Corporate diversification and earnings management: A path analysis approach

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Abstract

We examine how corporate diversification affects earnings management. We find that diversified firms exhibit a lower degree of earnings management than comparable portfolios of single-segment firms and that the magnitude of reduction in earnings management increases with higher levels of diversification. In addition, we shed light on how diversification decreases earnings management. Using path analysis, we find evidence that diversification decreases earnings management by reducing both earnings volatility and the need for external financing and by increasing the propensity to pay dividends. Our results are robust to using different measures of diversification and earnings management and continue to hold when we attempt to account for endogeneity using two different methods: the Heckman two-stage model and propensity score matching.

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1. Introduction

According to Dechow et al. (2011), identifying firm attributes that affect earnings management can be beneficial to several stakeholders such as 1) investors by improving returns, 2) auditors through avoiding costly litigations, 3) analysts by avoiding damaged reputation, and 4) regulators by enhancing investor protection. Although the existing literature has identified many firm characteristics that affect earnings management (see Dechow et al., 2010 for a review), to our knowledge, there is no empirical study in accounting or finance that examines whether and *how* the organizational form of a firm (multi-segment versus single-segment) affects earnings management. This motivates our investigation. Specifically, the purpose of this study is twofold. First, we examine the association between corporate diversification and earnings management. Second, using path analysis, we identify potential channels through which diversification affects earnings management.

While several studies examine the impact of diversification on earnings management, they have produced inconsistent results. For example, Jiraporn et al. (2008), Vasilescu and Millo (2016), and Berrill et al. (2021) find that diversification is associated with a decrease in earnings management across firms. Conversely, Lim et al. (2008), Rodríguez-Pérez and Hemmen (2010), Demirkan et al. (2012), and Lai and Liu (2018) document a positive association between diversification and earnings management.

Our paper is distinct from prior studies and contributes to the literature in three primary ways. First, prior studies measure earnings management at the consolidated level. However, given that the objective is to investigate the impact of corporate diversification on earnings management, we construct a measure that *compares* earnings management of the diversified firm to the earnings management that its segments would exhibit as stand-alone firms. This approach is consistent with Kuppuswamy and Villalonga (2016), who argue that the conceptually accurate method to examine the impact of diversification on a certain outcome variable (such as earnings management for the purpose of this study) is to compare a firm's actual earnings management to that of a comparable portfolio of same-industry, single-segment firms. Accordingly, we compute a measure of excess earnings management which benchmarks the degree of earnings management of a diversified firm against that of a comparable portfolio of single firms. Our methodology is also grounded in prior diversification studies that measure excess cost of capital (Hann et al., 2013), excess firm value (Berger & Ofek, 1995; Denis et al., 2002), excess financial leverage (Ahn et al., 2006; Ji et al., 2020), and excess cash holdings (Subramaniam et al., 2011).

Second, prior studies proxy for diversification using the number of segments and/or subsidiaries operated by the conglomerate. These measures are considered crude proxies of diversification because they do not capture two key factors that affect diversification and, in turn, earnings management: the volatility of each segment's operations and the correlation across the segments (Duchin, 2010). To overcome this limitation in prior studies, we follow Duchin (2010) in the construction of proxies for diversification that incorporate the number of segments, the weight and volatility of each segment, and the correlations among segments.

Third, to our knowledge, there is no empirical study that provides evidence on *how* corporate diversification affects earnings management. Consequently, using path analysis, we identify three specific channels through which diversification is linked to earnings management.[1] The first channel, which we label the "*volatility*" channel, is based on the notion that managers' incentives to manipulate earnings increase (decrease) as the firm's operational performance becomes more (less) volatile (Graham et al., 2005). Given that diversification decreases overall

[1] Path analysis is a technique that has been used in several accounting studies such as Defond et al. (2016), Goh et al. (2016) and Jin et al. (2022).

earnings and cash flow volatility (Lewellen, 1971; Galai & Masulis, 1976; Franco et al., 2016), we argue that diversification may lower managerial incentives to engage in earnings management by decreasing the variability of the diversified firm's overall earnings and cash flows.

The second channel is grounded in the observation that another incentive for earnings manipulation stems from the need to raise capital externally (Dechow et al., 1996; Dechow et al., 2011; Dechow et al., 2010; Rangan, 1998; Teoh et al., 1998). To the extent that a benefit of the multi-segment organizational structure is the availability of internal capital markets, a conglomerate is able to transfer resources from cash-rich segments to cash-poor segments, which in turn, can decrease the firm's demand for external financing (Duchin, 2010; Subramaniam et al., 2011; Bakke & Gu, 2017; Yan, 2006; Kuppuswamy & Villalonga, 2016; Yan et al., 2010). Accordingly, we conjecture that diversification may lower earnings management by decreasing the need to raise capital externally. We label this the "*demand for external financing*" channel.

A third channel through which corporate diversification could affect earnings management is through an impact on the firm's dividend payout policy. It is well documented in the accounting literature that the payment of dividends is associated with higher earnings quality (Skinner & Soltes, 2011; Caskey & Hanlon, 2013; Lawson & Wang, 2016). In addition, dividends reduce agency costs by decreasing discretionary cash flows available to management (Jensen, 1986). Therefore, to the extent that diversification facilitates dividend payout (Jordan et al., 2018) we argue that diversification may lower earnings management by influencing the firm's payout policy. We label this the "*dividends payout"* channel.

We test the relationship between corporate diversification and earnings management using data for U.S. firms over the 1993 to 2022 time period. We begin with a univariate analysis and find that the average diversified firm in our sample exhibits lower earnings management than a similarly constructed portfolio of single-segment firms. Next, using a standard OLS regression analysis and controlling for various earnings management determinants, we document a negative and significant association between diversification and earnings management. These results are robust to 1) using alternative measures of diversification and excess earnings management and 2) controlling for endogeneity using two well-accepted methods, namely, the Heckman two-stage analysis (Campa & Kedia, 2002; Hann et al., 2013) and propensity score matching (Villalonga, 2004; Ushijima, 2016; Lai & Liu, 2018).

We next perform a path analysis to test our maintained predictions that earnings and cash flow volatility, the demand for external financing, and dividends payout are channels through which diversification affects earnings management. Consistent with our predictions, the results indicate that the three channels partially mediate the negative association between diversification and earnings management. Moreover, we find that, of the three channels, lowering the demand for external financing is the most important in explaining the role diversification plays in reducing earnings management.

As an additional analysis, we study the role of internal capital markets within conglomerates (Rajan et al., 2000; Duchin, 2010; Jordan et al., 2018) by examining whether the degree of cross-segment transfers, the efficiency of transfers, or both affect the impact of diversification on earnings management. The coinsurance effect of diversification hypothesis suggests that the existence of internal capital markets enables a conglomerate to transfer funds between segments (Duchin, 2010; Jordan et al., 2018) and, as a result, decreases the incentives for earnings manipulation by reducing the need to raise funds externally (Dechow et al., 1996). Thus, we assess whether conglomerates with more active and/or efficient internal capital markets experience a lower degree of earnings management. Using internal capital market measures from Rajan et al. (2000), our findings suggest that the reduction in earnings management induced by diversification is stronger when internal capital markets are more active. Results regarding the role of the efficiency of internal capital markets are more equivocal.

The remainder of the paper is organized as follows: Section 2 discusses the theoretical channels underlying the relationship between corporate diversification and earnings management. Section 3 describes the data and presents univariate analysis. Section 4 presents our regression results for the effect of diversification on earnings management. Section 5 investigates the channels through which diversification affects earnings management. Section 6 examines the role of internal capital markets and Section 7 concludes the paper.

2. The impact of corporate diversification on earnings management

In theory, corporate diversification can affect managers' incentives to pursue earnings manipulation strategies via multiple channels. In this section, we discuss three theoretical channels underlying the relationship between diversification and earnings management.

2.1 The volatility channel

The earnings management literature suggests that managers' incentives to manipulate earnings are a direct function of earnings volatility. Volatile earnings are less predictable and more difficult to assess by analysts (Dichev & Tang, 2009) and are associated with a higher cost of capital (Smith & Stulz, 1985; Trueman & Titman, 1988; Francis et al., 2004). In an influential survey article, Graham et al. (2005) provide evidence that managers are willing to engage in accrual and real earnings management to dampen income fluctuations. Examining the relation between *sources* of earnings volatility and the magnitude of earnings management, Shust (2015) documents a positive association between R&D intensity (a corporate investment that increases earnings volatility (Kothari et al., 2002; Dichev & Tang, 2009)) and accrual-based earnings management. In a similar context, Dhole et al. (2016) document a negative association between CEO inside debt (a managerial compensation mechanism associated with lower volatility (Wei & Yermack, 2011; Cassell et al., 2012)) and both accrual and real activities-based earnings management.

The theoretical work of Lewellen (1971), Higgins and Schall (1975), and Galai and Masulis (1976) highlights that combining multiple business segments with less than perfectly correlated cash flow streams decreases the volatility of the diversified firm's overall earnings. An implication of this theory is that diversification may decrease managerial incentives to manage earnings by providing a natural hedge against earnings volatility. The logic underlying this argument is similar to that of Barton (2001), who documents a negative impact of both 1) the use of derivatives to decrease earnings and cash flow volatility and 2) diversification (measured by the entropy index on business segment sales) on the magnitude of earnings management. Similarly, based on a sample of oil and gas firms, Pincus and Rajgopal (2002) find that managers use earnings management techniques and hedging with derivates as substitutes to manage earnings volatility, which implies a negative association between hedging and earnings management. Importantly, Pincus and Rajgopal (2002) find that less diversified firms (those with a greater degree of sales from oil and gas production) engage in greater hedging activities to lower volatility, which implies that diversification decreases the need to hedge and to manage earnings.

2.2 The demand for external financing channel

Dechow et al. (1996) state that "… an important motivation for earnings manipulation is the desire to attract external financing at low cost." Specifically, when a firm cannot finance its ongoing operations and growth agenda with internally generated funds and, therefore, needs to rely on external financing, it can use overvalued stock to obtain a lower cost of new equity capital (Dechow et al., 2011). Consistent with this argument, Rangan (1998), Teoh et al. (1998), Shivakumar (2000), and DuCharme et al. (2004), among others, find that firms tend to manage earnings around seasoned equity offerings (SEOs).

The implications of several studies in corporate finance suggest that internal capital market imperatives of multi-segment firms (e.g., the reallocation of resources across segments) could decrease the incentives for earnings management by lowering the firm's dependency on and, therefore, demand for, external financing, especially during periods of financial distress when access to external financing is difficult. For instance, Yan (2006) finds that diversified firms enjoy higher valuations than focused firms during periods when external financing is more costly. Dimitrov and Tice (2006) find that during recessions, when credit constraints are high, bank-dependent multi-segment firms experience smaller drops in sales growth and inventory growth than do bank-dependent single-segment firms. Focusing on periods of economic distress in an industry, Gopalan and Xie (2011) document that, relative to single-segment firms, segments of diversified firms invest more in research and development and experience less of a decline in performance. Arguing that the ability to allocate resources between internal markets is a benefit of diversification, Kuppuswamy and Villalonga (2016) examine the effect of corporate diversification on firm value during the 2008–2009 financial crisis and document a positive association.

Additional support for the argument that corporate diversification decreases the demand for external financing comes from the stream of research on the relationship between diversification and cash holding (Duchin, 2010; Subramaniam et al., 2011). The premise of these studies is that diversified firms hold less cash because 1) the investment opportunities of the individual segments may be imperfectly correlated and 2) diversified firms could finance the investment projects of one segment using cash from other segments. To the extent that firms hold cash for potential growth opportunities (Opler et al., 1999) and that diversified firms hold less cash (Duchin, 2010; Subramaniam et al., 2011), it can be argued that diversification decreases the need to finance growth using external funds.

2.3 The dividend payout channel

It is well documented in the accounting literature that paying dividends is associated with higher earnings quality. For example, Skinner and Soltes (2011) find that dividend-paying firms report more persistent earnings. Caskey and Hanlon (2013) document a negative association between dividends and the likelihood of committing accounting fraud. Sun et al. (2012) document a negative relation between earnings quality and cash holdings (the opposite of paying dividends).

As we mention above, the coinsurance effect of diversification hypothesis predicts a negative relation between diversification and cash holdings through coinsurance (Duchin, 2010; Subramaniam et al., 2011). Consequently, based on the tenets of the coinsurance hypothesis, Jordan et al. (2018) argue that diversified firms can afford to pay back higher amounts to shareholders. Consistent with their prediction, the results show that diversified firms pay out more than single firms in both cash dividends and total payouts. In a recent study, Ham et al. (2021) find that the propensity to pay dividends increases as the firm’s earnings volatility decreases. Given that diversification decreases earnings volatility (Lewellen, 1971), we suggest that diversification increases the firm’s propensity to pay dividends. To summarize, the arguments in Duchin (2010), Subramaniam et al. (2011), Jordan et al. (2018), and Ham et al.

(2021) indicate that diversification increases both the propensity to pay dividends as well as the magnitude of dividends payments. Accordingly, we expect that the increase in the likelihood of paying dividends attributable to diversification to reduce earnings management.

3. Research design

3.1 Main variables of interest

3.1.1 Excess earnings management

To compare a diversified firm's earnings management to the earnings management that its segments would have as stand-alone firms, we compute a measure of excess earnings management attributable to diversification that benchmarks the accrual-based earnings management of a diversified firm against that of a comparable portfolio of single-firms. Our approach is similar to that used by Hann et al. (2013) to compute excess cost of capital, Berger and Ofek (1995) and Denis et al. (2002) to compute excess value, and Ahn et al. (2006) to compute excess leverage. Following these studies, excess earnings management (*EXEM*) is the natural logarithm of the ratio of the firm's earnings management to its imputed earnings management and is computed in the following manner:[2]

$$EXEM = In\frac{EM}{IEM} \quad (1)$$

where:

$EXEM$= access earnings management attributable to diversification;

EM = a firm's accrual-based earnings management (discussed below) and;

IEM = a firm's imputed accrual-based earnings management.

[2] For robustness, we also measure excess earnings management as the difference between the firm's accrual-based earnings management and its imputed accrual-based earnings management. Hann et al. (2013) used this methodology to calculate excess cost of capital.

A firm's imputed accrual-based earnings management is computed by multiplying the median ratio of accrual-based earnings management to sales for single-segment firms in a segment's industry by the segment's reported sales and then summing over the number of segments in the firm. Specifically, the firm's imputed earnings management is calculated as:

$$IEM = \sum_{i=1}^{n} S_i \, X \, [Ind_i \, (^{EM}/_{S})_{med} \qquad (2)$$

In Equation (2), *i* is a segment-specific index, *n* is the number of reported segments in segment *i*'s firm at the fiscal year end, S_i is total sales for segment *i*, and $Ind_i(^{EM}/_{S})_{med}$ is the median multiple of firm accrual-based earnings management to sales for all single-segment firms in the same industry as segment *i*. We define the industry for each segment based on the narrowest SIC grouping that includes at least five single-segment firms. Specifically, we first attempt to define an industry based on the four-digit SIC code then based on the three-digit SIC code and, finally, based on the two-digit SIC code for the segment (Berger & Ofek, 1995).

To measure the extent of a firm's accrual-based earnings management, we estimate the abnormal accruals in reported earnings utilizing two models frequently used in the earnings management literature. The first is the Dechow and Dichev (2002) model modified by McNichols (2002), in which total accruals for firm *i* in year *t* are given by:

$$TCA_{i,t} = \partial_0 + \partial_1 CFO_{i,t-1} + \partial_2 CFO_{i,t} + \partial_3 CFO_{i,t+1} + \partial_4 \Delta REV_{i,t} + \partial_5 PPE_{i,t} + \varepsilon_{i,t} \qquad (3)$$

Where:

$TCA_{i,t}$ = total current accruals for firm *i* in year *t*;

$CFO_{i,t}$ = cash flow from operations for firm *i* in year *t*;

$\Delta REV_{i,t}$ = the change in revenues for firm *i* between year *t-1* and year *t*; and

$PPE_{i,t}$ = the gross property, plant, and equipment for firm *i* in year *t*.

Consistent with Kothari et al. (2005), all variables in Equation (3) are scaled by lagged total assets. Equation (3) is estimated by year and two-digit SIC code. The modified Dechow and Dichev (2002) abnormal accruals (*MDD*) for firm *i* in year *t* are defined as the absolute value of the residuals from Equation (3).[3]

Second, we estimate abnormal accruals for firm *i* in year *t* based on the following cross-sectional modified Jones (1991) model:

$$TA_{it} = \beta_0 + \beta_1(\Delta REV_{it} - \Delta REC_{it}) + \beta_2 PPE_{it} + \beta_3 ROA_{it} + e_{it} \tag{4}$$

where:

TA_{it} = total accruals for company *i* in year *t* (defined as net income from continuing operations (*IB*) minus operating cash flow (*OANCF-XIDOC*));

ΔREV_{it} = sales (*SALE*) for company *i* in in year *t* minus sales for company *i* in year *t-1*;

ΔREC_{it} = accounts receivable (*RECT*) for company *i* in year *t* minus accounts receivable for company *i* in year *t-1*;

PPE_{it} = gross PP&E (*PPEGT*) for company *i* in year *t* and;

ROA_{it} = return on assets for company *i* in year *t* (defined as net income (*NI*) divided by lagged total assets).

Consistent with Kothari et al. (2005), all variables (other than *ROA*) in Equation (4) are scaled by lagged total assets. Equation (4) is estimated by year and two-digit SIC code.[4] The modified

[3] Similar to prior studies (Dechow & Dichev, 2002; Ramalingegowda et al., 2013; Hou, 2015), the mean and median values of (*MDD*) equal 0.06 and 0.03, respectively.

[4] In estimating Equations (3) and (4), we winsorize all variables at the top and bottom 1 percent levels. Further, in order to have meaningful parameter estimates, we mandate that the estimation sample have at least 10 observations in each industry and year

Jones (1991) abnormal accruals (*MDJ*) for firm *i* in year *t* are defined as the absolute value of the residuals from Equation (4).[5] Using the measures of earnings management described above, we calculate two measures of excess earnings management (*EXEM*) based on Equation (1): *EXEM_MDD* and *EXEM_MDJ*.

3.1.2 Diversification

Following Duchin (2010), diversification is measured directly through the cross-segment correlations in cash flow. Given that firms' segment composition changes over time, we calculate cross-segment correlations based on single-segment firms in the segment's industry (Duchin, 2010; Hann et al., 2013; Jordan et al., 2018).[6] Specifically, using single-segment firms only, we start by calculating the mean cash flow for each industry-year. Following Duchin (2010), we proxy for cash flow as earnings less interest and taxes divided by total assets ((*IB* + *DP*) / *AT*). Consistent with Hann et al. (2013), we define industries using the narrowest grouping that includes at least five single-segment firms.[7] Next, for firm *m* with a portfolio of *n* segments in year *t*, the inter-segment cash flow volatility is calculated as follows:

$$\sigma(CF)_{mt} = \sqrt{\sum_{i=1}^{n}\sum_{j=1}^{n} w_i w_j p(CF)_{i,j}\sigma(CF)_i\sigma(CF)_j} \quad (5)$$

Where:

$\sigma(CF)_{mt}$= cash flow volatility of firm *m* in year *t*;

(Kothari et al., 2005; Raman & Shahrur, 2008) and exclude observations with an absolute value of STUDENT greater than 2 (Fan, 2007). Finally, to more accurately estimate expected accruals, we follow prior research (Reichelt & Wang, 2010) and estimate Equations (3) and (4) from all available firm-year observations.

[5] Similar to prior studies (Raman & Shahrur, 2008; Kuang et al., 2014; Hou, 2015), the mean and median values of (*MDJ*) equal 0.09 and 0.05, respectively.

[6] Following Duchin (2010) and Hann et al. (2013), we estimate correlations and standard deviations over a 10-year window.

[7] Duchin (2010) defines industries at the three-digit North American Industry Classification System (NAICS). Defining industries using the narrowest grouping that includes at least five single-segment firms is consistent with the multiplier method of measuring the excess earnings management attributable to diversification discussed above.

w_i = the weight of segment *i* in the firm computed as the ratio of segment's *i* sales to total sales of the firm;

w_j = the weight of segment *j* in the firm computed as the ratio of segment's *j* sales to total sales of the firm;

$p(CF)_{i,j}$ = the pair-wise correlation between the cash flow streams of industries *i* and *j*;

$\sigma(CF)_i$ = the standard deviation of cash flow of segment *i* and;

$\sigma(CF)_j$ = the standard deviation of cash flow of segment *j*;

Next, we calculate a measure of "no-diversification" average volatility by setting all pair-wise correlations between cash flow streams of different industries equal to 1 ($\text{i.e.}, p(CF)_{i.j} = p(IV)_{i.j} = 1$). Specifically, for firm *m* with a portfolio of *n* segments in year *t*, the "no diversification" inter-segment cash flow volatility is calculated as follows:

$$\overleftarrow{\sigma(CF)_{mt}} = \sqrt{\sum_{i=1}^{n}\sum_{j=1}^{n} w_i w_j \sigma(CF)_i \sigma(CF)_j} \tag{6}$$

The coinsurance effect based on cash flow volatility is calculated as follows:

$$CECF = \overleftarrow{\sigma(CF)_{mt}} - \sigma(CF)_{mt} \tag{7}$$

Where *CECF* is the coinsurance effect based on cash flow volatility. By construction, *CECF* is always greater than or equal zero. More positive values of *CECF* imply a stronger coinsurance effect of diversification. For robustness, we follow Duchin (2010), and construct another measure of diversification (*CETQ*) based on cross-segment correlations in investment opportunities measured by Tobin's Q. Tobin's Q equals the market value of assets (*AT* + market value of common equity (*CSHO * PRCC*) – common equity (*CEQ*) – deferred tax (*TXDB)*) / (0.9 * *AT* + 0.1 * book value of assets).[8]

3.2 Sample construction

To construct the sample, we identify all firms with available data on Compustat North America Industrial Annual file and Compustat Segments file. Following prior research on earnings management and diversification (Berger & Ofek, 1995; Duchin, 2010; Reichelt & Wang, 2010; Hann et al., 2013), we eliminate firms with total sales less than $20 million, firms operating in the utility and financial industries (SIC codes 4900-4999 and 6000-6999, respectively), firms missing any 4-digit segment SIC code, and firms missing any segment sales. Further, we also eliminate firm-years missing data required to measure diversification, earnings management, and control variables. Finally, prior research suggests that segment data might be inaccurate (Denis et al., 1997) and that diversified firms may not fully allocate total firm sales to their reported segments (Cho, 2015). Therefore, to mitigate the effect of reporting errors in Compustat and to ensure the integrity of segment data, we eliminate firm-years in which the sum of business segment sales is not within one percent of the total firm sales (Berger & Ofek, 1995). Applying the above sampling procedures results in 62,067 firm-year observations and 49,357 firm-year observations of the *EXEM_MDJ* subsample and *EXEM_MDD* subsample, respectively.

3.3 Descriptive statistics

Insert Table 1 here

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[8] By definition, *CECF* and *CETQ* equal zero for single segment firms and for firms with multiple segments operating in the same industry.

Panel A of Table 1 displays the summary statistics of the variables for the multi-segment and single-segment subsamples. To mitigate the influence of extreme observations, we winsorize all continuous variables at the 1st and 99th percentiles. The results in the two subsamples indicate that the mean and median values of excess earnings management are negative. This implies that the average firm in each subsample exhibits a lower magnitude of earnings management than a comparable portfolio of stand-alone firms. However, comparing the multi-segment subsample with that of single-segments, the results show that the mean and median excess earnings management are both lower for firms in the multi-segments subsample than those for firms in the single-segment subsample and the difference is statistically significant.[9] Regarding the independent variables of interest, *CECF* and *CETQ*, the mean and median values in the single-segment subsample equal zero. For the multi-segment subsample, the mean (median) *CECF* and *CETQ* equal 0.003 (0.001) and 0.011(0.003), respectively.

Next, we sort the subsample of multi-segment firms into quintiles based on the two measures of diversification: *CECF* and *CETQ* (defined in Section 3.1.2), where the lowest (highest) quintile contains multi-segment firms with the lowest (highest) magnitudes of diversification. We then calculate the mean and median values of excess earnings management for each quintile. Panels B and C of Table 1 show the results for the two subsamples of *EXEM_MDJ* and *EXEM_MDD*, respectively. The variations in the proxies of excess earnings management across the quintiles of the two measures of diversification are nearly monotonic. Specifically, the mean and median values of *EXEM_MDJ* and *EXEM_MDD* almost always decrease as we move from a lower quintile to a higher quintile of *CECF* and *CETQ*. In addition,

[9] By construction, the median excess earnings management for single-segment firms should equal zero because imputed values are calculated using the earnings management of the median single-segment firm in each industry. However, because we eliminate observations with missing control variables, the median excess earnings management for single-segment firms differs from zero.

the difference in the mean and median excess earnings management between the highest quintile and the lowest quintile of diversification is statistically significant at the 1 percent level. Finally, the difference in the mean and median excess earnings management between firms in the highest quintile and single firms is statistically significant at the 1 percent level.

4. Diversification and excess earnings management: Regression analysis

In this section, we examine the effect of diversification on excess earnings management using a regression approach. The main empirical model is as follows:

$$EXEM_{i,t} = \beta_0 + \beta_1 DIVER_{i,t} + \beta_2 SZ_{i,t} + \beta_3 CFO_{i,t} + \beta_4 STDCFO_{i,t} + \beta_5 LEV_{i,t} + \beta_6 MB_{i,t} + \beta_7 Z_{i,t} + \beta_8 TENUR_{i,t} + \beta_9 ABACRL_{i,t} + \beta_{10} BIG_{i,t} + \beta_{11} LOSS_{i,t} + \beta_{12} LIT_{i,t} + v_{i,t} \quad (8)$$

Where subscripts *i* and *t* indicate firm and year, respectively. The dependent variable (*EXEM*) is one of the two proxies for excess earnings management attributable to diversification discussed in Section 3.1.1: *EXEM_MDJ* and *EXEM_MDD.* The independent variable of interest is diversification (*DIVER*) which is proxied by the cross-segment correlation in cash flows (*CECF*) and investment opportunities (*CETQ*). In addition, in estimating the regression model specified in Equation (8), we control for the following set of variables based on prior studies from the earnings management and diversification literature (Frankel et al., 2002; Ashbaugh et al., 2003; Ashbaugh-Skaife et al., 2008; Lim & Tan, 2008; Reichelt & Wang, 2010; Duchin, 2010; Hann et al., 2013; Kuang et al., 2014):

SZ = the natural logarithm of the market value of common equity (*CSHO* ∗ *PRCL F*) at the end of the fiscal year *t*;

CFO = operating cash flow (*OANCF-XIDOC*) scaled by total assets at the beginning of the year (*AT*);

STDCFO = the standard deviation of operating cash flow (*OANCF-XIDOC*) scaled by total assets *(AT)* at the beginning of the year. We calculate the standard deviation over 5 years from *t*-4 to *t*;

LEV = total liabilities (*LT*) scaled by total assets (*AT*);

MB = the market value of equity (*PRCC_F * CSHO*) divided by the book value of equity (total assets (*AT*) - total liabilities (*LT*));

Z = the Z-scores from Altman (1968; 2000) which equal 1.2 *((*ACT-LCT*)/*AT*) + ((1.4**RE*)/*AT*) + ((3.3**EBIT*)/*AT*) + .60*((*PRCC_F*CSHO*)/*LT*) + ((.99**SALE)/AT*);

TENUR = the cumulative number of years that an auditor has been retained by the firm;

ABACRL = the absolute value of total current accruals (net income from continuing operations (*IB*) minus operating cash flow (*OANCF-XIDOC*)) scaled by beginning of year total assets (*TA*);

BIG = an indicator variable that equals 1 if a company is audited by one of the big N audit firms; and 0 otherwise;

LOSS = an indicator variable that equals 1 if net income (*NI*) is less than 0; and 0 otherwise; and

LIT = an indicator variable that equals 1 if a company operates in a high litigation industry (SIC codes of 2833–2836; 3570–3577; 3600–3674; 5200–5961; and 7370–7370); and 0 otherwise.

4.1 Baseline regression results

Insert Table 2 here

Next, we investigate whether the univariate evidence in Table 1 is robust to controlling for the set of firm and auditor characteristics discussed in Section 4. Table 2 reports the regression results for the earnings management model in Equation (8). Following Duchin (2010), all regression models use t-statistics based on robust standard errors clustered by firm (Peterson, 2009), control for year fixed effects, and report two-tailed p-values. In columns (1) and (2), the dependent variable is *EXEM_MDJ*. Consistent with the results in Table 1, the coefficients on *CECF* and *CETQ* are -48.088 and -10.282, respectively, and both are statistically significant at the 1% level. In columns (3) and (4), the dependent variable is *EXEM_MDD*. The results show that the coefficients on *CECF* and *CETQ* are -50.354 and -10.729, respectively, and both are statistically significant at the 1% level.

4.2 Endogeneity of earnings management and diversification

Examining the impact of diversification on excess firm value, Campa and Kedia (2002) and Villalonga (2004) suggest that the decision to diversify is endogenous in that factors motivating the diversification decision are negatively associated with firm value. Consequently, there is a possibility that the characteristics driving the firm to diversify are correlated with earnings management. We address the endogeneity concern in two ways. First, following Campa and Kedia (2002), Hann et al. (2013), and Chang et al. (2016), we estimate a Heckman two-stage model to correct for potential selection biases. Second, we use a propensity-score matching model, which is a well-accepted method to control for self-selection bias (Lawrence et al., 2011; Lennox et al., 2012; Lai & Liu, 2018).

4.2.1 Heckman's two-stage analysis

Insert Table 3 here

To control for potential selection biases using Heckman's two-stage procedure, we first estimate a first-stage probit model for firms' decision to diversify. The dependent variable in the first-stage model is binary and equals one if the firm has more than one segment and zero if the firm has only one segment. We follow Campa and Kedia (2002) and Hann et al. (2013) and include all control variables in our main regression model in addition to two instruments, namely, *FND* (the fraction of all firms in the industry that are diversified) and *FSD* (the fraction of sales accounted for by diversified firms). The *FND* and *FSD* instruments capture the propensity of an industry to diversify. Consequently, we expect *FND* and *FSD* to have positive coefficients. In addition, there is no *a priori* reason to expect the tendency of the industry to diversify (as measured by *FND* and *FSD*) to affect the magnitude of earnings management of the individual firms. The first stage probit regression results in column (1) of Table 3 confirm our prediction: both *FND* and *FSD* are positively associated with the firm's propensity to diversify. In addition, the results show that larger and highly leveraged firms are more likely to diversify. Conversely, firms with greater market to book ratios, higher Z scores, higher amounts of cash flow and cash flow volatility, and firms having losses are less likely to diversify.

Next, from the first-stage probit regression, we obtain an estimate of the inverse Mills ratio *(IMR)* and use it as a control variable in the second-stage model. The results are reported in columns (2), (3), (4), and (5) of Table 3. In all models, the coefficients on the Mills ratio are positive and significant at the 1% level. Importantly, the estimated coefficients on the two measures of diversification are still negative and different from zero at the 1% level of statistical significance in all four models.

4.2.2 Propensity score matching

Insert Table 4 here

We follow Aivazian et al. (2015) and present the average treatment effect (ATE) of diversification on earnings management using a propensity score matching analysis (PSM). First, we estimate the propensity score from the probit diversification selection model used in the Heckman analysis above where the dependent variable is a diversification indicator variable and the independent variables are the control variables in Equation (8) in addition to the two instrumental variables, *FND* and *FSD*. We then match, with replacement, a treated (diversified) firm to a control (single-segment) firm(s) using nearest-neighbor matching (one-to-one, one-to-five, and one-to-ten).

Matching with replacement allows each control (focused) observation to be matched to multiple treated (diversified) observations. Consequently, matching with replacement reduces bias as each treated observation matches with the most similar control observation (Abadie & Imbens, 2002; Roberts & Whited, 2013; Shipman et al., 2017; Gaver & Utke, 2019). In addition, Roberts and Whited (2013) recommend matching with replacement within a reasonable range to improve the accuracy of matching. Moreover, Shipman et al. (2017) suggest that replacing observations allows for a more successful matching process which, in turn, maximizes the sample size.

Following the matching exercise described above, we rerun Equation (8) using the propensity score subsample. Panels A and B of Table 4 show the results when earnings management is proxied for as *EXEM_MDJ* and *EXEM_MDD*, respectively. In both panels, the coefficients on *CECF* and *CETQ* are negative and statistically significant at the 1% levels. These findings are consistent with the regression results summarized above and suggest that a self-selection problem of the diversification decision is not biasing our results.

4.3 Alternative measures of earnings management attributable to diversification

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Insert Table 5 here

As we explain in Section 3.1.1, our primary earnings management variables are measured as the natural logarithm of the ratio of the firm's actual earnings management to its imputed earnings management. For robustness, we create two measures based on the difference between a firm's actual earnings management and its imputed earnings management: *RLTV_MDJ* and *RLTV_MDD*. The results are reported in Table 5. In columns (1) and (2), the dependent variable is *RLTV_MDJ* and in columns (3) and (4), the dependent variable is *RLTV_MDD*. In all models, the coefficients on *CECF* and *CETQ* are always negative and statistically significant at the 1% level.

4.4 Alternative measures of diversification

Insert Table 6 here

To be comparable with prior studies, we estimate Equation (8) using three alternative measures of diversification: 1) *DIV* is an indicator variable that equals 1 if the firm has more than one business segment at the four-digit SIC level, and 0 otherwise, 2) *NSEG* is the number of business segments in which a firm operates, and 3) *SBHI* is a sales-based Herfindahl Index calculated as follows:

$$SBHI_{ct} = 1 - \sum_{i=1}^{N} S_i^2 \quad (9)$$

Where $SBHI_{ct}$ is the sales-weighted Herfindahl Index for firm *c* in year *t*, S_i is the sales-weighted share of segment I, and *N* is the number of segments.[10] The results, presented in Table

[10] Higher values of $SBHI$ indicate higher diversification as a result of a higher dispersion of the firm's sales across distinct industrial segments.

6, show that the coefficients on *DIV*, *NSEG*, *SBHI* are always negative and significant at the 1% level.

5. Channels through which diversification affects earnings management

In this section, we perform a path analysis to test the channels through which diversification affects earnings management as discussed in Section 2. We begin by discussing our identification strategy. Next, we explain our empirical proxies for the channels and, finally, we provide the results.

5.1 Estimation strategy

Insert Figure 1 here

We perform a path analysis to examine whether diversification affects earnings management on its own, or through mediating paths (earnings and cash flow volatility, demand for external financing, and dividends payout), or both. Path analysis uses a structural equation model (SEM) to answer *how* a source variable (diversification) affects an outcome variable (earnings management) by breaking down the relationship between these two variables into a direct path and indirect paths through the mediating variables (Baron & Kenny, 1986). The direct path from diversification to earnings management includes only one path coefficient, while each indirect path includes two path coefficients: one between the source variable and the mediating variable and another between the mediating variable and the outcome variable. The product of these two path coefficients represents the total magnitude of each indirect path. The path analysis standardizes all variables in the model with a mean of zero and a standard deviation of one to allow comparison of the coefficients. The significance of each indirect path is estimated using the Sobel (1982) test. In particular, we follow Defond et al. (2016) and specify our path analysis based on the following system of equations:

$$EXEM_{i,t} = \beta_0 + \beta_1 VOLT_{i,t} + \beta_2 FNEED_{i,t} + \beta_3 DIVID_{i,t} + \beta_4 DIVER_{i,t} + Controls + e_t \quad (10)$$

$$VOLT_{i,t} = \alpha_0 + \alpha_1 DIVER_{i,t} + e_t \quad (11)$$

$$FNEED_{i,t} = \gamma_0 + \gamma_1 DIVER_{i,t} + e_t \quad (12)$$

$$DIVID_{i,t} = \delta_0 + \delta_1 DIVER_{i,t} + e_t \quad (13)$$

In the above models, $DIVER_{i,t}$, $VOLT_{i,t}$, $FNEED_{i,t}$, and $DIVID_{i,t}$ refer to our empirical proxies for diversification, earnings and cash flow volatility, demand for external financing, and dividends payouts channels, respectively. $Controls$ represent the control variables from Equation (8).

5.2 Empirical proxies for the channels

The selection of precise and good proxies for each mediating variable is crucial in path analysis to capture the underlying constructs accurately and, in turn, improve the interpretation and analysis of the direct and indirect paths (Aivazian et al., 2015; Hilary et al., 2016; Bauer et al., 2021). Consequently, we follow prior literature and construct relevant empirical proxies for each of the three channels mentioned in Section 2.

Earnings is the sum of cash flows and accruals and, therefore, managers can reduce earnings volatility by decreasing cash flow volatility (Barton, 2001). Consequently, we use two proxies for volatility (*VOLT*). The first one is *STDCFO*, measured as the standard deviation of operating cash flow (*OANCF-XIDOC*) calculated over the most recent 5 years (from *t*-4 to *t*) scaled by total assets at the beginning of the year (*AT*). The second measure is *STDEARN*, the standard deviation of income before extraordinary items (*IB*) calculated over the most recent 5 years deflated by average assets (Dichev & Tang, 2009).[11]

[11] The tenor of our results remains the same if both *STDCFO* and *STDEARN* are measured as the standard deviation based on the 5 years preceding the current year.

To proxy for the demand for external financing (*FNEED*) channel, we use an *ex-ante* finance measure created by Dechow et al. (1996). First, we define *FREEC*, a measure of a firm's ex-ante demand for financing in year t as follows:

$$FREEC_t = \frac{Cash\ from\ operations_t - Average\ capital\ expenditures_{t-3\ to\ t-1}}{Current\ Assets_t} \quad (14)$$

Based on Equation (14) above, we create a dummy variable (*FNEED*) that equals 1 if a firm has a *FREEC* ratio less than or equal to -0.5, and 0 otherwise. The *FREEC* cutoff of -0.5 indicates that a firm will exhaust its internal funds (i.e., consume all of its available current assets) within two years and hence, is more likely to manage earnings (Dechow et al., 1996).

Finally, we use two proxies for the dividend payout (*DIVID)* channel. The first measure is a dummy variable (*DIVDUM*) that equals 1 if the firm pays cash dividends in year *t*, and zero otherwise (Skinner & Soltes, 2011; Caskey & Hanlon, 2013; Lawson & Wang, 2016). The second measure is a continuous variable (*DIVPAY*) that captures the magnitude of dividends paid during year *t* deflated by the market value of equity (Lawson & Wang, 2016; Koo et al., 2017).

5.3 Results

Insert Table 7 here

Table 7 presents the path coefficients of interest. Panel A reports the results for the first estimation model where we test the direct and mediated paths of the association between diversification and earnings management conditional on firm-specific controls and year fixed effects. We estimate the first model using the three mediating variables measured as cash flow volatility (*STDCFO*), the demand for external financing (*FNEED*), and the dividend dummy (*DIVDUM*). We focus our discussion on diversification measured as *CECF* since the results with *CETQ* are similar. The direct path coefficients between diversification and earnings management [*p(CECF, EXEM)*] are significantly negative at p<0.01, consistent with our initial results that diversification is associated with a reduction in earnings management. In addition, the results reveal that the effects of diversification on all three of the channels described previously are consistent with those discussed in Section 2 of the paper. Specifically, diversification reduces cash flow volatility, diversification decreases the demand for external financing, and diversification increases the likelihood of paying dividends. Moreover, the effects of the three channels on earnings management are also consistent with the arguments presented in Section 2 based on prior literature. In particular, earnings management increases in cash flow volatility and the need to access external financing while it decreases in dividends payout.

In terms of the mediating impact of the three channels, the results indicate that the total mediated path for each of the three channels is negative and statistically significant at the 1% level. Further, comparing the impact of each of the three channels, the results indicate that the effect of *CECF* on *EXEM_MDJ* (*EXEM_MDD*) is partially mediated, where the demand for external financing channel constitutes 43.75% (38.13%) of the total effect of diversification on earnings management, followed by a 14.58% (17.99%) proportion for the dividends payout channel and, finally, a 0.69% (0.72%) proportion for the volatility channel.[12] These results suggest that reducing the demand for external financing is the most important mechanism through which diversification reduces earnings management.

[12] The total mediated path for the demand for external financing [*p(CECF, FNEED)* × *p(FNEED, EXEM_MDJ*)] is significantly negative at p< 0.01, with a coefficient of -0.063. This coefficient suggests that an increase by one standard-deviation in *CECF* leads to a 0.063-standard-deviation decrease in earnings management (*EXEM_MDJ*) through *CECF*'s impact on the need for external financing. This implies that the proportion of the total effect (calculated as the sum of the direct and mediated path coefficients) of *CECF* on *EXEM_MDJ* that is attributable to the need for external financing is about 43.75 percent [= -0.063/(-0.059-0.001-0.063-0.021)]. Similarly, the total mediated path for cash flow volatility [*p(CECF, STDCFO)* × *p(STDCFO, EXEM_MDJ*)] is significantly negative at p< 0.01, with a coefficient of -0.001. This implies that the proportion of the total effect of *CECF* on *EXEM_MDJ* that is attributable to cash flow volatility is about 0.69 percent [= -0.001/(-0.059-0.001-0.063-0.021)]. Finally, the total mediated path for dividends payment [*p(CECF, DIVDUM)* × *p(DIVDUM, EXEM_MDJ*)] is significantly negative at p< 0.01, with a coefficient of -0.021. This implies that the proportion of the total effect of *CECF* on *EXEM_MDJ* that is attributable to dividends payment is about 14.58 percent [= -0.021/(-0.059-0.001-0.063-0.021)].

Panel B reports the results for the second estimation model where we replace cash flow volatility (*STDCFO*) with earnings volatility (*STDEARN*) and the dividend dummy (*DIVDUM*) with a dividend payout ratio (*DIVPAY*). We continue to proxy for the demand for external financing using the Dechow et al. (1996) measure (*FNEED*).

Similar to the results from Panel A, the direct path coefficients between the two measures of diversification and earnings management [*p(CECF, EXEM)* and *p(CETQ, EXEM)*] are significantly negative at $p<0.01$. Further, for the two measures of diversification, the results indicate a negative association between diversification and both earnings volatility and the demand for external financing. However, the association between diversification and the *degree* (amount) of dividends is not significant at conventional levels.

Concerning the effect of the three channels on earnings management, the results in Panel B reveal a positive (negative) association between earnings management and the demand for external financing (dividend payout ratio). However, in terms of the impact of earnings volatility on earnings management, the results are contingent on the diversification measure used. Specifically, the coefficient on [*p*(*STDEARN*, *EXEM*)] is positive and statistically significant (insignificant) when diversification is measured as *CETQ (CECF)*.

In terms of the mediating impact of the three channels, the results in Panel B indicate that the total mediated path for earnings volatility is negative and statistically significant only when diversification is proxied for using the *CETQ* measure. In addition, confirming the results in panel A, the total mediated path for the demand for external financing is always negative and statistically significant at the 1% level. Finally, we find that the dividend channel measured as dividend payout ratio (*DIVPAY*) is insignificant for all measures of diversification and earnings management.

Taken together, the results in Table 7 suggest that diversification decreases earnings management by decreasing both cash flow volatility and the need for external financing, and by increasing the likelihood of paying dividends. In addition, the results indicate that, of all three channels, the demand for external financing channel is the most important in explaining the role of diversification in reducing earnings management.[13]

6. Internal capital markets

The underlining logic of the arguments explaining the dividends and the need for external financing channels is based on the coinsurance effect of diversification hypothesis which suggests that the existence of internal capital markets enables a conglomerate to transfer funds between segments and may, as a result, 1) decrease the demand for cash holding and, in turn, increase the likelihood to pay dividends, and 2) decrease the demand for external financing. Therefore, a natural implication of the coinsurance hypothesis is that diversified firms with greater internal capital market activities should experience a higher reduction in earnings management. However, the "dark side" of the internal market hypothesis suggests that internal power struggles may lead to inefficient transfers of funds (Shin & Stulz, 1998; Rajan et al., 2000). This implies that it is not the frequency of the internal market activities but rather the efficiency of these activities that may lead to a reduction in earnings management.

While a comprehensive analysis of the overall efficiency of internal capital markets is beyond the scope of our paper, this subsection examines whether the degree of internal market activities, the efficiency of these activities, or both enhance the effect of diversification on earnings management. To do so, we follow the procedure of Duchin (2010) in which we regress the reduction in earnings management "induced" by diversification on measures of internal

[13] Our results are robust to using the alternative measures of diversification discussed in Section 4.4.

capital markets transfers. We calculate the reduction in earnings management induced by diversification as the difference between the predicted earnings management from Equation 8, estimated without the diversification measures, and the predicted earnings management from Equation 8, estimated by including the diversification measures. A bigger difference between the two indicates a larger reduction in earnings management induced by diversification.

To measure total transfers between divisions, we follow Rajan et al. (2000) by calculating the difference between the investment a segment makes when it is part of a conglomerate and the investment the segment would have made as a single firm. We proxy for the investment at the segment level as the capital expenditure of the segment scaled by the segment assets. Further, we impute the investment the segment would have made as an independent firm using the weighted average of the ratio of capital expenditures to assets of the single-segment firms in the segment's industry (industry is defined as the three-digit SIC codes). Further, Rajan et al. (2000) suggested that it is likely that diversified firms have more funds than single firms. Therefore, to calculate a more precise measure of the total transfers across segments, one should subtract the average industry-adjusted capital expenditure-to-assets ratio averaged across the segments of the firm. Consequently, cross-divisional transfers (*TOTAL_TRANSF*) are measured as:

$$\frac{CAPEX_j}{AT_j} - \frac{CAPEX_j^{ss}}{AT_j^{ss}} - \sum_{j=1}^{N} w_j \left(\frac{CAPEX_j}{AT_j} - \frac{CAPEX_j^{ss}}{AT_j^{ss}} \right)$$

where $j = 1 \ldots N$ refers to segment j, ss denotes single-segment firms, and w_j is segment j's share of the total firm assets (*AT).* Similar to Duchin (2010), we expect greater total transfers to be associated with a greater reduction in earnings management induced by diversification.

We use three measures to proxy for the efficiency of the transfers. First, we divide segments into high productivity and low productivity segments based on the segment's implied

Tobin's Q. The segment's implied Tobin's Q equals the mean asset-weighted Tobin's Q of the single segment firms operating in the same three-digit- SIC of the segment's industry. If the implied Tobin's Q of the segment is higher (lower) than the firm's Tobin's Q,[14] then the segment is classified as a high (low) productivity segment. We label the sum of the transfers made to high (low) productivity segments as *HIGH_PROD_TRANSF* (*LOW_PROD_TRANSF*). We expect transfers to high (low) productivity segments to increase (decrease) the reduction in earnings management induced by diversification.

The second measure of internal market efficiency is the relative value added from internal capital allocation, *RVA*, as proposed by Rajan et al. (2000):

$$\sum_{j=1}^{N} AT_j\,(Q_j - \bar{Q})\ \left(\frac{CAPEX_j}{AT_j} - \frac{CAPEX_j^{ss}}{AT_j^{ss}} - \sum_{j=1}^{N} w_j\left(\frac{CAPEX_j}{AT_j} - \frac{CAPEX_j^{ss}}{AT_j^{ss}}\right)\right)$$

where $j = 1 \dots N$ refers to segment *j*, *ss* denotes single-segment firms, w_j is segment *j*'s share of the total firm assets (*AT*), Q_j is segment *j*'s implied Tobin's Q as defined earlier, and $\bar{Q}$ is the mean asset-weighted imputed Q_j's of the multi-segment firm. The variables AT_j, Q_j, and w_j are measured as of the beginning of the year.

Our third measure of internal capital market efficiency is the absolute value added, *AVA*, measure as proposed by Rajan et al. (2000):

$$\sum_{j=1}^{N} AT_j\,(Q_j - 1)\ \left(\frac{CAPEX_j}{AT_j} - \frac{CAPEX_j^{ss}}{AT_j^{ss}}\right)$$

The variables AT_j, Q_j, and w_j are as defined earlier. We expect higher values of *RVA* and *AVA* to increase the reduction in earnings management induced by diversification.

[14] Calculated as the mean asset-weighted imputed Tobin's Q of the multi-segment firm.

Insert Table 8 here

Table (8) reports the results of the impact of internal capital markets on the reduction of earnings management induced by diversification. Panel A shows the results of the analysis when earnings management is proxied for using the *EXEM_MDJ* measure. In columns (1), (2), (3), and (4) diversification is proxied by the *CECF* measure. Similarly, in columns (5), (6), (7), and (8) diversification is proxied by the *CETQ* measure. The results show that for both measures of diversification, total transfers increase the reduction in earnings management induced by diversification. This is evident by the positive and statistically significant sign on the coefficients of the *TOTAL_TRANSF* variable in columns (1) and (5). Similarly, the results show that transfers to low productivity segments decrease the reduction in earnings management. This is evident by the negative and statistically significant sign on the coefficients of the *LOW_PROD_TRANSF* variable in columns (2) and (6). The impacts of 1) transfers to high productivity segments, 2) *RVA*, and 3) *AVA* are inconsistent. Specifically, when diversification is measured using the *CECF* variable, none of these measures have a statistically significant impact. However, when diversification is measured using the *CETQ* variable, the results show that the efficiency of the transfers does matter only when efficiency is proxied for using the *RVA* measure. This is evident by the positive and statistically significant sign on the coefficient of *RVA* in column (7).

Panel B shows the results of the analysis when earnings management is proxied for using the *EXEM_MDD* measure. The results are comparable to those in Panel A. Specifically, higher total transfers yield a greater reduction in earnings management induced by diversification as indicated by the positive and statistically significant sign on the coefficients of the *TOTAL_TRANSF* variable in columns (1) and (5). In addition, the results reveal that transfers to low productivity segments are associated with a smaller reduction in earnings management induced by diversification. This is evident by the negative and statistically significant sign on the coefficients of the *LOW_PROD_TRANSF* variable in columns (2) and (6). Finally, the efficiency of the transfer is significant only when using the *RVA* measure as shown in column (7).

7. Conclusion, implications, and directions for future research

The impact of corporate diversification on earnings management is important theoretically and practically. From a theoretical point of view, the tenets of the coinsurance hypothesis imply that combining multiple business segments with imperfectly correlated earnings provides a coinsurance effect that could affect several earnings management factors, such as earnings and cash flow volatility, the need for external financing, and dividend payout policy.

Using a new measure of earnings management attributable to diversification, we offer new and compelling empirical evidence supporting a negative and statistically significant association between diversification and earnings management. In addition, our results imply that diversification decreases the need to manage earnings by decreasing cash flow volatility, decreasing the need for external financing, and increasing the likelihood of paying dividends. As an additional analysis, we study the role of internal capital markets within conglomerates (Rajan et al., 2000; Duchin, 2010; Jordan et al., 2018) and document that the reduction in earnings management induced by diversification is more pronounced when internal capital markets are more active but not necessarily when these markets are more efficient.

Our findings have important implications for future research and for practitioners. The reduction in earnings management arising from diversification provides new insights into the tradeoffs associated with diversification. Future literature could further explore the role of specific corporate governance attributes on the relationship between diversification and excess earnings management. It may be the case that in situations where governance quality is weak, cross-subsidization in firms with significant internal capital markets may lead to a positive association between earnings management and diversification that offsets the impact of diversification on earnings management via other routes. Further, for firms characterized by high information asymmetry, financial constraints could create an incentive to practice earnings management more aggressively because these firms confront a greater struggle to raise capital externally due to adverse selection. These firms may also engage in real earnings management, by cutting investment in intangible assets beyond what would be value maximizing or by practicing cross-subsidization.

From a practical point of view, most large publicly traded firms are diversified. Given that earnings management has negative impacts in terms of shareholder wealth, auditors may need to take into account the positive impacts of diversification into their audit pricing decisions. Coinsurance benefits of diversification should be considered, in addition to the complexity induced by diversification.

This study has an important limitation. As in other organizational form studies (Berger & Ofek, 1995; Ahn et al., 2006; Hann et al., 2013; Kuppuswamy & Villalonga, 2016), our dependent variable is measured based on the *imputed* earnings management of the segments of the diversified firms. Implicit in this methodology is the assumption that the segments of diversified firms are similar to single segment firms. However, Campa and Kedia (2002), Villalonga (2004), and Boguth et al. (2022) suggest that the operations of firms that choose to diversify are different from those that operate as single firms. Therefore, while we acknowledge that this assumption is not totally tenable, we follow this methodology because data constraints prevent us from calculating proxies for earnings management specific to segments of diversified firms.

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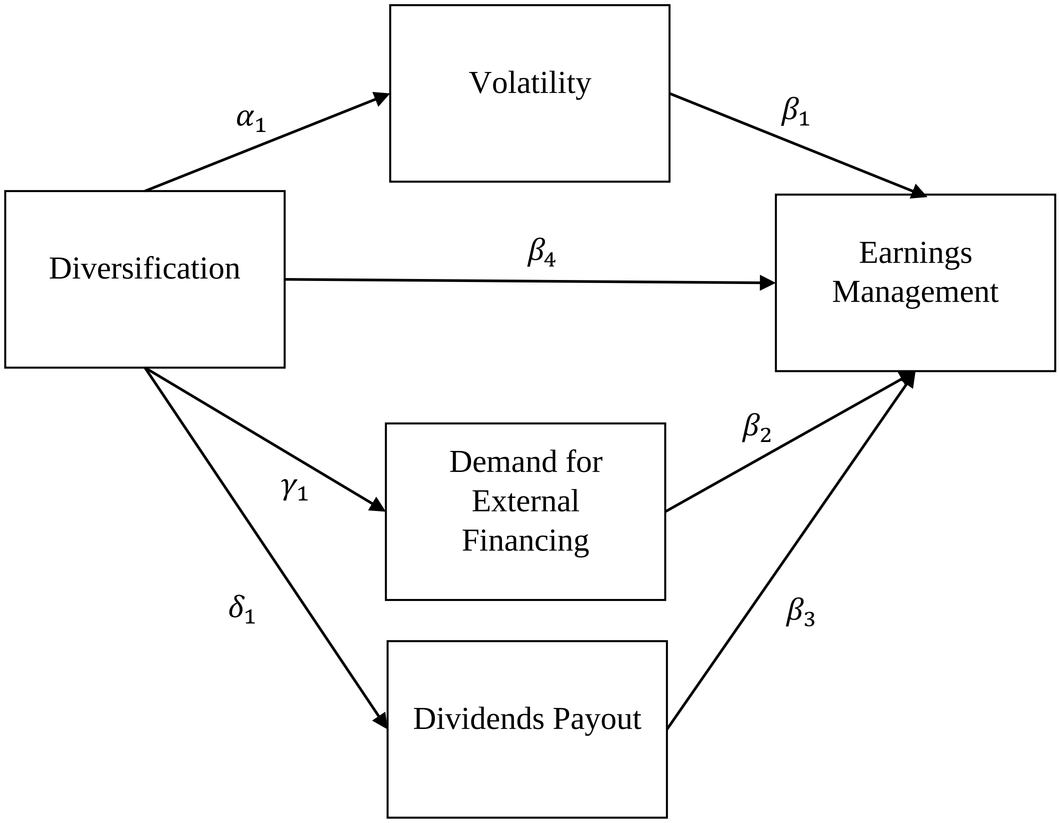
Figure 1. Paths between Diversification and Earnings Management



This figure shows the direct and indirect paths through which diversification (*DIVER*) affects earnings management (*EXEM*). We expect diversification to indirectly affect earnings management through its effect on volatility (*VOLT*), the demand for external financing (*FNEED*), and dividends payout (*DIVID*). Volatility is estimated using cashflow volatility and earnings volatility; the demand for external financing is estimated using an *ex-ante* finance measure created by Dechow et al. (1996); and dividends payout is estimated using a dummy variable that captures whether the firm pays dividends and a continuous variable that captures the magnitude of dividends paid. The following models are estimated in the path analysis:

$$EXEM_{i,t} = \beta_0 + \beta_1 VOLT_{i,t} + \beta_2 FNEED_{i,t} + \beta_3 DIVID_{i,t} + \beta_4 DIVER_{i,t} + Controls + e_t \quad (10)$$
$$VOLT_{i,t} = \alpha_0 + \alpha_1 DIVER_{i,t} + e_t \quad (11)$$
$$FNEED_{i,t} = \gamma_0 + \gamma_1 DIVER_{i,t} + e_t \quad (12)$$
$$DIVID_{i,t} = \delta_0 + \delta_1 DIVER_{i,t} + e_t \quad (13)$$

The dependent variable (*EXEM*) in the first equation above is the outcome variable earnings management. Controls are relevant control variables from the main model. The path coefficient β_1 is the magnitude of the direct path from diversification to earnings management. The path coefficients α_1, γ_1, and δ_1 represent the magnitude of the path coefficients from diversification to volatility, the demand for external financing, and dividends payout, respectively. The path coefficients β_1, β_2, and β_3 represent the magnitude of the paths from volatility, the demand for external financing, and dividends payout, respectively, to earnings management. The path coefficients $\alpha_1 \times \beta_1$, $\gamma_1 \times \beta_2$, and $\delta_1 \times \beta_3$ measure the magnitude of the indirect paths from diversification to earnings management mediated through volatility, the demand for external financing, and dividends payout, respectively.

Table 1. Summary Statistics

Panel A: Summary Statistics

	Single-Segment Firms				Diversified Firms				Test of Differences	
	N	**Mean**	**Median**	**Std**	**N**	**Mean**	**Median**	**Std**	**t-stat**	**z-stat**
EXEM_MDJ	49,465	-0.199	-0.003	1.869	12,602	-0.971	-0.917	2.139	0.772***	0.914***
EXEM_MDD	39,229	-0.243	-0.015	1.934	10,128	-1.022	-0.943	2.177	0.780***	0.928***
CECF	49,465	0.000	0.000	0.000	12,602	0.003	0.001	0.005	-0.003***	-0.001***
CETQ	48,927	0.000	0.000	0.000	12,262	0.011	0.003	0.019	-0.011***	-0.003***
SZ	49,465	5.553	5.539	2.108	12,602	5.868	5.862	2.153	-0.315***	-0.323***
STDCFO	49,465	0.162	0.068	0.740	12,602	0.112	0.054	0.451	0.050***	0.014***
CFO	49,465	0.071	0.084	0.200	12,602	0.078	0.086	0.142	-0.007***	-0.002
LEV	49,465	0.185	0.103	0.230	12,602	0.191	0.146	0.201	-0.006**	-0.043***
MB	49,465	3.018	1.942	7.189	12,602	2.537	1.874	5.649	0.481***	0.068***
Z	49,465	0.539	0.402	0.457	12,602	0.524	0.437	0.379	0.016***	-0.035***
TENUR	49,465	7.159	6.000	5.982	12,602	8.159	7.000	6.404	-1.000***	-1.000***
ABACRL	49,465	0.121	0.078	0.277	12,602	0.101	0.067	0.184	0.020***	0.011***
BIG	49,465	0.795	1.000	0.403	12,602	0.833	1.000	0.373	-0.037***	0.000***
LOSS	49,465	0.354	0.000	0.478	12,602	0.301	0.000	0.459	0.053***	0.000***
LIT	49,465	0.424	0.000	0.494	12,602	0.332	0.000	0.471	0.092***	0.000***

Panel B: Excess Earnings Management (*EXEM_MDJ*) and Diversification

	Firms sorted by					
	CECF			***CETQ***		
	Obs.	**Sort Variable**	***EXEM_MDJ***	**Obs.**	**Sort Variable**	***EXEM_MDJ***
Multi-segment Firms						
Q5 (Highest diversification)	2,520	0.009	-1.089	2,452	0.034	-1.086
Q4	2,521	0.004	-1.063	2,453	0.012	-0.998
Q3	2,520	0.001	-1.006	2,452	0.003	-1.057
Q2	2,521	0.000	-0.822	2,453	0.000	-0.900
Q1 (Lowest diversification)	2,520	0.000	-0.873	2,452	0.000	-0.840
Single-segment Firms	49,465	0.000	-0.199	48,927	0.000	-0.202
Q5-Q1			-0.216***			-0.247***
Q5-Single-segment			-0.890***			-0.884***

Panel C: Excess Earnings Management (*EXCESS_MDD*) and Diversification

	Firms sorted by					
	CECF			***CETQ***		
	Obs.	**Sort Variable**	***EXEM_MDD***	**Obs.**	**Sort Variable**	***EXEM_MDD***
Multi-segment Firms						
Q5 (Highest diversification)	2,025	0.009	-1.170	1,984	0.034	-1.097
Q4	2,026	0.004	-1.042	1,985	0.012	-1.033
Q3	2,026	0.001	-0.979	1,984	0.003	-1.073
Q2	2,026	0.000	-1.027	1,985	0.000	-1.018
Q1 (Lowest diversification)	2,025	0.000	-0.894	1,984	0.000	-0.919
Single-segment Firms	39,229	0.000	-0.243	38,925	0.000	-0.244
Q5-Q1			-0.277***			-0.178***
Q5-Single-segment			-0.928***			-0.853***

*, **, *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively. All continuous variables are winsorized at the 1st and 99th percentiles.
Panel A presents summary statistics for the multi-segment and single-segment subsamples. T-statistics and z-statistics for differences in the mean and median, respectively, betwee the two sub-samples are presented in the last columns.
Panel B presents univariate analysis where multi-segment firms are sorted into quintiles based on their level of diversification (*CECF* and *CETQ)* levels. The mean excess earnings management (*EXEM_MDJ*) level of each quintile is reported.
Panel C presents univariate analysis where multi-segment firms are sorted into quintiles based on their level of diversification (*CECF* and *CETQ)* levels. The mean excess earnings management (*EXEM_MDD*) level of each quintile is reported.

Table 2. The role of diversification on Excess Earnings Management

Variables	Earnings management measures			
	EXEM_MDJ		***EXEM_MDD***	
	(1)	(2)	(3)	(4)
CECF	-48.088***		-50.354***	
	(-11.616)		(-11.071)	
CETQ		-10.282***		-10.729***
		(-9.756)		(-9.201)
SZ	-0.544***	-0.545***	-0.578***	-0.580***
	(-73.599)	(-73.701)	(-67.458)	(-67.379)
STDCFO	0.094***	0.094***	0.106***	0.105***
	(4.716)	(4.723)	(4.990)	(4.967)
CFO	0.237**	0.245**	-0.232*	-0.237*
	(2.274)	(2.343)	(-1.869)	(-1.888)
LEV	-0.604***	-0.610***	-0.747***	-0.746***
	(-11.649)	(-11.701)	(-12.718)	(-12.629)
MB	0.021***	0.022***	0.024***	0.024***
	(14.174)	(14.171)	(13.234)	(13.234)
Z	0.184***	0.178***	0.183***	0.180***
	(6.387)	(6.197)	(5.188)	(5.070)
TENUR	-0.022***	-0.022***	-0.027***	-0.027***
	(-10.483)	(-10.535)	(-11.311)	(-11.172)
ABACRL	0.912***	0.907***	0.386***	0.385***
	(4.980)	(4.979)	(2.805)	(2.789)
BIG	-0.262***	-0.258***	-0.263***	-0.260***
	(-8.509)	(-8.373)	(-7.368)	(-7.251)
LOSS	0.039	0.044	0.068**	0.070**
	(1.380)	(1.525)	(2.230)	(2.269)
LIT	-0.010	-0.010	-0.025	-0.024
	(-0.387)	(-0.386)	(-0.845)	(-0.816)
Constant	2.901***	2.904***	3.203***	3.209***
	(58.629)	(58.800)	(58.466)	(58.344)
Observations	62,067	61,189	49,357	48,847
Adjusted R-squared	0.406	0.407	0.414	0.413
Year FE	Yes	Yes	Yes	Yes

*, **, *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

This table reports the coefficient estimates from Equation (8) where the dependent variable (*EXEM*) is one of the two proxies of excess earnings management discussed in Section 3.1.1. The independent variable of interest is diversification measured as *CECF* and *CETQ* as defined in Section 3.1.2. All continuous variables are winsorized at the 1st and 99th percentiles. Numbers in parentheses are test statistics based on robust standard errors clustered at the firm level.

Table 3. Heckman Two-Stage Model: Diversification and Excess Earnings Management

Variables	First Stage	Second Stage			
	Dependent Variable: DIV	***Dependent Variable: EXEM_MDJ***		***Dependent Variable: EXEM_MDD***	
	(1)	(2)	(3)	(4)	(5)
CECF		-44.681***		-47.801***	
		(-10.980)		(-10.568)	
CETQ			-9.482***		-10.126***
			(-9.035)		(-8.713)
SZ	0.048***	-0.530***	-0.532***	-0.567***	-0.569***
	(14.866)	(-69.188)	(-69.494)	(-64.361)	(-64.267)
STDCFO	-0.053***	0.077***	0.077***	0.092***	0.092***
	(-4.027)	(3.838)	(3.861)	(4.307)	(4.288)
CFO	-0.075*	0.210**	0.218**	-0.252**	-0.257**
	(-1.880)	(2.013)	(2.088)	(-2.034)	(-2.050)
LEV	0.061**	-0.611***	-0.618***	-0.752***	-0.751***
	(2.145)	(-11.812)	(-11.864)	(-12.781)	(-12.695)
MB	-0.008***	0.019***	0.019***	0.022***	0.022***
	(-9.302)	(12.293)	(12.335)	(12.010)	(12.019)
Z	-0.041***	0.135***	0.131***	0.149***	0.146***
	(-2.698)	(4.672)	(4.510)	(4.185)	(4.073)
TENUR	0.012***	-0.018***	-0.018***	-0.024***	-0.024***
	(12.545)	(-8.513)	(-8.583)	(-9.847)	(-9.728)
ABACRL	-0.106***	0.876***	0.872***	0.359***	0.358***
	(-2.992)	(4.788)	(4.789)	(2.611)	(2.595)
BIG	0.005	-0.263***	-0.259***	-0.264***	-0.261***
	(0.290)	(-8.574)	(-8.414)	(-7.396)	(-7.275)
LOSS	-0.028*	0.032	0.037	0.064**	0.066**
	(-1.938)	(1.139)	(1.286)	(2.116)	(2.155)
LIT	-0.081***	-0.074***	-0.073**	-0.073**	-0.072**
	(-6.133)	(-2.619)	(-2.562)	(-2.286)	(-2.245)
FND	3.560***				
	(37.719)				
FSD	0.187***				
	(4.346)				
IMR		0.357***	0.351***	0.274***	0.273***
		(7.408)	(7.269)	(5.155)	(5.109)
Constant	-1.884***	2.354***	2.366***	2.779***	2.785***
	(-63.279)	(26.337)	(26.563)	(28.215)	(28.077)
Pseudo R-squared	0.0622				
Wald Chi2	3,901				
Prob > Chi2	0.000				
Observations	62,112	62,067	61,189	49,357	48,847
Adjusted R-squared		0.408	0.408	0.414	0.414

*, **, *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively.
This table reports the Heckman two-stage model used to control for potential selection biases in the decision to diversify. Column (1) reports the first-stage probit regression for the choice of diversification on a set of controls from Equation (8) and instruments as discussed in Section 4.2.1. Columns (2-5) report the second stage regressions in which we include the inverse Mills ratio (*IMR*), estimated from the first stage, as a control variable. All continuous variables are winsorized at the 1st and 99th percentiles. Numbers in parentheses are test statistics based on robust standard errors clustered at the firm level.

Table 4. Propensity Score Matching: Diversification and Excess Earnings Management

Panel A: Excess Earnings Management (*EXEM_MDJ*)

Variables	**Dependent Variable: *EXEM_MDJ***					
	[N=1]	***[N=1]***	***[N=5]***	***[N=5]***	***[N=10]***	***[N=10]***
CECF	-25.515***		-25.212***		-25.700***	
	(-3.408)		(-3.866)		(-3.923)	
CETQ		-6.595***		-6.203***		-6.199***
		(-3.274)		(-3.650)		(-3.702)
SZ	-0.586***	-0.584***	-0.593***	-0.590***	-0.593***	-0.590***
	(-36.132)	(-35.161)	(-43.098)	(-41.895)	(-43.355)	(-42.140)
STDCFO	0.140***	0.140***	0.146***	0.146***	0.143***	0.143***
	(2.974)	(2.961)	(3.725)	(3.740)	(4.277)	(4.302)
CFO	-0.089	-0.046	-0.098	-0.062	-0.078	-0.046
	(-0.475)	(-0.241)	(-0.612)	(-0.380)	(-0.503)	(-0.292)
LEV	-0.845***	-0.860***	-0.752***	-0.762***	-0.755***	-0.762***
	(-6.526)	(-6.536)	(-6.869)	(-6.886)	(-7.016)	(-7.005)
MB	0.026***	0.026***	0.026***	0.025***	0.026***	0.025***
	(7.531)	(7.423)	(8.228)	(8.088)	(9.171)	(9.013)
Z	0.241***	0.241***	0.256***	0.254***	0.258***	0.251***
	(3.711)	(3.730)	(4.171)	(4.151)	(4.291)	(4.229)
TENUR	-0.026***	-0.025***	-0.023***	-0.022***	-0.022***	-0.022***
	(-6.834)	(-6.527)	(-6.783)	(-6.573)	(-6.773)	(-6.582)
ABACRL	0.655*	0.642*	0.819**	0.808**	0.991***	0.980***
	(1.771)	(1.729)	(2.216)	(2.176)	(2.861)	(2.812)
BIG	-0.279***	-0.276***	-0.320***	-0.315***	-0.308***	-0.301***
	(-3.954)	(-3.865)	(-4.984)	(-4.865)	(-4.837)	(-4.691)
LOSS	-0.038	-0.023	-0.099*	-0.090*	-0.118**	-0.110**
	(-0.640)	(-0.383)	(-1.930)	(-1.747)	(-2.470)	(-2.275)
LIT	-0.053	-0.065	-0.055	-0.066	-0.051	-0.063
	(-0.912)	(-1.108)	(-1.028)	(-1.225)	(-0.970)	(-1.193)
Constant	3.030***	3.014***	3.073***	3.050***	3.049***	3.026***
	(29.379)	(28.779)	(33.273)	(32.718)	(32.642)	(32.054)
Observations	20,428	20,041	43,271	42,580	52,765	51,994
Adjusted R-squared	0.443	0.441	0.454	0.451	0.454	0.451
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 4 *(Continued)*

Panel B: Excess Earnings Management (*EXEM_MDD*)

Variables	**Dependent Variable: *EXEM_MDD***					
	[N=1]	***[N=1]***	***[N=5]***	***[N=5]***	***[N=10]***	***[N=10]***
CECF	-30.230***		-30.179***		-30.345***	
	(-3.828)		(-4.478)		(-4.521)	
CETQ		-7.215***		-7.126***		-7.208***
		(-3.861)		(-4.350)		(-4.360)
SZ	-0.636***	-0.637***	-0.623***	-0.623***	-0.628***	-0.629***
	(-41.052)	(-40.558)	(-43.169)	(-42.658)	(-44.378)	(-43.821)
STDCFO	0.120**	0.118**	0.150***	0.148***	0.151***	0.148**
	(1.998)	(1.968)	(2.913)	(2.850)	(2.616)	(2.553)
CFO	-0.309	-0.302	-0.267	-0.270	-0.241	-0.248
	(-1.540)	(-1.487)	(-1.386)	(-1.380)	(-1.290)	(-1.307)
LEV	-0.924***	-0.917***	-0.906***	-0.898***	-0.912***	-0.902***
	(-7.031)	(-6.945)	(-7.818)	(-7.679)	(-8.170)	(-7.994)
MB	0.031***	0.031***	0.028***	0.028***	0.029***	0.029***
	(6.035)	(5.951)	(7.228)	(7.143)	(7.890)	(7.794)
Z	0.169**	0.185**	0.137**	0.150**	0.136**	0.148**
	(2.045)	(2.219)	(2.071)	(2.261)	(2.103)	(2.282)
TENUR	-0.023***	-0.022***	-0.024***	-0.024***	-0.025***	-0.024***
	(-5.675)	(-5.506)	(-6.726)	(-6.551)	(-6.916)	(-6.752)
ABACRL	0.449*	0.445*	0.407	0.404	0.525*	0.524*
	(1.689)	(1.656)	(1.362)	(1.336)	(1.852)	(1.823)
BIG	-0.316***	-0.320***	-0.309***	-0.311***	-0.298***	-0.299***
	(-4.059)	(-4.098)	(-4.591)	(-4.581)	(-4.522)	(-4.491)
LOSS	0.024	0.027	0.045	0.045	0.023	0.022
	(0.380)	(0.423)	(0.877)	(0.874)	(0.462)	(0.432)
LIT	-0.055	-0.054	-0.084	-0.090*	-0.085	-0.091*
	(-0.920)	(-0.899)	(-1.584)	(-1.675)	(-1.639)	(-1.725)
Constant	3.347***	3.337***	3.323***	3.313***	3.335***	3.325***
	(31.701)	(31.408)	(37.144)	(36.794)	(38.078)	(37.634)
Observations	16,358	16,127	34,732	34,324	42,361	41,897
Adjusted R-squared	0.462	0.460	0.459	0.458	0.462	0.461
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

*, **, *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

This table reports the propensity score matching analysis to control for the endogeneity in the decision to diversify. This table reports the second stage regressions in which we rerun Equation (8) in the matched samples. Matching is conducted, with replacement, using nearest-neighbor matching: one-to-one (*N=1*), one-to-five (*N=5*), and one-to-ten (*N=10*). Panel A reports the results for *EXEM_MDJ* while Panel B reports the results for *EXEM_MDD*. All continuous variables are winsorized at the 1st and 99th percentiles. Numbers in parentheses are test statistics based on robust standard errors clustered at the firm level.

Table 5. Alternative Measures of Earnings Management

Variables	**Earnings management measures**			
	RLTV_MDJ		***RLTV_MDD***	
	(1)	(2)	(3)	(4)
CECF	-20.294***		-12.754***	
	(-6.336)		(-5.315)	
CETQ		-3.807***		-2.446***
		(-6.003)		(-4.951)
SZ	-0.170***	-0.172***	-0.128***	-0.130***
	(-21.951)	(-21.908)	(-19.658)	(-19.635)
STDCFO	0.013***	0.013***	0.010***	0.010***
	(2.845)	(2.808)	(2.656)	(2.617)
CFO	-0.014	-0.011	-0.038*	-0.037*
	(-0.549)	(-0.436)	(-1.742)	(-1.681)
LEV	-0.109***	-0.109***	-0.099***	-0.098***
	(-3.842)	(-3.819)	(-4.172)	(-4.122)
MB	0.005***	0.005***	0.004***	0.004***
	(6.654)	(6.741)	(7.094)	(7.147)
Z	0.078***	0.077***	0.060***	0.060***
	(4.130)	(4.055)	(3.749)	(3.690)
TENUR	-0.012***	-0.012***	-0.010***	-0.010***
	(-5.929)	(-5.947)	(-6.112)	(-6.111)
ABACRL	0.117***	0.117***	0.040**	0.040**
	(4.217)	(4.221)	(2.383)	(2.387)
BIG	0.107***	0.109***	0.082***	0.083***
	(7.680)	(7.742)	(7.328)	(7.333)
LOSS	-0.037***	-0.036***	-0.026***	-0.025***
	(-4.363)	(-4.207)	(-3.695)	(-3.589)
LIT	-0.022	-0.020	-0.018	-0.017
	(-1.271)	(-1.167)	(-1.321)	(-1.242)
Constant	0.755***	0.761***	0.593***	0.596***
	(18.370)	(18.349)	(16.917)	(16.887)
Observations	62,067	61,189	49,357	48,847
Adjusted R-squared	0.230	0.231	0.232	0.232
Year FE	Yes	Yes	Yes	Yes

*, **, *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

This table reports the coefficient estimates from Equation (8) where we use two alternative measures of earnings management as discussed in Section 4.3. The two measures are based on the difference between a firm's actual earnings management and its imputed earnings management: *RLTV_MDJ* and *RLTV_MDD*. The independent variable of interest is diversification measured as *CECF* and *CETQ* as defined in Section 3.1.2. All continuous variables are winsorized at the 1st and 99th percentiles. Numbers in parentheses are test statistics based on robust standard errors clustered at the firm level.

Table 6. Alternative Measures of Diversification

Variables	Earnings management measures					
	EXEM_MDJ			***EXEM_MDD***		
	(1)	(2)	(3)	(4)	(5)	(6)
DIV	-0.474***			-0.467***		
	(-17.849)			(-15.843)		
NSEG		-0.266***			-0.263***	
		(-20.485)			(-18.670)	
SBHI			-1.153***			-1.131***
			(-20.250)			(-18.110)
SZ	-0.538***	-0.531***	-0.534***	-0.572***	-0.564***	-0.567***
	(-73.186)	(-72.170)	(-72.616)	(-67.262)	(-66.475)	(-66.705)
STDCFO	0.092***	0.092***	0.092***	0.103***	0.103***	0.102***
	(4.612)	(4.624)	(4.610)	(4.897)	(4.912)	(4.899)
CFO	0.237**	0.231**	0.226**	-0.232*	-0.237*	-0.243**
	(2.288)	(2.235)	(2.194)	(-1.881)	(-1.927)	(-1.977)
LEV	-0.606***	-0.601***	-0.600***	-0.748***	-0.741***	-0.741***
	(-11.808)	(-11.749)	(-11.721)	(-12.845)	(-12.768)	(-12.773)
MB	0.021***	0.021***	0.021***	0.023***	0.023***	0.023***
	(13.879)	(13.885)	(13.832)	(12.985)	(13.009)	(12.966)
Z	0.169***	0.171***	0.169***	0.171***	0.171***	0.172***
	(5.889)	(5.932)	(5.855)	(4.899)	(4.868)	(4.892)
TENUR	-0.021***	-0.021***	-0.020***	-0.026***	-0.026***	-0.025***
	(-9.997)	(-10.023)	(-9.803)	(-10.823)	(-10.737)	(-10.571)
ABACRL	0.905***	0.902***	0.901***	0.381***	0.378***	0.377***
	(4.980)	(4.978)	(4.973)	(2.792)	(2.785)	(2.774)
BIG	-0.265***	-0.271***	-0.270***	-0.265***	-0.274***	-0.270***
	(-8.667)	(-8.858)	(-8.790)	(-7.488)	(-7.704)	(-7.595)
LOSS	0.042	0.045	0.044	0.071**	0.075**	0.074**
	(1.495)	(1.596)	(1.559)	(2.357)	(2.471)	(2.437)
LIT	-0.029	-0.034	-0.030	-0.044	-0.047	-0.045
	(-1.114)	(-1.311)	(-1.160)	(-1.476)	(-1.609)	(-1.510)
Constant	2.948***	3.176***	2.924***	3.243***	3.468***	3.217***
	(59.573)	(62.571)	(59.277)	(59.220)	(62.073)	(59.031)
Observations	62,067	62,067	62,067	49,357	49,357	49,357
Adjusted R-squared	0.412	0.415	0.414	0.419	0.421	0.420
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

*, **, *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

This table reports the coefficient estimates from Equation (8) where we use three alternative measures of diversification (*DIV*, *NSEG*, and *SBHI*) as described in Section 4.4. The dependent variable (*EXEM*) is one of the two proxies of excess earnings management discussed in Section 3.1.1. All continuous variables are winsorized at the 1st and 99th percentiles. Numbers in parentheses are test statistics based on robust standard errors clustered at the firm level.

Table 7. Path Analysis

Panel A: First Estimation Model (*STDCFO, FNEED, DIV_DUM*)

	DIVER = CECF		***DIVER = CETQ***	
	EXCESS_MDJ	***EXCESS_MDD***	***EXCESS_MDJ***	***EXCESS_MDD***
	(1)	(2)	(3)	(4)
Direct Path	-0.059***	-0.060***	-0.052***	-0.053***
p(DIVER, EXEM)	(-11.757)	(-11.353)	(-10.577)	(-10.182)
Mediated Path for Volatility				
p(DIVER, STDCFO)	-0.021***	-0.021***	-0.023***	-0.023***
	(-9.420)	(-7.927)	(-11.329)	(-9.819)
p(STDCFO, EXEM)	0.030***	0.032***	0.029***	0.032***
	(4.493)	(4.868)	(4.482)	(4.830)
Total Mediated Path for Volatility	-0.001***	-0.001***	-0.001***	-0.001***
[p(DIVER, STDCFO)× p(STDCFO, EXEM)]	(-4.32)	(-4.51)	(-4.47)	(-4.77)
Mediated Path for Financing Need				
p(DIVER, FNEED)	-0.157***	-0.156***	-0.162***	-0.166***
	(-4.426)	(-3.602)	(-4.529)	(-3.817)
p(FNEED, EXEM)	0.399***	0.342***	0.401***	0.345***
	(16.925)	(13.305)	(17.020)	(13.372)
Total Mediated Path for Financing Need	-0.063***	-0.053***	-0.065***	-0.057***
[p(DIVER, FNEED)× p(FNEED, EXEM)]	(-4.34)	(-3.51)	(-4.45)	(-3.71)
Mediated Path for Dividends				
p(DIVER, DIVDUM)	0.173***	0.172***	0.162***	0.155***
	(9.688)	(8.610)	(8.788)	(7.499)
p(DIVDUM, EXEM)	-0.120***	-0.143***	-0.122***	-0.146***
	(-8.112)	(-9.091)	(-8.201)	(-9.222)
Total Mediated Path for Dividends	-0.021***	-0.025***	-0.020***	-0.023***
[p(DIVDUM, FNEED)× p(DIVDUM, EXEM)]	(-6.11)	(-6.20)	(-5.92)	(-5.80)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	62,067	49,740	61,189	49,098

Table 7 *(Continued)*

Panel B: Second Estimation Model (*STDEARN, FNEED, DIVPAY*)

	DIVER = CECF		***DIVER = CETQ***	
	EXCESS_MDJ	***EXCESS_MDD***	***EXCESS_MDJ***	***EXCESS_MDD***
	(1)	(2)	(3)	(4)
Direct Path	-0.062***	-0.055***	-0.063***	-0.056***
p(DIVER, EXEM)	(-12.153)	(-10.893)	(-11.797)	(-10.570)
Mediated Path for Volatility				
p(DIVER, STDEARN)	-0.007***	-0.008***	-0.007***	-0.008***
	(-4.441)	(-5.215)	(-3.773)	(-4.724)
p(STDEARN, EXEM)	0.004	0.004	0.013**	0.012**
	(0.737)	(0.710)	(2.515)	(2.509)
Total Mediated Path for Volatility	-0.000	-0.000	-0.000***	-0.000***
[p(DIVER, STDEARN)× p(STDEARN, EXEM)]	(-0.77)	(-0.74)	(-2.68)	(-2.90)
Mediated Path for Financing Need				
p(DIVER, FNEED)	-0.157***	-0.162***	-0.156***	-0.166***
	(-4.426)	(-4.529)	(-3.602)	(-3.817)
p(FNEED, EXEM)	0.414***	0.416***	0.360***	0.363***
	(17.092)	(17.184)	(13.696)	(13.763)
Total Mediated Path for Financing Need	-0.065***	-0.067***	-0.056***	-0.060***
[p(DIVER, FNEED)× p(FNEED, EXEM)]	(-4.34)	(-4.45)	(-3.52)	(-3.71)
Mediated Path for Dividends				
p(DIVER, DIVPAY)	-0.001	-0.001	-0.001	-0.001
	(-0.639)	(-0.727)	(-0.734)	(-0.775)
p(DIVPAY, EXEM)	-0.009***	-0.009***	-0.011***	-0.011***
	(-7.111)	(-7.107)	(-7.797)	(-7.854)
Total Mediated Path for Dividends	0.000	0.000	0.000	0.000
[p(DIVER, DIVPAY)× p(DIVPAY, EXEM)]	(0.69)	(0.79)	(0.79)	(0.84)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	62,067	61,189	49,740	49,098

*, **, *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

This table reports the results from a path analysis (Section 5) that examines the effect of diversification on earnings management through three channels (earnings/cash flow volatility, demand for external financing, and dividends payout). *p*(*X1*,*X2*) stands for the standardized path coefficient. The t-statistics of the coefficients are reported in parentheses. The significance of the indirect path is estimated using the Sobel (1982) test statistics. The table reports the path coefficients of interest. Diversification (*DIVER*) is measured using the two proxies defined in Section 3.1.2.: Columns (1) and (2) present the results using *CECF* while columns (3) and (4) represent the results using *CETQ*.

Table 8. Diversification and Excess Earnings Management: The Role of Internal Capital Markets

Panel A: Excess Earnings Management (*EXEM_MDJ*)

Variables	**Dependent Variable:** ***Reduction in EXEM Due to Diversification***							
	CECF				***CETQ***			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
TOTAL_TRANSF	0.921***				0.752***			
	(15.789)				(14.347)			
LOW_PROD_TRANSF		-0.032***				-0.022***		
		(-4.550)				(-3.162)		
HIGH_PROD_TRANSF		-0.000				-0.012		
		(-0.006)				(-1.362)		
RVA			0.142				0.345**	
			(1.030)				(2.211)	
AVA				-0.001				-0.001
				(-0.373)				(-0.425)
SZ	-0.003***	-0.012**	-0.002***	-0.003***	-0.002***	-0.011**	-0.001**	-0.001***
	(-7.971)	(-2.342)	(-4.664)	(-5.654)	(-4.916)	(-1.992)	(-2.391)	(-3.127)
STDCFO	0.001***	-0.069	0.001***	0.001***	0.002***	-0.004	0.002***	0.002***
	(6.456)	(-1.438)	(4.714)	(5.868)	(8.908)	(-0.056)	(6.872)	(7.791)
CFO	0.008***	-0.068	0.004	0.006**	0.001	-0.051	-0.003	0.001
	(3.286)	(-1.056)	(1.283)	(2.464)	(0.500)	(-0.705)	(-0.948)	(0.325)
LEV	-0.005*	-0.042	-0.003	-0.003	0.002	0.005	0.004	0.004
	(-1.792)	(-0.866)	(-1.005)	(-1.011)	(0.850)	(0.086)	(1.134)	(1.457)
MB	0.000***	-0.002	0.000***	0.000***	0.000***	-0.001	0.000***	0.000***
	(4.381)	(-1.451)	(3.840)	(12.921)	(5.625)	(-1.133)	(4.943)	(12.570)
Z	0.001	0.066**	0.004**	0.005***	0.006***	0.025	0.009***	0.009***
	(0.602)	(2.352)	(2.569)	(3.167)	(5.573)	(0.987)	(6.854)	(7.903)
TENUR	-0.001***	-0.000	-0.000**	-0.001***	-0.001***	0.002	-0.000***	-0.001***
	(-4.331)	(-0.221)	(-2.400)	(-3.648)	(-4.262)	(1.294)	(-2.704)	(-3.637)
ABACRL	0.003	-0.053	-0.000	-0.001	0.008***	0.062	0.006***	0.005***
	(1.474)	(-0.757)	(-0.022)	(-0.376)	(4.706)	(0.752)	(2.997)	(2.908)
BIG	0.005***	0.042	0.002	0.003	0.001	0.025	-0.001	-0.001
	(2.823)	(1.424)	(1.033)	(1.563)	(0.413)	(0.729)	(-0.635)	(-0.397)
LOSS	0.000	-0.005	-0.000	-0.000	-0.003***	0.005	-0.003***	-0.003***
	(0.128)	(-0.292)	(-0.307)	(-0.425)	(-2.830)	(0.237)	(-2.860)	(-2.977)
LIT	0.013***	0.059**	0.009***	0.009***	0.012***	0.008	0.008***	0.009***
	(9.371)	(2.509)	(5.477)	(6.118)	(8.695)	(0.329)	(5.373)	(6.128)
Constant	-0.016***	0.265***	-0.014***	-0.015***	-0.019***	0.215***	-0.017***	-0.018***
	(-7.005)	(6.967)	(-5.199)	(-5.689)	(-7.707)	(5.446)	(-6.108)	(-6.460)
Observations	41,363	1,767	41,363	40,549	41,217	1,757	41,217	40,398
Adjusted R-squared	0.229	0.030	0.033	0.033	0.193	0.044	0.033	0.030
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8 *(Continued)*

Panel B: Excess Earnings Management (*EXEM_MDD*)

Variables	***Reduction in EXEM Due to Diversification***							
	CECF				***CETQ***			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
TOTAL_TRANSF	0.949***				0.778***			
	(15.789)				(14.347)			
LOW_PROD_TRANSF		-0.033***				-0.023***		
		(-4.550)				(-3.162)		
HIGH_PROD_TRANSF		-0.000				-0.012		
		(-0.006)				(-1.362)		
RVA			0.146				0.358**	
			(1.030)				(2.211)	
AVA				-0.001				-0.001
				(-0.373)				(-0.425)
SZ	-0.003***	-0.012**	-0.002***	-0.002***	-0.001**	-0.010*	0.000	-0.000
	(-7.232)	(-2.284)	(-4.038)	(-4.993)	(-1.965)	(-1.799)	(0.203)	(-0.401)
STDCFO	0.001***	-0.072	0.001***	0.001***	0.002***	-0.004	0.002***	0.002***
	(4.592)	(-1.447)	(3.092)	(4.127)	(8.099)	(-0.059)	(6.183)	(7.051)
CFO	0.007***	-0.072	0.002	0.005*	0.013***	-0.041	0.009***	0.012***
	(2.672)	(-1.079)	(0.750)	(1.893)	(5.212)	(-0.548)	(3.181)	(5.175)
LEV	-0.010***	-0.048	-0.008***	-0.008***	-0.011***	-0.009	-0.010***	-0.009***
	(-3.827)	(-0.973)	(-2.749)	(-2.927)	(-4.038)	(-0.143)	(-3.085)	(-2.942)
MB	0.000***	-0.002	0.000***	0.000***	0.000***	-0.002	0.000***	0.000***
	(3.915)	(-1.481)	(3.390)	(11.676)	(5.044)	(-1.160)	(4.389)	(11.331)
Z	-0.003**	0.065**	0.001	0.001	0.000	0.020	0.003**	0.003***
	(-2.222)	(2.230)	(0.328)	(0.833)	(0.261)	(0.751)	(2.230)	(2.786)
TENUR	-0.001***	-0.001	-0.001***	-0.001***	-0.001***	0.002	-0.001***	-0.001***
	(-5.978)	(-0.366)	(-3.821)	(-5.087)	(-6.383)	(1.115)	(-4.596)	(-5.466)
ABACRL	0.002	-0.055	-0.001	-0.002	0.004**	0.060	0.002	0.001
	(0.985)	(-0.769)	(-0.444)	(-0.822)	(2.183)	(0.699)	(0.762)	(0.423)
BIG	0.004**	0.043	0.001	0.002	0.000	0.025	-0.002	-0.002
	(2.288)	(1.393)	(0.580)	(1.097)	(0.162)	(0.714)	(-0.858)	(-0.606)
LOSS	-0.000	-0.006	-0.001	-0.001	-0.000	0.008	-0.001	-0.001
	(-0.306)	(-0.317)	(-0.690)	(-0.827)	(-0.258)	(0.369)	(-0.575)	(-0.672)
LIT	0.012***	0.060**	0.008***	0.008***	0.009***	0.005	0.006***	0.007***
	(8.156)	(2.438)	(4.446)	(4.987)	(6.768)	(0.218)	(3.717)	(4.387)
Constant	-0.012***	0.277***	-0.010***	-0.011***	-0.018***	0.224***	-0.017***	-0.018***
	(-5.116)	(7.083)	(-3.602)	(-4.040)	(-7.278)	(5.473)	(-5.735)	(-6.083)
Observations	41,363	1,767	41,363	40,549	41,217	1,757	41,217	40,398
Adjusted R-squared	0.230	0.029	0.034	0.034	0.193	0.042	0.032	0.030
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*, **, *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

This table reports the results from regressions explaining the role of internal capital markets on firm-level reduction in earnings management (*EXEM*) due to diversification, that is, the reduction in earnings management explained by firms' diversification in cash flow (*CECF*) and investment opportunities (*CETQ*). This table presents the results from the analyses detailed in Section (6) where the dependent variable is the reduction in earnings management due to diversification. The independent variables are proxies of the activeness (*TOTAL_TRANSF*) and efficiency (*HIGH_PROD_TRANSF, LOW_PROD_TRANSF, RVA,* and *AVA)* of the internal capital markets. All continuous variables are winsorized at the 1st and 99th percentiles. Numbers in parentheses are test statistics based on robust standard errors clustered at the firm level.