Managerial Ability and Revenue-Expense Matching:

Accrual Estimation versus Real Business Decision

Running title: Managerial Ability and Revenue-Expense Matching

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Abstract

We investigate the association between managerial ability and revenue-expense matching. We find that firms having more capable managers exhibit a better contemporaneous revenue-expense matching, partly attributable to their ability at accrual estimation. We also find that the association between current revenue and past expense is weaker for firms having more talented managers due to cash flow effects. These findings are robust to a battery of control variables and to alternative proxies of managerial ability. Our study indicates that the relation between managerial ability and earnings attribute could be a function of accrual estimation process as well as real business decision.

Keywords: managerial ability; revenue-expense matching; accrual estimation; real business decision
JEL codes: G32

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1. Introduction

The matching between revenue and expense determines reported earnings, and such reported earnings is the key indicator of firm value and performance. Graham *et al*. (2005) report that CFOs of U.S. firms believe that earnings is the single most important number in financial reporting mechanism, and Dichev *et al*. (2013) also find that CFOs believe that proper revenue-expense matching produces high-quality earnings. These studies deliver the implication that executives are interested in revenue-expense matching. Despite the potential presence and importance of managerial influence on revenue-expense matching, relevant evidence is rare in prior studies.[1] We fill this gap by providing an initial empirical evidence and examining possible channels to search fundamental reasons.

Prior studies compare accounting and economic factors to explain the variation in revenue-expense matching. Dichev and Tang (2008) attribute the deterioration in contemporaneous matching between revenue and expense to accounting factors such as the shift from income-statement-based-model of earnings calculation to the balance-sheet-based-model. Prakash and Sinha (2013) add that deferred revenue recognition impairs revenue-

[1] A lack of recent research on revenue-expense matching could be attributable to standard setters' negative approach on revenue-expense matching. Particularly, Financial Accounting Standards Board abandoned matching by shifting their focus in earnings estimation from income-statement-based-model of earnings calculation to the balance-sheet-based-model. However, this does not mean that the comparison of revenue and expense is meaningless in earnings estimation. Rather, as shown above, Dichev *et al*. (2013) present that CFOs of U.S. firms believe that matching is still important in earnings estimation. Center for Excellence in Accounting and Security Analysis (2007) suggests that using matching in accounting is necessary because it reflects the inescapable reality of cost-benefit considerations and results that pervade every business. It also states, "Matching should be the cornerstone of financial reporting, and failing that, all these other concepts are deficient in content and utility."

expense matching. In contrast, Donelson *et al*. (2011) argue that economic factors damage revenue-expense matching through frequent use of special items. In addition, Srivastava (2014) and Hyun and Cho (2018) suggest that a weaker revenue-expense matching in recent periods is attributable to period costs such as research and development (R&D) expense and interest expense, respectively. However, those studies do not investigate whether and how managers influence revenue-expense matching.

To explore this research question, we examine the sample of U.S. firms from 1990 to 2017. We use the empirical construct of managerial ability based on Demerjian *et al*. (2012). Using 68,008 firm-year observations, we find that firms having more competent managers exhibit a stronger contemporaneous relation between revenue and expense, while such firms have a weaker relation between current revenue and past expense. The association between managerial ability and current revenue-future expense matching is insignificant. These findings are robust after controlling for various firm characteristics which may influence financial reporting quality and firm performance. This finding remains unchanged when we partition the sample based on the listing period and when we exclude period costs from total expenses.

We then examine two possible channels that managerial ability is associated with revenue-expense matching. First, firms with more capable managers may have better revenue-expense matching through better managerial ability of accrual estimation. This expectation is based on Demerjian *et al*. (2013) who report that firms having managers with better ability exhibit higher accrual quality[2]. Second, as previous evidence shows that

[2] We note that this argument does not assume that accrual estimation ability is directly associated with revenue-expense matching. Rather, this argument is based on the presumption that a better accrual estimation leads to a better contemporaneous revenue-expense matching, implying that managerial ability could influence revenue-expense matching through accrual estimation. For instance, higher managerial ability on operating activities will be associated with better inventory management and less inventory manipulation (Huang and Sun, 2017). This

economic factors affect revenue-expense matching (Donelson *et al*., 2011; Srivastava, 2014; Hyun and Cho, 2018), managers' business decisions can change the matching between revenue and expense through cash inflows and outflows. For instance, Chen *et al*. (2015) and Cheung *et al*. (2017) report that managerial ability is positively associated with innovative output. Then, we can predict that cash outflows due to R&D will be followed by faster cash inflows from goods and services based on R&D outcome. Firms with high managerial ability will thus have a better contemporaneous association between cash-revenue and cash-expense, which will result in more matching between total revenue and total expense.

To understand the underlying mechanism through which managerial ability relates with revenue-expense matching, we follow Dichev and Tang (2008) to partition revenue and expense into accrual and cash flow components. We find that higher managerial ability is significantly associated with better contemporaneous accrual-based revenue-expense matching. We also find that firms having more capable managers exhibit weaker matching between current cash-based revenue and past cash- based expense. These findings indicate that we should interpret our previous finding cautiously. Stronger contemporaneous revenue-expense matching for firms under more capable managers is attributable to those managers' accrual estimation, while weaker current revenue-past expense matching for firms having more talented managers is due to those managers' real business decision which reduces cash-outflows earlier than cash-inflows.

We also employ forced CEO turnover to verify whether managerial ability is a really important determinant in revenue-expense matching. Since forced CEO turnover event implies that new CEO is expected to have better ability than previous CEO (Jenter and

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will lead to less inventory write-offs in future periods, which deteriorates future contemporaneous revenue-expense matching.

Kanaan, 2015), such an event is expected to capture an increase in CEO ability without confounding effects of other firm characteristics. We find that contemporaneous revenue-expense matching improves and the associations that current revenue has with past and future expenses deteriorate after forced CEO turnover, supporting our previous inferences.

We note that using managerial ability measure constructed by Demerjian *et al*. (2012) could bias our empirical results because their managerial ability measure relies on the degree that managers generate revenue from limited corporate resources such as assets and expenses, which are also crucial determinants of revenue-expense matching estimation. We thus employ alternative proxies of managerial ability such as industry-adjusted return-on-assets, industry-adjusted stock returns, CEO cash compensation, and CEO tenure. Our inference remains unchanged.

This paper contributes to the literatures of earnings attribute as well as managerial ability. First, this paper provides incremental contribution that managerial ability is significantly associated with earnings attribute. While there is a list of papers on this issue, none of them have examined the relation between managerial ability and revenue-expense matching. Although there is an ongoing academic debate on whether revenue-expense matching is a desirable characteristic of reported earnings, many researchers and practitioners still regard revenue-expense matching as being desirable or required (Center for Excellence in Accounting and Security Analysis, 2007; Dichev *et al*., 2013).

Second, this paper highlights the importance of understanding underlying mechanism of earnings attribute proxies. Reviewing empirical proxies of earnings attribute, Dechow, Ge, and Schrand (2010) emphasize that reported earnings is a function of accrual estimation as well as the firm's fundamental performance. Demerjian *et al*. (2013) also show that addressing the impact of fundamental factors can change the inference from empirical investigation of earnings attribute. Consistent with them, this paper documents that the

positive association between managerial ability and revenue-expense matching is partly explained by cash components, implying that the variation in revenue-expense matching is another earnings attribute which requires careful consideration of economic fundamentals.

2. Prior Research and Hypothesis Development

2.1. Revenue-Expense Matching

How to match expenses with relevant revenues determines reported earnings, which is the single most important output of financial reporting mechanism (Graham *et al*., 2005). Revenue-expense matching is valuable to accounting information users including investors and creditors because it can be helpful in understanding current performance and predicting future operating performance (Zimmerman and Bloom, 2016). Consistent with this view, the survey result in Dichev *et al*. (2013) suggests that CFOs believe matching is the most important principle to produce high-quality earnings.

Dichev and Tang (2008) report that the matching between revenue and expense has decreased over the period from 1967 to 2003 and attribute such a decline in revenue-expense matching to the standard-setters' shift toward the balance-sheet-based-model of earnings calculation. Prakash and Sinha (2013) report that the recognition of deferred revenue exacerbates revenue-expense matching, heightening complexity in predicting future earnings. While those studies argue that accounting factors complicate revenue-expense matching, Donelson *et al*. (2011) suggest that the deterioration of revenue-expense matching is largely due to special items, which are associated with increasing product market competitions, implying that economic rather than accounting factors drive the deterioration of matching in recent period. Srivastava (2014) also reports that an influx of newly listed firms, mainly in innovative industries heavily relying on R&D activities, results in poor revenue-expense matching among U.S. firms. Hyun and Cho (2018) argue that recent deleveraging among

U.S. firms leads to poor matching between revenue and interest expense. Encompassing these two perspectives, He and Shan (2016) document that the decline in revenue-expense matching is not unique to U.S. and it is attributable to both accounting and economic factors.

2.2. Managerial Ability and Earnings Quality

Whether and how managers influence firm performance has attracted attentions from academics and practitioners for a long time. For instance, Jensen and Meckling (1976) suggest that managers behave in the interest of their own benefits rather than in the interest of shareholders or debtholders. Bertrand and Mullainathan (2001, 2003) argue that managers are rewarded for firm performance not attributable to managerial decisions and that they prefer avoiding attentions from outside stakeholders at the expense of investors. Scharfstein and Stein (1990) also report that managers mimic other managers' investment decisions to maintain reputation in the labor market. These evidence casts doubt on managerial influence on firm performance. However, there are other studies documenting significant impact of managerial ability on firm behaviors. Bertrand and Schoar (2003), Chang *et al*. (2010), and Demerjian *et al*. (2012) report the cross-sectional differences in firm performance across managerial ability. Other evidence includes managerial impact on investment (Chemmanur and Paeglis, 2005), cash holding adjustment (Cho *et al*., 2018), innovation (Chen *et al*., 2015; Cheung *et al*., 2017), and tax avoidance (Koester *et al*., 2017).[3]

A recent addition to this line of literature is the association between managerial ability and financial reporting outcome. An increasing number of studies document that managers influence financial reporting through management earnings forecasts (Baik *et al*., 2011),

[3] However, it is unlikely that managerial ability influences every aspects of corporate behaviors because papers documenting insignificant associations between managerial ability and corporate behaviors are less likely to be published than those with significant findings.

internal control systems (Hoitash *et al*., 2012; Li *et al*., 2010), and voluntary financial disclosure (Bamber *et al*., 2010). More closely related to this paper, Demerjian *et al*. (2013) suggest that firms with higher managerial ability have better earnings quality because managers with ability to run operation more efficiently estimate accruals more accurately due to deeper understanding on firm's operating performance, industry competition, and macro-economic conditions.

2.3. Hypothesis Development

We focus on whether and why managerial ability is associated with matching between revenue and expense. As we discussed above, revenue-expense matching determines reported earnings, meaning that revenue-expense matching is an important issue in earnings quality discussion.[4] However, there is scarce evidence on the relation between managerial ability and revenue-expense matching. When Demerjian *et al*. (2013) report that firms with high managerial ability exhibit better financial reporting quality, they use restatements and accrual quality measures to proxy financial reporting quality. While Baik *et al*. (2011) and Bamber *et al*. (2010) discuss how managers influence financial reporting mechanism, they focus on management earnings forecasts and voluntary financial disclosure. Thus, despite its huge importance, there is a low level of understanding on revenue-expense matching in the context of managerial ability.

We expect firms having managers with better ability to exhibit better contemporaneous matching between revenue and expense through two channels:

[4] As we stated in the footnote 1, the recent shift from income-statement-based-model to balance-sheet-based-model in earnings estimation may damage the strength of our argument on the importance of revenue-expense matching. However, Center for Excellence in Accounting and Security Analysis (2007) argue that focusing on asset-liability-comparison does not reduce the importance of revenue-expense matching to estimate bottom line item in the income statement.

First, we expect managerial ability to influence revenue-expense matching through accrual estimation. Managers who better understand their firms' operating performance, industry, and macro-economic conditions can use their knowledge to improve accrual estimation because accrual estimation requires the judgment and calculation of accounting items related with fundamental economic events (Demerjian *et al*., 2013). More capable managers will thus make better estimation of accruals, leading to better contemporaneous revenue-expense matching. For instance, we can expect more capable managers to be better at inventory management through more precise prediction on the customers' demand and better understanding on production process. This will lead firms with more capable managers to report smaller write-offs of inventory due to obsolescence, damaged goods, or price-level change. Since inventory write-off deteriorates contemporaneous revenue-expense matching, smaller valuation loss of inventory for firms with more capable managers will result those firms to exhibit better revenue-expense matching. We refer this explanation as accrual estimation channel of the positive association between managerial ability and revenue-expense matching.

Second, we expect managerial ability to affect revenue-expense matching through real business decisions. Firms with more capable managers are expected to understand better the outcome of corporate activities (Chemmanur and Paeglis, 2005; Cho *et al*., 2018). For instance, Chen *et al*. (2015) and Cheung *et al*. (2017) report that managerial ability is positively associated with innovative output. Then, we can predict that cash outflows due to R&D will be followed by faster cash inflows from goods and services based on R&D outcome. We can provide a similar argument on advertising expense. Firms equipped with more capable manager will execute marketing activities when the related benefits such as more brand exposure and an increase in revenue are expected to follow in nearer future. Even though R&D and marketing expenses are recorded when they are incurred regardless of

revenue recognition, those period costs will be more likely to be accompanied with revenue recognition under more capable managers. Firms with high managerial ability will thus have a better contemporaneous association between cash-revenue and cash-expense, which will result in more matching between total revenue and total expense. We refer this possible impact of managerial ability on revenue-expense matching as real business channel.

Based on these two arguments, we posit the following hypothesis:

H1: Firms with more capable managers exhibit better contemporaneous revenue-expense matching.

3. Research Design

Our investigation on the association between managerial ability and revenue-expense matching starts from the basic revenue-expense matching model in Dichev and Tang (2008).

$$REV_{i,t} = \beta_0 + \beta_1 EXP_{i,t-1} + \beta_2 EXP_{i,t} + \beta_3 EXP_{i,t+1} + Fixed\text{-}Effects + \varepsilon_{i,t} \quad (1)$$

REV_t	=	Revenues (Compustat: SALE)in year *t* scaled by the average value of total assets (AT) in years *t-1* and *t*, and
EXP_t	=	Total expenses in year *t* scaled by the average value of total assets in years *t-1* and *t*. We calculate total expenses as revenue minus net income before extraordinary items (IB).

This model estimates the matching of current revenue with past, current, and future expenses. It thus presumes that corporate resources consumed to produce current revenue are recorded as expenses within three years spanning the timing of revenue recognition. β_2 captures the contemporaneous association between revenue and expense. Thus, a higher value of β_2 indicates better contemporaneous revenue-expense matching. β_1 and β_3 gauge the extent that the use of corporate resources to generate current revenue is recorded as past and future expenses, respectively. Dichev and Tang (2008) suggest that more conservative accounting makes β_1 larger because conservatism results in earlier recognition of expense. β_3 will be larger for firms recording revenue earlier than recording expense.

To examine the hypothesis, we modify Eq. (1) by including managerial ability proxy and its interaction terms with past, current, and future expenses.

$$REV_{i,t} = \beta_0 + \beta_1 EXP_{i,t-1} + \beta_2 EXP_{i,t} + \beta_3 EXP_{i,t+1} + \beta_4 MA\_LOW_{i,t-1} + \beta_5 MA\_HIGH_{i,t-1} + \beta_6 EXP_{i,t-1} \times MA\_LOW_{i,t-1} + \beta_7 EXP_{i,t} \times MA\_LOW_{i,t-1} + \beta_8 EXP_{i,t+1} \times MA\_LOW_{i,t-1} + \beta_9 EXP_{i,t-1} \times MA\_HIGH_{i,t-1} + \beta_{10} EXP_{i,t} \times MA\_HIGH_{i,t-1} + \beta_{11} EXP_{i,t+1} \times MA\_HIGH_{i,t-1} + \gamma_k \sum_k Control_{k,i,t} + Fixed\text{-}Effects + \varepsilon_{i,t} \quad (2)$$

MA_LOW_{t-1} = Indicator variable for firms having MA in the lowest quartile, zero otherwise. MA is managerial ability estimation based on Demerjian *et al*. (2012).

MA_HIGH_{t-1} = Indicator variable for firms having MA in the highest quartile, zero otherwise.

Control Variables

$SIZE_{t-1}$ = Natural log of the firm's assets (AT) reported at the end of year *t*.

$SALESVOLA_{t-1}$ = Standard deviation of sales [(SALE)/average assets (AT)] over at least three of the last five years (*t*–4, *t*).

$CFOVOLA_{t-1}$ = Standard deviation of cash from operations [(OANCF)/average assets (AT)] over at least three of the last five years (*t*–4, *t*).

$LOSS\%_{t-1}$ = Percentage of years reporting losses in net income (IBC) over at least three of the last five years (t–4, t).

$OPERCYCLE_{t-1}$ = Natural log of the length of the firm's operating cycle, defined as sales turnover plus days in inventory [360/(SALE/average RECT) + 360/(COGS/average INVT)] and is averaged over at least three of the last five years (*t*–4, *t*).

$SALEGROWTH_{t-1}$ = One-year change in sales defined as $SALE_t/SALE_{t-1}$.

BIG_{t-1} = Indicator variable for firms audited by big auditors, zero otherwise.

ROA_{t-1} = Return-on assets, calculated as income before extraordinary items scaled by average total assets in *t*-1 and *t*.

CFO_{t-1} = Cash flows from operating activities (OANCF) scaled by average total assets in *t*-1 and *t*.

We employ one-year-lagged rather than current managerial ability variable (MA_{t-1}) to reduce any empirical bias that rises when managers choose to work for firms having certain revenue-expense matching. According to the ability matching theory of managerial labor market, managerial talent is tenure-invariant and more talented managers are matched with larger and more successful firms (Rosen, 1981; Gabaix and Landier, 2008; and Baranchuk *et*

al., 2011). Since Srivastava (2014) find that large and old firms have better revenue-expense matching, we concern that larger or more successful firms which can offer more attractive compensation contracts take more talented managers, leading to the mechanical positive relation between revenue-expense and managerial ability.[5]

Another important reason that we use one-year lagged managerial ability relative to revenue-expense matching estimation is a possible overlap between managerial ability estimation and revenue-expense matching estimation. Manager ability measure in Demerjian *et al*. (2012) gauges the extant that managers generate revenues using limited corporate resources such as assets as well as expenses. Although the construction of managerial ability tries to eliminate the effect of firm-specific characteristics, we cannot discard the possibility that managerial ability proxy and revenue-expense matching could capture the same revenue-expense association if we use the contemporaneous managerial ability estimates. Thus, using lagged managerial ability measure alleviates the concern of mechanical bias.

While previous studies on revenue-expense matching are silent on the issue of model specification in revenue-expense regression, we attempt to mitigate the potential omitted variable problem by adding fixed effects of year and industry (2-digit Standard Industry Classification).

We use managerial ability estimation obtained from Demerjian's website, constructed based on the methodology in Demerjian *et al*. (2012). Particularly, Demerjian *et al*. (2012) use the two-stage measurement method: (1) They first employ data envelopment analysis to gauge total firm efficiency by setting revenue as a function of revenue-generating resources

[5] The empirical data seems to support the ability matching theory's view that managerial ability is time-invariant. Untabulated analysis indicates that the regression of managerial ability on one-year-lagged managerial ability yields the coefficient of 0.734 (t-stat.: 166.95) with R^2 of 54.56%. Thus, using one-year-lagged managerial ability reduces the possibility that our empirical analysis captures the potential bias arising from talented managers taking jobs on more successful firms, which would have better revenue-expense matching.

including COGS, SG&A, tangible assets, operating leases, R&D expenditures, and intangibles. (2) Then they calculate managerial ability as the residuals from the regression of total firm efficiency on firm characteristics including firm size, product market share, cash availability, business cycle, number of business segment, and the presence of foreign currency transaction for each industry-year.

The coefficients on the interaction terms between low (high) managerial ability and lagged, current, and forward expenses (β_6, β_7, and β_8 for low MA; β_9, β_{10}, and β_{11} for high MA) present the association between low (high) managerial ability and revenue-expense matching. If firms having less (more) capable managers exhibit stronger (weaker) matching of past expense with current revenue, β_6 (β_9) will be significantly positive (negative). When the contemporaneous expense-revenue matching is stronger for highly capable managers and weaker for low capable ones, β_7 will be significantly negative, whereas β_{10} will be significantly positive.

4. Empirical Results

4.1. Sample Construction

We retrieve U.S. public firms' financial data from Compustat. We remove financial companies (SIC code: 6000-6099) and utilities (4900-4999) because they are under close scrutiny from regulators, leaving them different from other industries. We obtain U.S. public firms' managerial ability estimates from Demerjian's website.[6] After eliminating observations without variables necessary to estimate the regression model and matching

[6] http://faculty.washington.edu/pdemerj/data.html. Peter Demerjian updated managerial ability data of U.S. public firms from 1980 to 2016.

managerial data, our final sample includes 68,008 firm-year observations from 1990 to 2017. Following Dichev and Tang (2008), we truncate all continuous variables at the 1% level.

4.2. Descriptive Statistics

Table 1 presents the descriptive statistics of variables in Eq. (2). REV_t and EXP_t have mean values of 1.229 and 1.228, respectively. These values are much larger than those in Dichev and Tang (2008) for two possible reasons. First, while Dichev and Tang (2008) use the sample from 1967 to 2003, we employ the observations in more recent period from 1990 to 2017. Second, while Dichev and Tang (2008) focus on the 1,000 largest U.S. firms to mitigate the issue of uneven firm coverage over time in the database, we employ all possible observations from the intersection of Compustat financial data and Demerjian's managerial ability data. These differences raise the possibility that our sample includes smaller firms with higher asset turnover compared to the sample of Dichev and Tang (2008). We note that the descriptive statistics in Table 1 are similar with those in Hyun and Cho (2018), which employ all U.S. companies from 1972 to 2013. The empirical proxy of managerial ability (*MA*) has a mean value close to zero by construction because it is the residual value from the regression of firm efficiency on firm characteristics.

[add Table 1 around here]

4.3. Main Results

We start the empirical analysis by estimating Eq. (1) to exhibit our sample firms' matching between current revenue and past, current, and future expenses. In Table 2, Column (1), we present the result of OLS regression with year- and industry-fixed effects and standard errors clustered at the firm-level. It shows that the relation between lagged expense (EXP_{t-1}) and current revenue (REV_t) is significantly positive, implying accounting

conservatism (Dichev and Tang 2008). The coefficients on current expense (EXP_t) indicate that the contemporaneous revenue-expense association is significantly positive. These results are comparable with prior studies in revenue-expense matching (Dichev and Tang, 2008; Donelson *et al*., 2011; Hyun and Cho, 2018). The coefficient on forward expense (EXP_{t+1}) is significantly negative.[7]

Columns (2)-(4) of Table 2 present our main result on the association between managerial ability and revenue-expense matching. The coefficient on the interaction term between one-year-lagged expense and low (high) managerial ability (EXP_{t-1}*MA_LOW_{t-1} (EXP_{t-1}*MA_HIGH_{t-1})) is significantly positive (negative) in Columns (2)-(4). It raises the possibility that (1) more talented managers making real business decisions reducing cash-outflows earlier than cash-inflows (cash flow channel), or (2) firms having more capable managers may exhibit less conservatism (i.e., smaller expense recognition earlier than revenue recognition; accrual estimation channel).[8] The coefficient on the interaction term between current expense and low (high) managerial ability (EXP_t*MA_LOW_{t-1} (EXP_t*MA_HIGH_{t-1})) is negative (positive) and significant in Columns (2)-(4). This indicates that firms run by managers with higher ability have better contemporaneous revenue-expense matching compared to those run by less capable managers. However, the

[7] The negative coefficient on future expenses in Columns (1) and (2) may indicate that future expenses produce negative current revenues, drawing the question over the validity of revenue-expense matching estimation model. Note that Dichev and Tang (2008) suggest that the significantly positive coefficient on lagged expenses indicate that firms are conservative in recognizing earnings, meaning that firms tend to recognize expenses earlier than when they recognize related revenue. We conjecture that such a conservative reporting decision will generate insignificant or negative coefficients on future expenses. However, we are very cautious in drawing any interpretation on the coefficients on future expenses because the coefficient on future expenses flips when we control for additional control variables in Columns (3) and (4).

[8] This interpretation is inconsistent with the positive association between managerial ability and accounting conservatism in García-Meca and García-Sánchez (2018) and Haider *et al*. (2021). One possible explanation is the use of different observations. In untabulated result, we follow Haider *et al*. (2021) and find that the relation between managerial ability and *CONS_ACC*, average total accruals for three years multiplied by (-1), is significantly negative. This implies that our sample exhibits the negative association between managerial ability and conservatism, supporting our interpretation on the negative coefficient on past expense.

association between low (high) managerial ability and current revenue-forward expense matching, captured by $EXP_{t+1}*MA\_LOW_{t-1}$ ($EXP_{t+1}*MA\_HIGH_{t-1}$), is largely insignificant.

The coefficients on the interaction terms between expense variables and managerial ability variables imply that the association between managerial ability and revenue-expense matching is economically significant. For instance, in Column (4), firms run by average managers exhibit contemporaneous revenue-expense matching coefficient (EXP_t) of 0.896. The coefficient on $EXP_t*MA\_LOW_{t-1}$ and $EXP_t*MA\_HIGH_{t-1}$ are -0.115 and 0.086, respectively. These indicates that firms with less talented managers have low contemporaneous revenue-expense matching by -0.115 (12.8% relative to 0.896) and those with more talented managers have better contemporaneous matching by 0.086 (9.6% relative to 0.896). As we move from the lowest quartile (*MA_LOW*) to the highest quartile of managerial ability (*MA_HIGH*), contemporaneous revenue-expense matching increases by 0.201 (=0.086-(-0.115)) and this corresponds to 22.4% relative to the baseline case.

[add Table 2 around here]

4.4. Accrual Estimation versus Business Decision

Previously, we formulated the hypothesis that managerial ability is associated with revenue-expense matching through accrual channel (accrual estimation) and cash flow channel (real business decision). However, the results in Table 2 do not reveal the channel through which managerial ability is associated with revenue-expense matching. We thus examine those two channels by partitioning revenue and expense into cash flows and accruals. We calculate cash-based revenue as net revenue minus the change in trade receivables plus the changes in deferred revenue, scaled by average total assets for year *t*-1 and *t*. Cash-based expense is the difference between cash revenue and operating cash flows. To mitigate the measurement error of operating cash flows, we use operating cash flows in

the cash flow statements rather than the approximation using balance sheet items. We calculate accrual-based revenue (expense) as the differences between total revenue (expense) and cash-based revenue (expense).

Columns (1) and (2) of Table 3 present the estimation results of Eq. (2) using cash- and accrual-based revenue and expense, respectively. In Column (1), the coefficient on the interaction term between cash-based past expense and managerial ability is significantly positive for low MA ($C\_EXP_{t-1}*MA\_LOW_{t-1}$) and significantly negative for high MA ($C\_EXP_{t-1}*MA\_HIGH_{t-1}$). Interestingly, the coefficient on the interaction term between cash-based forward expense and low managerial ability ($C\_EXP_{t+1}*MA\_LOW_{t-1}$) is significantly negative, while the coefficients on the interaction terms between cash-based current expense and high managerial ability ($C\_EXP_{t}*MA\_HIGH_{t-1}$) and between cash-based forward expense and high managerial ability ($C\_EXP_{t+1}*MA\_HIGH_{t-1}$) are positive but insignificant. These could be interpreted as weak evidence that more talented managers making real business decisions which delay cash-outflows (cash expenses) later than cash-inflows (cash revenues).

When we estimate accrual-based revenue-expense matching in Column (2), the coefficient on the interaction terms between accrual-based past expense and low managerial ability ($A\_EXP_{t-1}*MA\_LOW_{t-1}$) is significantly positive, and that on the interaction term between accrual-based current expense and low managerial ability ($A\_EXP_{t}*MA\_LOW_{t-1}$) is significantly negative. Furthermore, the interaction term between accrual-based forward expense and low managerial ability ($A\_EXP_{t+1}*MA\_LOW_{t-1}$) has significantly positive coefficient. In the other hand, the coefficients for high MA show opposite signs and are largely significant. These results indicate that firms with higher managerial ability exhibit

better contemporaneous revenue-expense matching and weaker associations of current revenue with past and forward expenses.[9]

Table 3 provides interesting interpretation of the result in Table 2. First, weaker association between current revenue and past expense for firms having more capable managers (Table 2) could arise mainly due to those talented managers reducing cash outflows earlier than cash inflows (Column (1), Table 3). Second, stronger contemporaneous revenue-expense matching for firms run by more capable managers (Table 2) is mostly attributable to better accrual revenue-accrual expense matching thanks to those managers' accrual estimation ability (Column (2), Table 3). Thus, we can draw different explanations for the matching of current revenue with past expense and that with current expense.

[add Table 3 around here]

5. Additional Results

5.1. An Influx of Newly Listed Firms

Srivastava (2014) reports that U.S. firms' earnings quality including revenue-expense matching declines over time because newly listed firms have different firm characteristics from firms listed in older time. This influx of newly listed firms may disrupt proper estimation of accruals even when managers have incentives to report high-quality earnings, possibly damaging our previous findings. To address this concern, we partition the sample based on listing years. Following the convention, listing year is defined as the first year that

[9] The negative coefficient on $A\_EXP_{t+1}*MA_{t-1}$ would indicate that managers with better operating decision recognize fewer future expenses associated with current revenues. For instance, if managers with good understanding on the business are better at estimating the allowance loss for current noncash sales, firms having those managers will report less allowance loss related with current revenue in the future. Thus, the positive association between current revenue and future allowance loss will be weaker for firms having more talented managers.

sample firm appears in Compustat database for the first time. We estimate Eq. (2) after partitioning the sample into firms listed before 1990, and firms listed in or after 1990.

Panel A of Table 4 presents the estimation results after listing year partition. The coefficient on past expense (EXP_{t-1}) has larger magnitude in late period (0.113, t-statistic = 11.02) than in early period (0.071, t-statistic = 10.28), whereas the coefficient on current expense (EXP_t) is smaller in late period (0.857, t-statistic = 54.01) than in early period (0.946, t-statistic = 90.28). These indicate that newly listed firms have higher reliance on R&D and advertisement activities, leading them to recognize more upfront expense earlier than revenue recognition (Srivastava, 2014).

More importantly, the coefficient on $EXP_{t-1}*MA\_LOW_{t-1}$ is significantly positive for both groups, and that on $EXP_t*MA\_LOW_{t-1}$ is significantly negative for both groups. $EXP_t*MA\_HIGH_{t-1}$ has significantly positive coefficient in either periods. Overall, our previous finding on the how managerial ability is associated with current revenue-past expense matching and contemporaneous revenue-expense matching is significant even after partitioning the sample based on listing years.

5.2. A Noise in Revenue-Expense Matching due to Period Costs

Hyun and Cho (2018) report that an increasing pattern of deleveraging among U.S. firms generate poorer matching between revenue and interest expense in recent period. As we note earlier, Srivastava (2014) also point out that an increase in R&D expense, another period cost item, deteriorates revenue-expense matching of newly listed firms. These findings imply that period costs may damage the validity of revenue-expense matching model in capturing the true managerial choice to recognize revenue-related expenses. To address this concern, we modify the expense items by adding back period costs such as depreciation and amortization costs, R&D and advertising expenses, and net interest expense. The result in

Panel B, Table 4 presents that the coefficients on $EXP_{t-1}*MA\_LOW_{t-1}$ and $EXP_t*MA\_LOW_{t-1}$ are significantly positive and negative, respectively. The coefficients on $EXP_{t-1}*MA\_HIGH_{t-1}$ and $EXP_{t+1}*MA\_HIGH_{t-1}$ are significantly negative and that on $EXP_t*MA\_HIGH_{t-1}$ is significantly positive. Overall, these results are similar with Table 2, indicating that period costs are unlikely to bias our empirical result.

[add Table 4 around here]

5.3. Forced Turnover and Revenue-Expense Matching[10]

Another possible concern is that firms exhibiting better revenue-expense matching may hire more capable mangers. If this reverse causality drives the results, then it means that revenue-expense matching does not vary by replacing the manager of the firm. To address this possibility, we test whether revenue-expense matching is associated with forced CEO turnover. The rationale of using forced CEO turnover in the place of managerial ability proxy is that forced CEO performed poor and new CEO is expected to perform better (Jenter and Kanaan, 2015). If it is the firm characteristics, not the managerial ability, are the ones that enable better matching between revenue and expense, the effect should be constant for pre- and post-turnover. We construct an indicator variable, *POST*, which identifies the after CEO is dismissed. We omit the year that CEO is fired to eliminate possible confounding effects of uncontrolled factors. *POST* takes the value of zero for two years before forced CEO turnover and it is one for two years after forced CEO turnover.

Result in Table 5 shows that the EXP_t*POST_t is significantly positive, while $EXP_{t-1}*POST_t$ and $EXP_{t+1}*POST_t$ are significantly negative. These indicate that firms having CEOs better ability after forced CEO turnover have better contemporaneous revenue-expense

[10] We appreciate the anonymous reviewer who suggested this possibility and remedy.

matching. This is consistent with our previous inference and alleviate the concern of reverse causality.

[add Table 5 around here]

5.4. Alternative Definitions of Managerial Ability

Although our results are robust to a battery of control variables and potential issues such as new listings and period costs, they do not address the possible bias arising from the construction of managerial ability measure in Demerjian *et al*. (2012) as well as revenue-expense matching estimation model. Managerial ability measure is based on how much revenue is generated revenue from limited corporate resources such as assets and expenses. Revenue-expense matching estimation model also compares revenue and expense. Thus, our research design may not be free from possible bias that both managerial ability measure and matching model could move mechanically together.

To address this concern, we employ alternative proxies of managerial ability in Demerjian *et al*. (2012). They use (1) industry-adjusted return-on-assets, (2) industry-adjusted stock returns, (3) CEO cash compensation, and (4) CEO tenure. Table 6 presents the results. The coefficients on $EXP_t*MA\_LOW_{t-1}$ are negative and statistically significant except Column (2). The coefficients on $EXP_t*MA\_High_{t-1}$ are significant in all columns, although it is statistically significant only in Column (3). These results are, albeit weak, consistent with our previous findings, enhancing the confidence on the inference we have.

[add Table 6 around here]

6. Conclusions

Prior studies have examined how managerial ability influences financial reporting quality using various aspects such as earnings management, accrual quality, restatement, and

internal control system. Despite its importance in generating reported earnings, the matching between revenue and expense has not been explored in the context of managerial ability. We try to fill this gap by directly testing the association between managerial ability and revenue-expense matching. We find that firms having more capable managers exhibit better contemporaneous revenue-expense matching, while such firms have weaker matching of past and future expenses with current revenue. When, we re-estimate revenue-expense matching model after decomposing revenue and expense into accruals and cash flows components, we find that managerial ability impact on current revenue-past expense matching is through cash flows, and that on contemporaneous revenue-expense matching comes through accruals. Thus, the association between managerial ability and revenue-expense matching could be explained by both accrual estimation and real business decision.

We provide several caveats. First, the empirical construction of managerial ability is still imperfect, incurring the debate on the validity issue. Thus, although we tried alternative proxies and employed forced CEO turnover event, potential measurement error may bias our inference. Second, incumbent revenue-expense matching is designed to investigate the time-series property of matching, not the cross-sectional variation. Thus, although we employ various control variables to address possible omitted variable problem, our empirical results are not free from such a limitation. Third, the comparison of cash-based and accrual-based revenue-expense matching models is not well discussed in prior studies, raising the question mark on our interpretation. Furthermore, those two models leave possible matching across cash- and accrual-based revenue and expense.

References

Baik, B., D. Farber and S. Lee (2011), 'CEO Ability and Management Earnings Forecasts', *Contemporary Accounting Research*, Vol. 28, No. 5, pp. 1645–1668.

Bamber, L., J. Jiang and I. Wang (2010), 'What's My Style? The Influence of Top Managers on Voluntary Corporate Financial Disclosure', *The Accounting Review*, Vol. 85, No. 4, pp. 1131–1162.

Baranchuk, N., G. MacDonald, and J. Yang (2011), 'The economics of super managers' *Review of Financial Studies*, Vol. 24, No. 10, pp. 3321-3368

Bertrand, M. and S. Mullainathan (2001), 'Are CEOs Rewarded for Luck? The Ones without Principals are', *The Quarterly Journal of Economics*, Vol. 116, No. 3, pp. 901-932.

Bertrand, M. and S. Mullainathan (2003), 'Enjoying the Quiet Life? Corporate Governance and Managerial Preference', *Journal of Political Economy*, Vol. 111, No. 5, pp. 1043-1075.

Bertrand, M. and A. Schoar (2003), 'Managing with Style: The Effect of Managers on Firm Policies', *The Quarterly Journal of Economics*, Vol. 118, No. 4, pp. 1169-1208.

Brickley, J. A. (2003), 'Empirical Research on CEO Turnover and Firm Performance: A Discussion', *Journal of Accounting & Economics*, Vol. 36, No. 1/3), pp. 227–233.

Center for Excellence in Accounting and Security Analysis, (2007), *On the Balance Sheet-Based Model of Financial Reporting*, Occasional Paper Series. Columbia University.

Chang, Y. Y., S. Dasgupta and G. Hilary (2010), 'CEO Ability, Pay, and Firm Performance', *Management Science*, Vol. 56, No. 10), pp. 1633–1652.

Chen, Y., E. J. Podolski and M. Veeraraghavan (2015), 'Does Managerial Ability Facilitate Corporate Innovation Success?' *Journal of Empirical Finance*, Vol. 34, pp. 313-326.

Chemmanur, T. J. and I. Paeglis (2005), 'Management Quality, Certification, and Initial Public Offerings', *Journal of Financial Economics*, Vol. 76, pp. 331-368.

Cheung, K. T. S., D. Naidu, F. Navissi, and K. Ranjeeni (2017), 'Valuing talent: Do CEO's ability and discretion unambiguously increase firm performance', *Journal of Corporate Finance*, Vol. 42, pp. 15-35.

Cho, H., S. Choi and M.-O. Kim (2018), 'Cash Holding Adjustment Speed and Managerial Ability', *Asia-Pacific Journal of Financial Studies*, Vol. 47, pp. 695-719.

Dechow, P. W. Ge and C. Schrand (2010), 'Understanding Earnings Quality: A Review of the Proxies, their Determinants and their Consequences', *Journal of Accounting & Economics*, Vol. 50, pp. 344-401.

Demerjian, P. R., B. Lev, M. F. Lewis and S. E. McVay (2013), 'Managerial Ability and Earnings Quality', *The Accounting Review*, Vol. 88, No. 2, pp. 463-498.

Demerjian, P. R., B. Lev and S. E. McVay (2012), 'Quantifying Managerial Ability: A New Measure and Validity Tests', *Management Science*, Vol. 58, No. 7, pp. 1229–1248.

Dichev, I. D. and V. W. Tang (2008), 'Matching and the Change Properties of Accounting Earnings over the Last 40 Years', *The Accounting Review*, Vol. 83, pp. 1425-1460.

Dichev, I. D., J. R. Graham, C. R. Harvey and S. Rajgopal (2013), 'Earnings Quality: Evidence from the Field', *Journal of Accounting & Economics*, Vol. 56, No. 2, pp. 1-33.

Donelson, D. C., R. Jennings and J. McInnis (2011), 'Change over Time in the Revenue-Expense Relation: Accounting or Economics?', *The Accounting Review*, Vol. 86(3), pp. 945-974.

Gabaix, X., and A. Landier (2008), 'Why has CEO pay increased so much?' *Quarterly Journal of Economics*, Vol. 123, No. 1, pp. 49-100.Graham, J. R., C. R. Harvey and

S. Rajgopal (2005), 'The Economic Implications of Corporate Financial Reporting', *Journal of Accounting & Economics*, Vol. 40, pp. 3-73.
García-Meca, E., and I.-M, García-Sánchez (2018), 'Does managerial ability influence the quality of financial reporting?' *European Management Journal*, Vol. 36, No. 4, pp. 544-577.
Gul, F. A., M. Khedmati, E. K. Lim and F. Navissi (2018), 'Managerial Ability, Financial Distress, and Audit Fees', *The Accounting Horizon*, Vol. 32, No. 1, pp. 29-51.
Haider, I., H. Singh, and N. Sultana (2021), 'Managerial ability and accounting conservatism' *Journal of Contemporary Accounting & Economics*, Vol. 17, No. 1, 100242.
He, W. and Y. Shan (2016), 'International Evidence on the Matching between Revenues and Expenses', *Contemporary Accounting Research*, Vol. 33, No. 3, pp. 1267-1297.
Hoitash, R., U. Hoitash and K. Johnstone (2012), 'Internal Control Material Weaknesses and CFO Compensation', *Contemporary Accounting Research*, Vol. 29, No. 3, pp. 768–803
Huang, X. S., and L. Sun (2017), 'Managerial ability and real earnings management', *Advance in Accounting*, Vol. 39, pp. 91-104.
Hyun, J.-H. and H. Cho (2018), 'Deleveraging and Decline in Revenue-Expense Matching over Time', *Journal of Business Finance & Accounting*, Vol. 45, No. 9-10, pp. 1031-1050.
Jensen, M. C. and W. H. Meckling (1976), 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure', *Journal of Financial Economics*, Vol. 3, pp. 305-360.
Jenter, D. and F. Kanaan (2015), 'CEO Turnover and Relative Performance Evaluation', *The Journal of Finance*, Vol. 70, No. 5, pp. 2155–2184.
Koester, A., T. Shevlin and D. Wangerin (2017), 'The Role of Managerial Ability in Corporate Tax Avoidance', *Management Science*, Vol. 63, No. 10, pp. 3285-3310.
Li, C., L. Sun and M. Ettredge (2010), 'Financial Executive Qualifications, Financial Executive Turnover, and Adverse SOX 404 Opinions', *Journal of Accounting & Economics*, Vol. 50, No. 1, pp. 93–110.
Prakash, R. and N. Sinha (2013), 'Deferred Revenues and the Matching of Revenues and Expenses', *Contemporary Accounting Research*, Vol. 30, No. 2, pp. 517-548.
Rosen, S (1981), 'The economics of superstars' *American Economic Review*, Vol. 71, No. 5, pp. 845-858.
Scharfstein, D. S. and J. C. Stein (1990), 'Herd Behavior and Investment', *American Economic Review*, Vol. 80, No. 3, pp. 465-479.
Srivastava, A. (2014), 'Why Have Measures of Earnings Quality Changed over Time?', *Journal of Accounting & Economics*, Vol. 57, pp. 196-217.
Zimmerman, A. B. and R. Bloom (2016), 'The Matching Principle Revisited', *Accounting Historians Journal*, Vol. 43, No. 1, pp. 79-119.

Table 1. Descriptive Statistics

	Mean	Std.	P25	Median	P75
MA_{t-1}	0.005	0.118	-0.064	-0.014	0.044
REV_t	1.229	0.722	0.716	1.086	1.574
EXP_{t-1}	1.221	0.714	0.716	1.080	1.561
EXP_t	1.228	0.716	0.720	1.085	1.561
EXP_{t+1}	1.218	0.709	0.712	1.076	1.550
$SIZE_{t-1}$	5.715	2.379	3.967	5.647	7.367
$SALESVOLA_{t-1}$	0.206	0.648	0.078	0.140	0.248
$CFVOLA_{t-1}$	0.081	0.394	0.029	0.050	0.087
$LOSS\%_{t-1}$	0.258	0.314	0.000	0.200	0.400
$OPERCYCLE_{t-1}$	4.821	0.714	4.496	4.875	5.237
$SALESGROWTH_{t-1}$	0.233	14.565	-0.027	0.073	0.202
BIG_{t-1}	0.796	0.403	1.000	1.000	1.000

This table presents summary statistics for variables to estimate the relation between revenue and expense. MA_{t-1} is managerial ability in year *t*-1, estimated by Demerjian *et al*. (2012). REV_t is revenues (Compustat code: SALE) in year *t*, scaled by average value of total assets (AT) in years *t*-1 and *t*. EXP_t is total expenses, calculated as revenue (SALE) minus net income before extraordinary items (IB), in year *t*, scaled by average value of total assets in years *t*-1 and *t*. EXP_{t-1} and EXP_{t+1} are the lagged and forward values of EXP_t, respectively. *SIZE* is the natural log of the firm's assets (AT) reported at the end of year *t*. *SALESVOLA* is the standard deviation of sales [(SALE)/average assets (AT)] over at least three of the last five years (*t*–4, *t*). *CFVOLA* is the standard deviation of cash from operations [(OANCF)/average assets (AT)] over at least three of the last five years (*t*–4, *t*). *LOSS%* is the percentage of years reporting losses in net income (IBC) over at least three of the last five years (*t*–4, *t*). *OPERCYCLE* is the natural log of the length of the firm's operating cycle, defined as sales turnover plus days in inventory [360/(SALE/average RECT) + 360/(COGS/average INVT)] and is averaged over at least three of the last five years (*t*–4, *t*). *SALEGROWTH* is the one-year change in sales defined as $SALE_t/SALE_{t-1}$). *BIG* is an indicator variable for firms audited by big auditors, zero otherwise. The sample contains 65,926 observations with all variables available from 1990 to 2017. We truncate the top and bottom percentiles of all continuous variables.

Table 2. The Association between Managerial Ability and Revenue-Expense Matching

Dep. Var.	(1)			(2)			(3)			(4)		
$= REV_t$	*Coeff.*		*T-stat.*	*Coeff.*		*T-stat.*	*Coeff.*		*T-stat.*	*Coeff.*		*T-stat.*
Intercept	0.039	***	3.04	0.057	***	4.37	0.175	***	9.48	-0.033	***	-3.06
MA_LOW_{t-1}				-0.045	***	-11.09	-0.027	***	-7.95	-0.003		-1.38
MA_HIGH_{t-1}				0.099	***	19.05	0.056	***	13.44	0.005	*	1.82
EXP_{t-1}	0.141	***	24.54	0.106	***	15.63	0.090	***	14.41	0.106	***	15.92
EXP_t	0.863	***	107.68	0.893	***	87.66	0.902	***	92.91	0.896	***	90.62
EXP_{t+1}	-0.015	***	-3.05	-0.011	*	-1.76	0.002		0.38	0.005		0.85
$EXP_{t-1} * MA\_LOW_{t-1}$				0.120	***	6.52	0.097	***	5.87	0.091	***	6.58
$EXP_t * MA\_LOW_{t-1}$				-0.104	***	-4.25	-0.115	***	-5.08	-0.115	***	-5.97
$EXP_{t+1} * MA\_LOW_{t-1}$				-0.003		-0.21	0.014		1.08	0.023	**	2.33
$EXP_{t-1} * MA\_HIGH_{t-1}$				-0.096	***	-4.56	-0.052	***	-2.70	-0.070	***	-3.91
$EXP_t * MA\_HIGH_{t-1}$				0.066	**	2.32	0.068	**	2.56	0.086	***	3.40
$EXP_{t+1} * MA\_HIGH_{t-1}$				0.004		0.24	-0.021		-1.42	-0.017		-1.39
$SIZE_{t-1}$							0.004	***	7.30	0.003	***	8.27
$SALESVOLA_{t-1}$							-0.001		-0.38	-0.001		-0.33
$CFOVOLA_{t-1}$							-0.011	**	-2.10	-0.006		-1.19
$LOSS\%_{t-1}$							-0.199	***	-46.76	-0.033	***	-10.97
$OPERCYCLE_{t-1}$							-0.019	***	-7.41	0.003	**	2.06
$SALEGROWTH_{t-1}$							0.000	***	12.26	0.000		-1.26
BIG_{t-1}							0.005	*	1.93	0.003	*	1.79
ROA_{t-1}										0.434	***	36.03
CFO_{t-1}										0.266	***	23.51
Controls	No			Yes			Yes			Yes		
Year FE	Yes			Yes			Yes			Yes		
Industry FE	Yes			Yes			Yes			Yes		
Firm Clustering	Yes			Yes			Yes			Yes		
Observations	68,008			68,008			68,008			68,008		
Adjusted R^2	0.954			0.955			0.964			0.978		

This table presents estimates of revenue-expense matching and its association with managerial ability as in Equations (1) and (2). *MA_LOW* is an indicator variable for firms having *MA* in the lowest quartile, zero otherwise. *MA_HIGH* is an indicator variable for firms having *MA* in the highest quartile, zero otherwise. Please refer the variable definitions in the notes of Table 1. The sample contains 68,008 observations with all variables available from 1990 to 2017. To mitigate the influence of

outliers, we truncate the top and bottom percentiles of revenue and expense variables. The superscripts *, **, and *** correspond to 10%, 5%, and 1% significance levels for two-tailed t-tests.

Table 3. Comparison of Cash- and Accrual-Based Matching

	(1) Dep. Var. = C_REV_t			(2) Dep. Var. = A_REV_t		
	Coeff.		*T-stat.*	*Coeff.*		*T-stat.*
Intercept	0.242	***	14.45	0.012		2.60
MA_LOW_{t-1}	-0.027	***	-9.95	0.001		0.81
MA_HIGH_{t-1}	0.062	***	16.08	0.001		0.76
C_EXP_{t-1}	0.040	***	8.90			
C_EXP_t	0.932	***	153.52			
C_EXP_{t+1}	0.024	***	5.56			
$C\_EXP_{t-1} * MA\_LOW_{t-1}$	0.050	***	4.35			
$C\_EXP_t * MA\_LOW_{t-1}$	-0.023		-1.53			
$C\_EXP_{t+1} * MA\_LOW_{t-1}$	-0.023	**	-2.22			
$C\_EXP_{t-1} * MA\_HIGH_{t-1}$	-0.045	***	-3.64			
$C\_EXP_t * MA\_HIGH_{t-1}$	0.025		1.57			
$C\_EXP_{t+1} * MA\_HIGH_{t-1}$	0.001		0.09			
A_EXP_{t-1}				-0.034	***	-6.10
A_EXP_t				0.178	***	17.76
A_EXP_{t+1}				-0.056	***	-9.65
$A\_EXP_{t-1} * MA\_LOW_{t-1}$				0.013	*	1.68
$A\_EXP_t * MA\_LOW_{t-1}$				-0.066	***	-4.68
$A\_EXP_{t+1} * MA\_LOW_{t-1}$				0.025	***	2.98
$A\_EXP_{t-1} * MA\_HIGH_{t-1}$				0.001		0.12
$A\_EXP_t * MA\_HIGH_{t-1}$				0.055	***	3.15
$A\_EXP_{t+1} * MA\_HIGH_{t-1}$				-0.025	**	-2.30
Controls	Yes			Yes		
Industry FE	Yes			Yes		
Year FE	Yes			Yes		
Firm Clustering	Yes			Yes		
Observations	68,008			68,008		
Adjusted R^2	0.973			0.108		

This table presents estimates of the association between managerial ability and cash- / accrual-based revenue-expense matching. C_REV_t is cash-based revenues in year *t*, scaled by average value of total assets in years *t*-1 and *t*. Cash revenue is net revenue (Compustat item: SALE) minus the change in trade receivables (RECTR) plus the change in deferred revenue (DRLT and DRC). C_EXP_t is cash-based expenses, scaled by average value of total assets in years *t*-1 and *t*. Cash expense is the difference between cash revenue and operating cash flows (OANCF). A_REV_t is accrual-based revenues in year *t*, scaled by average value of total assets in years *t*-1 and *t*. Accrual-based revenue is the difference between net revenue and cash revenue. A_EXP_t is accrual-based expense in year *t*, scaled by average value of total assets in years *t*-1 and *t*. Accrual-based expense is the difference between total expense and cash-based expense. Total expense is the difference between net revenue and net income before extraordinary items (IB). Definitions of other variables are available at the note of Table 1. The sample contains 68,008 observations with all variables available from 1990 to 2017. To mitigate the influence of outliers, we truncate the top and bottom percentiles of revenue and expense variables. The superscripts *, **, and *** correspond to 10%, 5%, and 1% significance levels for two-tailed t-tests.

Table 4. Additional Tests

Panel A. Time Partition based on Listing Year

Dep. Var.	(1) Listed before 1990			(2) Listed in or after 1990		
$= REV_t$	*Coeff.*		*T-stat.*	*Coeff.*		*T-stat.*
Intercept	0.102	***	5.38	0.232	***	6.74
MA_LOW_{t-1}	-0.020	***	-5.59	-0.035	***	-6.69
MA_HIGH_{t-1}	0.056	***	11.66	0.058	***	8.98
EXP_{t-1}	0.071	***	10.28	0.113	***	11.02
EXP_t	0.946	***	90.28	0.857	***	54.01
EXP_{t+1}	-0.013	**	-2.07	0.017	*	1.70
$EXP_{t-1} * MA\_LOW_{t-1}$	0.071	***	2.70	0.097	***	4.43
$EXP_t * MA\_LOW_{t-1}$	-0.083	**	-2.46	-0.111	***	-3.63
$EXP_{t+1} * MA\_LOW_{t-1}$	0.015		1.06	0.006		0.33
$EXP_{t-1} * MA\_HIGH_{t-1}$	-0.039		-1.40	-0.049	*	-1.81
$EXP_t * MA\_HIGH_{t-1}$	0.053	**	2.46	0.054	**	2.43
$EXP_{t+1} * MA\_HIGH_{t-1}$	-0.028		-1.68	-0.005		-0.23
Controls	Yes			Yes		
Year FE	Yes			Yes		
Industry FE	Yes			Yes		
Firm Clustering	Yes			Yes		
Observations	36,157			31,851		
Adjusted R^2	0.973			0.955		

Panel B. Revenue-Expense Matching without Period Costs

Dep. Var. $= REV_t$	*Coeff.*		*T-stat.*
Intercept	0.274	***	13.60
MA_LOW_{t-1}	-0.042	***	-13.14
MA_HIGH_{t-1}	0.112	***	25.65
EXP_{t-1}	0.059	***	10.28
EXP_t	0.948	***	109.57
EXP_{t+1}	-0.014	**	-2.38
$EXP_{t-1} * MA\_LOW_{t-1}$	0.100	***	6.14
$EXP_t * MA\_LOW_{t-1}$	-0.109	***	-4.94
$EXP_{t+1} * MA\_LOW_{t-1}$	0.016		1.32
$EXP_{t-1} * MA\_HIGH_{t-1}$	-0.072	***	-3.76
$EXP_t * MA\_HIGH_{t-1}$	0.087	***	3.32
$EXP_{t+1} * MA\_HIGH_{t-1}$	-0.038	***	-2.58
Year FE	Yes		
Year FE	Yes		
Industry FE	Yes		
Firm Clustering	Yes		
Observations	94,820		
Adjusted R^2	0.981		

Panel A of this table presents the estimates of revenue-expense matching and its association with managerial ability after partitioning the sample based on the listing period. Listing period is identified as the first year that the firm appears on Compustat database. Panel B of this table presents the estimates of revenue-expense matching and its association with managerial ability after excluding period costs including depreciation and amortization costs (DP), research and development expense (XRD), advertising expense (XAD), and interest expense (XINT) from total expenses. The sample contains 68,008 observations with all variables available

from 1990 to 2017. To mitigate the influence of outliers, we truncate the top and bottom percentiles of revenue and expense variables. The superscripts *, **, and *** correspond to 10%, 5%, and 1% significance levels for two-tailed t-tests.

Table 5. Forced Turnover and Revenue-Expense Matching

Dep. Var. = REV_t	*Coeff.*		*T-stat.*
Intercept	0.609	***	5.14
$POST_t$	0.011		1.25
EXP_{t-1}	0.204	***	13.37
EXP_t	0.683	***	35.09
EXP_{t+1}	0.082	***	4.43
$EXP_{t-1} * POST_t$	-0.086	***	-3.62
$EXP_t * POST_t$	0.179	***	6.26
$EXP_{t+1} * POST_t$	-0.101	***	-4.14
Controls	Yes		
Year FE	Yes		
Industry FE	Yes		
Firm Clustering	Yes		
Observations	2,183		
Adjusted R^2	0.983		

This table presents estimates of revenue-expense matching and its association with forced CEO turnover. *POST* is an indicator variable equal to one for firms having their CEOs forced to resign in year *t*-1 or *t*, zero for firms with forced CEO turnover in year *t*+1 or *t*+2. We omit the year that firms experience forced CEO turnover to eliminate possible confounding effects of uncontrolled factors. The sample contains 2,183 observations with all variables available from 1991 to 2017. To mitigate the influence of outliers, we truncate the top and bottom percentiles of revenue and expense variables. The superscripts *, **, and *** correspond to 10%, 5%, and 1% significance levels for two-tailed t-tests.

Table 6. Alternative Definitions of Managerial Ability

Dep. Var.	(1) *MA* = Historical ROA			(2) *MA* = Historical Industry-Adjusted Return			(3) *MA* = CEO Cash Compensation			(4) *MA* = CEO Tenure		
$= REV_t$	*Coeff.*		*T-stat.*	*Coeff.*		*T-stat.*	*Coeff.*		*T-stat.*	*Coeff.*		*T-stat.*
Intercept	0.071	***	6.58	0.117	***	5.62	0.146	***	6.91	0.085	***	3.99
MA_LOW_{t-1}	-0.021	***	-6.71	0.110	***	15.51	0.094	***	9.75	0.104	***	10.02
MA_HIGH_{t-1}	0.008	***	3.44	0.880	***	83.01	0.912	***	70.13	0.911	***	65.63
EXP_{t-1}	0.058	***	12.49	0.006		0.89	0.001		0.14	-0.004		-0.53
EXP_t	0.976	***	173.39	-0.019	***	-5.61	-0.026	***	-4.87	-0.010	***	-3.01
EXP_{t+1}	-0.028	***	-7.41	0.010	***	3.17	0.023	***	6.51	0.002		0.55
$EXP_{t-1} * MA\_LOW_{t-1}$	0.051	***	5.93	0.022	*	1.88	0.095	***	4.67	0.039	*	1.65
$EXP_t * MA\_LOW_{t-1}$	-0.035	***	-3.57	-0.019		-1.05	-0.116	***	-3.05	-0.095	**	-2.37
$EXP_{t+1} * MA\_LOW_{t-1}$	-0.010		-1.49	-0.001		-0.08	0.019		0.78	0.054	***	2.58
$EXP_{t-1} * MA\_HIGH_{t-1}$	0.007		0.88	-0.019		-1.44	-0.032	*	-1.94	0.030		1.45
$EXP_t * MA\_HIGH_{t-1}$	0.009		1.26	0.003		1.45	0.026	**	2.25	0.011		0.43
$EXP_{t+1} * MA\_HIGH_{t-1}$	-0.012	*	-1.69	-0.021		-1.79	0.007		0.53	-0.021		-1.64
Controls	Yes			Yes			Yes			Yes		
Year FE	Yes			Yes			Yes			Yes		
Industry FE	Yes			Yes			Yes			Yes		
Firm Clustering	Yes			Yes			Yes			Yes		
Observations	48,277			53,592			23,004			23,004		
Adjusted R^2	0.984			0.966			0.983			0.982		

This table present the estimates of the association between revenue-expense matching and different proxies of managerial ability. Column (1) uses historical return-on-assets (ROA) to gauge managerial ability. Historical ROA is the five-year industry-adjusted return on assets (cumulative income before extraordinary items (IBC) scaled by average total assets (AT) from year *t*-5 to year *t*-1). Historical industry-adjusted return is the five-year historical value-weighted industry-adjusted return (from year *t*-5 to year *t*-1). CEO cash compensation is the salary and bonus of the firm CEO (TOT_CURR from Execucomp; in thousands) for year *t*. CEO tenure is the number of years an executive has been listed as CEO by Execucomp at the end of year *t*. Each column has different numbers of observations due to the availability of managerial ability proxies. The sample period is from 1991 to 2017. To mitigate the influence of outliers, we truncate the top and bottom percentiles of revenue and expense variables. The superscripts *, **, and *** correspond to 10%, 5%, and 1% significance levels for two-tailed t-tests.