distribution is skewed to the right with median profit margin being about 4.7%. The average asset utilization (ATO) or sales-to-assets ratio is about 0.81 times. The average labor productivity (PROD) is about INR 10,736 (USD 130)[2] of sales per employee while about 192 employees are used (INT) for every INR 1 million (USD 12,101) of assets.

Table 2 shows correlation between the variables. Consistent with the previous literature, we find the correlation between the log of pay gap ratio (LOG_PI) and return of assets (ROA) is

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[1] For example, see the IiAS (Institutional Investor Advisory Services) CEO Pay Chartbook - Studying the 2018 CEO pay trends for the BSE 500 companies. https://80cb29c1-d47b-4d4e-a4b4-a262ad35f48b.filesusr.com/ugd/09d5d3_e640348d871f4c019dc55839ba033997.pdf; accessed on February 12, 2021).

[2] The exchange rate of USD to INR as on August 29, 2023 is INR 82.64 (Source: https://www.xe.com/).

positive and statistically significant. We also find a similar association of LOG_PI with asset turnover ratio (ATO) and labor intensity (INT). However, there is a statistically significant negative correlation between LOG_PI and labor productivity (PROD), indicating that higher levels of pay inequality between the top management and other employees is likely to lead to a decline in productivity.

To get further insights into the relation between pay inequality and drivers of ROA (PM, ATO, PROD, and INT), we first form deciles. We then graph pay inequality (X-Axis) and ROA and its drivers (Y-Axis). Figures 2 through 4 depict the association of PI with ROA, and ROA drivers. Figure 2 shows that while the association between PI and ROA is nearly flat between PI deciles of 2 and 7, ROA is very responsive to changes in PI in the last three quintiles. Consistent with prior studies, the association is positive. Figure 3 breaks down ROA into PM and ATO. It shows that PM behaves very similar to ROA. However, initially, ATO rises with PI. However, as we move to higher deciles of PI, it becomes less and less responsive and unlike ATO, the relationship between ATO and PI is nearly flat at highest deciles of PI. Overall, the association between PI and ATO is positive. The most interesting finding emerges when we decompose ATO into labor productivity (PROD) and labor intensity (INT) and plot them against PI (Figure 4). Initially, labor productivity rises with PI. However, as PI becomes extreme (decile 6 and above), relative deprivation theory dominates at high levels of pay inequality. As employees reduce their effort to cope with feelings of anger, resentment, and negative tension, productivity suffers significant decline. What is surprising is that as labor productivity ebbs and flows, labor intensity flows and ebbs in the opposite direction acting as a countervailing force. In other words, more employees are hired for a given level of assets, and this increase in labor intensity completely eclipses decline in labor productivity, and leads to a net gain in asset utilization.

Taken together, these graphs show that the sole source of improvement in ROA is an increase in labor intensity. However, as these graphs show univariate relationships, we caution readers against drawing any definitive conclusions.

5. RESULTS

5.1. Main results

Our main results are presented in Tables 3 through 7. In all tables, column A presents the results of regression of ROA or one of its drivers on pay inequality (LOG_PI). Column B extends this regression to include control variables. Columns C and D replace dependent variables in Columns A and B with industry-adjusted variables. Industry-adjustment is done by subtracting median industry value of a year for the variable. We also include year fixed effects in all our regressions to control for time specific variations in pay inequality. Since results in all columns are very similar, we restrict our discussion to industry-adjusted regressions (Column D).

In Table 3, we find a positive and statistically significant association between pay inequality (LOG_PI) and return on assets (ROA). This finding supports competition for promotion and talent assignment that has been documented in previous studies. Specifically, a one standard deviation (145.647) increase from the mean (92.016) pay inequality ratio (PI) increases ROA by about 0.85% ((ln(92.016 + 145.647) - ln(92.016))*0.009). This increase is economically significant - about 25% of the average ROA (3.43%) in our sample.

Table 4 shows a statistically insignificant association between LOG_PI and PM. This finding is interesting and suggests that higher levels of pay inequality don't lead to a significant change in profit margins. As mentioned earlier, one would expect a talented CEO to reduce costs and/or sell high margin products. Mueller et al. (2017) do indicate that improvement in ROA is primarily driven by an increase in sales.

Table 5 shows a positive and statistically significant association between LOG_PI and ATO. Specifically, a one standard deviation increase from the mean PI increases ATO by about 0.037 ((ln(92.016 + 145.647) - ln(92.016)) * 0.039). This increase about 5% of the average ATO (0.809) in our sample. Thus, the improvement in future ROA reported in Table 3 is driven by better asset utilization.

In order to find the source of gains in efficient asset utilization, we further decompose ATO into its sub-components – labor productivity (PROD) and labor intensity (INT). Tables 6 and 7 show the regressions of PROD and INT, respectively on LOG_PI. Table 6 shows a negative and statistically significant association between LOG_PI and PROD. Specifically, a one standard deviation increase from the mean PI decreases PROD by about 2.076 ((ln(92.016 + 145.647) - ln(92.016)) * -2.188). This decrease is economically significant - about 19% of the average labor productivity of INR 10,736 of sales per employee in our sample. This finding is consistent with inequity aversion which suggests that high pay inequality may cause employees to withhold their efforts, engender resentment, and adversely impact employee morale. As a consequence, employee productivity is likely to take a hit.

In Table 7 we find a positive and statistically significant association between LOG_PI and INT. Specifically, a one standard deviation increase from the mean PI increases INT by about 0.047 ((ln(92.016 + 145.647) - ln(92.016)) * 0.049). Again, this increase is economically significant - about 24% of average INT, considering that, on average, a firm uses 192 employees for every one thousand INR of assets in our sample.

Thus, the sole source of ROA improvement in our sample firms is increased labor intensity or hiring more employees for a given level of assets. Prior research has taken ROA improvement as an evidence supporting talent assignment or competition for promotion. Our results cast doubt on the validity of such inferences. For instance, we would expect a talented CEO to increase product profitability or reduce costs. However, we fail to find any association between pay inequality and profit margin. Our results indicate that pay inequality leads to a decline in labor productivity. This finding is at odds with competition for promotion hypothesis, which, if anything, would predict an increase in labor productivity as employees work hard for promotion.

These results support our conjecture made earlier that pay inequality is unlikely to lead to real efficiencies for firms. Since the sole driver of ROA improvement in our sample is increased labor intensity, it appears that highly paid CEOs improve ROA by simply hiring more employees. In an economy like India where labor costs are relatively low, it makes sense though it is hardly a reflection of executive talent. To summarize, our results indicate that ROA improvement documented in prior studies is properly ascribed to increased labor intensity rather than any executive talent or competition for promotion.

5.2. Effect of Competition and Corporate Governance

Mueller et al. (2011) suggest that pay inequality reflects talent assignment. Consistent with this, they find that pay inequality is more strongly associated with the future performance of firms facing more competition or of firms that are better governed. To see whether their findings extend to our sample, we partition the sample along competition (High and Low) dimension based on a composite tercile ranking of three competition proxies- Herfindahl-Hirschmann index (HHI), Lerner index (LI) and Top 5 concentration ratio (TOP5). We also partition the sample along governance dimension using tercile ranking of percentage of independent directors (IND_PER), our proxy of good governance. We exclude middle tercile and use extreme tercile ranks (1 and 3) to form four subsamples- (A) High Competition-Good Governance, (B) Low

Competition-Good Governance, (C) High Competition-Poor Governance, and (D) Low Competition-Poor Governance. We then run regression models (1) and (2) separately for each of the four subsamples.

The results appear in Table 8. To conserve space, only regressions using industry-adjusted variables are reported. Comparing Panel A (High competition-Good Governance) and Panel D (Low competition-Poor Governance), we find that ROA improvement is associated with pay inequality only when firms have good governance and face high competition. This is consistent with talent assignment. However, we do not find that pay inequality has any adverse impact on productivity. In sharp contrast to this, we find no relationship between pay inequality and ROA improvement in firms that have poor governance and face low competition. This is consistent with rent extraction. We also find that pay inequality has a large and significantly negative impact on labor productivity. This is indicative of inequity aversion. Echoing results reported earlier, we find that although the pay inequality is unconditionally associated with labor intensity irrespective of competition and governance, the association is much stronger in firms with good governance and high competition.

6. CONCLUSION

Pay inequality between CEO and lower-level employees of the firm has been the subject of intense debate among academicians, economists, and regulators. Theoretical literature relating to the impact of pay inequality on firm performance states two countervailing forces at play at the employee level- inequity aversion which negatively affects firm performance and competition for promotion which positively affects firm performance. Likewise at the CEO level, if high pay is due to the talent and ability of the CEO, it is expected to lead to better firm performance. However, if the high pay is the result of rent extraction by an entrenched CEO, the firm's performance will be subpar. Most of the existing studies draw separately on one of these forces to formulate their hypotheses. Taken as a whole, one finds the evidence inconclusive as some studies find support for inequity aversion or rent extraction while other studies find support for promotion competition or talent assignment.

Our study makes two contributions to the existing literature. First, we devise and employ an advanced DuPont ROA decomposition to empirically test the predictions of competing theories about the effects of pay inequality on firm performance. The analysis of the drivers of ROA yields rich insights as we examine the impact of competing theories in a unified framework. Consistent with some of the prior literature, we find prima facie evidence that pay inequality leads to better future performance as measured by the ROA. The analysis of ROA drivers reveals that the source of improvement is not better profit margin and makes no contribution to ROA improvement. This is consistent with rent extraction. The sole source of ROA improvement is better asset utilization. When we look at the drivers of asset utilization, we find that labor productivity declines significantly in response to pay inequality consistent with inequity aversion. The surprising finding is that labor intensity increases significantly and is the sole source of observed improvement in ROA. The labor intensity is so large that it dominates the labor productivity decline resulting in a net improvement in ROA. In other words, the observed improvements in ROA are simply the result of hiring more employees. Although it makes sense to hire more employees in an economy like India that has low labor costs, it is hard to see it as an act of executive talent. Second, while previous studies have studied pay inequality in different countries such as Korea, China, UK, and USA, ours is the first study to focus on India, a rapidly developing emerging economy. The social and ethical norms shaped by its long history, and the vast cultural, ethnic, and religious diversity make it a unique setting to study pay ratio.

As this study is focused on only one country, future research can examine pay inequality performance link in different countries across different time periods. This would enhance the generalizability of the results presented here.

References

Adams, S.J., (1965). Inequity in social exchange. In: Berkowitz, L. (Ed.), Advances in Experimental Social Psychology., vol. 2. Academic Press, New York. Pp. 267-299.

Arya, A., & Mittendorf, B. (2005). Offering stock options to gauge managerial talent. *Journal of Accounting & Economics*, *40*(1–3), 189–210.

Banker, R. D., Bu, D., & Mehta, M. N. (2016). Pay gap and performance in China. *Abacus*, *52*(3), 501–531.

Bao, M. X., Cheng, X., & Smith, D. (2020). A path analysis investigation of the relationships between CEO pay ratios and firm performance mediated by employee satisfaction. *Advances in Accounting*, *48*, 100457.

Bebchuk, L.A., Cremers, K. M., & Peyer, U. C. (2011). The CEO pay slice. *Journal of Financial Economics*, *102*(1), 199–221.

Bivens, J., and J. Kandra. (2022). "CEO pay has skyrocketed 1,460% since 1978." Economic Policy Institute Publication. (https://www.epi.org/publication/ceo-pay-in-2021/, accessed on August 29, 2023)

Breza, E., Kaur, S., & Shamdasani, Y. (2018). The morale effects of pay inequality. *Quarterly Journal of Economics*, *133*(2), 611–663.

Burns, Natasha and Minnick, Kristina and Starks, Laura T., (2015). CEO Tournaments: A cross-country analysis of causes, cultural influences and consequences. Available at SSRN: http://dx.doi.org/10.2139/ssrn.2010095

Cheng, Q., Ranasinghe, T., & Zhao, S. (2017). Do high CEO pay ratios destroy firm value? Robert H. Smith School Research Paper No. RHS, 2861680.

Connelly, B. L., Haynes, K. T., Tihanyi, L., Gamache, D. L., & Devers, C. E. (2016). Minding the gap: Antecedents and consequences of top management-to-worker pay dispersion. *Journal of Management*, 42(4), 862–885.

Cornelissen, Himmler, O., & Koenig, T. (2011). Perceived unfairness in CEO compensation and work morale. *Economics Letters*, *110*(1), 45–48.

Dai, Y., Kong, D., & Xu, J. (2017). Does fairness breed efficiency? Pay gap and firm productivity in China. *International Review of Economics & Finance*, *48*, 406-422.

Deloitte. (2018). Pay ratios and executive pay reporting. (https://www2.deloitte.com/uk/en/pages/tax/articles/pay-ratios-and-executive-pay-reporting.html, accessed on August 31, 2023)

Faleye, O., Reis, E., & Venkateswaran, A. (2013). The determinants and effects of CEO–employee pay ratios. *Journal of Banking & Finance*, *37*(8), 3258-3272.

Gopalan, R.,Nanda, V.,&Seru,A. (2007).Affiliated firms and financial support: Evidence from Indian business groups, *Journal of Financial Economics*, 86(3): 759–95

Holt, A. (2019). UK regulations force disclosure of top bosses' pay versus average worker. (https://irmagazine.com/esg/uk-regulations-force-disclosure-top-bosses-pay-versus-average-worker, accessed on October 20, 2022)

Khanna, T. & Palepu, K. (2000). Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups, *The Journal of Finance*, 55(2): 867–91.

Krishnan, G.V., and P. Tanyi. (2021). Is the CEO-to-employee pay ratio disclosure relevant to stakeholders? Paper presented at the 5th JAAF India Symposium Hosted by IIM Calcutta, India. (https://www.iimcal.ac.in/sites/all/files/pdfs/paper2.pdf, accessed on August 29, 2023)

Kulik, C.T., & Ambrose, M. L. (1992). Personal and situational determinants of referent choice. *The Academy of Management Review*, *17*(2), 212–237.

Lazear, & Rosen, S. (1981). Rank-order tournaments as optimum labor contracts. *The Journal of Political Economy*, *89*(5), 841–864.

Mueller, H. M., Ouimet, P. P., & Simintzi, E. (2017). Within-firm pay inequality. *Review of Financial Studies*, *30*(10), 3605–3635.

Jeffrey, P. & Langton, N. (1993) The effect of wage dispersion on satisfaction, productivity, and working collaboratively: Evidence from college and university faculty. *Administrative Science Quarterly*, *38*(3), 382–407.

Przychodzen, W., & Gómez-Bezares, F. (2021). CEO–employee pay gap, productivity and value creation. *Journal of Risk and Financial Management*, *14*(5), 196.

Rost, K., & Weibel, A. (2013). CEO pay from a social norm perspective: The infringement and reestablishment of fairness norms. *Corporate Governance: An International Review*, *21*(4), 351-372.

Rouen. (2020). Rethinking measurement of pay disparity and its relation to firm performance. *The Accounting Review*, *95*(1), 343–378.

Shin, J. Y., Kang, S.-C., Hyun, J.-H., & Kim, B.-J. (2015). Determinants and performance effects of executive pay multiples: Evidence from Korea. *ILR Review*, *68*(1), 53–78.

Vinayak, C. (2019). Disclosures pertaining to remuneration of directors and employees - Section 197(12). (https://www.caclubindia.com/articles/disclosures-pertaining-to-remuneration-of-directors-and-employees-section-197-12--38175.asp, accessed on August 29, 2023)

Wade, J. B., O'Reilly, C. A., III, & Pollock, T. G. (2006). Overpaid CEOs and underpaid managers: Fairness and executive compensation. *Organization Science*, *17*(5), 527-544.

World Economic Forum (2014). Outlook on the Global Agenda. Geneva, Switzerland. (https://www.weforum.org/reports/outlook-global-agenda-2014/, accessed on August 31, 2023)

Appendix 1 - Variable Definitions

ADJ_RETURN	Adjusted Stock Return (Firm Stock Return - Mean Industry Stock Returns)
ATO	Asset Turnover (Net Sales/Total Assets)
CAPITAL_INTENSITY	Capital Intensity (Net Property, Plant and Equipment/Total Assets)
IND_CONCENTRATION	Industry Concentration (Herfindahl-Hirschmann Index)
INDP_PER	Percentage of Independent Directors on the Board
INT	Labor Intensity [Number of Employees/(Total Assets/1000)]
LEVERAGE	Leverage (Long-term Debt/Total Assets)
LI	Lerner Index (Median Industry-Year Operating Margin: Operating Profit/Net Sales)
LOG_PI	Log (Highest paid Director's Pay-to-Median Employee Pay Ratio)
MTB	Market-to-Book ratio (Market Capitalization/Book Value of Common Equity)
OP_MARGIN	Operating Margin (Operating Profit/Net Sales)
PI	Pay Inequality (Highest paid Director's Pay-to-Median Employee Pay Ratio)
PM	Profit Margin (Income before Extraordinary Items/Net Sales)
PROD	Employee Productivity [(Net Sales/1000)/Number of Employees]
R&D_INTENSITY	Research and Development Intensity (Research and Development Expense/Total Assets)
ROA	Return on Assets (Income before Extraordinary Items/Total Assets)
SIZE	Firm Size [Log (Total Assets)]
TOP5	Top 5 Concentration Ratio (Sum of Market Shares for Top 5 Firms in every Industry-Year)

APPENDIX II - Advanced DuPont ROA Decomposition

The traditional DuPont approach suggests that return on assets (ROA) can be divided into two components – profit margin (PM) and asset turnover ratio (ATO). While PM focuses on average net profit margins, ATO focuses on utilization of assets. We augment this by dividing ATO further into two components – labor productivity (PROD) and labor intensity (INT). Labor productivity (PROD) is defined as sales per employee, Labor intensity (INT) is defined as the number of employees per dollar of assets. It is a measure of how much human resources are devoted for utilization of assets.

The complete ROA decomposition is presented below-

ROA = Net Profits/Total Assets

= (Net Profits/Net Sales) * (Net Sales/Total Assets)

= PM * ATO (1)

ATO = Net Sales/Total Assets

= (Net Sales/Number of Employees) *(Number of Employees/Total Assets)

= PROD * INT (2)

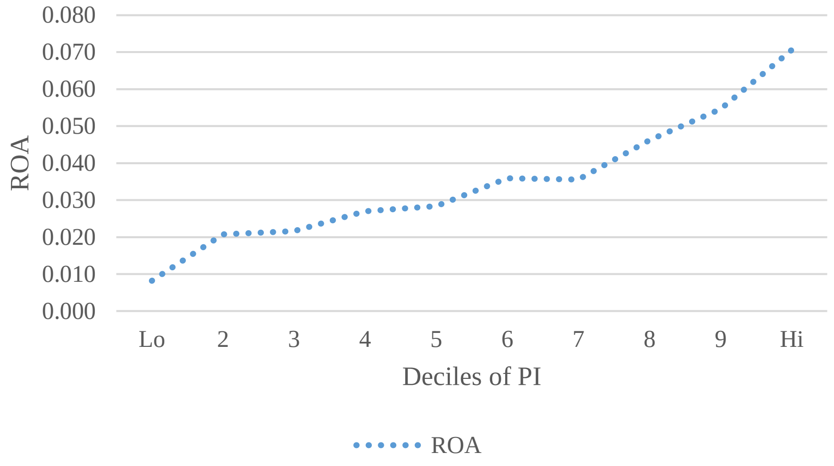
Plugging (2) into (1), we obtain-

ROA = PM * PROD * INT

= Profit Margins * Labor Productivity * Labor Intensity (3)

As equation (3) shows, an increase in ROA can be driven by either PM or ATO or both. Similarly, any increase in ATO can be driven by either PROD or INT or both. Importantly, ROA can increase even in the presence of a decline in PM or PROD if the increase in INT is large enough to offset the decline in PM or PROD.

Figure 2: Association between Pay Inequality (PI) and Firm Performance (ROA)



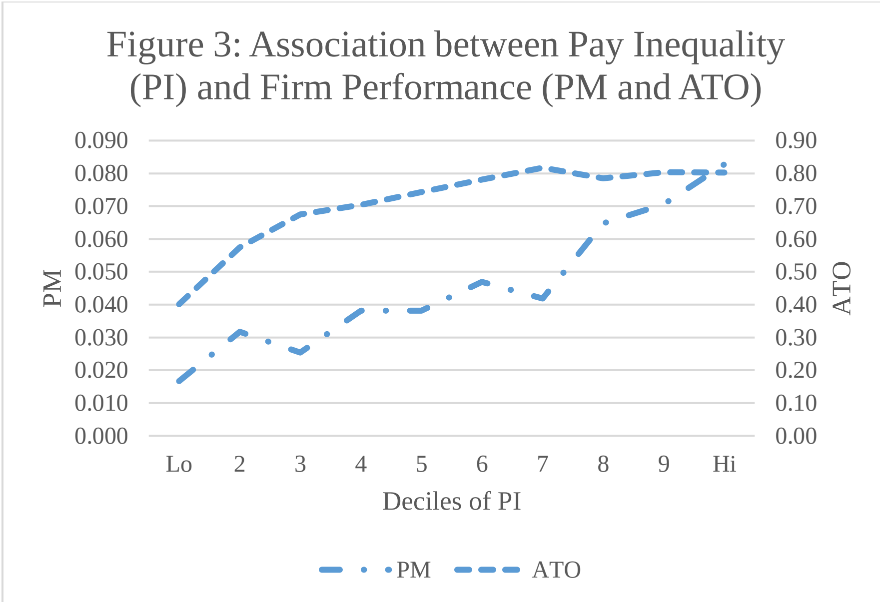


Figure 3: Association between Pay Inequality (PI) and Firm Performance (PM and ATO)
PM
ATO
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
0.90
0.80
0.70
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Lo
2
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PM
ATO

Figure 4: Association between Pay Inequality (PI) and Firm Performance (PROD and INT)

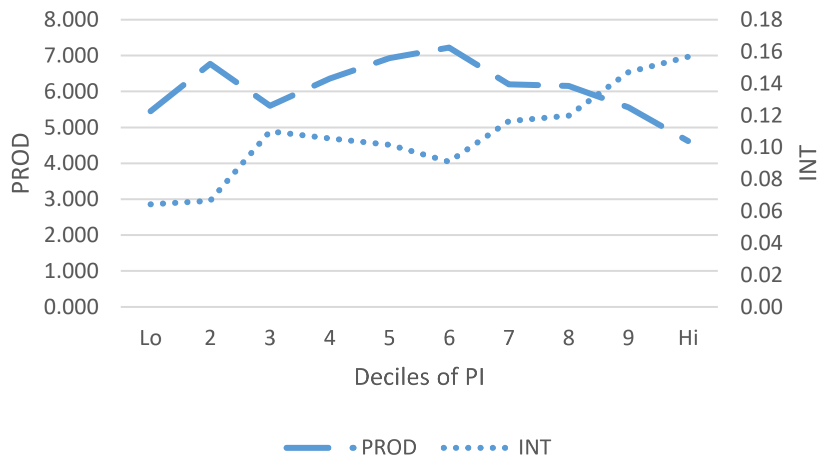

Table 1: Descriptive Statistics

Variable	N	Minimum	25th Pctl	Mean	Median	75th Pctl	Maximum	Std Dev
ATO	3,247	0.001	0.375	0.809	0.728	1.126	3.026	0.582
INT	3,247	0.001	0.046	0.192	0.108	0.230	1.791	0.268
PI	3,247	1.000	18.510	92.016	42.020	94.510	957.000	145.647
PM	3,247	-6.177	0.006	0.316	0.047	0.108	27.153	3.032
PROD	3,247	0.062	2.884	10.736	6.074	11.560	113.540	16.200
ROA	3,247	-0.331	0.004	0.034	0.034	0.078	0.252	0.085
SIZE	3,247	5.399	8.036	9.135	9.073	10.150	14.074	1.624

All continuous variables have been winsorized at extreme 1 percent.

Table 2: Pearson (Spearman) Correlations above (below) the diagonal

Variable	LOG_PI	SIZE	ROA	PM	ATO	PROD	INT
LOG_PI	1	0.477***	0.229***	-0.033*	0.126***	-0.092***	0.134***
SIZE	0.508***	1	0.073***	0.117***	-0.172***	0.118***	-0.224***
ROA	0.274***	0.104***	1	0.142***	0.289***	-0.002	0.084***
PM	0.192***	0.169***	0.823***	1	-0.126***	-0.043**	-0.065***
ATO	0.175***	-0.151***	0.389***	-0.033*	1	0.236***	0.290***
PROD	-0.030*	0.199***	0.083***	-0.015	0.226***	1	-0.290***
INT	0.204***	-0.267***	0.228***	-0.014	0.523***	-0.609***	1

*, ** and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table 3: Pay inequality and future return on assets

	Dependent Variables			
	ROA_{t+1}		**Ind-Adj ROA_{t+1}**	
	(A)	**(B)**	**(C)**	**(D)**
LOG_PI_t	**0.015*** (10.099)**	**0.009*** (5.133)**	**0.013*** (9.274)**	**0.009*** (5.006)**
$SIZE_t$		-0.002 (-1.096)		-0.001 (-0.703)
MTB_t		0.006*** (8.229)		0.006*** (7.868)
ADJ_RETURN_t		0.074*** (5.276)		0.078*** (5.520)
OP_MARGIN_t		0.002 (1.295)		0.001 (0.938)
$IND\_CONCENTRATION_t$		0.013 (0.739)		0.021 (1.177)
$R\&D\_INTENSITY_t$		0.523*** (3.118)		0.032 (0.174)
$CAPITAL\_INTENSITY_t$		0.010 (0.843)		-0.008 (-0.718)
$LEVERAGE_t$		-0.146*** (-7.313)		-0.131*** (-6.562)
Constant	-0.018*** (-2.984)	0.001 (0.100)	-0.035*** (-5.798)	-0.020 (-1.552)
Year F.E.	Yes	Yes	Yes	Yes
N	3,247	2,474	3,247	2,474
Adj R-Square	5.3%	24.8%	4.3%	21.8%
p	0.000	0.000	0.000	0.000

In Panel A, the dependent variable is the firm's return on assets (ROA). In Panel B, the dependent variable is the firm's industry-adjusted return on assets. Industry adjustment is done by subtracting the industry-year median. t-statistics (in parentheses) are based on standard errors clustered at the firm level. ** and *** represent statistical significance at the 5% and 1% level, respectively.

Table 4: Pay inequality and future profit margin

	Dependent Variables			
	PM_{t+1}		**Ind-Adj PM_{t+1}**	
	(A)	**(B)**	**(C)**	**(D)**
LOG_PI_t	**-0.075**	**0.040**	**-0.064**	**0.045**
	(-0.988)	**(1.329)**	**(-0.863)**	**(1.491)**
$SIZE_t$		0.003		0.000
		(0.126)		(0.005)
MTB_t		0.024***		0.024***
		(2.966)		(3.034)
ADJ_RETURN_t		1.125***		1.117***
		(3.333)		(3.313)
OP_MARGIN_t		-0.503***		-0.483***
		(-3.161)		(-3.060)
$IND\_CONCENTRATION_t$		0.362		0.363
		(1.603)		(1.624)
$R\&D\_INTENSITY_t$		0.870		0.600
		(0.678)		(0.470)
$CAPITAL\_INTENSITY_t$		-0.208		-0.164
		(-1.190)		(-0.934)
$LEVERAGE_t$		-0.393		-0.379
		(-1.394)		(-1.339)
Constant	0.561*	-0.134	0.474	-0.177
	(1.744)	(-0.769)	(1.501)	(-1.020)
Year F.E.	Yes	Yes	Yes	Yes
N	3,247	2,474	3,247	2,474
Adj R-Square	0.0%	22.3%	0.0%	21.1%
p	0.555	0.000	0.633	0.000

In Panel A, the dependent variable is the firm's profit margin (PM). In Panel B, the dependent variable is the firm's industry-adjusted profit margin. Industry adjustment is done by subtracting the industry-year median. t-statistics (in parentheses) are based on standard errors clustered at the firm level. * and *** represent statistical significance at the 10% and 1% level, respectively.

Table 5: Pay inequality and future asset utilization

	Dependent Variables			
	ATO_{t+1}		**Ind-Adj ATO_{t+1}**	
	(A)	**(B)**	**(C)**	**(D)**
LOG_PI_t	**0.055*** **	**0.068*** **	**0.019** **	**0.039*** **
	(4.870)	**(4.705)**	**(2.034)**	**(2.948)**
$SIZE_t$		-0.099***		-0.072***
		(-7.815)		(-5.973)
MTB_t		0.032***		0.025***
		(5.902)		(5.554)
ADJ_RETURN_t		0.223**		0.340***
		(2.248)		(3.651)
OP_MARGIN_t		0.036***		0.009*
		(5.515)		(1.925)
$IND\_CONCENTRATION_t$		-0.437**		0.238
		(-2.420)		(1.352)
$R\&D\_INTENSITY_t$		-1.144		-2.818**
		(-0.787)		(-2.219)
$CAPITAL\_INTENSITY_t$		0.288***		-0.194**
		(3.213)		(-2.404)
$LEVERAGE_t$		-0.569***		-0.390***
		(-4.898)		(-3.624)
Constant	0.589***	1.404***	-0.004	0.589***
	(12.635)	(13.397)	(-0.095)	(5.822)
Year F.E.	Yes	Yes	Yes	Yes
N	3,247	2,474	3,247	2,474
Adj R-Square	1.7%	17.1%	0.2%	11.6%
p	0.000	0.000	0.062	0.000

In Panel A, the dependent variable is the firm's asset turnover (ATO). In Panel B, the dependent variable is the firm's industry-adjusted asset turnover. Industry adjustment is done by subtracting the industry-year median. t-statistics (in parentheses) are based on standard errors clustered at the firm level. *, ** and *** represents statistical significance at the 10%, 5% and 1% level, respectively.

Table 6: Pay inequality and future employee productivity

	Dependent Variables			
	$PROD_{t+1}$		**Ind-Adj $PROD_{t+1}$**	
	(A)	**(B)**	**(C)**	**(D)**
LOG_PI_t	**-1.119*** **	**-2.485*** **	**-1.105*** **	**-2.188*** **
	(-3.233)	**(-4.997)**	**(-3.582)**	**(-4.858)**
$SIZE_t$		2.440***		1.956***
		(5.366)		(4.732)
MTB_t		-0.110		-0.087
		(-0.999)		(-0.896)
ADJ_RETURN_t		2.225		1.599
		(0.786)		(0.624)
OP_MARGIN_t		1.066***		0.727***
		(6.351)		(5.362)
$IND\_CONCENTRATION_t$		-1.285		-2.534
		(-0.252)		(-0.554)
$R\&D\_INTENSITY_t$		-202.414***		-155.274***
		(-8.065)		(-6.925)
$CAPITAL\_INTENSITY_t$		-10.500***		-11.050***
		(-4.059)		(-4.621)
$LEVERAGE_t$		-1.247		-1.335
		(-0.326)		(-0.385)
Constant	15.572***	2.282	9.141***	-0.796
	(10.063)	(0.712)	(6.662)	(-0.271)
Year F.E.	Yes	Yes	Yes	Yes
N	3,247	2,474	3,247	2,474
Adj R-Square	1.0%	9.6%	1.1%	8.5%
p	0.000	0.000	0.000	0.000

In Panel A, the dependent variable is the firm's employee productivity (PROD). In Panel B, the dependent variable is the firm's industry-adjusted employee productivity. Industry adjustment is done by subtracting the industry-year median. t-statistics (in parentheses) are based on standard errors clustered at the firm level. *** represents statistical significance at the 1% level.

Table 7: Pay inequality and future labor intensity

	Dependent Variables			
	INT_{t+1}		**Ind-Adj INT_{t+1}**	
	(A)	**(B)**	**(C)**	**(D)**
LOG_PI_t	**0.027*** **	**0.062*** **	**0.019*** **	**0.049*** **
	(4.946)	**(8.133)**	**(3.928)**	**(6.936)**
$SIZE_t$		-0.065***		-0.049***
		(-11.007)		(-8.985)
MTB_t		0.007**		0.005*
		(2.385)		(1.787)
ADJ_RETURN_t		0.073		0.098**
		(1.573)		(2.268)
OP_MARGIN_t		0.004		-0.000
		(1.435)		(-0.217)
$IND\_CONCENTRATION_t$		0.240**		0.237**
		(1.969)		(2.033)
$R\&D\_INTENSITY_t$		0.031		-1.025**
		(0.061)		(-2.139)
$CAPITAL\_INTENSITY_t$		0.131***		0.073
		(2.684)		(1.616)
$LEVERAGE_t$		-0.090*		-0.074*
		(-1.924)		(-1.664)
Constant	0.085***	0.485***	-0.018	0.280***
	(4.502)	(9.394)	(-1.052)	(5.897)
Year F.E.	Yes	Yes	Yes	Yes
N	3,247	2,474	3,247	2,474
Adj R-Square	1.8%	15.9%	1.1%	11.5%
p	0.000	0.000	0.000	0.000

In Panel A, the dependent variable is the firm's labor intensity (INT). In Panel B, the dependent variable is the firm's industry-adjusted labor intensity. Industry adjustment is done by subtracting the industry-year median. t-statistics (in parentheses) are based on standard errors clustered at the firm level. *, ** and *** represents statistical significance at the 10%, 5% and 1% level, respectively.

Table 8: Governance, competition and future performance

(A) High Competition-Good Governance

	Dependent Variables				
	Ind-Adj ROA_{t+1}	**Ind-Adj PM_{t+1}**	**Ind-Adj ATO_{t+1}**	**Ind-Adj $PROD_{t+1}$**	**Ind-Adj INT_{t+1}**
LOG_PI_t	**0.016*** **	**-0.009**	**0.013**	**-1.044**	**0.068*** **
	(4.370)	**(-0.362)**	**(0.415)**	**(-1.345)**	**(2.789)**
Constant	-0.022	-0.071	1.316***	14.820	0.443**
	(-0.673)	(-0.520)	(3.370)	(1.308)	(2.083)
Year F.E.	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
N	306	306	306	306	306
Adj R-Square	38.5%	25.1%	22.2%	10.0%	6.1%
p	0.000	0.000	0.000	0.019	0.001

(B) Low Competition-Good Governance

	Dependent Variables				
	Ind-Adj ROA_{t+1}	**Ind-Adj PM_{t+1}**	**Ind-Adj ATO_{t+1}**	**Ind-Adj $PROD_{t+1}$**	**Ind-Adj INT_{t+1}**
LOG_PI_t	**0.009***	**0.063**	**0.072*** **	**-3.321*** **	**0.046*** **
	(1.708)	**(0.657)**	**(2.910)**	**(-2.945)**	**(3.236)**
Constant	-0.017	-0.467	0.080	8.895	0.084
	(-0.584)	(-1.057)	(0.497)	(1.218)	(0.924)
Year F.E.	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
N	260	260	260	260	260
Adj R-Square	25.5%	9.4%	11.1%	9.8%	13.0%
p	0.000	0.023	0.001	0.024	0.040

(C) High Competition-Poor Governance

	Dependent Variables				
	Ind-Adj ROA_{t+1}	**Ind-Adj PM_{t+1}**	**Ind-Adj ATO_{t+1}**	**Ind-Adj $PROD_{t+1}$**	**Ind-Adj INT_{t+1}**
LOG_PI_t	**0.007**	**0.077**	**0.063**	**-2.229**	**0.027*** *
	(0.930)	**(1.390)**	**(1.447)**	**(-1.206)**	**(2.198)**
Constant	-0.031	0.225	0.713**	14.408	0.088
	(-0.683)	(0.573)	(2.586)	(1.384)	(1.283)
Year F.E.	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
N	189	189	189	189	189
Adj R-Square	12.8%	20.7%	15.5%	12.1%	7.9%
p	0.000	0.148	0.000	0.081	0.017

(D) Low Competition-Poor Governance

	Dependent Variables				
	Ind-Adj ROA_{t+1}	**Ind-Adj PM_{t+1}**	**Ind-Adj ATO_{t+1}**	**Ind-Adj $PROD_{t+1}$**	**Ind-Adj INT_{t+1}**
LOG_PI_t	**0.002**	**-0.116**	**0.031**	**-4.542*** *	**0.045*** *
	(0.511)	**(-1.091)**	**(0.635)**	**(-2.008)**	**(2.402)**
Constant	-0.002	-0.141	0.926***	-24.024**	0.447***
	(-0.092)	(-0.741)	(3.425)	(-2.338)	(3.265)
Year F.E.	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
N	256	256	256	256	256
Adj R-Square	21.0%	17.1%	15.0%	21.2%	17.9%
p	0.000	0.058	0.000	0.003	0.001

Panels A through D show the results for regressions on sub-samples of competition and governance. Competition is based on a sum of the tercile ranks of Herfindahl - Hirschmann index (HHI), Lerner Index (LI) and Top 5 concentration ratio (TOP5). Governance is based on the tercile ranks of percentage of independent directors on the board (INDP_PER). The dependent variables are the firm's industry-adjusted return on assets (ROA), profit margin (PM), asset turnover (ATO) employee productivity (PROD), employee sufficiency (SUFF) and Tobin's Q (Q). Industry adjustment is done by subtracting the industry-year median. t-statistics (in parentheses) are based on standard errors clustered at the firm level. *, ** and *** represent statistical significance at the 10%, 5% and 1% level, respectively.