

HOW DEFERRED REVENUE CHANGES IMPACT FUTURE FINANCIAL PERFORMANCE

H. Kent Baker^{*}, Harit Satt^{**}, Fadi Atmounia^{***}, Basma El Fadel^{***}

^{*} Department of Finance and Real Estate, Kogod School of Business, American University, Washington, DC, the USA

^{**} Corresponding author, School of Business Administration, Al Akhawayn University, Ifrane, Morocco

Contact details: School of Business Administration, Al Akhawayn University, P.O. Box 104, Hassan II Avenue, 53000 Ifrane, Morocco

^{***} School of Business Administration, Al Akhawayn University, Ifrane, Morocco



Abstract

How to cite this paper: Baker, H. K., Satt, H., Atmounia, F., & El Fadel, B. (2020). How deferred revenue changes impact future financial performance. *Corporate Ownership & Control*, 17(4), 72-85. <http://doi.org/10.22495/cocv17i4art6>

Copyright © 2020 The Authors

This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0). <https://creativecommons.org/licenses/by/4.0/>

ISSN Online: 1810-3057

ISSN Print: 1727-9232

Received: 14.02.2020

Accepted: 15.05.2020

JEL Classification: M410, G3, G4

DOI: 10.22495/cocv17i4art6

This study examines the potential predictive power of changes in deferred revenues on future profitability based on evidence from the region of the Middle East and North Africa (MENA). It examines whether financial analysts should consider deferred revenues as useful information when evaluating a firm's future profitability. A pooled OLS regression is used to test the relation. The observations of different companies from various periods are combined into a pooled sample of observations consisting of data from the 500 largest companies in the MENA in terms of market share. Aligned with the existing literature, the findings reveal that changes in deferred revenues are a predictive tool for future financial performance as proven by the positive correlation with the growth of future annual sales, gross profit margin, net profit margin, return on asset, and Tobin's Q. Testing for this impact adds to the literature given various robustness tests under different circumstances and economic conditions.

Keywords: Financial Performance, Deferred Revenue Changes, MENA, Predictive Tool

Authors' individual contribution: Conceptualization - H.K.B. and H.S.; Methodology - H.S. and F.A.; Software - B.El F.; Validation - H.K.B. and H.S.; Formal Analysis - H.S. and F.A.; Investigation - H.S. and F.A.; Resources - H.K.B. and B.El F.; Data Curation - F.A.; Writing - Original Draft - H.S. and F.A.; Writing - Review & Editing - H.K.B. and B.El F.; Visualization - B.El F.; Supervision - H.S.; Project Administration - H.K.B. and H.S.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

In many industries and business environments, companies engage in contractual sales with customers enabling them to collect cash payments in advance from customers before delivering their obligations stated in the contract. This situation creates an increase in a firm's current liabilities in the form of a deferred revenue account. Deferred revenue changes may affect profit margins by deferring revenue recognition while recognizing some expenses associated with this transaction. As a result, a firm's profit margin alone may be a weak forecast of future profit margins and financial

performance (Prakash & Sinha, 2012). Prior studies have found a positive relation between deferred revenue changes and the following two years' sales growth, gross profit margin, profit margin, and return on assets which stipulates that deferred revenue changes are a relevant indicator for future financial performance (Zhong, Wang, & Zhou, 2017). Financial analysts may not fully incorporate the power of the changes in deferred revenues to predict future financial performance due to their complex nature. This study examines the relevance of deferred revenues in the process of evaluating a firm's future profitability.

Recent changes in regulations have increased the presence of deferred revenues within the liability

section of a firm's balance sheet (Marshall, Dimattia, & Amstutz, 2019). Despite the presence of deferred revenues, few studies focus on the actual nature of deferred revenues and little guidance is available on how to classify or manage such deferrals (Sondhi & Taub, 2006). As companies incur deferred revenues, they defer revenue recognition until a future period. However, the costs associated with deferred revenues are not deferred but rather recognized as they are incurred. The costs of deferring revenues, which are recognized in the present, thus impact a firm's current profit margin. Such costs can be research and development (R&D), advertising, marketing, and other indirect costs that constitute a part of a company's expenditures, especially those operating in the pharmaceutical, industrial, healthcare, and information technology industries where deferring revenues is most common.

Empirical evidence shows that companies engage in manipulating or managing earnings and revenues (Nelson, Elliott, & Tarpley, 2002). Long-term and short-term deferred revenues should also be examined to detect potential earnings management procedures (Giedt, 2018). One aspect of this manipulation process involves deferred revenues because it relates to revenue recognition (Caylor, 2010).

Two main components qualify the changes in deferred revenues to be useful in predicting a company's future profitability and thus financial performance. The first component is that sales contracts might be recognized as deferred revenues. Therefore, an increase in deferred revenues may indicate an increase in sales contracts. This situation would enable analysts to forecast an increase in a firm's future financial performance. The second component relates to the bargaining power over customers. If a firm experiences an increase in deferred revenues, this event may indicate that it exercises greater bargaining power over its customers than in the past. The reason is that the firm can demand and collect cash from its customers before fulfilling the delivery of a product or service and fulfilling the contract requirement even more than it did previously. By contrast, a company with less bargaining power over its customers may experience a decrease in deferred revenues and be obliged to accept slower payments from customers to survive and compete (Porter, 1985).

Conditions and environments change from one market to another. The effect of deferred revenue changes on a company's future profitability is a new concept that has not been tested in certain markets. This study provides empirical evidence on the impact of deferred revenues changes on future financial performance in the rapidly developing MENA region. The MENA region has several characteristics that make it different from other regions in the world and worth studying independently. For example, based on the Corruption Perception Index (Transparency International, 2010), the MENA region is characterized by pervasive corruption. Although corruption can have a political connotation, it can also affect investments and economic activities (O'Sullivan, Rey, & Mendez, 2011). Corruption hinders transparency in business environments. This trait of pervasive corruption could potentially affect the extent of revenue manipulation in the MENA

region and the process of revenue recognition. Therefore, testing the impact of deferred revenue changes in this region contributes to the literature and permits assessing the consistency of the results under different circumstances and macro-economic conditions.

The next section explains the background literature on deferred revenues, official accounting standards for the revenue recognition process, and how companies approach this process. The following section sets forth three testable hypotheses followed by a description of the data sample and criteria for selection. Subsequent sections explain the methodology, research design, and analysis of results followed by a discussion of the findings. The next to last section discusses the study's potential limitations, future research, and the managerial implications followed by the conclusions.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Revenue and expense matching concept

Firms should periodically match revenues and expenses with their corresponding period of performance to provide a realistic evaluation of their financial reporting (Paton & Littleton, 1940; Blocker, 1949). The American Accounting Association Concepts and Standards Research Study Committee (CSRSC, 1965) has thoroughly assessed the matching rule in guiding the reporting of financial statements. During the late 1970s, the Financial Accounting Standards Board (FASB) adopted the balance sheet approach instead of the income statement approach as the basis for the correct financial reporting, along with its concept of the matching of revenues and expenses.

Many researchers have assessed the matching process of revenues and expenses followed in the United States. They have observed a decline in matching quality and a weakening of earnings management quality measured by the rate of its volatility, resulting from FASB's paradigm of moving toward adopting a fair value accounting approach. Donelson, Jennings, and McInnis (2011) contend that the decrease in matching quality resulted from the rising appearance of unusual and extraordinary items expenses that arise from the changes in the economic environment. According to Srivastava (2014), another factor affecting the decline in matching quality is the change within the U.S. economy to mainly focus on industries and segments with much higher period costs requiring more investment and expenditure in R&D activities.

2.2. Revenue recognition process in the software industry

The complexity of contractual arrangements that firms make with customers has increased over time, which makes managing the recognition of their deferred revenues even more challenging. Still, this type of contractual agreement obligates firms to attain certain quality and performance standards over the ensuing period. As a result, firms needed to avoid missing opportunities that would lead to greater sales and increased future revenues. In this type of contract, companies may be able to collect

cash from customers before delivering the good or service leading to an increase in a firm's current liabilities in the form of deferred revenues.

2.3. Revenue manipulation

Identifying the appropriate time to recognize revenues has been a complex issue addressed by both the International Accounting Standards Board (IASB) and FASB. The two main accounts that create controversy in terms of recognizing revenues involve accruals and/or deferrals. Accruals relate to accounts receivable (a current asset), while deferrals relate to deferred revenues (a current liability).

Caylor (2010) examines the existence of manipulation and discretion in the revenue recognition process to accomplish three managerial objectives involving earnings: 1) avoiding a decline in earnings; 2) bypassing unexpected, negative earnings; 3) escaping losses in net income. Both accruals and deferrals offer managers opportunities to achieve these objectives, which can be crucial in achieving their earnings management strategies. Caylor (2010) studies whether managers prefer these accounts. His results show that managers participate in earnings manipulations through accelerating revenues by prematurely recognizing both accounts receivables and deferred revenues when a firm's earnings benchmark is not met. Moreover, managers tend to exercise their manipulation strategies more on deferred revenues than on accounts receivable to bypass incurring any unexpected negative earnings. Accelerating revenues through account receivables can be riskier because the company has not yet received any cash, unlike deferred revenues where the company collects cash in advance from its customers. The cost of managing accounts receivables is also higher compared with deferred revenues and involves more uncertainty making it a less efficient approach to accelerate or decelerate revenues. Detecting earnings management not only calls for investigating accruals but also long-term and short-term deferred revenues accounts (Giedt, 2018). In fact, Giedt (2018) uses three related accruals for earnings, namely accounts receivables, short-term deferred revenues, and long-term deferred revenues.

2.4. Revenue recognition standards

In May 2014, FASB and IASB collaborated to develop the most recent revenue recognition standards called the Accounting Standards Codification (ASC). These new standards upgrade the old practices based on a one-dimensional understanding of the deferred revenue concepts, industry-specific, transaction-focused standards. The main advantage of adopting these new standards is to unify the revenue recognition principles among all industries and firms and thus to eliminate the recognition of principles discrimination that existed among industries in previous standards.

This unification is likely to improve the ability to compare and understand financial reporting without considering the type of industry in which a company operates. However, the main disadvantage of ASC is the difficulty of applying it across all industries (Hepp, 2018).

ASC is characterized by several elements. First,

a firm initiates a contract with a customer based on an asset, good, or service to be delivered and performance requirement. Next, satisfying the performance requirements creates revenue. Finally, the firm meets its performance requirement once the control over the goods or services shifts to the end customer. The following steps characterize the revenue recognition process based on ASC (Yrudek, 2014):

1. Customer contract identification.
2. Performance identification obligated within the contract.
3. Transaction price identification.
4. Allocation of the transaction price to the equivalent performance obligation.

Revenue recognition upon satisfying the performance obligation.

2.5. Hypothesis development

A company's current revenues provide useful insights about its profitability and financial performance (Wagenhofer, 2014). Current reported revenues aid market analysts to predict a company's future performance based on the current and previous performance reported in its financial statements. Deferred revenues also offer insights about future period revenues. As a result, understanding variations in deferred revenues is an overlooked but powerful means of predicting a firm's financial performance.

Changes in deferred revenues are likely to affect a firm's future sales growth due to two factors. First, any variation in a company's deferred revenues over time may indicate either an increase or a decrease in its ability to demand new sales contracts. The former leads to an increase in advance payments that will not be shown in the company's current reported financial statement as total revenues. According to the ASC, a company must recognize any payment in advance by customers when the payment is built on a customer contract as a deferred payment in the current liabilities section of its balance sheet. The recognition of this form of revenue in total revenues should only occur after the fulfillment of the contract obligation and the product's full delivery. Due to this principle, a large increase (decrease) in the company's customer sales contracts leads to an increase (decrease) in the amount of cash received in advance by customers and ultimately an increase (decrease) in the company's deferred revenues. Thus, an increase in a company's deferred revenues is likely to contribute to an increase in its revenue growth and improvement in its performance because the firm already recognized the expenses associated with those deferred revenues during the current period of deferred revenues recognition.

Second, variations in the deferred revenue account indicate a company's bargaining power over its customers. Companies with higher bargaining power over their customers are likely to secure more new sales in the future and to have brighter financial prospects. The firm records deferred revenues as it collects cash from customers before delivering the full product or service. A customer's willingness to pay in advance for a product to be received over a protracted period signals the customer's loyalty to the firm and the high demand for its products or

services. Thus, a change in deferred revenues due to new customer contractual agreements suggests that the company has bargaining power over its customers.

Since deferred revenues are expected to be translated and recognized into actual revenues in the future after satisfying the performance criterion in the contract, deferred revenues changes are likely to signal a firm's ability to demand more contract sales, which is expected to be positively associated with its future revenue growth. The bargaining power over customers is part of Porter's five forces model and enables a company to set a suitable price for its products and services (Porter, 1979). Therefore, an increase (decrease) in a company's bargaining power over customers signaled by an increase (decrease) in a change in deferred revenues is expected to show a positive (negative) impact on a company's gross profit margin. As such, a positive association between deferred revenues variations and future gross profit margin is anticipated. Thus, the first hypothesis is as follows:

Hypothesis 1 (H1): Variations in revenue deferrals have a positive relation with both a firm's future gross profit margin and sales growth.

An increase in revenue growth is likely to lead to a higher contribution margin for the company, which should also help the company cover its fixed costs such as for insurance, marketing, and advertising, and R&D. Helping to cover these costs may lead to improving a firm's profit margin and return on assets (ROA). A higher gross profit margin leads to a higher gross profit that enables a company to better cover its operating expenses leading to a higher profit margin and ROA. The second hypothesis tests the relation between a change in deferred revenues and future financial performance.

Hypothesis 2 (H2): Variations in revenue deferrals have a positive relation with both a firm's future profit margin and ROA.

Having a more complete idea of the impact of deferred revenues changes on a firm's future financial performance involves considering both its accounting and capital market performance. Accounting and financial measures offer two different perspectives on a company's financial performance. Tobin's Q provides a way of

determining a firm's performance in the financial market. Demand for a company's stock helps to increase its market capitalization, which is a component used in calculating Tobin's Q. To fully assess a company's financial performance, investors and financial analysts should consider both accounting and market performance. Accordingly, the third hypothesis states:

Hypothesis 3 (H3): Variations in revenue deferrals have a positive relation with future period capital market performance using Tobin's Q.

3. SAMPLE, VARIABLE MEASUREMENT, AND DESCRIPTIVE STATISTICS

3.1. Sample

DataStream Eikon Reuters was the source of the financial data between 2012 and 2017 for the 500 companies with the largest market share in the MENA region based on Forbes ranking (Forbes Middle East, 2014). The sample excluded financials, utilities, and companies with missing data. It included 45 companies with a non-zero deferred revenue during the sample period. The base year for calculating the change in deferred revenues and other independent variables was 2011 resulting in 270 observations.

3.2. Variable measurement

As Table 1 shows, the dependent variables include the following year's sales growth, gross profit margin, profit margin, ROA, and Tobin's Q. The primary dependent variable is deferred revenue change. The change in deferred revenue was adapted to each dependent variable in terms of scale to provide an accurate relation. If the dependent variable is either next year's sales growth, profit margin, or gross profit margin, the change in deferred revenues is scaled by total sales. Using either ROA or Tobin's Q as the dependent variables requires scaling the change in deferred revenues by total assets (Sloan, 1996; Barth, Cram, & Nelson, 2001). In this study, we opted to use both ROA and Tobin's Q to capture both accounting and market performance.

Table 1. Primary variables

<i>Variable</i>	<i>Description</i>
Deferred revenue change	$\Delta DR(t-1) / Sales(t-1)$: Deferred revenue change (DR) in the previous year divided by the total sales of the previous year $t-1$.
Deferred revenue change*	$\Delta DR(t-1) / ATA(t-1)$: Deferred revenue change (DR) in the previous year divided by the average of the beginning and ending total assets of the previous year $t-1$.
Sales growth	$SaleGr(t)$: Sales growth at year t , calculated as $(Sale(t)/Sales(t-1)) - 1$.
Gross profit margin	$GPM(t)$: Gross profit margin at year t , calculated as $GP(t)/SALE(t)$.
Profit margin	$PM(t)$: Profit margin at year t , computed as operating income at year $t/Sales(t)$.
ROA	$ROA(t)$: Return on assets at year t , calculated as operating income at year t /average of beginning and ending total assets of year t .
Tobin's Q	$Tobin\ Q(t)$: Tobin's Q at year t , $(market\ capitalization\ (t) + book\ value\ of\ liabilities\ (t))/book\ value\ of\ total\ assets\ (t)$.

Note: This table shows all the model's primary variables along with their respective descriptions and formulas.

Table 2 includes the control variables used in the study, along with their respective descriptions and formulas. Each control variable is introduced

and explained. Furthermore, the formulas used to compute each variable are provided.

Table 2. Control variables

Variable	Description
Sales growth	$SaleGr(t-1)$: Sales growth at year $t-1$, calculated as $(Sales(t-1)/Sales(t-2)) - 1$.
Gross profit margin	$GPM(t-1)$: Gross profit margin at year $t-1$, calculated as $GP(t-1)/Sales(t-1)$.
Profit margin	$PM(t-1)$: Profit margin at year $t-1$, calculated as operating income at year $t-1/Sales(t-1)$.
ROA	$ROA(t-1)$: Return on assets at year $t-1$, calculated as operating income at year $t-1/$ average of the beginning and ending total assets of year $t-1$.
Tobin's Q	$Tobin's Q(t-1)$: Tobin's Q at year $t-1$, (market capitalization $(t-1) +$ book value of liabilities $(t-1)/$ book value of total assets $(t-1)$.
Size	$Size(t-1)$: Size at year $t-1$, calculated as the natural log of the ending year total assets at year $t-1$.
Cash ratio	$Cash(t-1)$: Cash ratio at year $t-1$, calculated as cash and short-term investment at year $t-1/$ ending year total assets at year $t-1$.
Leverage ratio	$Lev(t-1)$: Leverage ratio at year $t-1$, calculated as long-term debt at year $t-1/$ ending year total assets at year $t-1$.
Investment ratio	$Inv(t-1)$: Investment ratio at year $t-1$, calculated as capital expenditures at year $t-1/$ ending year-end total assets at year $t-1$.
Accruals ratio	$ACCR(t-1)/Sales(t-1)$: Accruals ratio, calculated as (income before extraordinary and discontinued operations in year $t-1 -$ net operating cash flow in year $t-1 +$ change in deferred revenues in year $t-1)/$ total sales at year $t-1$.
Accruals ratio*	$ACCR(t-1)/ATA(t-1)$: Accruals ratio, calculated as (income before extraordinary and discontinued operations in year $t-1 -$ net operating cash flow in year $t-1 +$ change in deferred revenues in year $t-1)/$ average of beginning and ending total assets of previous year $t-1$.
ROE	$ROE(t-1)$: Return on equity at year $t-1$. calculated using the ratio of net income to equity at the end of the year $t-1$.
Industry	<i>Industry</i> : Categorical variable representing the industry in which each firm operates. Data for each industry was collected by using the industry classification of industries in the DataStream Eikon Reuters. Industries vary from i1 to i20. Table 3 shows the number assigned to each industry.

Note: This table shows the control variables used in the study along with their respective descriptions and formulas.

Table 3 includes all the dummy variables in the sample. Panel A lists the categorical industry variables ranging from i1 to i20 each referring to an industry. Panel B lists the categorical year variables ranging from t1 to t6. Panel C includes categorical country variables ranging from c1 to c9 each referring to the year.

1. *Year*. Categorical variables represent the

year of each observation as shown by the letter "t" in the model, which varies from t1 to t6.

2. *Country*. Categorical variables represent the country of each firm as shown by the letter "c" in the model, which varies from c1 to c9.

3. *Firm*. Categorical variables represent each firm as shown by the letter "f", which varies from f1 to f45.

Table 3. Dummy variables

Panel A: Categorical industry variables in the sample	
Industry	Dummy
Construction and engineering	i1
IT Services and consulting	i2
Pharmaceuticals	i3
Food processing	i4
Real estate rental, development, and operations	i5
Miscellaneous specialty retailers	i6
Industrial conglomerates	i7
Computer and electronics retailers	i8
Passenger transportation, ground and sea	i9
Iron and steel	i10
Airlines	i11
Courier, postal, air freight and land-based logistics	i12
Shipbuilding	i13
Telecommunications services	i14
Construction supplies and fixtures	i15
Marine freight and logistics	i16
Auto and truck manufacturers	i17
Personal services	i18
Leisure and recreation	i19
Consumer publishing	i20
Panel B: Categorical year variables in the sample	
Year	Dummy
2012	t1
2013	t2
2014	t3
2015	t4
2016	t5
2017	t6
Panel C: Categorical country variables in the sample	
Country	Dummy
Morocco	c1
KSA	c2
UAE	c3
Oman	c4
Qatar	c5
Egypt	c6
Jordan	c7
Kuwait	c8
Bahrain	c9

Note: This table shows the dummy variables and includes the categorical industry, year, and country variables used in the study.

3.3. Descriptive statistics

Table 4 lists the descriptive statistics for all variables used in the model. These statistics include

the mean, standard error, median, and standard deviation for each variable. Each variable has 270 observations.

Table 4. Descriptive statistics

Variables	Mean	Standard error	Median	Standard deviation
Tobin Qq(t)	2.732	0.513	1.202	8.430
Roa(t)	0.076	0.006	0.059	0.098
Pm(t)	0.168	0.013	0.142	0.211
Gmp(t)	0.317	0.014	0.275	0.229
sgr (t)	0.066	0.018	0.052	0.304
def rev(t - 1)/ata(t - 1)	0.004	0.014	0.000	0.227
def rev(t - 1)/sales(t - 1)	0.020	0.070	0.000	1.151
Tobin Q(t - 1)	3.359	0.730	1.244	11.992
Roa(t - 1)	0.085	0.005	0.061	0.086
Pm(t - 1)	0.186	0.014	0.143	0.223
Gpm(t - 1)	0.323	0.014	0.274	0.225
Sgr(t - 1)	0.112	0.030	0.074	0.487
Accr(t - 1)/ata(t - 1)	-0.019	0.015	-0.018	0.240
Accr(t - 1)/sales(t - 1)	0.005	0.056	-0.036	0.920
Size(t - 1)	20.021	0.100	20.105	1.636
Leverage(t - 1)	0.175	0.010	0.133	0.164
Investmentratio(t - 1)	-0.047	0.005	-0.021	0.081
Cashratio(t - 1)	0.111	0.006	0.078	0.101

4. METHODOLOGY AND RESULTS ANALYSIS

4.1. Multivariate analysis

A pooled OLS regression is used to test the relation between the independent and dependent variables to search for associations between deferred revenues changes and future financial performance. After pooling the observations of different companies from various periods, an OLS regression was conducted on the pooled sample using Stata software. This approach checks for multicollinearity and adjusts for it by dropping any variables causing multicollinearity in the model.

Since a pooled OLS regression does not control for time and firm effects, the model was strengthened by controlling for both a group and time-specific effect by including time and firm-specific dummies to make the model more robust. The previous year's dependent variable was also included among the independent variables in all the equations to control for a time effect. The purpose

was to absorb all the effects that are unrelated to the independent variable of interest.

All hypotheses met the assumptions underlying tests for normality, linearity, and homoscedasticity except homoscedasticity for *Hypothesis 3 (H3)*. After testing for endogeneity, the assumption was satisfied since the correlation was not detected between the independent variables and residuals indicating that all the hypotheses in the model are exogenous. Table 6 includes the results of the endogeneity tests (see Appendix).

4.2. Test of Hypothesis 1 (H1)

Hypothesis 1 (H1) predicts a positive relation between the variations in revenue deferrals and both the future period gross profit margin and sales growth. Equation (1) represents the test between future period sales growth and current deferred revenues changes. Equation (2) tests the relation between current deferred revenue changes and future period gross profit margin.

$$\begin{aligned} SaleGr(t) = & \alpha + \beta_1 \frac{\Delta DR(t-1)}{SALE(t-1)} + \beta_2 SaleGr(t-1) + \beta_3 Size(t-1) + \beta_4 Lev(t-1) + \beta_5 Inv(t-1) \\ & + \beta_6 Cash(t-1) + \sum \gamma Year\ Dummies + \sum \lambda Industry\ Dummies + \sum \lambda Country\ Dummies \\ & + \sum \lambda Firm\ Specific\ Dummies + \varepsilon \end{aligned} \quad (1)$$

$$\begin{aligned} GPM(t) = & \alpha + \beta_1 \frac{\Delta DR(t-1)}{SALE(t-1)} + \beta_2 GPM(t-1) + \beta_3 Size(t-1) + \beta_4 Lev(t-1) + \beta_5 Inv(t-1) + \beta_6 Cash(t-1) \\ & + \beta_7 SaleGr(t-1) + \beta_8 \frac{ACCR(t-1)}{SALE(t-1)} + \sum \gamma Year\ Dummies + \sum \lambda Industry\ Dummies \\ & + \sum \lambda Country\ Dummies + \sum \lambda Firm\ Specific\ Dummies + \varepsilon \end{aligned} \quad (2)$$

The year, industry, country, and firm-specific dummies are included to control for any potential impact that these differences might have on the dependent variable in both Equations (1) and (2). Also, *SaleGr* for year $t-1$ is included in *H1* equations to control for any time series effect between current and future year sales growth. Additionally, size, investment ratio, and leverage are included in both equations of *H1* due to the effect that asset size, long-term debt financing, and a

firm's capital expenditure have on its product performance and future sales growth (Chevalier, 1995; Campello, 2006). Studies demonstrate that firms with high cash reserves have a competitive edge in product markets, which ultimately provides future opportunities for high sales growth and consequently high gross profit margins (Fresard, 2010).

This finding led to adding the cash ratio to control for any potential effect related to high cash

reserves. To control for time-series effects, *GPM* was included at $t - 1$. Since sales growth can also affect a firm's gross profit margin by empowering the company in its market, it was incorporated in Equation (2) to control for any potential effect. Accruals are considered to have a negative relation with a company's future profitability making it a mandatory control variable (see Table 2) in Equation (2) to control for its effect on the gross profit margin. Accruals are scaled by total sales making it a convenient control variable to compare with a gross profit margin. Given that deferred revenues change is a component of accruals, the methodology adjusted for accruals to net out any effect of deferred revenue change as shown in the variable measurement section (Sloan, 1996).

Panel A of Table 5 (see Appendix) shows the relation between deferred revenues changes and sales growth as stated in Equation (1) in *H1*. The model resulted in an R^2 of 19.2 percent indicating that the independent variables explain 19.2 percent of the variations in the dependent variable. The results show that deferred revenues changes do not significantly affect the firm's next year's sales growth. Yet, a significant relation exists at the 0.01 level between sales growth in year $t - 1$ and sales growth at t , which indicates the presence of a time

series effect. Additionally, another significant relation exists between the computer and electronics retailers' industry and future sales growth.

Panel B of Table 5 (see Appendix) shows the results from Equation (2) of *H1*. This hypothesis tests for the association of deferred revenue changes and gross profit margin to determine any potential impact of deferred revenues on bargaining power over customers. The R^2 indicates that the model's independent variables explain 93.4 percent of the variations in the future gross profit margin. The results also show that deferred revenues changes and previous year gross profit margins both have a significantly positive relation with the gross profit margin at the 0.01 level with coefficients of 0.034 and 0.281, respectively. On the other hand, accruals show a significantly negative relation with a gross profit margin at the 0.01 level with a coefficient of -0.047.

4.3. Test of Hypothesis 2 (H2)

Hypothesis 2 (H2) predicts a positive relation between variations in deferred revenues and both future period profit margin and *ROA*. The following equations represent *H2*:

$$PM(t) = \alpha + \beta_1 \frac{\Delta DR(t-1)}{SALE(t-1)} + \beta_2 PM(t-1) + \beta_3 Size(t-1) + \beta_4 Lev(t-1) + \beta_5 Inv(t-1) + \beta_6 Cash(t-1) + \beta_7 SaleGr(t-1) + \beta_8 \frac{ACCR(t-1)}{SALE(t-1)} + \sum \gamma Year\ Dummies + \sum \lambda Industry\ Dummies + \sum \lambda Country\ Dummies + \sum \lambda Firm\ Specific\ Dummies + \varepsilon \quad (3)$$

$$ROA(t) = \alpha + \beta_1 \frac{\Delta DR(t-1)}{ATA(t-1)} + \beta_2 ROA(t-1) + \beta_3 Size(t-1) + \beta_4 Lev(t-1) + \beta_5 Inv(t-1) + \beta_6 Cash(t-1) + \beta_7 SaleGr(t-1) + \beta_8 \frac{ACCR(t-1)}{ATA(t-1)} + \sum \gamma Year\ Dummies + \sum \lambda Industry\ Dummies + \sum \lambda Country\ Dummies + \sum \lambda Firm\ Specific\ Dummies + \varepsilon \quad (4)$$

Both Equations (3) and (4) include the year, industry, country, and firm-specific dummies to control for any potential impact that such differences might have on the dependent variable. These two equations also include *PM* for year $t - 1$ and *ROA* for year $t - 1$ to control for time-series effects. Prior evidence shows that firm size affects operating income performance, which explains its inclusion in both Equations (3) and (4) (Barber & Lyon, 1997; Fama & French, 1992). Consistent with the previous literature on leverage affecting a firm's profitability, both equations include the leverage ratio to control for the effect of the amount of long-term debt. Prior research also shows that capital investment has a potential effect on future profitability (Titman, Wei, & Xie, 2004). Since cash reserves may affect a firm's future profitability, the present model also includes cash reserves (Fresard, 2010). Because current period sales growth can influence future profitability, both equations include *Sgr* at year $t - 1$ as a control variable. Previous researchers such as Sloan (1996) find that current accruals negatively affect a firm's future profitability, which justifies including this variable in Equations (3) and (4). However, in Equation (3) where the dependent variable is the profit margin at year t , accruals are scaled by total sales, while in Equation (4) where *ROA* at year t is the dependent variable, accruals are scaled on the average of the

beginning and ending total assets of year $t - 1$.

Panel C of Table 5 (see Appendix) shows the results from Equation (3) of *H2*. The tests examine the impact of deferred revenue changes on future profit margins. The table shows an R^2 of 82.4 percent, indicating that the model's independent variables explain 82.4 percent of the variations in the future profit margin (dependent variable). The results also show that deferred revenues changes and profit margin at year $t - 1$ both have a significantly positive association with a profit margin at year t at the 0.01 level. Yet, accruals show a significantly negative relation with a gross profit margin at the 0.01 level.

Panel D of Table 5 (see Appendix) shows the results from Equation (4) of *H2*, which tests for the relation between deferred revenue changes on future *ROA*. The table indicates an R^2 of 71.3 percent, indicating that all the independent variables in the model explain 71.3 percent of the variations in the future *ROA* (dependent variable). Deferred revenues changes show a positive but not statistically significant relation with *ROA*. *ROA* at year $t - 1$ represents a significantly positive relation with the following year's *ROA* at the 0.01 level, suggesting the presence of a time series effect. The control variable cash ratio also has a significantly positive relation with *ROA* at year t at the 0.10 level.

4.4. Test of Hypothesis 3 (H3)

Hypothesis 3 (H3) predicts that the variations in revenue deferrals are positively related to future

capital market performance as measured by Tobin's Q as shown below in Equation (5).

$$\begin{aligned} \text{Tobin } Q(t) = & \alpha + \beta_1 \frac{\Delta DR(t-1)}{ATA(t-1)} + \beta_2 \text{Tobin } Q(t-1) + \beta_3 \text{Size}(t-1) + \beta_4 \text{Lev}(t-1) + \beta_5 \text{SaleGr}(t-1) \\ & + \beta_6 \text{ROE}(t-1) + \sum \gamma \text{Year Dummies} + \sum \lambda \text{Industry Dummies} + \sum \lambda \text{Country Dummies} \\ & + \sum \lambda \text{Firm Specific Dummies} + \varepsilon \end{aligned} \quad (5)$$

Equation (5) includes the year, industry, country, and firm-specific dummies to control for any potential impact that year, industry, country and firm differences might have on the dependent variable. This equation also includes *Tobin's Q* at year $t-1$ to control for any potential time-series effects. Size, leverage, and return on equity (*ROE*) are all controlled for when constructing the model of market performance. The leverage ratio controls for any potential association between capital leverage and market performance. *ROE* is expected to positively influence market performance (Florio & Leoni, 2017). Current sales growth is included as a control variable because it can affect future sales growth and thus firm performance.

Panel E of Table 5 (see Appendix) shows the results involving *H3*, which tests the potential relation between deferred revenues changes and their impact on market performance. The results indicate an R^2 of 24.8 percent. Deferred revenue changes have a positive relation with *Tobin's Q*. *Tobin's Q* at year $t-1$ is also insignificant showing no time series effect.

5. DISCUSSION

5.2. Hypothesis 2 (H2)

Hypothesis 2 (H2) tests two more accounting performance measures to evaluate the consistency of the results and the relation between deferred revenue changes and future financial profitability. Equation (3) shows that a strong positive relation exists between changes in deferred revenues and a firm's future profit margin, which is consistent with Fresard (2010). Accruals have a significantly negative association with the profit margin supporting Sloan's claim (1996). Equation (4) does not show any statistically significant relation between deferred revenues changes and ROA, despite being positive. The reason behind this finding could be the same as that of future sales growth. That is, the sample size is too small to average out statistical noise. Hence, the insignificance of the relation could be overcome by a larger sample.

5.1. Hypothesis 1 (H1)

Testing the impact of deferred revenue changes on future sales growth reveals a positive but not statistically significant relation at normal levels. According to Caylor (2010), firms manipulate the deferred revenues recognition process to avoid reporting losses, which conveys false information about revenues. This view might explain the insignificant but positive relation between future revenues growth and current deferred revenues changes because firms recognize some deferred

revenues before the full delivery of the product or service to avoid showing losses. Another reason behind the lack of statistical significance could be noisy data resulting from a sample size. Having a sample consisting of 45 firms increases the difficulty of achieving a significant relation involving next year's sales growth.

Equation (2) tests the impact of deferred revenue changes on bargaining power over customers. Deferred revenues have a strong positive association with future gross profit margins because companies can receive the full cash in advance of delivering the full product or service to their customers, which is consistent with Porter (1985). Thus, deferred revenues changes appear to serve as a predictive indicator of the future bargaining power of the sample companies over their customers. Accruals also have a significantly negative association with the gross profit margin, which is consistent with Sloan (1996).

5.3. Hypothesis 3 (H3)

Hypothesis 3 (H3) tests the implication of deferred revenues changes on future market performance using Tobin's Q as the dependent variable for market evaluation. The regression analysis shows a positive but statistically insignificant relation between changes in deferred revenue and market performance. This finding could reflect the failure of investors to fully incorporate deferred revenues changes in their investment decisions thus showing an under-reaction of market performance to such changes (Prakash & Sinha, 2012).

6. CONCLUSION

6.1. Limitations

The study has several limitations. For example, the findings cannot be generalized to all the companies of the MENA region. Although the initial sample consisted of the 500 companies with the highest market share, the final sample contained only 45 companies with deferred revenues involving 270 observations. Also, the homoscedasticity assumption in the third hypothesis was not satisfied because the sample had some heterogeneous behaviour.

6.2. Managerial implications

Although this study provides some insights into the predictive power of deferred revenues changes on a firm's future financial performance, the results are mixed. It shows a positive association between deferred revenue changes and future financial performance of high market share companies in the

MENA region. Some relations are significantly positive, namely involving the profit margin and gross profit margin, reinforcing the predictive power in the changes in deferred revenues. However, the relation with next year's sales growth, ROAs, and Tobin's Q, while positive, are not statistically significant at normal levels. As previously discussed, these findings could be due to statistical noise involving these variables that could not be averaged out due to the small sample size. Despite mixed results, the study shows relevant relations between deferred revenues changes and profit margin and gross profit margin that remain valuable for managers, analysts, and other stakeholders. Thus, investors and financial analysts may find deferred revenue changes useful in making informed decisions.

6.3. Further research

The relation between deferred revenue changes and future financial performance is a neglected area of research. Future research could examine other areas outside of the MENA region and increase the sample size. Further studies could also investigate whether any significant differences exist between low and high market share companies. Further testing in different environments is likely to add to the robustness of the results. Finally, survey research may reveal whether analysts consider deferred revenue changes into their evaluation process and if so how.

Various factors play a role in predicting a firm's future profitability. One such factor appears to be when deferred revenues change from year to year. This result is likely due to the mismatching of costs associated with deferred revenues and the recognition of those deferred revenues, which increases current costs and future profits creating a dual effect. The current study provides a preliminary examination of whether changes in deferred revenues can serve as a predictive tool for high market share companies in the MENA region. The findings show that underweighting deferred revenue changes can affect the ability to forecast firm performance, leading analysts to make prediction errors. Thus, those who are forecasting the future profitability of companies that are experiencing high yearly changes in deferred revenues should consider incorporating the impact of those changes. Doing so may help to improve forecasting accuracy by decreasing the margin of error in analyst forecasts.

The current study finds that deferred revenue changes have a significantly positive relation with next year's profit margin and gross profit margin. However, the results also show a statistically insignificant relation between deferred revenue changes with next year's sales growth, ROAs, and Tobin's Q. These latter findings could be due to the study's small sample size. Thus, analyzing changes in deferred revenues may provide incremental and complementary information to the existing financial indicators.

REFERENCES

1. Barber, B. M., & Lyon, J. D. (1997). Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics*, 43(3), 341-372. [https://doi.org/10.1016/S0304-405X\(96\)00890-2](https://doi.org/10.1016/S0304-405X(96)00890-2)
2. Barth, M. E., Cram, D. P., & Nelson, K. K. (2001). Accruals and the prediction of cash flows. *The Accounting Review*, 76(1), 27-58. <https://doi.org/10.2308/accr.2001.76.1.27>
3. Blocker, J. G. (1949). Mismatching of costs and revenues. *The Accounting Review*, 24(1), 33-43. Retrieved from <https://www.jstor.org/stable/240594>
4. Campello, M. (2006). Debt financing: Does it boost or hurt firm performance in product markets? *Journal of Financial Economics*, 82(1), 135-172. <https://doi.org/10.1016/j.jfineco.2005.04.001>
5. Caylor, M. L. (2010). Strategic revenue recognition to achieve earnings benchmarks. *Journal of Accounting and Public Policy*, 29(1), 82-95. <https://doi.org/10.1016/j.jaccpubpol.2009.10.008>
6. Chevalier, J. A. (1995). Do LBO supermarkets charge more? An empirical analysis of the effects of LBOs on supermarket pricing. *The Journal of Finance*, 50(4), 1095-1112. <https://doi.org/10.1111/j.1540-6261.1995.tb04051.x>
7. Concepts and Standards Research Study Committee (CSRSC). (1965). *The entity concept*. The Accounting Review, 40(2), 358-367. Retrieved from <https://www.jstor.org/stable/242303?seq=1>
8. Donelson, D. C., Jennings, R., & McInnis, J. (2011). Changes over time in the revenue-expense relation: Accounting or economics? *The Accounting Review*, 86(3), 945-974. <https://doi.org/10.2308/accr.00000046>
9. Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, 47(2), 427-465. <https://doi.org/10.1111/j.1540-6261.1992.tb04398.x>
10. Florio, C., & Leoni, G. (2017). Enterprise risk management and firm performance: The Italian case. *The British Accounting Review*, 49(1), 56-74. <https://doi.org/10.1016/j.bar.2016.08.003>
11. Forbes Middle East. (2014). *Top 500 companies in the Arab world 2014*. Retrieved from <https://www.forbesmiddleeast.com/list/top-500-companies-in-the-arab-world-2014>
12. Fresard, L. (2010). Financial strength and product market behavior: The real effects of corporate cash holdings. *The Journal of Finance*, 65(3), 1097-1122. <https://doi.org/10.1111/j.1540-6261.2010.01562.x>
13. Giedt, J. Z. (2018). Modelling receivables and deferred revenues to detect revenue management. *Abacus*, 54(2), 181-209. <https://doi.org/10.1111/abac.12119>
14. Hepp, J. (2018). ASC 606: Challenges in understanding and applying revenue recognition. *Journal of Accounting Education*, 42, 49-51. <https://doi.org/10.1016/j.jaccedu.2017.12.002>
15. Marshall, B. H., Dimattia, T., & Amstutz, J. K. (2019). *A guide to revenue recognition*. Retrieved from <https://rmsus.com/what-we-do/services/assurance/financial-reporting-resource-center/financial-reporting-resource-center-revenue-recognition/a-guide-to-revenue-recognition.html>
16. Nelson, M. W., Elliott, J. A., & Tarpley, R. L. (2002). Evidence from auditors about managers' and auditors' earnings management decisions. *The Accounting Review*, 77(1), 175-202. <https://doi.org/10.2308/accr.2002.77.s-1.175>

17. O'Sullivan, A., Rey, M.-E., & Mendez, J. G. (2011). *Opportunities and challenges in the MENA region*. Retrieved from <http://www.oecd.org/mena/49036903.pdf>
18. Paton, W. A., & Littleton, A. C. (1940). *An introduction to corporate accounting standards*. Chicago, IL: American Accounting Association. Retrieved from <https://catalog.hathitrust.org/Record/006566049>
19. Porter, M. E. (1979). How competitive forces shape strategy. *Harvard Business Review*, 57(2), 137-145. Retrieved from <https://www.hbs.edu/faculty/Pages/item.aspx?num=10692>
20. Porter, M. (1985). *The competitive advantage: Creating and sustaining superior performance*. New York, NY: Free Press.
21. Prakash, R., & Sinha, N. (2012). Deferred revenues and the matching of revenues and expenses. *Contemporary Accounting Research*, 30(2), 517-548. <https://doi.org/10.1111/j.1911-3846.2012.01164.x>
22. Sloan, R. G. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings. *The Accounting Review*, 71(3), 289-315. Retrieved from <https://www.jstor.org/stable/248290>
23. Sondhi, A. C., & Taub, S. (2006). *Revenue recognition guide 2007*. Chicago, IL: CCH.
24. Srivastava, A. (2014). Why have measures of earnings quality changed over time? *Journal of Accounting and Economics*, 57(2-3), 196-217. <https://doi.org/10.1016/j.jacceco.2014.04.001>
25. Titman, S., Wei, K. C. J., & Xie, F. (2004). Capital investments and stock returns. *Journal of Financial and Quantitative Analysis*, 39(4), 677-700. <https://doi.org/10.1017/S0022109000003173>
26. Transparency International. (2010). *Corruption Perceptions Index 2010*. Retrieved from <https://www.transparency.org/cpi2010/results>
27. Wagenhofer, A. (2014). The role of revenue recognition in performance reporting. *Accounting and Business Research*, 44(4), 349-379. <https://doi.org/10.1080/00014788.2014.897867>
28. Yrudek. (2014, May 28). *IAS plus*. Retrieved from [-us/standards/fasb/revenue/asc606](https://www.iasplus.com/us/standards/fasb/revenue/asc606)
29. Zhong, K., Wang, F., & Zhou, L. (2017). Deferred revenue changes as a leading indicator for future financial performance: Evidence from China. *Asian Review of Accounting*, 25(4), 549-568. <https://doi.org/10.1108/ARA-11-2015-0118>

APPENDIX

Table 5 shows how a ΔDR is related to future sales growth, future gross profit margin, profit margin, future return on asset (ROA), and future Tobin's Q.

Table 5. Relation between ΔDR and other variables (Part 1)

<i>Panel A. Relation between a ΔDR and future sales growth</i>			
<i>Independent variables</i>	<i>Dependent variables</i>	<i>Independent variables</i>	<i>Dependent variables</i>
Defrevsales t - 1	0.025	f15	-0.855**
Sgr t - 1	-0.136***	f17	-0.363
Size t - 1	0.008	f18	-0.516
Leverage t - 1	0.346	f20	0.796*
Investmentratio t - 1	-0.170	f21	0.447
Cashratio t - 1	-0.647	f27	-0.391
i1	0.244	f28	0.077
i3	0.536**	f29	-0.307
i4	0.640**	f31	-0.247
i5	0.642*	f32	-0.207
i6	0.857**	f33	0.383**
i7	0.615*	f40	0.714
i8	0.894***	f42	0.362
i9	0.871**	f43	0.070
i10	0.777**	t1	-0.001
i11	0.179	t2	-0.058
i12	0.283	t3	-0.018
i14	0.188	t4	-0.050
i15	0.965**	t6	-0.050
i16	0.650*	Constant	-0.187
i17	0.273		
i19	1.087**		
i20	1.009*	Observations	270
c1	-0.224	R ²	0.192
c2	-0.707**		
c3	-0.035		
c4	-0.779*		
c5	-0.561		
c6	-0.133		
c8	-0.942		
c9	-0.399		
f3	0.236		
f6	0.201		
f9	0.266		
f13	-0.462		
<i>Panel B. Relation between a ΔDR and the future gross profit margin</i>			
	GPMT	f13	0.366***
Defrevsales	0.034***	f17	0.394***
Gpm t - 1	0.281***	f18	0.407***
Sgr t - 1	-0.011	f22	0.457***
Size	-0.005	f25	0.577***
Leverage	0.019	f27	0.621***
Investmentratio	0.086	f28	-0.341***
Cashratio	0.105	f29	0.187***
Accrsales	-0.047***	f31	0.095**
i1	0.071	f32	0.620***
i3	0.134***	f33	-0.201**
i4	-0.309***	f34	-0.442***
i5	-0.692***	f37	0.540***
i7	-0.290***	f39	-0.700***
i8	-0.329***	f40	0.284***
i9	-0.293***	f42	0.138**
i10	-0.350***	f43	-0.759***
i11	-0.458***	f45	1.511***
i12	-0.191***	t1	0.016
i13	-0.402***	t2	0.012
i14	0.606***	t3	0.000
i15	0.324***	t4	0.006
i17	-0.250***	t	-0.022
i19	-0.499***	Constant	-0.167
c1	0.395***		
c2	0.704***		
c3	0.832***		
c4	0.231***		
c5	0.733***		
c6	0.587***		
c8	0.867***		
f3	0.035		
f6	0.510***		
f7	-0.337***		
f9	0.827***		

Table 5. Relation between Δ DR and other variables (Part 2)

Panel C. Relation between a ΔDR and future profit margin			
Independent variables	Dependent variables	Independent variables	Dependent variables
	PMT	F9	0.444***
Defrevesales	0.084***	F13	-0.060
Pm t - 1	0.286***	F15	-0.362***
Sgr t - 1	-0.016	F17	0.087
Size	0.006	F18	0.156
Leverage	0.015	F21	-0.146
Investmentratio	0.171	F25	-0.018
Cashratio	0.192	F28	-0.206***
Accrsales	-0.110***	F29	0.093
I1	0.162**	F31	0.111*
I3	0.194***	F32	-0.025
I4	-0.024	F34	-0.334***
I5	0.099	F37	0.345**
I6	0.107	F39	-0.114
I7	0.043	F40	0.033
I8	0.044	F42	-0.296**
I9	0.125	F43	-0.114
I10	0.056	F45	0.552***
I11	-0.011	T1	0.023
I13	-0.031	T2	0.021
I14	0.159	T3	0.018
I15	0.150	T4	0.003
I17	0.013	T6	-0.062***
I19	0.064	Constant	-0.253
I20	0.051		
C1	0.050		
C2	0.124		
C3	0.187		
C4	0.126**		
C5	0.246*		
C6	0.158		
C8	0.260*		
F3	0.036		
F5	0.065		
F6	0.092		
Panel D. Relation between a ΔDR and future return on asset (ROA)			
	ROAT		ROAT
Defrevava t - 1	0.069	F27	0.111
ROA t - 1	0.523***	F28	0.126***
Sgr t - 1	-0.006	F29	0.002
Size	0	F31	0.033
Leverage	-0.005	F33	0.222***
Investmentratio	0.071	F38	0.161
Cashratio	0.142 *	F40	0.124
Accravat	-0.068	F42	0.087
I1	-0.028	F43	0.006
I3	0.006	F44	0.161
I4	0.157 ***	F45	-0.066
I5	0.029	C1	-0.005
I6	0.283 ***	C2	-0.188***
I7	0.146 **	C3	-0.047
I9	0.202**	C4	-0.160*
I10	0.135**	C5	-0.096
I11	-0.008	C6	-0.189***
I12	0.028	C8	-0.185*
I14	-0.071	Constant	0.040
I15	0.146*		
I16	0.040		
I17	0.119*		
I19	0.158		
T1	0.021		
T2	0.028**	Observations	270
T3	0.022*	R ²	0.713
T4	0.001		
T6	-0.005		
F3	0.023		
F6	0.103*		
F9	0.119*		
F10	0.167**		
F13	-0.024		
F15	-0.057		
F17	-0.036		
F18	-0.027		
F20	0.213**		
F21	0.126*		

Table 5. Relation between Δ DR and other variables (Part 3)

Panel E. Relation between a ΔDR and future Tobin's Q			
Independent variables	Dependent variables	Independent variables	Dependent variables
	Tobin Qt	f21	16.651*
Defrevavat	0.456	f25	37.647**
Tobin Q t - 1	0.001	f28	-4.649
Roe	-0.224	f29	-30.709***
Size	1.84	f31	-26.942**
leverage	-1.004	f32	4.520
i1	-21.485***	f33	0.083
i3	-17.046***	f35	-28.356**
i4	8.064	f38	-21.911*
i5	-29.213***	f39	-31.275**
i6	16.486*	f40	-0.785
i7	9.994	f43	-30.987*
i8	14.067*	t2	2.286
i9	13.154	t3	-0.129
i10	17.771**	t4	-0.488
i11	-3.055	t5	0.672
i12	-0.468	t6	-0.411
i14	-4.583	Constant	-31.899
i15	0.479		
i16	8.572		
i17	-25.108***	Observations	270
i19	-25.614**	R ²	0.248
i20	-23.910**		
c1	17.974***		
c2	-15.993**		
c3	-3.934		
c4	-0.796		
c5	-16.915*		
c6	21.432**		
	Tobin Qt		
8	25.712**		
9	38.994***		
f3	2.411		
f6	36.121***		
f9	40.565***		
f13	23.643**		
f15	26.344**		
f17	26.608**		
f18	26.659**		

Note: *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

Table 6 shows the correlation between residuals and independent variables for the different equations of the hypotheses: Equation (1) for *H1*, Equation (2) for *H1*, Equation (3) for *H2*, Equation (4) for *H2*, and Equation (5) of *H3*.

Table 6. Endogeneity tests

Panel A. Correlation between the residuals and independent variables for Equation (1) for H1	
	Res
Res	1.0000
Defrevesales	-0.0240
Gpmt	0.0010
Sgrr	-0.0137
Size	0.0035
Leverage	0.0001
Investment	0.0035
Cashratio	-0.0000
Panel B. Correlation between residuals and independent variables for Equation (2) for H1	
	Res
Res	1.0000
defrevesales	-0.0137
Gpmt	-0.0031
Sgrr	0.0007
Size	-0.0005
Leverage	-0.0013
investment	0.0005
Cashratio	-0.0014
Accrsales	-0.0128
Panel C. Correlation between residuals and independent variables for Equation (3) for H2	
	Res
Res	1.0000
Defrevesales	-0.0195
Sgrr	-0.0018
Size	0.0037
Leverage	-0.0035
Investment	-0.0013
Cashratio	0.0018
Accrsales	-0.0193
Panel D. Correlation between residuals and independent variables for Equation (4) for H2	
	Res
Res	1.0000
Defravat	0.0049
Roat	0.0062
Sgrr	0.0018
Size	0.0023
Leverage	0.0033
Investment	-0.0026
Cashratio	0.0033
	0.0065
Panel E. Correlation between residuals and independent variables for Equation (5) for H3	
	Res
Res	1.0000
Defreavat	-0.0045
Tobinq	0.0046
Roe	-0.0111
Size	-0.0147
Leverage	0.0150
Investment	0.0097
Cashratio	-0.0159
Accravat	0.0014