

MARKET COMPETITION AND EARNINGS MANAGEMENT: EVIDENCE FROM VIETNAM

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Abstract - With a panel data of 596 non-financial firms and 4,988 firm-year observations, the paper examines the relation between product market competition and earnings management in Vietnamese listed firms on Ha Noi and Ho Chi Minh stock exchanges during the period 2008–2014. The empirical results show that market competition is negatively correlated with earnings management. This means firms operating in highly competitive market have low level of earnings management. It could be that intensified market competition works as an external disciplinary governance mechanism or it makes corporate misreporting more costly by increasing firms' exposure to predation risk so as to curtail managers' opportunistic behavior in these firms. The results are robust with respect to alternative measures of market competition and earnings management.

Key words - Product market competition; earnings management; Vietnamese listed firms

1. Introduction

The growing number of accounting scandals in Vietnamese listed firms raised serious concerns about earnings quality as a source of information about firms' core operating performance and prospects. The issue of incentives for managers to "cook the books" has been the focus of regulatory authorities, users of financial reports, and researchers and frequently discussed [1]. Specifically, as earnings management serves as an effective tool for misrepresenting economic performance and avoiding scrutiny and interference from outside investors, the determinants of earnings management incentives have been investigated widely in the extant literature. Given that product market competition is considered as an external environment factor that can influence managers' behavior, its relation with managers' incentives to manage earnings has become a controversial topic.

This paper examines the relation between market competition and earnings management in Vietnamese listed firms. By using the absolute value of discretionary accruals as a measure of earnings management, I am able to capture both directions of earnings management, and offer evidence on the impact of heightened competition on earnings management. I add texture to the discussion of the determinants of firms' engagement in manipulating their financial reports (e.g. [1], [2], [3], [4], [5]). With a panel data of 596 non-financial firms listed on HOSE or HNX over the period 2008-2016 and 4,988 firm-year observations, the main result shows that market competition help curtail earnings management in these companies. The main result survives two robustness tests with alternative measures of market competition and earnings management.

2. Literature review and Hypothesis development

Existing literature has been inconclusive and shaped two diverting expectations about the relation between product market competition and earnings management. On the one hand, high competition might result in more earnings management. [6] argues that intensified competition might lead to the spread of unethical behavior (such as earnings management). Operating in a highly competitive market, firms face higher probability of market share loss, lower market power, and lower profitability. In such unfavorable situations, managers may have stronger incentives to manage earnings upward in order to ameliorate earnings decreases (or losses) caused by intensified competition, given that such losses are not desirable to the firm's managers ([7], [8]). Managers may also engage in income-increasing earnings management to meet market expectations so as to maintain capital market credibility and investor confidence ([9], [10]). In contrast, high competition could increase incentives for managers to deliberately lower earnings. For example, managers could have stronger incentives to manage earnings downwards to limit information flows to their rivals and potential entrants when competitive pressures increase ([11], [12]). Furthermore, managers could deflate earnings to get in a favorable position when renegotiating contracts with different stakeholders, e.g. labor unions, the government, or creditors ([13], [14], [15]). Overall, intensified competition could theoretically lead to more upward or downward earnings management.

On the other hand, intensified competition could discipline managers and curtail earnings management. Agency theory suggests the separation between ownership and control create incentives and rooms for managers to misrepresent economic performance and conceal private benefits ([1], [16], [17]). Serving as an external mechanism, product market competition can help align managers' interests with shareholders', offer an easier assessment of corporate performance relative to peers, reduce managerial slack, and generally curb managerial misbehavior (e.g. [18], [19], [20]). Moreover, the potential negative consequences of exposed corporate misreporting such as negative and significant stock market reactions [21], reputational loss and a dramatic increase in the cost of equity and cost of debt could result in high risk of losing investment opportunities and market share to product market rivals [22]. The intensified competition in the market escalates managers' concerns about these potential predation risks [10]. In sum, heightened market competition increases firms' exposure to predation risk, makes corporate misreporting more costly and thus may curb earnings management incentives.

Based on these arguments, the testable prediction in this paper is stated as follows:

H1: Product market competition is negatively associated with earnings management.

3. Methodology

3.1. Data collection and variables measurement

3.1.1. Data collection

The sample includes all non-financial firms listed on the Ho Chi Minh or Hanoi stock exchange during the period 2008–2014. The annual financial and ownership data were obtained from Stoxplus Corporation, which is the leading provider of financial and business information on Vietnamese listed firms. Firms in the financial industry were removed from the sample, as they typically publish their financial statements in a format that differs substantially from that of other corporations. The sample initially consisted of 683 firms and 5,415 firm-year observations. After removing financial firms and the firms without the market competition and financial data, the final panel dataset is unbalanced, including data on 596 firms and 4,988 firm-year observations. The dataset includes newly listed as well as delisted firms over 2008–2014, in order to avoid any survival bias.

3.1.2. Variables measurement

I construct variables to separately measure market competition from potential entrants and competition from existing rivals by conducting principal component analysis on commonly employed proxies of market competition. Following [23] and [24], I use six proxies, including industry concentration, measured as Herfindahl-Hirschman Index (HHI) or four-firm concentration ratio (CON4), industry-average size of plant and equipment (PPE, calculated as the weighted average of PP&E for all firms operating in the same industry and measures the minimum investments required to enter the market), product market size (MKTS, measured as the natural log of aggregate industry sales), industry capital expenditures (CPX, calculated as the weighted average of capital expenditures for all firms in an industry), and total number of firms operating in an industry (NUM).

Though the above six proxies are interrelated, they also characterize different aspects of competition. Based on the aspect of competition that they are most closely related to, these proxies could be categorized into the following two groups:

Proxies for competition from potential entrants: Industry size of plant and equipment (PPE) is widely used to measure the setup costs for a new player to enter the product market and operate as an average firm in the industry (see Chap. 4 of [25]). As industry capital expenditures (CPX) reflects necessary investments for potential entrants to make to compete with average existing rivals, they are also likely to be positively related with entry barrier. Product market size (MKTS) is likely to be negatively associated with potential competition. First, entry is less harmful to the incumbent operating in a higher demand product market. [26] finds that, when the demand growth is sufficiently large, the established firm will choose to raise its prices above the

entry-preventing level, accepting a decrease in its market share caused by entry of a successive finite number of new firms. Second, large market size is usually associated with a high entry barrier, since industries with large sales usually have heavy investments in either PP&E (to increase volume) or technology (to increase price).

Proxies for competition from existing rivals: The variables capture industry concentration, including CON4, HHI, and NUM, reflect competition among existing rivals, given that highly concentrated industries or industries with fewer firms typically face lower existing competition. Product market size (MKTS) is likely to be positively correlated with existing competition as large market demand attracts more entrants, which would in turn lead to more firms competing in the same product market [25], and aggregate sales and the number of firms in the market are positively correlated.

To reduce the number of variables employed in the regressions but still capture the various effects of competition, I conduct principal component analysis on the above six variables. After using orthogonal rotation method and requiring eigenvalues to be greater than one, I retain two components. The results of principal component analysis are reported in Table 1. Panel A shows that the first two principal components have eigenvalues greater than one and account for approximately 86,7% of the total variance. Consistent with the prior that these six variables are categorized into two groups, the rotated factor pattern reported in Panel B suggests that PC1 is loaded by MKTS, CON4, HHI, and NUM, that PC2 is loaded by PPE, CPX, and MKTS. Therefore, PC1 and PC2 reflect competition from existing rivals and competition from potential entrants, respectively. In the following analysis, I use the negative of PC1, denoted as EXIST, to measure competition from existing rivals; and the negative of PC2, denoted as POTENT, to measure competition from potential entrants. Larger values of EXIST and POTENT, suggest higher competition from existing rivals and higher competition from potential entrants, respectively.

Table 1. Principal component analysis results

Panel A: Eigenvalues of the correlation matrix				
Principal Component	Eigen value	Diff in eigen value	Variance explained (%)	Cumu-lative variance (%)
PC1	3.121	1.040	0.520	0.520
PC2	2.081	1.520	0.347	0.867
PC3	0.561	0.376	0.094	0.961
PC4	0.185	0.133	0.031	0.991
PC5	0.052	0.052	0.009	1
PC6	0.000	.	0	1

Panel B: Standardized scoring coefficients		
Raw Variable	PC1(EXIST)	PC2(POTENT)
PPE	-0.123	0.654
CPX	0.072	0.622
MKTS	-0.471	0.345
CON4	0.519	0.185
HHI	0.523	0.182
NUM	-0.464	-0.015

This study relies on two proxies for earnings management. The first proxy (DA1) is obtained from the Modified Jones model, suggested by [27]. The second proxy (DA2) is computed from the performance-augmented model, developed by [28]. The computation of the earnings management variables from these two models is discussed in more detail below.

Modified Jones Model

In the first step, total accruals are computed as follows:

$$TA_{it} = NI_{it} - CFO_{it} \quad (1)$$

where:

NI_{it} = net income after extraordinary items for firm i in year t .

CFO_{it} = cash flow from operating activities for firm i in year t .

A number of studies follows the cash-flow approach to estimate total accruals by comparing accounting earnings and cash flow from operations, in order to avoid any measurement errors arising from using balance-sheet items [29-34].

In the second step, an OLS regression model is estimated for each industry and year¹ to determine the parameters in the equation below:

$$\frac{TA_{it}}{A_{it-1}} = \beta_0 \frac{1}{A_{it-1}} + \beta_1 \frac{\Delta REV_{it}}{A_{it-1}} + \beta_2 \frac{PPE_{it}}{A_{it-1}} + \varepsilon_{it} \quad (2)$$

where:

ΔREV_{it} = change in net revenues from sales for firm i between year $t-1$ and year t .

A_{it-1} = total assets of firm i at the end of year $t-1$.

PPE_{it} = gross property, plant and equipment for firm i at the end of year t .

The third step, based on the estimates for the parameters $\beta_0, \beta_1, \beta_2$, identifies a firm's non-discretionary accruals (NDA) as follows:

$$NDA_{it} = b_0 \frac{1}{A_{it-1}} + b_1 \left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} \right) + b_2 \frac{PPE_{it}}{A_{it-1}} \quad (3)$$

where:

b_0, b_1 , and b_2 are the estimates of β_0, β_1 , and β_2 in equation (2)

ΔREC_{it} = change in net accounts receivable for firm i between year $t-1$ and year t .

Finally, the first proxy of earnings management, discretionary accruals ($DA1_{it}$), is computed as the difference between $\frac{TA_{it}}{A_{it-1}}$ and NDA_{it} .

Performance-augmented model

In this model, the estimation process is implemented in the same way as in the Modified Jones model, except that the equations in the second and third steps are slightly adjusted, as follows:

$$\frac{TA_{it}}{A_{it-1}} = \beta_0 \frac{1}{A_{it-1}} + \beta_1 \left(\frac{\Delta REV_{it}}{A_{it-1}} \right) + \beta_2 \frac{PPE_{it}}{A_{it-1}} + \beta_3 ROA_{it-1} + \varepsilon_{it} \quad (4)$$

$$NDA_{it} = \beta_0 \frac{1}{A_{it-1}} + \beta_1 \left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} \right) + \beta_2 \frac{PPE_{it}}{A_{it-1}} + \beta_3 ROA_{it-1} + \varepsilon_{it} \quad (5)$$

Where:

ROA_{it-1} = return on assets of firm i in year $t-1$, computed as the ratio of net income after extraordinary items in year $t-1$ over total assets at the end of year $t-2$.

Earnings management is measured as the average absolute value of discretionary accruals across all firms in an industry. A higher absolute value for DA_{it} represents a higher level of earnings management.

More details of variables measurement are shown in Table 2. To mitigate the influence of potential outliers, I winsorize all variables at the 1 and 99 percent levels.

Table 2. Variables measurement

Variable	Measures
DA1	Obtained from the Modified Jones model, following Dechow et al. [27]
DA2	Obtained from the performance-augmented Model, following Kothari et al. [28]
HHI	Herfindahl-Hirschman Index, measured as the sum of squared market shares of all firms in an industry.
CONC4	Four-firm concentration ratio, measured as the sum of market shares of the four largest firms in an industry.
PPE	The weighted average of property, plant, and equipment of all firms in an industry. A firm's market share, calculated as the ratio of its segment sales to industry aggregate sales, is used as its weight. A firm's segment PP&E is allocated according to the ratio of the segment sales to the firm's total sales.
CPX	The weighted average of capital expenditures of all firms in an industry. A firm's market share, calculated as the ratio of its segment sales to industry aggregate sales, is used as its weight. If a firm's segment capital expenditures are missing, they are replaced by the firm's total capital expenditures multiplied with the ratio of the segment sales to the firm's total sales.
NUM	Total number of firms in the industry
MKTS	Product market size, measured as the natural log of industry aggregate sales.
MANGR	Number of ordinary shares held by the top management and their relatives divided by total number of outstanding shares at the beginning of the fiscal year. To uniquely capture the equity stake held by professional managers, MAN_OWN is set equal to zero if the manager is a representative of the family firm or sole-founder firm.
STATE	The percentage of ordinary shares held by the State divided by the total number of shares outstanding at the beginning of the fiscal year.
FOREI	The percentage of ordinary shares held by foreign investors divided by the total number of shares outstanding at the beginning of the fiscal year.
SIZE	Natural logarithm of total assets at the beginning of the year.

¹ I perform regressions for 63 industry-year groups. Industries are identified by means of the Industry Classification Benchmark (ICB), in line with [35] and [36]. According to ICB, firms are classified into ten industries (see Table 1), from which I excluded Financials. The minimum number of observations in each industry is six. Following [37] and [28], I winsorize all the scaled variables used in the models at 1-99% to estimate the EM proxies to limit the effect of outliers on the estimates.

ROA	Net income after extraordinary items divided by lagged total assets.
LEVER	Net debt divided by total assets at the beginning of the fiscal year.
MTB	Market value of equity divided by book value of equity at the ending of the previous fiscal year.
DEBT	Cash flow from operations divided by net debt (i.e. financial debt minus cash and equivalents, including marketable securities) measured in the previous fiscal year.
TAX	Income tax expense divided by taxable income.
BIG4	Equal to 1 if the firm's financial report is audited by a Big Four audit company during the fiscal year, and 0 otherwise.
TENURE	Equal to the number of consecutive years during which a firm is audited by the same audit company.
NOA	Lagged NOA is equal to shareholders' equity plus net debt at the beginning of the fiscal year divided by lagged sales.
OPERAT	Equal to the length of the operating cycle for firm <i>i</i> in year <i>t</i> (computed as the sum of days receivable plus days inventory minus days payable) divided by 365. Days receivable is equal to accounts receivable divided by net sales times 365. Days inventory is equal to net inventories divided by the cost of goods sold times 365. Days payable is equal to accounts payable divided by the cost of goods sold times 365.

3.2. Model specification

To test the relation between product market competition and earnings management, I use the following regression model:

$$\begin{aligned}
 DA_{it} = & \beta_0 + \beta_1 POTENT_{it-1} + \beta_2 EXIST_{it-1} \\
 & + \beta_3 MANGR_{it-1} + \beta_4 STATE_{it-1} \\
 & + \beta_5 FOREIG_{it-1} + \beta_6 DEBT_{it-1} \\
 & + \beta_7 TAX_{it-1} + \beta_8 BIG4_{it-1} + \beta_9 TENURE_{it-1} \\
 & + \beta_{10} NOA_{it-1} + \beta_{11} OPERAT_{it-1} \\
 & + \beta_{12} SIZE_{it-1} + \beta_{13} ROA_{it-1} + \beta_{14} LEVER_{it-1} \\
 & + \beta_{15} MTB_{it-1} + \sum_{k=1}^n Year_FE + \varepsilon_{it}
 \end{aligned}$$

This model is estimated at the industry-year level, where *i* and *t* are industry and year indices, respectively. For the dependent variable, I use the DA variable obtained from the Modified Jones model (i.e. DA1) as my main proxy for earnings management. DA2 is then used in a robustness check. The main independent variables of interest are POTENT and EXIST, measuring competition from potential entrants and competition from existing rivals.

Consistent with the model specifications used by [38], [39], [40] and [41], I control for firm's ownership structure (i.e., MANGR, STATE and FOREI), financial distress (DEBT as an inverse measure), and the income tax rate (TAX), having a Big4 audit company (BIG4), the length of the audit relationship (TENURE), accounting flexibility (NOA), the length of the operating cycle (OPERAT), firm size (SIZE), firm performance (ROA), firm leverage (LEVER), and growth opportunities (MTB). All firm-level control variables are averaged within each industry-year. The model is estimated by using an ordinary least squares (OLS) regression with year fixed effects. Since earnings

management behavior is likely to be correlated across time, the standard errors are adjusted for Newey–West heteroscedasticity and autocorrelation.

4. Empirical results and discussions

4.1. Summary statistics

Table 3. Descriptive statistics

	N	mean	median	sd
DA1	4,988	0.1104	0.0752	0.1114
DA2	4,988	0.1075	0.0737	0.1085
MANGR	4,988	0.0345	0.0120	0.0528
STATE	4,988	0.2839	0.2957	0.2454
FOREI	4,988	0.0616	0.0102	0.1060
SIZE	4,988	26.6073	26.5480	1.3896
ROA	4,988	0.0693	0.0508	0.1003
LEVER	4,988	0.1543	0.1510	0.2631
MTB	4,988	1.1404	0.7900	1.1819
DEBT	4,988	0.0760	0.0586	4.5970
TAX	4,988	0.1940	0.2200	0.0664
BIG4	4,988	0.1684	0.0000	0.3743
TENURE	4,988	2.7438	2.0000	2.0726
NOA	4,988	-0.0308	0.0000	0.2047
OPERAT	4,988	0.4051	0.2615	0.5936

Table 3 presents the post-winsorized descriptive statistics for all main variables. In terms of earnings management, the average absolute values for discretionary accruals obtained from the Modified Jones model (DA1) and the performance-augmented model (DA2) are approximately 11 percent and 10 percent of lagged total assets, respectively. With respect to the sample firms' ownership structure, the average stake held by firm managers is about 3.5 percent, by the State is about 28.4 percent, by foreign investors is 6.2 percent of shares outstanding, respectively. As regards firm characteristics, the mean (median) total assets is VND 1,078 billion (VND 333 billion) (not tabulated). Firm profitability, measured by ROA, averages to 6.9 percent. The debt ratio (LEVER), that is the ratio of net debt to total assets, averages to 15.4 percent. The mean and median market-to-book ratios are 1.14 and 0.79, respectively. The mean (median) measure of financial health (DEBT), computed as cash flow from operations divided by net debt, is 7.6 percent (5.9 percent). The average tax rate faced by Vietnamese listed firms is 19.4%. Approximately 16 percent of sample firms are audited by a Big4 auditor (BIG4). Regarding audit tenure (TENURE), the average length of the audit relationship is two years. The mean value of NOA is -.03, suggesting that the average value of net operating assets is approximately 3 percent of lagged sales. Finally, the sample firms have an operating cycle (OPERAT) of 144 days on average.

4.2. Main regression results

Regression results for Eq. 1 are reported in Column (1) of Table 4. Consistent with the predictions that product market competition discourages earnings management, the coefficients on POTENT and EXIST are negative, both significant at the 1% level. This suggests that firms operating in highly competitive market have lower level of earnings

management. Theoretically, the result supports the rationale that product market competition could curb managerial misbehavior either by serving as an external governance mechanism ([18], [19], [20]) or escalating managers' concerns about potential predation risks [10] and thus make misreporting more costly. For the control variables, the results show that industries with more managerial ownership, state ownership, foreign ownership, larger size, higher income tax rate, longer operating cycle, and higher growth opportunities have lower level of earnings management.

Table 4. Regression results

	DA1 (1)	DA2 (2)	DA1 (3)
EXIST	-0.001*** [0.000]	-0.001*** [0.000]	
POTENT	-0.003*** [0.001]	-0.004*** [0.000]	
EFA1			-0.004*** [0.000]
EFA2			-0.005*** [0.000]
MAGNR	-0.627*** [0.000]	-0.457*** [0.000]	-0.483*** [0.000]
STATE	-0.310*** [0.000]	-0.292*** [0.000]	-0.306*** [0.000]
FOREI	-0.557*** [0.000]	-0.491*** [0.000]	-0.600*** [0.000]
DEBT	0.004*** [0.000]	0.001* [0.077]	0.005*** [0.000]
TAX	-0.275*** [0.000]	-0.526*** [0.000]	-0.303*** [0.000]
BIG4	0.246*** [0.000]	0.231*** [0.000]	0.263*** [0.000]
TENURE	-0.005*** [0.000]	-0.004*** [0.002]	-0.008*** [0.000]
NOA	0.038** [0.033]	0.075*** [0.000]	0.016 [0.333]
OPERAT	-0.037*** [0.000]	-0.030*** [0.000]	-0.025*** [0.000]
SIZE	-0.029*** [0.000]	-0.036*** [0.000]	-0.035*** [0.000]
ROA	0.258*** [0.000]	0.236*** [0.000]	0.340*** [0.000]
LEVER	0.215*** [0.000]	0.248*** [0.000]	0.248*** [0.000]
MTB	-0.046*** [0.000]	-0.045*** [0.000]	-0.042*** [0.000]
Constant	1.101*** [0.000]	1.308*** [0.000]	1.227*** [0.000]
Observations	4988	4988	4988
Adjusted R ²	0.829	0.864	0.832

*p-values in brackets. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$*

4.3. Robustness tests

Given that the dependent variable and the variable of interest in this study are constructed, the potential measurement errors in these estimates need to be taken into account. Following [23], for reinforcement of the main

results, I perform two robustness tests. In particular, I try to examine whether the main regression results still hold when: (1) Using alternative measure of earnings management; (2) Changing the way to construct competition measure.

4.3.1. Issues with earnings management measure

To examine whether the result is robust to an alternative measure of earnings management, I re-estimate the model using DA2, which is obtained from the performance-augmented model. The result using DA2 shown in Table 4, Column (2) is similar to that reported in the main analysis. In detail, market competition is shown to have negative impacts on earnings management as the coefficients on POTENT and EXIST are negative and significant at the 1% level. Similar to the main results, all control variables are statistically significant.

4.3.2. Issues with competition measure

So far competition measures are constructed by conducting principal component analysis on original competition measures. It is likely that the original competition variables are measured with error. The advantage of principal component analysis is to obtain maximum variance from original variables. However, if the variables are measured with error, exploratory factor analysis (EFA) should be a better method. The advantage of EFA is to identify the latent variables or common factors underlying a group of raw variables and keep only variance of these common factors. Applying EFA in the analysis may result in some loss of information but could mitigate the measurement error problem by throwing away uncommon variances existing in the data. Similar to principal component analysis, two common factors EF1 and EF2 are retained from EFA by requiring eigenvalues larger than one. EF1 is loaded by MKTS, CON4, HHI, and NUM. EF2 is loaded by PPE, CPX, and MKTS. I use the negative of EFA1, to measure competition from existing rivals, the negative of EFA2, to measure competition from potential entrants in this robustness analysis. The regression result is reported in Column (3) of Table 4. The coefficients on competition measures are qualitatively similar to those in Column (1), once again confirming the negative relation between market competition and earnings management.

Overall, the results of these two tests imply the robustness of the paper findings.

5. Conclusion

This research aims to investigate the relation between product market competition and earnings management in Vietnamese listed firms. It employs a panel data set including 596 firms during the period of 2008 to 2014. All regression results, including both baseline model and robustness tests, support the prediction that product market competition is negatively related to earnings management. This means heightened market competition could serve as a tool to curb earnings management incentives in Vietnamese listed firms. Future research could further investigate whether market competition works as an external disciplinary governance mechanism or it makes corporate misreporting more costly by increasing firms' exposure to predation risk so as to curtail managers' opportunistic behavior.

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