

# 노동투자비효율성에 대한 감사인의 반응

## How Do Auditors Respond to Labor Investment Inefficiency?

조정은

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### 요약

본 연구는 기업의 노동투자비효율성에 대한 감사인의 반응에 대해 분석하였다. 구체적으로 노동투자비효율성이 감사보수와 감사시간에 미치는 영향에 대해 검증하였다. 비효율적인 노동투자가 이루어지는 기업일수록 감사인들은 사업위험을 높게 평가하여 감사위험이 증가한 것으로 인식하게 된다. 이로 인해 높아진 감사위험을 낮추기 위해 감사범위를 확대하고 충분한 감사증거를 수집하려는 유인이 있다. 따라서 감사인들은 더 높은 감사보수를 요구하고, 추가된 감사노력으로 인해 감사시간이 증가할 것으로 예상된다. 2002년부터 2018년까지 유가증권시장 및 코스닥시장에 상장된 기업을 대상으로 분석한 결과, 노동투자에 대한 비효율성이 증가할수록 감사보수와 감사시간은 증가하는 것으로 나타났다. 이러한 결과는 감사인들이 노동투자의 비효율성이 높은 기업에 대해 사업위험이 높은 것으로 평가하여 이에 대한 보상으로 높은 감사보수를 요구한다는 것으로 해석된다. 또한 감사인들이 감사위험을 낮추기 위해 추가적인 감사시간을 투입한다는 것을 시사하고 있다. 본 연구는 기업의 경쟁력을 결정하는 중요한 요소인 인력에 대한 투자가 비효율적으로 이루어지는 경우 감사보수와 감사시간이 증가한다는 실증적인 근거를 제시하였다는 점에서 공헌점을 찾을 수 있다.

■ 중심어 : | 노동투자비효율성 | 감사보수 | 감사시간 | 감사위험 |

### Abstract

This study examines how auditors respond to labor investment inefficiency, specifically its impact on audit fees and audit hours. Using a sample of Korean firms listed on the Korea Stock Exchange from 2003 to 2018, our empirical results indicate that firms involved in inefficient investment in labor incur higher audit fees and audit hours. This implies that auditors consider inefficient labor investment to cause considerable business risk, thus requesting higher external audit fees to compensate for higher audit risk. Furthermore, auditors expend more time and effort while auditing those firms by expanding the audit procedures to reduce the audit risk to an acceptable level. Finally, this study provides empirical evidence on whether the investment inefficiency in labor, an important factor in firms' competitiveness, incur higher audit fees as well as audit hours.

■ keyword : | Labor Investment Inefficiency | Audit Fees | Audit Hours | Audit Risk |

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## I. Introduction

Auditors are responsible for providing credible and transparent accounting information to the capital market participants and exerting great effort to reduce firms' audit risk[1][2]. Numerous studies indicate that auditors price their services based on the level of assessed risk for the client[3-5]. Specifically, the audit fee premium is associated with audit effort, which are increased when auditors perform extensive substantive testing in response to higher inherent risk[6-8] and control risk[1][9].

Based on these prior studies, this study investigates how auditors react to inefficient labor investment. Auditors could evaluate such firms as having a higher business risk, since inefficient labor investment increases the uncertainty of the client's business and the possibility of future losses[5][10]. Auditors should perform additional audit procedure to collect more audit evidences to reduce audit risk at an acceptable level[6-9]. Thus, auditors are likely to expend more time and effort to mitigate audit risk arising from inefficient labor investment. Following these arguments, we predict that labor investment inefficiency is positively associated with audit fees and audit hours.

This study contributes to the literature by examining the association between labor investment inefficiency and audit fees as well as audit hours using Korean firm data. Prior research examining firms' investment inefficiency focuses on inefficiency in capital investment, research and development (R&D) expenses, and mergers and acquisition (M&A) expenses. Investment in human capital, which

is a key factor in production, is also a very important aspect of firms' investment decisions. Therefore, this study extends the literature by documenting that auditors respond to labor investment inefficiency by increasing their audit fees and audit hours. Furthermore, this study provides empirical evidence that firms with inefficient investment practices in the labor market affect auditors' evaluation of a firm's audit risk.

## II. Literature Review and Hypotheses Development

### 1. Labor Investment Inefficiency

Recent studies have provided evidence that high-quality financial reporting results in lower inefficiency in labor investment by mitigating information asymmetry between managers and outside investors[11-13]. Jung et al. (2014) find that high-quality financial reporting is negatively associated with inefficient labor investments[11]. They further reveal that high accounting quality reduces both overinvestment and underinvestment in labor. Ha and Feng (2018) document that accounting conservatism is negatively associated with inefficiency in labor investment, suggesting that conservatism reduces inefficient investment practices in the labor market[12]. Ben-Nasr and Alshwer (2016) investigate whether stock price informativeness reduces labor investment inefficiency[13]. They show that a higher probability of informed trading (PIN) is significantly associated with a lower deviation of actual labor investment from the expected labor investment level, indicating a lower labor investment inefficiency.

A large body of literature examining labor

investment decisions document that internal and external corporate governance mechanisms affect firms' labor investment decisions. Khedmati et al. (2020) find that a strong CEO-director ties results in inefficient labor investment, suggesting that board members may be ineffective at monitoring the CEO, resulting in the CEO involving in inefficient investment in labor[14]. Jung et al. (2019) report that business group-affiliated firms have greater efficiency in labor investment than non-affiliated firms. They provide evidence that group-affiliated firms make more efficient labor investment due to their easy access to external financing and labor sharing among affiliated firms, than stand-alone firms do[15]. Mo et al. (2019) document that CEO's debt-based compensation is negatively associated with inefficiency in labor investment, suggesting that CEO's inside debt holdings affect managers to focus on long-term performance[16].

Lee and Mo (2020) investigate whether analyst coverage impacts firms' investment inefficiency in labor. Their findings reveal that firms with a greater analyst following decrease inefficient labor investment decisions. These results emphasize the external governance role of analysts in firms' labor investment decisions[17]. Pinnuck and Lillis (2007) document that firms incurring accounting losses tend to invest less in labor than they would otherwise. They interpret this finding as an accounting loss to trigger firms to reduce agency problems, inducing firms to exercise the abandonment option in labor[18]. Kang and Cho (2017) report that accounting information quality and market competition are negatively associated with labor investment inefficiency. They argue that these two factors serve as effective internal and

external corporate governance mechanisms by mitigating information asymmetry between management and investors and restraining managers' opportunistic behavior[19].

## 2. Effect of Firms' Investment Decision on Audit Fees and Audit Hours

Prior studies have examined the association between firms' investment decision and audit fees and audit hours. Lee et al. (2013) report that corporate overinvestment results in opacity of accounting information. They argue that lower accounting information quality increases audit risk, causing auditors to demand higher audit fees[5]. Park et al. (2018) document that abnormal R&D investment is positively associated with audit fees and audit hours, while non-R&D investment is negatively related to audit fees as well as audit hours. These results suggest that the association between investment and audit fees and audit hours depends on the source of corporate investment[10]. Cahan et al. (2015) show that firm-specific investment opportunity sets are important factors in determining audit fees as auditors demand compensation for higher audit risk[20]. Lu et al. (2017) document that M&A firms with unfavorable acquisition announcement returns have higher audit fees and increased audit report lag. These results suggest that auditors expend more audit effort to reduce audit risk caused by underperforming investment decisions[21]. Shagerdi et al. (2020) provide evidence that firms with lower investment efficiency incur higher audit fees[22]. These previous literature focuses on capital expenditure, R&D expenses, and M&A expenses. However, this study investigates investment in labor, which is an important

factor of production and has not been thoroughly examined in prior studies.

### 3. Hypotheses Development

According to Korean Auditing Standards 300, auditors should have overall understanding about clients' business during audit planning so that they can perform effective auditing. Following this audit procedure, auditors are able to evaluate clients' audit risk by assessing the clients' business risk. Auditors are likely to perceive firms with inefficient investment in labor to have higher business risk as the inefficient labor investment increases uncertainty of clients' business and the probability of future losses[5][10]. Auditors would expand the audit scope to collect more audit evidence when they are faced with higher inherent risk[6-9]. Therefore, auditors are likely to demand higher audit fees to compensate for clients' higher audit risk. Furthermore, they have incentive to expend more time and effort in order to mitigate audit risk arising from inefficient labor investment. Based on these arguments, we predict that labor investment inefficiency is positively associated with audit fees and audit hours.

Moreover, Lee and Yu (2017) find that inefficiency in labor investment is associated with lower future operating performance[23]. When firms predict future performance to decline, they are concerned that poor performance would be reflected in the stock price, and eventually damage firm value. It is well documented in the literature that firms have incentives to manipulate earnings numbers in order to avoid losses or earnings decrease from prior year[24-27]. Burgstahler and Dichev (1997) show that companies

manage reported earnings so that they can avoid earnings decline and losses[24]. Roychowdhury (2006) provides evidence of firms involving in earnings management through real-activities manipulation such as sales manipulation, overproduction, and aggressive reduction of discretionary expenditures in order to avoid losses[25]. Based on these prior studies, auditors are likely to evaluate firms making inefficient investment decision in labor to have higher audit risk as these firms have incentive to manage earnings to hide poor operating performance. As a result, auditors would expend more effort to mitigate audit risk occurring from labor investment inefficiency, which leads to increased audit fees and audit hours. Following this reasoning, we hypothesize that labor investment inefficiency is positively associated with audit fees and audit hours.

Hypothesis 1. Labor investment inefficiency is positively associated with audit fees.

Hypothesis 2. Labor investment inefficiency is positively associated with audit hours.

## III. Research Design

### 1. Measure of Labor Investment Inefficiency

Prior studies have measured labor investment as the percentage change in the number of employees [11][23]. These studies consider that the higher the employment growth rate, the greater the company's investment in labor. We label the percentage change in the number of employees as net hiring. To measure inefficient labor investment, we obtain abnormal net

hiring, which is computed by subtracting expected net hiring according to firms' economic fundamentals, such as sales growth, profitability, annual stock returns, firm size, liquidity, and leverage, from actual net hiring. Following prior research, we estimate expected net hiring using the regression model (1). The residuals from this estimation are labeled abnormal net hiring (*AB\_NET\_HIRE*), which indicates labor investment inefficiency.

[Model 1]

$$\begin{aligned} \text{NET\_HIRE} = & \beta_0 + \beta_1 \text{SALES\_GROWTH}_{t-1} \\ & + \beta_2 \text{SALES\_GROWTH}_t + \beta_3 \Delta \text{ROA}_t \\ & + \beta_4 \Delta \text{ROA}_{t-1} + \beta_5 \text{ROA}_t + \beta_6 \text{RET}_t + \beta_7 \text{SIZE\_R}_t \\ & + \beta_8 \text{QUICK}_{t-1} + \beta_9 \Delta \text{QUICK}_{t-1} + \beta_{10} \Delta \text{QUICK}_t \\ & + \beta_{11} \text{LEV}_{t-1} + \beta_{12} \text{LOSSBIN1}_{t-1} + \beta_{13} \text{LOSSBIN2}_{t-1} \\ & + \beta_{14} \text{LOSSBIN3}_{t-1} + \beta_{15} \text{LOSSBIN4}_{t-1} \\ & + \beta_{16} \text{LOSSBIN5}_{t-1} + \Sigma \text{IND} + \Sigma \text{YR} + \epsilon \end{aligned}$$

<i>NET_HIRE</i>	The percentage change in the number of employees;
<i>SALES_GROWTH</i>	The percentage change in sales revenue;
<i>WTH</i>	
<i>ROA</i>	Net income/total assets;
<i>RETURN</i>	Total annual stock return;
<i>SIZE_R</i>	The natural logarithm of the market value of equity, ranked into percentiles;
<i>QUICK</i>	The sum of cash and cash equivalents, and receivables/current liabilities;
<i>LEV</i>	The sum of cash and cash equivalents, and receivables, divided by current liabilities;
<i>LOSSBIN1</i>	Equals one if a firm's ROA is between -0.005 and 0;
<i>LOSSBIN2</i>	Equals one if a firm's ROA is between -0.01 and -0.005;
<i>LOSSBIN3</i>	Equals one if a firm's ROA is between -0.015 and -0.01;
<i>LOSSBIN4</i>	Equals one if a firm's ROA is between -0.02 and -0.015;
<i>LOSSBIN5</i>	Equals one if a firm's ROA is between -0.025 and 0.02;
<i>IND</i>	Industry dummy;
<i>YR</i>	Year dummy.

Equation (2) is used to test Hypothesis 1, which examines the relationship between labor investment inefficiency and audit fees.

[Model 2]

$$\begin{aligned} \text{AUDIT\_FEE}_t = & \beta_0 + \beta_1 \text{AB\_NET\_HIRE}_{t-1} \\ & + \beta_2 \text{SIZE}_{t-1} + \beta_3 \text{LEV}_{t-1} + \beta_4 \text{MTB}_{t-1} \\ & + \beta_5 \text{INVREC}_{t-1} + \beta_6 \text{GROWTH}_{t-1} + \beta_7 \text{LOSS}_{t-1} \\ & + \beta_8 \text{BIG}_t + \beta_9 \text{OPINION}_t \\ & + \Sigma \text{IND} + \Sigma \text{YR} + \epsilon \end{aligned}$$

<i>AUDIT_FEE</i>	The natural logarithm of audit fees;
<i>AB_NET_HIRE</i>	Inefficient investment in labor; The absolute values of the residuals from equation (1);
<i>SIZE</i>	The natural logarithm of total assets;
<i>LEV</i>	Total liabilities scaled by total assets;
<i>MTB</i>	The ratio of the market value of equity to the book value of equity;
<i>INVREC</i>	The ratio of inventory and receivables to total assets;
<i>GROWTH</i>	The percentage change in sales revenue;
<i>LOSS</i>	Indicator variable equal to 1 if net income is less than zero, 0 otherwise;
<i>BIG</i>	Indicator variable equal to 1 if the firm is audited by one of the Big 4 audit firms, 0 otherwise;
<i>OPINION</i>	Indicator variable equal to 1 if the firm did not receive unqualified opinion, 0 otherwise;
<i>IND</i>	Industry dummy;
<i>YR</i>	Year dummy.

The dependent variable in Equation (2) is the natural logarithm of the external audit fees. Our main explanatory variable is the level of inefficient labor investment, which we obtain using the absolute values of the residuals from Equation (1). As we hypothesize that inefficiency in labor investment is positively related to audit fees, we expect  $\beta_1$  to be positive. In the Korean audit market, audit fees are determined at the beginning of the year based on firms' financial position and performance in the preceding year. Thus, we

## 2. Regression Model

use independent variables computed from financial information using prior years' data. However, we use independent variables using non-financial data for the current year[28][29].

We include control variables commonly used in the audit fee literature to control for the impacts of client size, client business risk, complexity, firm growth and auditor-specific characteristics[3][28-30]. First, to control for client size and audit complexity, we include the natural logarithm of total assets (SIZE), and the ratio of inventory and receivables to total assets (INVREC), respectively. Second, we include leverage (LEV) and an indicator variable for firms reporting negative income (LOSS) to capture client business risk. We also include an indicator variable for firms that do not receive unqualified audit opinions to control for audit risk. Third, we control for whether the firm uses a Big 4 auditor (BIG) to capture auditor-specific characteristics. Fourth, we include firm-growth variables, the percentage change in sales from the prior period (GROWTH), and the ratio of the market value of equity to the book value of equity (MTB). Finally, we include industry and year dummies to control for the differences in industry and year characteristics.

We then use Equation (3) to test Hypothesis 2, which investigates the association between the level of inefficient labor investment and audit hours. Our dependent variable is the natural logarithm of the audit hours. The independent variables, including our primary explanatory variable, inefficiency in labor investment, are identical to the variables used in Equation (2). We predict that labor investment inefficiency is positively related to audit hours. Therefore,  $\beta_1$  is expected to be positive.

[Model 3]

$$\begin{aligned} \text{AUDIT HOUR}_t = & \beta_0 + \beta_1 \text{AB\_NET\_HIRE}_{t-1} \\ & + \beta_2 \text{SIZE}_{t-1} + \beta_3 \text{LEV}_{t-1} + \beta_4 \text{MTB}_{t-1} \\ & + \beta_5 \text{INVREC}_{t-1} + \beta_6 \text{GROWTH}_{t-1} + \beta_7 \text{LOSS}_{t-1} \\ & + \beta_8 \text{BIG}_t + \beta_9 \text{OPINION}_t \\ & + \Sigma \text{IND} + \Sigma \text{YR} + \varepsilon \end{aligned}$$

*AUDIT HOUR* The natural logarithm of audit hours.  
See Equation (2) for definitions of other variables.

### 3. Sample Selection

We include a sample of firms listed on the Korean Stock Exchange from 2003 to 2018. Firms in financial industries are excluded from the analyses. Financial data are extracted from the KIS-Value database of the Korea Investor Services. Data on audit fees and audit hours are obtained from business reports filed by Korean financial supervisory authorities. To control for the effect of any outlier bias, the top and bottom 1% of all the continuous variables are winsorized. Our final sample consists of 15,831 firm-year observations.

## IV. Empirical Results

### 1. Descriptive Statistics

[Table 1] reports the descriptive statistics of the variables used in this study. The mean values for audit fees and audit hours, the dependent variables, are 11.239 and 6.835, respectively. The mean and median values of our primary independent variable, AB\_NET\_HIRE, are 0.112 and 0.066, respectively. The average leverage ratio is 0.402, and approximately 26.2% of the firms in our sample reported losses. In addition, about 52.4% of the sample

firms were audited by Big 4 auditors.

**Table 1. Descriptive statistics**

Variable	Mean	STD	Q1	Median	Q3
AUDIT FEE	11.239	0.695	10.800	11.120	11.513
AUDIT HOUR	6.835	0.776	6.370	6.739	7.208
AB_NET_HIRE	0.112	0.140	0.029	0.066	0.132
SIZE	18.488	1.494	17.470	18.246	19.210
LEV	0.402	0.200	0.239	0.402	0.552
MTB	1.458	1.438	0.619	0.993	1.715
INVREC	0.269	0.162	0.147	0.253	0.375
GROWTH	0.077	0.214	-0.024	0.043	0.136
LOSS	0.262	0.440	0.000	0.000	1.000
BIG	0.524	0.499	0.000	1.000	1.000
OPINION	0.002	0.048	0.000	0.000	0.000

*AUDIT FEE* The natural logarithm of audit fees;  
*AUDIT HOUR* The natural logarithm of audit hours;  
*AB\_NET\_HIRE* Inefficient investment in labor; =The absolute values of the residuals from equation (1);  
*SIZE* The natural logarithm of total assets;  
*LEV* Total liabilities scaled by total assets;  
*MTB* The ratio of the market value of equity to the book value of equity;  
*INVREC* The ratio of inventory and receivables to total assets;  
*GROWTH* The percentage change in sales revenue;  
*LOSS* Indicator variable equal to 1 if net income is less than zero, 0 otherwise;  
*BIG* Indicator variable equal to 1 if the firm is audited by one of the Big 4 audit firms, 0 otherwise;  
*OPINION* Indicator variable equal to 1 if the firm did not receive unqualified opinion, 0 otherwise;  
*IND YR* Industry dummy; Year dummy.

## 2. Results of Regression Analysis

[Table 2] presents the regression results for Hypothesis 1, which predicts that inefficient investment in labor increases external audit fees. The results of our regression analysis in [Table 2] show that the coefficient of AB\_NET\_HIRE is positive and significant at the 1% level. This indicates that inefficiency in labor investment leads to higher external audit

fees. The results in [Table 2] can be interpreted as follows. When firms engage in inefficient labor investment, auditors perceive those firms as having higher business risk, thus demanding higher audit fees in response to higher audit risk.

With respect to the control variables in [Table 2], the coefficients of SIZE, LEV, LOSS, BIG, and OPINION are significantly positive. This implies that larger firm size, higher leverage, firms incurring a loss, firms audited by large auditors, and firms that did not receive unqualified audit opinions exhibit higher external audit fees. However, the coefficients of MTB, GROWTH, and INVREC are significantly negative, suggesting that higher firm growth decreases audit fees.

**Table 2. Labor Investment Inefficiency and Audit Fees**

Variable	Dependent Variable: Audit Fees	
	Estimate	t-value
Intercept	4.379	87.58 ***
AB_NET_HIRE	0.102	4.47 ***
SIZE	0.362	139.79 ***
LEV	0.989	58.19 ***
MTB	-0.102	-40.09 ***
INVREC	-0.049	-2.23 **
GROWTH	-0.206	-13.71 ***
LOSS	0.112	14.19 ***
BIG	0.170	24.86 ***
OPINION	0.126	1.99 **
IND DUMMY		Included
YR DUMMY		Included
Adj R2	0.69	
N	15,831	

1) See Table 1 for variable definitions.

2) \*\*\*, \*\* and \* denote statistical significance at the 0.01, 0.05, and 0.001 levels, respectively.

**Table 3. Labor Investment Inefficiency and Audit Hours**

Variable	Dependent Variable: Audit Hours	
	Estimate	t-value
Intercept	0.270	4.59 ***
AB_NET_HIRE	0.096	3.53 ***
SIZE	0.353	116.1 ***

LEV	0.870	43.37 ***
MTB	-0.121	-42.06 ***
INVREC	-0.097	-3.72 ***
GROWTH	-0.279	-15.68 ***
LOSS	0.106	11.53 ***
BIG	0.322	40.02 ***
OPINION	0.141	1.88 *
IND DUMMY		Included
YR DUMMY		Included
Adj R2		0.66
N		15,831

1) See Table 1 for variable definitions.

2) \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.001 levels, respectively.

[Table 3] reports the regression results for Hypothesis 2, which addresses a significant increase in audit hours in response to firms' inefficient labor investment decisions. The results in [Table 3] also show that the coefficient of AB\_NET\_HIRE is significantly positive at the 1% level. This suggests that inefficient labor investment increases audit hours. These results indicate that auditors perform additional audit procedures to reduce audit risk to an acceptable level, exerting increased audit effort through expanded audit procedures. The coefficients of control variables show qualitatively similar results to the results of [Table 2]. The regression results in [Tables 2] and [Tables 3] support Hypotheses 1 and 2, respectively.

### 3. Additional Analysis

In this study, we use the absolute value of abnormal net hiring as a proxy for inefficient labor investment. Here, we create subsamples according to the sign of abnormal net hiring to analyze overinvestment and underinvestment in labor separately [11][31]. A positive (negative) abnormal net hiring indicates overinvestment (underinvestment) and is considered as having

hired more (fewer) employees than the expected level of net hiring. We continue to use the absolute value of abnormal net hiring and perform regression analysis to investigate for both subsamples.

Panel A of [Table 4] shows that the estimated coefficient of AB\_NET\_HIRE is positive and significant for the overinvestment sample, while the coefficient of AB\_NET\_HIRE is insignificant in the underinvestment sample in Panel B. This suggests that auditors evaluate overinvestment in labor to have a higher business risk, and as more likely to have a negative impact on firms' future operating performance; thus, auditors require higher external audit fees.

In Panels A and B of [Table 5], we find that the coefficient of AB\_NET\_HIRE is significantly positive for both the overinvestment and underinvestment samples, indicating that audit hours are increased in response to both overinvestment and underinvestment in labor. This suggests that auditors expend increased effort into auditing overinvestment and underinvestment in labor, which are both inefficient investment decisions, by performing more extensive audit procedures.

**Table 4. Labor Investment Inefficiency and Audit Fees: overinvestment vs. underinvestment**

Panel A: overinvestment		
Variable	Dependent Variable: Audit Fees	
	Estimate	t-value
Intercept	4.300	56.52 ***
AB_NET_HIRE	0.144	5.00 ***
SIZE	0.364	92.08 ***
LEV	0.972	38.29 ***
MTB	-0.099	-26.95 ***
INVREC	0.001	0.04
GROWTH	-0.166	-7.41 ***
LOSS	0.120	10.25 ***
BIG	0.185	18.10 ***
OPINION	0.061	0.64



IND DUMMY	Included	
YR DUMMY	Included	
Adj R2	0.69	
N	7,120	
Panel B: underinvestment		
Variable	Dependent Variable: Audit Fees	
	Estimate	t-value
Intercept	4.453	66.94 ***
AB_NET_HIRE	0.028	0.73
SIZE	0.359	104.65 ***
LEV	1.013	43.98 ***
MTB	-0.106	-29.63 ***
INVREC	-0.096	-3.20 ***
GROWTH	-0.239	-11.80 ***
LOSS	0.106	9.86 ***
BIG	0.158	17.08 ***
OPINION	0.196	2.28 **
IND DUMMY	Included	
YR DUMMY	Included	
Adj R2	0.70	
N	8,711	

1) See Table 1 for variable definitions.  
 2) \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.001 levels, respectively.

**Table 5. Labor Investment Inefficiency and Audit Hours: overinvestment vs. underinvestment**

Panel A: overinvestment		
Variable	Dependent Variable: Audit Hours	
	Estimate	t-value
Intercept	0.256	2.86 ***
AB_NET_HIRE	0.076	2.19 **
SIZE	0.352	75.78 ***
LEV	0.841	28.08 ***
MTB	-0.117	-27.65 ***
INVREC	-0.069	-1.78 *
GROWTH	-0.287	-11.08 ***
LOSS	0.114	8.36 ***
BIG	0.341	28.39 ***
OPINION	0.054	0.49
IND DUMMY	Included	
YR DUMMY	Included	
Adj R2	0.66	
N	7,120	

Panel B: underinvestment		
Variable	Dependent Variable: Audit Hours	
	Estimate	t-value
Intercept	0.271	3.46 ***
AB_NET_HIRE	0.139	3.06 ***
SIZE	0.354	87.60 ***
LEV	0.900	32.92 ***
MTB	-0.125	-31.72 ***
INVREC	-0.117	-3.31 ***
GROWTH	-0.267	-10.63 ***
LOSS	0.098	7.85 ***
BIG	0.305	28.19 ***
OPINION	0.219	2.16 **
IND DUMMY	Included	
YR DUMMY	Included	
Adj R2	0.66	
N	8,711	

1) See Table 1 for variable definitions.  
 2) \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.001 levels, respectively.

## V. Conclusion

This study investigates the response of auditors to labor investment inefficiency. Following prior studies, labor investment inefficiency is obtained by the difference between actual labor investment and expected labor investment, reflecting firms' growth, profitability, and liquidity. The larger the difference, the higher the inefficiency in labor investment. We tested our arguments using a sample of Korean public companies from 2003 to 2018. Our empirical results show that firms that engage in inefficient labor investment incur higher audit fees and audit hours. This suggests that as auditors perceive inefficiency in labor investment as being a higher business risk, they demand higher external audit fees to compensate for the higher audit risk. Further, they exert increased audit effort by expanding audit procedures to reduce audit risk to an

acceptable level.

This study contributes to the literature in the following ways. First, the results of this study extend prior research on the economic consequences of labor investment inefficiency. For example, Lee and Yu (2018) find that inefficient investment in labor leads to lower future operating performance and greater debt and equity financing costs[23]. Cho (2020) shows that labor investment inefficiency reduces the value relevance of accounting information[31]. This study is similar to these prior studies but differs in the sense that we examine whether how auditors evaluate firms with inefficient labor investment. Second, this study contributes to the literature on auditing by showing that suboptimal investment in labor leads to higher audit fees and audit hours. Auditors may refer to these findings when they plan the audit or determine audit fees and audit hours. For example, as firms with inefficient labor investment are more likely to have higher audit risk and relatively higher agency costs, auditors may consider these aspects when they plan analytical procedures and substantive audit procedures. Finally, this study suggests that firms may incur higher audit fees and audit hours if they make inefficient labor investment. Prior studies have documented that inefficient labor investments provide negative signal in the capital markets. This study provides additional evidence that firms are likely to bear the costs in auditing due to higher inefficiency in labor investment. Furthermore, the findings in this study allow other stakeholders of the firms to understand that auditors consider labor investment inefficiency when evaluating firms' audit risk.

In this study, audit fees and audit hours are

used to analyze auditors' response to labor investment inefficiency. Majority of prior studies use audit fees as a proxy for auditors' reaction[4][9][32]. As Korean firms are required to disclose audit hours to the public, audit hour data are available to analyze auditors' perception of labor investment inefficiency [28][29][33]. In addition to audit fees and audit hours, audit report lag may also be used to examine auditors' response[21][34]. Audit report lag is measured as the difference between a firm's fiscal year-end date and its audit report date. Longer audit report lag reflects that auditors perform more substantial audit procedures and expend greater audit effort. Future research may use audit report lag to examine auditors' reaction to labor investment inefficiency.

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