

LABOR INTENSITY, ADVERTISING INTENSITY, AND FIRM PERFORMANCE: EVIDENCE FROM MERGERS & ACQUISITIONS

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Abstract

This study examines the relation between a firm's labor intensity and its operating performance. Using a large sample of US public firms from the period 2001 to 2018, we find that firms with a higher level of labor intensity are less likely to engage in mergers & acquisitions (M&As) activities. Our main finding suggests that a firm's operating performance, proxied by return on assets and return on equity, decreases with a higher level of labor intensity. Further analysis shows that if labor-intensive firms engage in M&As, they are less likely to use cash and stock as payment methods and consider the target's legal forms of business orientation. The negative relation between labor intensity and firm performance is aggravated (attenuated) by the firm's advertising intensity (stock payment method and private target of potential M&A characteristics). Finally, labor productivity is also negatively associated with labor intensity.

Keywords: labor intensity, advertising intensity, firm performance, mergers & acquisitions.

JEL Classification: J24, L25.

1. Introduction

Mergers and acquisitions (M&As) are important business events for firms and the overall economy. The importance of such an event is seen as a central research phenomenon in corporate finance. Though such an event requires the dedication of a remarkable level of resources and activities from the beginning to the end of the deal,

the success of the post-merger operation remains uncertain and is subject to the effective management of cultural integration (Saunders et al., 2009). Human resources contribute greatly to this remarkable dedication. If the acquirer or the target is from a labor-intensive industry, the relative expedition to the dedication is noticeable. As one of the most important factors of a firm's production, labor lowers the entry barriers to integration (Dogan, 2015). Segarra and Callejón (2002) argue that labor intensity increases competition along with lowering barriers to entry whereas rising labor costs could lead to a loss of competitiveness for the labor-intensive production process in an advanced economy (Meyer, 1995).

Kojima and Ozawa (1984) show that this competition intensity can be surpassed by easy movement of firms' production facilities or labor-intensive parts of the production process abroad. Schmenner (1986) shows that cost compared to plant and equipment relatively remains at a low level. Newman (1983) finds that the increased price of capital will not adversely affect the labor-intensive firm. In the same way, Aggarwal and Agmon (1990) confirm that labor-intensive international business activities indicate a simple application of the factors intensity model with static comparative advantage.

As the labor force can play a crucial role to materialize merger integration, value creation in a merger can be secured for such relatively low labor costs (Brandenburger & Stuart, 1996). Markusen and Venables (1997) report that the replacement of low skilled-labor could be another way to create value for a merger deal. Johnson (1985) also reports that labor-intensive firms could indeed fit into a process of evolutionary change. Makino et al. (2002) find superior production capabilities in labor-intensive firms, leading to a comparative advantage for the firm. The garment industry is very competitive because of having labor intensity. The labor force can adapt to new technologies quickly. This adaptability of the labor force represents a major source of competitive advantage both in local and multinational firms (Diaz-Alejandro, 1977). Porter (1998) finds that cheap labor contributes to a firm's comparative advantage while Cunat et al. (2012) find that role of labor market flexibility is a source of comparative advantage. Pfeffer (1994, 1998) find the same that competitive advantages are largely derived from firms' human resources. Labor intensity has a proportional impact on firms' performance when they are broadly categorized into two parts-labor intensive and capital-intensive.

Thus, the comparative advantage is a driving force toward firm performance. Extensive research has shown that small companies enjoy much comparative advantage due to labor capital. However, much less is known about the impact of such comparative advantage induced by labor intensity for US firms that engage in mergers & acquisitions decisions. The motivation for this research comes from the point that comparative advantage can be tested in merger and acquisition phenomena that are done by labor-intensive firms. How a comparative advantage of the acquirer contributes

to merger performance is ignored by merger and acquisition literature. The study attempts to bridge this gap by examining the relation between a firm's labor intensity and its operating performance from mergers & acquisitions.

Using a large sample of US public firms from the period 2001 to 2018, we find that firms with a higher level of labor intensity are less likely to engage in mergers & acquisitions (M&As) investment. Our multinomial logistic regression results suggest that a firm's likelihood to engage in mergers & acquisitions decisions reduces by 11% in response to a one-point increase in the measure of the firm's labor intensity. Our main finding suggests that a firm's operating performance, proxied by return on assets (ROA) and return on equity (ROE), decreases with a higher level of labor intensity. If labor-intensive firms engage in M&As, they choose to avoid using cash and stock as payment methods. Instead of cash and stock, they are likely to use other forms of payment methods, such as leverage buyout, which seems to overpay. The target firm's business characteristics seem not to influence their M&A decisions. Labor intensity has no significant relation with different forms of target types, such as public vs private targets. This negative relation between labor intensity and firm performance is aggravated by the firm's advertising intensity. In our investigation of the effect of mergers & acquisitions deal characteristics on the firm performance, we observe that if firms with higher labor intensity engage in mergers & acquisitions and pay stock as a payment method, their operating performance (ROE) tends to increase. No other form of payment method has a moderating effect on the relation between a firm's labor intensity and operating performance. If the target is a private firm, the operating performance of acquirers with higher labor intensity also increases. This result is consistent with the finding reported by Fuller et al. (2002) that acquirer's shareholders gain when buying private targets. We also observe that if the target is a subsidiary of another public firm, it is likely to negatively affect the labor-intensive¹ firm's operating performance. Our further analysis suggests that labor productivity is also negatively associated with labor intensity.

The remainder of the paper continues as follows: Section 2 provides an overview of related literature and hypothesis development, Section 3 summarizes the sample and shows descriptive statistics, Section 4 presents empirical analysis and results, and Section 5 concludes the paper.

2. Literature Review and Hypothesis Development

Prior literature has theoretically and empirically focused on many facets of mergers & acquisitions as determinants of post-merger performance. For the apparent reason, post-merger performance has been seen as an outcome of target types, payment methods, CEOs' hubris, and so on. Because the market reaction could be exploited to tell the story behind the respective merger deal done based on these

¹ We interchangeable use labor intensity and labor intensive firms throughout the paper.

events. The contribution of the labor-intensive firm to post-merger performance is less pronounced in mergers and acquisitions and very little indirect research has been done on labor-intensive merger deals. Acquirers are more skilled-labor intensive than targets (Slaughter, 1995). Research also shows that labor-intensive target enjoys a comparative advantage. The integration of such firms through mergers should be an interesting area of corporate finance research.

Dollar et al. (2005) wonder why labor-intensive firms' performance is diverse considering garment and other labor intensive-industry. Merz and Yashiv (2007) find that labor affects firms' value in the labor friction market as the frictional labor markets and capital adjustment costs affect the relation between the labor and the market value of the firm. The integration process of a merger is full of complexity but the human resource serves as a contribution to streamlining such a complex process. In merger and acquisition, changing the composition of the labor force in labor-intensive firms tends to be much easier than changing plant and equipment (Miller & Cardinal, 1994). The labor force has the ability to adapt mature technologies (Buckley et al., 2002; Loof et al., 2002).

Kogut (1985) attributes the value-added chain to labor intensity. Hendricks and Singhal (2001) find that labor-intensive firms are likely to offer more opportunities for process improvements. The foreign acquisition increases post-merger local firms' labor productivity (Piscitello & Rabbiosi, 2005). Almeida (2007) finds that foreign merger has small effects on the human capital and on the average wages of the acquired firms. As labor protection laws allow foreign acquirers to cherry-pick more skilled and productive local firms, leading to post-merger greater deal synergies and improved operating performance (Alimov, 2015).

Labor-intensive firms are innovative firms. There is much research on these. For example, Acs and Audretsch (1987) find in their research that virtually all labor-intensive industries are highly innovative. Tomiura (2007) finds that labor-intensive firms are innovative, globally productive, and more computerized than capital-intensive firms. This innovativeness makes a firm perfectly competitive (Huang, 2004). This innovativeness is an important route through which union affects the long-run firm performance (Hirsch & Link, 1987). The labor's innovativeness can be partly attributed to their prompt response to the changes in unionization. If the labor force is a source of firms' innovativeness, post-merger performance must be proportionately related to the labor intensity of a firm. As the foreign merger does not negatively affect the targets' performance (Navaretti et al., 2009), the acquirer's labor innovativeness should have an impact on post-merger performance. These lead to the assumption that labor intensity may positively affect firm performance through its innovativeness. We formally postulate our first hypothesis as follows:

Innovativeness hypothesis (H1(a)): *Labor intensity of a firm that engages in mergers & acquisitions investment is positively related to its operating performance.*

On the other side the labor intensity of firms, there is some research. Caballero et al. (2013) show that labor market regulation increases the cost of employee dismissals when firms experience exogenous negative shocks, which increases the operating cost for the firms during bad times. This regulatory cost pushes firms towards greater capital intensity (Hasan et al., 2010). Labor-intensive firms face productivity that regresses from its counterpart (Manjappa & Mahesha, 2008). As per Chandler (1992), labor-intensive firms lag behind the adaptation to new production technology to exploit the advantages of scale and scope.

Post-merger performance is negatively affected by strong labor rights when such rights are strongly practiced in the country (John et al., 2015). Because labor market regulation impedes the creative-destruction process (Caballero et al., 2013) and under such an environment labor-intensive firms cannot be fully adaptive to the competitive environments (Fligenspan et al., 2015). At a certain segment of the market, the lower relative price of products indicates the origin of the labor-intensive firm and intense competition in the foreign market (Bernard et al., 2007). Pennings and Sleuwaegen, (2000) treated labor-intensive firms suffer from relative disadvantage as they are unable to follow the high labor productivity gains made in the other sectors of the economy.

Although there is less research on labor-intensive firms' merger performance, research has shown the reversal effect of the merger on labor sentiment. For example, Brown and Medoff (1988) find that merger is bad for employees as the organized labor force has explicitly stated its concerns. Agrawal and Knoeber (1998) find that a greater takeover has two opposing effects on managerial compensation and long-run job with the company. Merger and acquisitions failures can be partly attributed to the discontinuous ways of change in which employees lost their loyalty to the job as they did before the merger (Ullrich et al., 2005) and labor unions increase firms' costs of equity by decreasing firms' operating flexibility (Chen et al., 2011).

The employees suffer from serious frustration and anxiety about the merger announcement. This frustration and anxiety made them lose their loyalty to the job as they did before the merger. This lead to assuming that if firms do not take initiatives to overcome employees' frustration and anxiety and exploit their innovativeness, the post-merger firm performance will be negatively affected. We formally state our alternative hypothesis as follows:

Cost-push hypothesis (H1(b)): *Labor intensity of a firm that engages in mergers & acquisitions investment is negatively related to its operating performance.*

3. Data & Sampling

Information on mergers& acquisitions comes from Thomson Reuters Securities Data Company (SDC) and financial data are obtained from the Compustat database as they are troves of research data and provide comprehensive details about the company's business operation and corporate events. Although the mergers& acquisitions booming period is just before the dawn of the 21st century, the main focus on post-merger labor-intensive firm performance changes over the period 2001-2018 in this study. To be included in the sample of the study, the merger and acquisition transactions are chosen if they satisfy the following criteria:

1. The merger and acquisition deals were announced between January 1, 2001, and December 31, 2018
2. The acquirers are publicly traded companies
3. The status of the deal is completed only
4. The deal value and the target's assets are reported in the data set
5. The acquirer acquires more than 50% of the target
6. Acquirers are listed in Compustat before and after the merger deal

Following the above criteria, 6,418 unique deals are taken within the sample period from the SDC database. To see their merger performance, the financial data are taken from Compustat over the period of 2001-2018. From there, an observation that has no reporting necessary controls is deleted from the sample. After merger SDC merger and acquisition data set with Compustat data, 45,351 observations are perfectly matched. In this way, the final sample for the study reports 6,149 unique firms and 6,418 merger deals, totaling 45,351 observations.

The descriptive statistics of firm characteristics and necessary variables for the analysis are shown in Table 1. Return on asset is the main dependent variable for the regression analysis, which is an indicator of firm performance. The mean return on assets (ROA) of the sample is negative (-5.91%) with a standard deviation of 28%. In the top quartile, the firm has on average 7.1% profitability while in the bottom quartile; the firm has on average 6% loss. The average return of equity (ROE) is also negative (-13.1%), with a higher level of standard deviation (57%). In our sample, 14% of firm-year observations engage in mergers & acquisitions, with a larger variety of about 35%. The key variable of interest is labor intensity. The mean value of labor intensity is 0.604 with a standard deviation of 0.827. The higher value of this measure indicates the higher labor intensity of a firm in our sample period. The descriptive statistics of these firm characteristics are similar to those reported in the previous research.

TABLE 1
Descriptive statistics

Variable	N	Mean	SD	P25	Median	P75
<i>Prob(M&A)</i>	45351	0.142	0.349	0.000	0.000	0.000
<i>ROA</i>	45351	-0.059	0.282	-0.060	0.028	0.071
<i>ROE</i>	45351	-0.131	0.572	-0.070	0.028	0.058
<i>Labor Intensity</i>	45351	0.604	0.827	0.165	0.339	0.684
<i>Cash Flow</i>	45351	-0.011	0.274	-0.011	0.068	0.115
<i>Firm Size</i>	45351	6.035	2.040	4.525	6.010	7.454
<i>Leverage</i>	45351	0.228	0.224	0.023	0.186	0.350
<i>FCF</i>	45351	-0.027	0.257	-0.050	0.042	0.099
<i>MB</i>	45351	1.695	1.435	0.824	1.231	1.998
<i>Firm Age</i>	45351	20.060	15.650	8.000	15.000	27.000
<i>Working Capital</i>	45351	0.051	0.184	-0.047	0.043	0.158
<i>Stock Return</i>	45351	0.125	0.640	-0.255	0.038	0.348
<i>Tobin's Q</i>	45351	2.022	1.503	1.117	1.527	2.329
<i>Sales Growth</i>	45351	0.160	0.541	-0.035	0.067	0.203
<i>High Tech</i>	45351	0.215	0.411	0.000	0.000	0.000
<i>Capex</i>	26483	0.048	0.055	0.016	0.030	0.056
<i>Tangibility</i>	26483	0.242	0.225	0.074	0.162	0.335
<i>R&D</i>	26483	0.047	0.090	0.000	0.005	0.058
<i>Cash Pay</i>	6418	0.523	0.456	0.000	0.646	1.000
<i>Stock Pay</i>	6418	0.104	0.259	0.000	0.000	0.000
<i>Other Pay</i>	6418	0.121	0.272	0.000	0.000	0.024
<i>Public Target</i>	6418	0.120	0.324	0.000	0.000	0.000
<i>Private Target</i>	6418	0.509	0.500	0.000	1.000	1.000
<i>Subsidiary Target</i>	6418	0.364	0.481	0.000	0.000	1.000
<i>Foreign Target</i>	6418	0.203	0.403	0.000	0.000	0.000
<i>Advertising</i>	26483	0.011	0.027	0.000	0.000	0.008
<i>Labor Productivity1</i>	26251	5.587	0.867	5.124	5.545	6.031
<i>Labor Productivity2</i>	26226	5.012	0.941	4.446	4.963	5.524

This table reports descriptive statistics of the variables used in this study. Labor Intensity is measured as the number of employees scaled by total assets and then multiplied by 100, which is the key independent variable. The final sample for the study consists of 6,149 unique firms and 6,418 merger deals, totaling 45,351 observations covering the period 2000-2018. All variables are winsorized at the top and bottom 1% levels. All variables are defined in Appendix A.

4. Empirical methodology and results

4.1 Empirical Model

Before examining our two competing hypotheses, we first identify the firm's acquisitiveness. We use a multinomial logistic regression model to examine US firms' propensity to engage in mergers & acquisitions activities. We employ the following baseline empirical model that links the labor intensity of firm i in year t to its mergers & acquisitions (M&As) decisions together with a vector of the firm and industry-specific control variables in year t that the literature has shown to affect corporate payout decisions.

$$Prob(M\&A = 1)_{it} = \alpha_0 + \beta_1 * Labor Intensity_{it} + \sum_{j=2}^n \beta_j X_{it} + \lambda_t + \delta_{ind} + \varepsilon_{it} \quad (1)$$

Where the dependent variable is an M&A dummy indicating 1 if a firm in any year during our sample period engaged in M&A investment (buys any target), and 0, otherwise. The key independent variable is labor intensity. Following Lin et al. (2012), we measure labor intensity as the total number of employees per one million dollars of a firm's total assets. While Lin et al. (2012) use physical capital, proxied by the net value of fixed assets to scale the total number of employees, we use a firm's total assets as a proxy for physical capital to broadly capture the labor intensity of the firm, which is consistent with Dewenter and Malatesta (2001). A higher value of the ratio of the total number of employees to total assets indicates a firm's higher level of labor intensity. X_s represent a set of standard control variables, including *cash flow, firm size, leverage, free cash flow, market-to-book ratio, firm age, non-cash working capital, stock return, Tobin's q, sales growth, and high-tech dummies* (variable definitions are in Appendix A). These control variables are used in M&A literature (Nguyen and Phan, 2017). λ_t and δ_{ind} are the year and industry-fixed effects, respectively. j and n are integers. ε_{it} is an error term. Further, our standard errors are robust to heteroskedasticity and clustered at the firm level. Additionally, we also explore potential mergers & acquisitions deal characteristics such as different methods of payment and types of target companies that may affect firm performance.

Second, to test our two competing hypotheses for our main results, we employ the following ordinary least square method that links the firm performance measures to labor intensity and other commonly known determinants of firm performance.

$$Y_{it} = \alpha + \beta_1 Labor Intensity_{it} + \sum_{j=2}^n \beta_j X_{it} + \delta_i + \theta_t + \varepsilon_{it} \quad (2)$$

$$Y_{it} = \alpha + \beta_1 Labor Intensity_{it} + \beta_2 Advertising Intensity_{it} + \beta_3 (Labor Intensity * Advertising Intensity)_{it} + \sum_{j=4}^n \beta_j X_{it} + \delta_i + \theta_t + \varepsilon_{it} \quad (3)$$

Where the dependent variable, Y , indicates either the return on assets (*ROA*) or return on equity (*ROE*) of firm, i , for a given year, t , and j and n are integers. δ and θ are the year and industry fixed effects, respectively. The key variable of interest is labor intensity, measured as the total number of employees per one million dollars of a firm's total assets. Advertising intensity is the advertising expense scaled by the total sales of a firm in a given year. X_s represent a set of standard control variables, including *firm size, leverage, free cash flow, market-to-book ratio, firm age, sales growth, capex, tangibility, and R&D expenditure* (variable definitions are in Appendix A). ε_{it} is an error term. Further, our standard errors are robust to heteroskedasticity and clustered at the firm level.

4.2 Firm's Acquisitiveness

We use the multinomial logistic regression model 1 to investigate a firm's acquisitiveness. The key dependent variable is the M&A dummy that indicates 1 if a firm engages in mergers & acquisition activities in a year during our sample period, and 0, otherwise. Table 2 reports the results of the M&As multinomial logistic regressions. In column 1, the coefficient of labor intensity is negative (-0.300), which is statistically significant at the 1 percent level. When we add firm-specific control variables in the model and report the result in column 2, we find the coefficient of labor intensity on the likelihood of engaging in M&As activities is also negative (-0.0113), which is statistically significant at the one percent level. These results suggest that firm acquisitiveness is negatively associated with its labor intensity. Using the coefficient estimates to calculate the economic effect of labor intensity, we document that holding all other things constant at their sample means, a one-point increase in labor intensity is associated with a 9.34% (0.827×0.113) decrease in acquisition probability. We next examine the main effect of labor intensity on firm performance in the following section.

TABLE 2
Firm's Acquisitiveness

Variable	(1)	(2)
	<i>Prob(M&A=1)</i>	
<i>Labor Intensity</i>	-0.300*** (-6.70)	-0.113*** (-3.08)
<i>CashFlow</i>		-0.108 (-0.73)
<i>Firm Size</i>		0.288*** (19.76)
<i>Leverage</i>		0.348*** (3.44)
<i>FCF</i>		1.184*** (6.66)
<i>MB</i>		0.059 (1.21)
<i>Firm Age</i>		-0.004*** (-2.62)
<i>Working Capital</i>		0.243* (1.74)
<i>Stock Return</i>		0.035 (1.32)
<i>Tobin's Q</i>		-0.084* (-1.75)
<i>Sales Growth</i>		0.349*** (12.70)
<i>High Tech</i>		0.331*** (3.94)
Constant	-1.859*** (-4.57)	-3.561*** (-9.31)
Year FE	Yes	Yes
Industry FE	Yes	Yes
N	45351	45351
Pseudo R2	0.040	0.093

This table presents the baseline results regressing labor intensity on a firm's propensity to engage in mergers & acquisitions decisions. M&A is a dummy variable indicating 1 if a firm in any year during our sample period engaged in M&A investment (buys any target). The key independent variable is the labor intensity, measured as the total number of employees scaled by total assets, and then multiplied by 100. All other interdependent variables are defined in Appendix A. t-statistics are computed using robust standard errors (clustered at the firm level) and reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, **, and * correspond to 1%, 5%, and 10% levels of significance, respectively.

4.3 Main results and the moderating effect of advertising intensity

To understand firm performance in labor-intensive merged firms, we exploit models 2 and 3. The results are reported in Table 3. Where the dependent variable is either return on asset (ROA) or return on equity (ROE) for a firm, i , in year t . The first column of Table 3 shows the negative coefficient of labor intensity on the merged firm's operative performance. The coefficient estimate for labor intensity is -0.011, which is significant at the 1 % level. Especially, a one standard deviation increase in labor intensity reduces about 1% (0.827×0.011) return on assets, which corresponds to a 32.49% decrease in the median level (0.028) of firm performance. Column 2 also reports the negative coefficient of labor intensity on firm performance when the return on equity is used as a dependent variable. This result supports our cost push hypothesis that the *Labor intensity of a firm that engages in mergers & acquisitions investment is negatively related to its operating performance*. Firms seem not to take the initiatives to overcome employees' frustration and anxiety and exploit their innovativeness. We further investigate whether a firm's advertising intensity affects the relation between labor intensity and firm performance using model 3. Columns 3-4 show the results. The coefficients on the interaction between labor intensity and advertising intensity are negative and statistically significant at the 1 percent level. This result implies that the negative impact of labor intensity is more when a labor-intensive acquirer is also advertising-intensive. All the results are statistically significant. The baseline regression results imply that the post-merger firm performance is negatively affected by labor intensity and the negative performance is greatly affected by a firm's advertising intensity. In the next sections, we explore potential channels through which labor intensity negatively affects firm performance.

TABLE 3
Labor intensity, advertising intensity, and firm performance

Variable	(1) ROA	(2) ROE	(3) ROA	(4) ROE
<i>Labor Intensity* Advertising</i>			-0.111** (-2.04)	-0.391* (-1.81)
<i>Advertising</i>			-0.212*** (-3.58)	-0.491*** (-2.81)
<i>Labor Intensity</i>	-0.011*** (-5.13)	-0.012* (-1.66)	-0.010*** (-4.54)	-0.009 (-1.23)
<i>Firm Size</i>	0.003*** (4.91)	0.015*** (6.64)	0.003*** (5.13)	0.015*** (6.81)
<i>Leverage</i>	-0.047*** (-7.34)	-0.340*** (-11.34)	-0.048*** (-7.50)	-0.342*** (-11.42)
<i>FCF</i>	0.931*** (76.29)	1.091*** (20.51)	0.928*** (76.37)	1.085*** (20.44)
<i>MB</i>	0.001 (0.78)	0.023*** (4.85)	0.001 (1.42)	0.025*** (5.12)
<i>Firm Age</i>	0.000** (2.36)	0.000** (2.25)	0.000** (2.32)	0.000** (2.22)
<i>Sales Growth</i>	0.015*** (5.19)	0.070*** (7.10)	0.015*** (5.15)	0.070*** (7.05)
<i>Capex</i>	0.861*** (27.23)	1.100*** (8.80)	0.864*** (27.39)	1.111*** (8.90)
<i>Tangibility</i>	-0.023*** (-3.21)	-0.044 (-1.36)	-0.026*** (-3.71)	-0.052 (-1.60)
<i>R&D</i>	-0.221*** (-9.39)	0.243*** (2.94)	-0.225*** (-9.60)	0.235*** (2.85)
Constant	-0.098*** (-14.46)	-0.285*** (-11.87)	-0.096*** (-14.36)	-0.281*** (-11.74)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	26483	26483	26483	26483
Adj. R2	0.759	0.256	0.760	0.257

This table presents the results from the effect of the labor intensity of firms that engaged in mergers & acquisitions activities on their operating performance and also the moderating effect of advertising intensity on the relation between labor intensity and firm performance. The key dependent variables are returns on assets (ROA) and returns on equity (ROE). ROA is the ratio of net income before extraordinary items to the total assets of acquirer firms. ROE is net income scaled by the total market capitalization of a firm in a given year. Advertising intensity is the advertising expense scaled by the total sales of a firm in a given year. The key independent variable is the labor intensity, measured as the total number of employees scaled by total assets, and then multiplied by 100. All other interdependent variables are defined in Appendix A. t-statistics are computed using robust standard errors (clustered at the firm level) and reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, **, and * correspond to 1%, 5%, and 10% levels of significance, respectively.

4.4 Deal Characteristics: Payment Methods

Payment methods are an important determinant of merger performance. Previous research shows that if firms are uncertain about the target, they will not use cash as a payment method and prefer stock as a payment method instead. Myers and Majluf (1984) claim that an acquirer firm uses stock as a payment method for a merger deal when the firm believes that its share is undervalued. Franks et al. (1988) argue that acquirers suffer from post-merger losses if they use stock as a payment method instead of a cash payment method. Gregory (1997) also finds an average lower abnormal performance of acquirers if they buy the targets using stock as a payment method.

Ghosh (2001) finds post-merger performance declines for stock acquisitions and improves for cash acquisitions. Stock financing in merger payment plays a significant role in maximizing shareholders' wealth of both acquiring and target firms (Datta, 1992). There are significant differences in the bidder's post-merger abnormal returns between common stock and cash offers for the deal (Travlos, 1987). Travlos and Waagelein (1992) find that if the firm uses a cash offer for the merger deal, it will experience long-term performance plans and significantly higher abnormal returns surrounding the announcement. Martin (1996) finds a positive relation between stock financing for a merger deal with higher acquirers' growth opportunities. Davidson and Cheng (1997) find that uncertainty about the target cannot be reduced by using cash as a payment method and the market does not consider cash as means of acquiring a firm's growth. The method of payment for a merger deal has no impact on the acquirer's post-merger-operating performance ((Jung, 2010). Sudarsanam and Mahate (2003) find that acquirers who used stock as a payment method for the merger pay losses but gains if they use cash offers.

Top managers preferred using stock as a payment method to secure their job in the acquiring firms after the merger deal to consider post-merger performance (Ghosh & Ruland, 1998). Berkovitch and Narayanan (1990) find that if the target is acquired with equity financing, the stockholders of both acquiring and target firms experience higher returns. Brown and Ryngaert, (1991) argue that acquiring firms use a combination of cash and stock as a payment method for the deal to avoid the capital gains tax consequences of cash offers.

Based on the previous literature on different types of merger payment methods, the stock and combo payment has a significantly negative impact on post-merger performance. In this study, we explore the potential method of payment a firm with a higher level of labor intensity uses to complete the M&A deal if the firm engages in mergers & acquisitions activities. The negative impact of labor intensity on firm performance may be due to the merger payment methods i.e. stock or combo payment. In this section, we regress the different types of payment methods on labor intensity.

Table 4 reports the results of the different methods of merger payment of labor-intensive firms. The first column 1 (2) of Table 3 shows the relation between labor intensity and cash pay (stock pay) for merger deals. The coefficients on labor intensity in columns (1-2) are negative and statistically significant at the 10 and 5 percent levels, respectively. The negative coefficients on labor intensity suggest that labor-intensive firms are less likely to pay cash or stock as a payment method if they engage in mergers & acquisitions activities. The result from column (1) explains one potential reason for labor-intensive firms' poorer performance. Because using a cash offer for the merger deal, the firm experiences long-term performance plans and significantly higher abnormal returns surrounding the announcement (Travlos & Waagelein, 1992). But in this study, we find that labor-intensive firms reduce cash payments for merger deals, leading to poorer firm performance. The results from column (2) suggest another potential reason for labor-intensive firms' poorer performance. They could be the gainer if they use stock as a payment method for their mergers deal. Several benefits of using stock as a payment method are documented in mergers & acquisitions literature. For example, Berkovitch and Narayanan (1990) find that if the target is acquired with equity financing, the stockholders of both acquiring and target firms experience higher returns. Martin (1996) finds a positive relation between stock financing for a merger deal with higher acquirers' growth opportunities.

Overpayment is one of the most frequently pronounced in mergers& acquisitions research. The overpayment is coupled with CEOs' hubris as Hayward and Hambrick (1997) show that acquisition premium payment is associated with greater CEO overconfidence and greater losses incurred in acquiring the firm's shareholder wealth following the acquisition. Considering different types of payment methods and target types, when the impact of labor intensity on post-merger performance remains the same, even in some cases increased.

Some might argue the merger performance is a result of overpayment for the deal. Literature regarding overpayment in merger deals overly emphasizes overpayment on post-merger performance. Abhyankar et al. (2005) find that post-merger long-run underperformance can be possibly attributed to the overpayment made by the acquiring firms in mergers and acquisitions. Eckbo et al. (1990) find that bidders use the all-stock payment to reduce their overpayment cost. Sometimes, firms pay an extra amount to acquire a target to attain the plants which have a comparative advantage and relative productivity (Maksimovic et al., 2011). Sirower (1997) attributed the post-merger performance loss as equal to the overpayment during the merger deal. Haspeslagh and Jemison (1991) find that overpayment comes from the increasing commitment, complexity, and loophole of the due diligence process, leading to a post-merger failure. Cording et al. (2002) treat overpayment as the driver of horizontal merger failures. Overpayment is a valuation above the current market price and a reflection of poor financial purchase decisions backed by CEO hubris (Roll, 1986).

As CEO compensation is directly related to the size of the firm, CEOs tend to engage in mergers and acquisitions to increase their private benefit along with compensation (Schmidt & Fowler, 1990), which results in overpayment and ultimate merger failure.

Mueller and Sirower 2003 argue that “every dollar of premium paid produces a dollar loss to the acquirer’s shareholders”. In post-merge operation, most merger failure is because of the acquirer’s extensive overpay to their targets at the time of the merger deal (Fubini et al., 2006). Overpayment can be possibly explained by the overestimation of expected synergies of post-merger operation and market mispricing Kyriazis (2010). When acquirers overpay for a merger deal, it destroys the post-merger shareholder’s wealth (Lin et al., 2011). The post-merger operating performance is heavily affected by the overpayment as low-synergy targets are acquired in such cases (Harford et al., 2012). Finally, Bouwman et al. (2003) argue that the underperformance of acquiring firms is not for overpayment but for using stock during high-valuation periods for the merger deal. Based on the above literature on an overpayment, some might argue that post-merger underperformance may be caused by overpayment. So, we investigate the effect of labor intensity on other forms of payment methods other than cash or stock payment. Column (3) shows the results. The coefficient on labor intensity is positive and statistically significant at the 1 percent level. This result suggests that the other form of payment is positively related to the labor intensity of a firm, leading to poorer firm performance in labor-intensive firms. Because, through other forms of payment methods, labor-intensive firms are likely to overpay the deal value which destroys shareholder value, which is consistent with the above literature.

TABLE 4
Deal Characteristics: Payment Method

Variable	(1) <i>Cash Pay</i>	(2) <i>Stock Pay</i>	(3) <i>Other Pay</i>
<i>Labor Intensity</i>	-0.018* (-1.75)	-0.019** (-2.57)	0.017*** (3.12)
<i>Cash Flow</i>	0.086 (1.50)	-0.257*** (-5.33)	-0.006 (-0.19)
<i>Firm Size</i>	0.011*** (2.58)	-0.005* (-1.90)	-0.015*** (-6.57)
<i>Leverage</i>	-0.043 (-1.29)	-0.106*** (-5.23)	-0.007 (-0.40)
<i>FCF</i>	0.211*** (3.16)	-0.102** (-2.03)	0.015 (0.43)
<i>MB</i>	0.075*** (5.05)	-0.058*** (-3.72)	-0.006 (-0.65)
<i>Firm Age</i>	-0.000 (-0.98)	-0.001*** (-2.66)	-0.000 (-0.46)
<i>Working Capital</i>	-0.002 (-0.04)	-0.072** (-2.21)	-0.092*** (-3.28)
<i>Stock Return</i>	-0.006 (-0.50)	0.024*** (2.67)	-0.003 (-0.44)
<i>Tobin's Q</i>	-0.079*** (-5.45)	0.061*** (4.12)	0.000 (0.00)
<i>SalesGrowth</i>	-0.003 (-0.25)	0.034*** (3.25)	-0.002 (-0.24)
<i>High Tech</i>	0.043** (2.04)	-0.000 (-0.00)	-0.003 (-0.27)
Constant	0.347*** (8.96)	0.312*** (11.07)	0.182*** (9.19)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
N	6418	6418	6418
Adj. R2	0.062	0.151	0.310

This table presents the baseline results regressing labor intensity on different payment methods if a firm engages in mergers & acquisitions decisions. Cash pay is the percentage of mergers & acquisitions deal value paid in cash if a labor-intensive firm uses cash as a payment method to buy a target. Stock pay is the percentage of mergers & acquisitions deal value paid in stock or equity if a labor-intensive firm uses cash as a payment method to buy a target. Other pay is the percentage of mergers & acquisitions deal value paid in other forms of payment methods such as leverage buyout as a payment method to buy a target. The key independent variable is the labor intensity, measured as the total number of employees scaled by total assets, and then multiplied by 100. All other interdependent variables are defined in Appendix A. t-statistics are computed using robust standard errors (clustered at the firm level) and reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, **, and * correspond to 1%, 5%, and 10% levels of significance, respectively.

4.5 Deal Characteristics: Target Types

As different types of payment methods, target types can influence merger performance. Because the success of acquiring firm varied as a function of target selection (Capron & Shen, 2007). A previous study shows that public target has a negative impact on merger performance. For example, Jung (2010) finds acquirers' post-merger performance is weakened if they buy public targets other than a private target and suffer wealth losses for buying a public target. On the other hand, Capron and Shen (2007) find that acquirers experience higher returns when they buy private targets over public targets but they have the inclination to buy private targets as they have an information asymmetry problem.

Acquirers experience negative abnormal returns if they used stock as a payment method and buy publicly target targets (Chang, 1998). In relation to private targets, a study shows that a private target merger provides significant wealth gains for both participants over a public target merger (Ang & Kohers, 2001). Hansen and Lott (1996) find that acquiring firms gain a two percent higher return when they purchase a private target over a public target. Acquiring firms have significantly negative returns for buying public targets over private targets (Fuller et al., 2002). Conn et al. (2005) find that acquiring public targets, acquirers significantly suffer from negative abnormal returns over both an announcement and post-merger period, which reflects as the poor operational performance of acquiring firms after the deal. Koeplin et al. (2000) reported that private targets are acquired at an average 20-30% discount in comparison with similar public targets. Fuller et al. (2002) find that bidders experience significant negative returns when they used stock payment. Asquith et al. (1990) find that acquirers get negative and significantly smaller gains on using the stock payment method. Public target is associated with negative abnormal returns for the acquiring firm after the merger deal (Wong & Cheung, 2009).

Based on the previous literature on different types of merger targets, the public target has a significantly negative impact on post-merger performance. In this study, we also explore different types of targets that a labor-intensive firm acquires. Specifically, we regress the public target, private target, subsidiary target, and foreign target on labor intensity.

Table 5 reports the results. In the results, we do not find any influence of labor intensity on the choice of a different target company when a labor-intensive firm engages in merger activities.

TABLE 5
Deal Characteristics: Target types

Variable	(1) <i>Public Target</i>	(2) <i>Private Target</i>	(3) <i>Subsidiary Target</i>	(4) <i>Foreign Target</i>
<i>Labor Intensity</i>	-0.022 (-0.23)	0.043 (0.84)	0.061 (1.10)	0.034 (0.45)
<i>Cash Flow</i>	-1.260*** (-3.46)	-0.026 (-0.09)	0.574* (1.77)	-0.088 (-0.25)
<i>Firm Size</i>	0.430*** (11.54)	0.249*** (10.30)	0.063*** (2.87)	0.133*** (5.20)
<i>Leverage</i>	-0.056 (-0.21)	0.834*** (4.98)	0.962*** (5.68)	-0.501** (-2.20)
<i>FCF</i>	1.225** (2.46)	-0.591* (-1.78)	-1.134*** (-3.22)	-0.023 (-0.05)
<i>MB</i>	-0.417*** (-3.11)	-0.060 (-0.72)	0.100 (1.15)	0.062 (0.48)
<i>Firm Age</i>	-0.001 (-0.46)	0.003 (1.44)	0.002 (0.81)	0.004* (1.70)
<i>Working Capital</i>	-0.564 (-1.39)	-0.137 (-0.53)	0.222 (0.87)	0.159 (0.48)
<i>Stock Return</i>	0.090 (0.96)	0.118** (2.07)	0.108* (1.85)	-0.131* (-1.67)
<i>Tobin's Q</i>	0.332*** (2.62)	-0.030 (-0.37)	-0.168** (-1.97)	0.059 (0.48)
<i>Sales Growth</i>	0.166* (1.68)	0.041 (0.66)	-0.036 (-0.55)	-0.191** (-1.96)
<i>High Tech</i>	0.169 (0.94)	0.020 (0.16)	-0.061 (-0.52)	0.134 (1.06)
Constant	-5.292*** (-5.01)	-1.246*** (-3.97)	-0.594* (-1.95)	-2.861*** (-5.08)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	6418	6418	6418	6418
Pseudo R2	0.116	0.083	0.051	0.067

This table presents the baseline results regressing labor intensity on different types of targets if a firm engages in mergers & acquisitions decisions. Public target is a dummy variable indicating 1 if a labor-intensive firm buys a target whose business legal form is public, and 0, otherwise. Private target is a dummy variable indicating 1 if a labor-intensive firm buys a target whose business legal form is private, and 0, otherwise. Subsidiary target is a dummy variable indicating 1 if a labor-intensive firm buys a target whose business legal form is subsidiary of another public firm, and 0, otherwise. Foreign target is a dummy variable indicating 1 if a labor-intensive firm buys a target whose business operation is in a non-US country, and 0, otherwise. The key independent variable is the labor intensity, measured as the total number of employees scaled by total assets, and then multiplied by 100. All other interdependent variables are defined in Appendix A. t-statistics are computed using robust standard errors (clustered at the firm level) and reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, **, and * correspond to 1%, 5%, and 10% levels of significance, respectively.

4.6 Moderating Effects of Deal Characteristics

In this section, we examine the moderating effects of mergers & acquisitions deal characteristics on the relation between labor intensity and firm performance. As per the results reported in Table 6, the coefficient of the interaction between labor intensity and stock pay in column (4) is positive and statistically significant at the 1 percent level. This result suggests that the stock payment attenuates the negative relation between labor intensity and firm performance. Individually, cash payment in columns (1-2) is positively related to firm performance. But labor-intensive firm seems not to use cash as a payment method for mergers deal (see Table 3). Once we extend our analysis to target types, we observe consistent results with the mergers & acquisitions literature. For example, Ang and Kohers (2001) show that a private target merger provides significant wealth gains for both participants over a public target merger. Hansen and Lott (1996) find that acquiring firms gain a two percent higher return when they purchase a private target over a public target. Acquiring firms have significantly negative returns for buying public targets over private targets (Fuller et al., 2002). The coefficients of interaction between labor intensity and private target are positive and statistically significant at the 5 percent level. These results suggest that labor-intensive firms may choose other types of target firms while buying them, leading to poorer performance. As per payment and targets related literature, the finding of the study that labor intensity has a negative impact on merger performance may stem from avoiding cash and stock and using more other forms of payment as payment methods and private targets.

TABLE 6
Labor intensity, Payment method, and firm performance

Variable	(1) ROA	(2) ROE	(3) ROA	(4) ROE	(5) ROA	(6) ROE
<i>Labor Intensity*Cash Pay</i>	0.001 (0.51)	0.012 (1.52)				
<i>Labor Intensity* Stock Pay</i>			0.005 (0.50)	0.049** (2.13)		
<i>Labor Intensity*Other Pay</i>					0.002 (0.47)	0.004 (0.30)
<i>Cash Pay</i>	0.005** (2.28)	0.023*** (2.92)				
<i>Stock Pay</i>			- 0.027*** (-3.18)	- 0.076*** (-2.79)		
<i>Other Pay</i>					0.002 (0.54)	0.031* (1.78)
<i>Labor Intensity</i>	- 0.011*** (-5.07)	-0.013* (-1.69)	- 0.011*** (-5.16)	-0.013* (-1.83)	- 0.011*** (-5.08)	-0.012* (-1.65)
<i>Firm Size</i>	0.003*** (4.72)	0.014*** (6.36)	0.003*** (5.05)	0.015*** (6.75)	0.003*** (4.90)	0.015*** (6.63)
<i>Leverage</i>	- 0.048*** (-7.35)	- 0.341*** (-11.35)	- 0.048*** (-7.40)	- 0.342*** (-11.37)	- 0.048*** (-7.33)	- 0.341*** (-11.34)
<i>FCF</i>	0.931*** (76.21)	1.089*** (20.46)	0.930*** (76.11)	1.089*** (20.44)	0.931*** (76.26)	1.091*** (20.49)
<i>MB</i>	0.001 (0.79)	0.023*** (4.86)	0.001 (0.77)	0.023*** (4.85)	0.001 (0.79)	0.023*** (4.86)
<i>Firm Age</i>	0.000** (2.45)	0.001** (2.36)	0.000** (2.21)	0.000** (2.15)	0.000** (2.38)	0.000** (2.29)
<i>Sales Growth</i>	0.015*** (5.13)	0.069*** (7.02)	0.015*** (5.35)	0.071*** (7.18)	0.015*** (5.18)	0.070*** (7.06)
<i>Capex</i>	0.860*** (27.24)	1.099*** (8.80)	0.859*** (27.20)	1.097*** (8.79)	0.861*** (27.23)	1.100*** (8.80)
<i>Tangibility</i>	- 0.022*** (-3.13)	-0.041 (-1.27)	- 0.023*** (-3.24)	-0.044 (-1.36)	- 0.023*** (-3.20)	-0.043 (-1.33)
<i>R&D</i>	- 0.221*** (-9.38)	0.245*** (2.96)	- 0.220*** (-9.39)	0.246*** (2.99)	- 0.221*** (-9.39)	0.244*** (2.95)
Constant	- 0.098*** (-14.46)	- 0.285*** (-11.82)	- 0.096*** (-14.26)	- 0.281*** (-11.73)	- 0.098*** (-14.44)	- 0.286*** (-11.88)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N	26483	26483	26483	26483	26483	26483
Adj. R2	0.759	0.256	0.759	0.256	0.759	0.256

This table presents the results from the effect of the labor intensity of firms that engaged in mergers & acquisitions activities on their operating performance and also the moderating effect of different payment methods on the relation between labor intensity and firm performance. All variables are defined in Appendix A. t-statistics are

computed using robust standard errors (clustered at the firm level) and reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, **, and * correspond to 1%, 5%, and 10% levels of significance, respectively.

TABLE 7
Labor intensity, target types, and firm performance

Variable	(1) ROA	(2) ROE	(3) ROA	(4) ROE	(5) ROA	(6) ROE
<i>Labor Intensity*Public Target</i>	-0.006 (-0.57)	-0.026 (-0.56)				
<i>Labor Intensity* Private Target</i>			0.006** (2.28)	0.018** (2.33)		
<i>Labor Intensity # Subsidiary Target</i>					-0.004* (-1.65)	-0.011 (-1.27)
<i>Subsidiary Target</i>					0.007*** (2.90)	0.037*** (4.04)
<i>Private Target</i>			-0.002 (-0.78)	0.004 (0.50)		
<i>Public Target</i>	-0.003 (-0.57)	0.010 (0.52)				
<i>Labor Intensity</i>	- 0.011*** (-5.12)	-0.011 (-1.61)	- 0.011*** (-5.23)	-0.014* (-1.86)	- 0.010*** (-4.97)	-0.011 (-1.54)
<i>Firm Size</i>	0.003*** (4.99)	0.015*** (6.62)	0.003*** (4.90)	0.015*** (6.60)	0.003*** (4.80)	0.014*** (6.46)
<i>Leverage</i>	- 0.047*** (-7.34)	- 0.340*** (-11.34)	- 0.048*** (-7.35)	- 0.341*** (-11.34)	- 0.048*** (-7.38)	- 0.342*** (-11.37)
<i>FCF</i>	0.931*** (76.32)	1.091*** (20.51)	0.931*** (76.30)	1.091*** (20.48)	0.931*** (76.28)	1.091*** (20.52)
<i>MB</i>	0.001 (0.78)	0.023*** (4.85)	0.001 (0.78)	0.023*** (4.84)	0.001 (0.80)	0.023*** (4.87)
<i>Firm Age</i>	0.000** (2.36)	0.000** (2.25)	0.000** (2.39)	0.001** (2.31)	0.000** (2.42)	0.001** (2.33)
<i>Sales Growth</i>	0.015*** (5.21)	0.070*** (7.10)	0.015*** (5.17)	0.069*** (7.03)	0.015*** (5.13)	0.069*** (7.02)
<i>Capex</i>	0.860*** (27.22)	1.100*** (8.80)	0.860*** (27.22)	1.097*** (8.78)	0.861*** (27.25)	1.100*** (8.81)
<i>Tangibility</i>	- 0.023*** (-3.22)	-0.044 (-1.36)	- 0.023*** (-3.18)	-0.042 (-1.29)	- 0.023*** (-3.21)	-0.044 (-1.35)
<i>R&D</i>	- 0.221*** (-9.39)	0.243*** (2.95)	- 0.221*** (-9.38)	0.245*** (2.96)	- 0.221*** (-9.37)	0.245*** (2.97)
<i>Constant</i>	- 0.098*** (-14.50)	- 0.285*** (-11.88)	- 0.097*** (-14.41)	- 0.285*** (-11.84)	- 0.098*** (-14.48)	- 0.286*** (-11.90)
<i>Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	26483	26483	26483	26483	26483	26483
<i>Adj. R2</i>	0.759	0.256	0.759	0.256	0.759	0.256

This table presents the results from the effect of the labor intensity of firms that engaged in mergers & acquisitions activities on their operating performance and also the moderating effect of different legal forms of target companies' business on the relation between labor intensity and firm performance. All variables are defined in Appendix A. t-statistics are computed using robust standard errors (clustered at the firm level) and reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, **, and * correspond to 1%, 5%, and 10% levels of significance, respectively.

4.7 Labor productivity

In this section, we further investigate the effect of labor intensity on a firm's labor productivity. Labor productivity is the key indicator of workforce performance (Delery & Shaw, 2001). If the workforce performance is not achieved, the targeted firm performance will also not be achieved. So, it is rational to have a firm's employee productivity for a given year. We measure labor productivity in two ways. Firstly, we define labor productivity as the natural logarithm of sales scaled by the total number of employees of a firm in a given year. Secondly, we further define labor productivity as the summation of the cost of goods sold and changes in inventory and then scaled by the total number of employees of a firm in a given year.

If the coefficient of labor intensity is negative on labor productivity, it specifies that the firm does not take the initiative to alleviate employees' merger anxiety and frustration. Employee frustration and anxiety caused for merger announcements swallow their innovativeness. Target employee productivity is one of the factors to determine post-merger firm performance and adjustment toward target employee productivity is a driving force to achieving target employee productivity.

Table 8 reports the results. The first column of Table 8 shows the negative coefficient (-0.588) of labor intensity, which is statistically significant at the 1 percent level. Column 2 shows the similar negative effect of labor intensity on labor productivity once it is alternatively defined. These results suggest that firms during the merger period do not take the initiatives to resolve employees' frustration and anxiety. As a result, the intended employee productivity is not achieved. This employee productivity gap simultaneously affects post-merger firm performance.

Table 8
Labor intensity and labor productivity

Variable	(1)	(2)
	<i>Labor productivity</i>	
<i>Labor Intensity</i>	-0.588*** (-25.66)	-0.444*** (-19.67)
<i>Firm Size</i>	0.025*** (3.66)	0.028*** (3.25)
<i>Leverage</i>	-0.006 (-0.12)	0.029 (0.49)
<i>FCF</i>	0.987*** (13.99)	-0.461*** (-5.88)
<i>MB</i>	-0.011* (-1.66)	-0.084*** (-9.15)
<i>Firm Age</i>	-0.004*** (-4.99)	-0.002* (-1.93)
<i>Sales Growth</i>	0.001 (0.04)	-0.000 (-0.00)
<i>Capex</i>	2.018*** (7.64)	-0.299 (-1.09)
<i>Tangibility</i>	-0.424*** (-4.89)	-0.235** (-2.54)
<i>R&D</i>	-0.016 (-0.11)	-0.481** (-2.41)
Constant	5.634*** (104.43)	5.162*** (81.13)
Year FE	Yes	Yes
Industry FE	Yes	Yes
N	26251	26226
Adj. R2	0.583	0.479

This table presents the results from the effect of the labor intensity of firms that engaged in mergers & acquisitions activities on their employee productivity. The key dependent variable is labor productivity. Column (1) shows the labor productivity₁ as a dependent variable, which is measured as the natural logarithm of sales scaled by the total number of employees of a firm in a given year. Column (2) shows the labor productivity₂ as a dependent variable, which is measured as the summation of the cost of goods sold and changes in inventory and then scaled by the total number of employees of a firm in a given year. The key independent variable is the labor intensity, measured as the total number of employees scaled by total assets, and then multiplied by 100. All other interdependent variables are defined in Appendix A. t-statistics are computed using robust standard errors (clustered at the firm level) and reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, **, and * correspond to 1%, 5%, and 10% levels of significance, respectively.

5. Conclusion

The paper attempts to examine the merger performance of labor-intensive firms. The underlying argument is that if the firm takes initiatives to exceed the merger frustration of employees with their innovativeness, the labor intensity of the firm contributes to the positive firm performance and the firm's inertia about such initiatives produces the reversal contribution of labor intensity to merger performance. The result shows that firm performance is negatively associated with the proportional change in labor intensity. The total employee productivity is also negative, leading to a serious impact on target employee productivity. The merger announcement greatly arouses employees' frustrations and anxiety that supersede their innovativeness for the firm, receiving less productive hours from employees. Overall results demonstrate that labor Intensive acquirers experience higher merger performance when they use stock as a payment method and buy private targets. They also experience downward merger performance when they buy subsidiary targets. Merger performance of the labor-intensive firm that acquires a target having relatively high labor intensity is vulnerable to the years of operation unless firms take positive initiatives to dispel employee's frustration as the previous study confirms that labor costs do not fall when the revenue falls as a result of exogenous shocks, e.g. economic recession, or financial crisis. The negative employee productivity explains significant variance in merger performance. The positive initiatives can contribute to positive firm performance and the performance could be vulnerable to inertia or negative initiative in firms with a high labor intensity. The ignorance or inertia toward target employee productivity in labor-intensive firms can partially be attributed to the failure to really look at post-closing integration complexity, which deters firms' innovativeness and squeezes firms' performance. How long the firms with higher labor intensity take to compensate for the negative performance could be confirmed in future research.

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APPENDIX A.

Variable Definition

Variables	Definitions
M&A=1	A dummy variable indicating 1 if a firm in any year during our sample period engaged in M&A investment (buys any target)
ROA	The ratio of net income before extraordinary items to the total assets of acquirer firms
ROE	The ratio of net income to by the total market capitalization of a firm in a given year
Labor Intensity	The key independent variable is the labor intensity, measured as the total number of employees scaled by total assets, and then multiplied by 100. See section 4.1 empirical model development for detailed construction of labor intensity variable.
Cash Flow	The sum of income before extraordinary items and depreciation and amortization scaled by the lagged asset
Firm Size	The natural logarithm of total assets of firms
Leverage	The sum of short-term and long-term debt scaled by the total asset.
FCF	Free cash flow is measured as firm's total free cash flows divided by total assets. Compustat items: $\text{sum (oibdp, xint, txt, capx)}/\text{at}$
MB	The market value of equities divided by the book value of equities
Firm Age	The number of years a firm appears in the Compustat database
Working Capital	The ratio of (working capital - cash) to the bookvalue of assets
Stock Return	Continuously compounded annually company returns using the daily CRSP stock price
Tobin's Q	The ratio of the market value to the book value of assets
Sales Growth	Changes in sales scaled by lagged sales
High Tech	A dummy variable that equals 1 if an acquirer's 4-digit SIC code is equal to 3571, 3572, 3575, 3577, 3578, 3661, 3663, 3669, 3671, 3672, 3674, 3675, 3677, 3678, 3679, 3812, 3823, 3825, 3826, 3827, 3829, 3841, 3845, 4812, 4813, 4899, 7371-7375, 7378, or 7379, and 0 other
Capex	Capital expenditure scaled by lagged assets
Tangibility	Net property, plant, and equipment scaled by the total asset.
R&D	Research & Development expenditure scaled by total assets. In case of missing R&D, we replace it with zero.

Cash Pay	The percentage of mergers & acquisitions deal value paid in cash if a labor-intensive firm uses cash as a payment method to buy a target.
Stock Pay	The percentage of mergers & acquisitions deal value paid in stock or equity if a labor-intensive firm uses cash as a payment method to buy a target.
Other Pay	The percentage of mergers & acquisitions deal value paid in other forms of payment methods such as leverage buyout as a payment method to buy a target. If the payment is not identified by common payment methods and other than cash or stock payment, it is treated as an unknown payment in the SDC database
Public Target	A dummy variable indicating 1 if a labor-intensive firm buys a target whose business legal form is public, and 0, otherwise.
Private Target	A dummy variable indicating 1 if a labor-intensive firm buys a target whose business legal form is private, and 0, otherwise.
Subsidiary Target	A dummy variable indicating 1 if a labor-intensive firm buys a target whose business legal form is a subsidiary of another public firm, and 0, otherwise.
Foreign Target	A dummy variable indicating 1 if a labor-intensive firm buys a target whose business operation is in a non-US country, and 0, otherwise.
Advertising	Advertising intensity is the advertising expense scaled by the total sales of a firm in a given year.
Labor Productivity1	The natural logarithm of sales scaled by the total number of employees of a firm in a given year.
Labor Productivity2	The summation of cost of goods sold and changes in inventory and then scaled by the total number of employees of a firm in a given year.