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Chapter

Accounting Information Quality and Investment Decisions

Nouha Khoufi

Abstract

Accounting information quality has been said to play an important role in reducing information asymmetry. Thus, firms with high accounting information quality may enhance more investors' decisions. This paper aims to empirically examine the association between accounting information quality and investment decisions among firms in Tunisia. The sample of this study consists of 50 firms listed on the Tunis Stock Exchange covering 2012 to 2016. The findings imply that accounting information quality is significantly negatively related to investment inefficiency. The inclusion of control variables and the use of alternative models to measure accounting information quality provide consistent findings. This paper has several important contributions. First, this paper provides new empirical evidence in an emerging market. Although emerging markets make up the vast majority of economic activity around the world, they have received limited attention in academic research. Second, this paper can also help researchers to better understand and realize the governance role of accounting information, and push them to investigate the other role of accounting information deeply and broadly.

Keywords: accounting information quality, investment inefficiency, agency costs, financial constraint, asymmetry

1. Introduction

Many researchers have explored that the major objective of accounting information was to help its users make informed decisions. In addition, high-quality accounting information can also inform investors in a timely manner about the orientation of the firm's capital investments and help them to supervise managerial activities. Similarly, Bushman and Smith [1] find that high-quality information disclosures are beneficial to investors by monitoring management, encouraging them to make investment decisions efficiently and effectively and finally improving capital allocation efficiency and gaining more returns to investors. Houcine, [2] argue that investors are concerned with the quality of accounting information because it helps them to better understand the company's operating situation and other fundamentals. Therefore, high-quality accounting information affords external stakeholders a comprehensive understanding of firm fundamentals and allows them to take action to supervise management behavior.

An investment decision basically consists of the process of accepting or rejecting a particular investment project. Thus, it can be noted that, from a theoretical point of view, the decision is simple: projects for which the return is greater than the opportunity cost must be accepted, while others must be rejected. In real life,

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this process is not so easy, since the decision to accept or reject a project can be influenced by agents' interests in the decision-making process. Thus, accepting economically unviable projects or rejecting economically attractive projects can occur when the outcome of such deliberations offers benefits to decision makers, even when it causes losses to shareholders [3].

Firms use accounting information in investment decision-making to whether invest in physical project or invest in capital market. Firms need to invest in efficient investments with positive Net Present Value (NPV), and let go projects with negative NPV for better future growth and expansion. Accounting information is therefore important to facilitate informed decision [4].

This main objective of this study is to investigate the association of accounting information quality and investment decision using firm level observations in an emerging market such as Tunisia. The primary reason for choosing Tunisia is that we found an interesting research track in order to test the economic consequences of the quality of financial information in such an environment. Especially, in the face of this increasing doubt done over the quality of accounting results following the wave of financial scandals whereby Tunisia was not spared with BATAM case[1]. Also the Tunisian firms are characterized by a weak informational environment, namely a weak level of voluntary divulgation of information, little follow-up by financial analysts as well as quasi absence of media coverage by the economic and financial press, that turns the accountable information a component relatively more dominant among the set of information used by the different users of financial statements in their decision-making process [5].

The paper is organized into five sections including this introduction. Section 2 presents a brief theoretical framework discussing the determinants of the quality of accounting information, and the relationship between accounting information quality, investment decision, and financial constraint. Section 3 explains the empirical methodology, including the choice of variables and data issues. Estimation results are presented and discussed in Section 4 and we concluded in Section 5.

2. The association between the quality of accounting information and the investment decision

One of the main objectives of accounting information is to provide information that can facilitate the efficient allocation of capital. In other words, quality of financial information should be one of the most important inputs in decision-making regarding capital allocation that is investments [6]. The Financial Accounting Standards Board (FASB) states that one objective of financial reporting is to help present and potential investors in making rational decisions for investment. Firm is seen as investing efficiently if it invested in projects with positive Net Present Value (NPV). If the firm passed up on investment opportunities that would have positive NPV, then the firm was under-investing. On the other hand, when firm invests in investments with negative NPV, the firm was over-investing. Under or over-investment indicate that the firm is not investing efficiently. Hence, the level of firm's investment efficiency can be gauged from the absence of under or over-investment [1].

Based on 3600 firm-year observations of A-share listed companies on the Shanghai and Shenzhen exchanges from 2004 to 2006, Li [7] examines the

[1] It is a manipulation case of accounts that auditors, such as in the Enron case in the United States, did not report in time and that took on the emergence of a real financial scandal, affecting the credibility of the stock market as well as weakening seven local banks.

influence of accounting information quality on the under- and over-investment of listed companies. His results show that high-quality accounting information reduces the risks of moral hazard and adverse selection and inhibits both under-investment and overinvestment by ameliorating contracts and supervision, thereby improving capital allocation efficiency at the company level.

2.1 Quality of financial information, capital cost and information asymmetry

The accounting The accounting information represents an important source of information specific to the company that tends to reduce the level of information asymmetry between investors and the company and therefore contributing to a better functioning of financial markets [8].

Under lower external financing costs and investor's capital rationing, there is less possibility that managers pass up investments with positive NPV (lower under-investment). According to Jensen [9], lower adverse selection opportunity decreases the opportunity for managers to engage in value-destroying activities and self-maximizing decisions such as build an empire-building with ample capital (less over-investment).

Therefore, Easley and O'Hara [10] show that poor quality of accounting information leads to an undiversifiable information risk between informed and uninformed investors, thus increasing the cost of capital. On the other hand, the publication of better financial information in terms of quality and quantity would reduce this level of risk and therefore the cost of capital. Similarly, Yee [11] asserts that poor quality of the published information is considered to be a non-diversifiable risk factor leading to an increase in the risk premium, a component of the cost of capital. Also, Lambert [12] demonstrate how better quality of information accounting disclosure consents to reduce systematic risk by changing the perceptions of different stakeholders in the financial market regarding the distribution of future cash flows, and as a result, attenuating the cost of capital. For his part, Suijs [13] illustrates that better quality of financial information reduces the cost of capital by lowering the volatility of securities by improving risk sharing between generations of investors.

As well, in the light of literature developed above and empirical works, if a better quality of accounting information published, namely in terms of reliability, enables to reduce the levels of information asymmetry, and so the capital cost, it will be associated with a better decision of investment, facilitating the access to external funding sources for companies with a less cost, and consequently to reduce under-investment. Such an association was documented as well over the emerging developed markets, from which, we suggest testing the following hypothesis:

H1*:* A better quality of published accounting information is negatively associated with under-investment.

2.2 Quality of financial information, agency costs and control of managers

According to previous studies from the perspective of agency theory, the main reason for financial information is to alleviate the problem of information asymmetry by increasing shareholders, creditors, and others access to information about a company.

As the access to the accounting information increases, the privileged position held by managers in relation to private information decreases [9]. Based on this assertion, the accounting information is currently used as an input within contracts of inciting remuneration in order to motivate the managers to act in the interest of stakeholders and constitute an important source of information on which governance organs are based on controlling managerial activities [1, 2].

For instance, several past studies find that accounting information is used by shareholders to monitor managers [1, 12] and it is an important source for investors in monitoring firms' performances [4, 14]. Therefore, if higher financial information quality improved investors and shareholders ability to monitor managerial activities and detect their dysfunctional behavior such as over and under-investment, it could lead to managers investing more efficiently.

Based on the above theoretical arguments, we tend to check the hypothesis below:

H2*:* A better quality of published accounting information is negatively associated with over-investment.

3. Research methodology

3.1 Sample and data collection

In order to test our hypotheses in the Tunisian context, we select a sample of 50 companies listed on the Tunisian Stock Exchange (TSE). This number is limited because we have eliminated the financial companies due to their specific financial data. This study is based on observations from 2012 to 2016. The data are collected from the publications of the sample companies (annual reports, prospectuses…) available at the Financial Market Council, among some brokers or some companies' websites and on the publications of the TSE.

Table 1 provides distribution of the sample by industry based on the DataStream-industry classification. The sample is represented by 12 industries.

3.2 Investment decisions

First, we tested the association between the investment decisions and the quality of accounting information conditional on the assumption that the company is in a situation more prone to over or underinvestment. Similar with past studies [6, 15],

Industry	N	Percentage (%)
Construction and materials	7	14%
Electronic and electrical equipment	3	6%
Food producers	2	4%
Telecommunication	5	1%
Electronic and electrical equipment	6	12%
Oil equipment and services	3	6%
Health care equipment	2	4%
Industrial metals and mining	4	8%
Industrial transportation	5	1%
Software and computer services	6	12%
Support services	4	8%
Technology hardware	3	6%
Total	50	100%

Table 1.
Sample distribution by industries.

both overinvestment (positive deviations from expected investment) and underinvestment (negative deviations from expected investment) are considered inefficient investments. Specially, we use the model that predicts investment as a function of revenue growth. The model is described as follow:

$$\text{Invest}_{i,t+1} = \beta_{i,t+1+} \text{RevGrowth}_{i,t} + \varepsilon_{i,t+1} \quad (1)$$

Where:

$Invest_{i,t+1}$ = total investment expenditure for year t + 1, which relate to fixed capital investment and are measured by the difference between the gross values of fixed assets of t + 1 and t, deflated by the capital stock at the start of the period.

$RevGrowth_{i,t}$ = revenue growth and defined as percentage change in revenue from year $t - 1$ to t.

$\varepsilon i, t$: the residuals of the model, which represent the inefficiency of the investment.

Then, we will then use the residuals of model (1) as a specific proxy for the level of deviation of the company from its expected level of investment. The negative (positive) residuals from the regression model (1) indicate under investment (over investment). In our analyses, we use the absolute value of residuals as a proxy for investment efficiency.

Thus, based on the residual of the model, we could identify differences and make the necessary groupings, as shown in **Figure 1**.

3.3 Accounting information quality

There is no universally accepted measure of accounting information quality [6, 16]. But no number could be as attractive to users of financial statements as the accounting result [16]. According to Francis et al. [17], the quality of accounting results has several attributes, namely reliability, relevance, conservatism, punctuality, smoothing, predictability and persistence. At the level of this research, we will in particular be interested in two attributes of the accounting result, namely: the quality of accruals and accounting conservatism. Our choice focused on these two attributes since it has been widely demonstrated by the various previous works [6, 15, 18, 19] that it is mainly these two attributes of the accounting result which improve the investment behavior of companies. Practically, a better quality of accruals increases the accuracy and reliability of accounting results, lowering the cost of capital and thus reducing underinvestment. On the other hand, a more conservative accounting result, allocates to governance bodies to exercise better

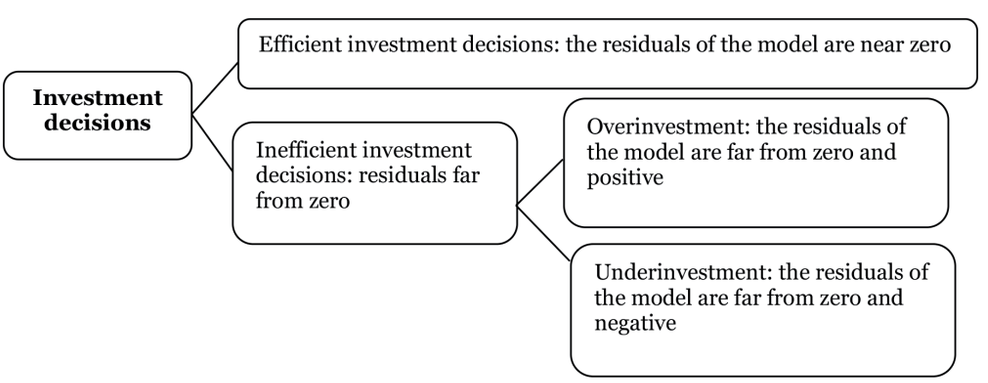


Figure 1.
Grouping of firms according to efficiency in investment decisions.

control over managerial decisions, and therefore to reduce ex-ante their incentive and ability to undertake unprofitable investments.

3.3.1 Measure of the quality of accruals

Managers can use their discretion to manipulate results via accruals and to alter the actual performance of the business. This is why the results, which quickly turn into cash flow, represent the most desirable quality of profits. Francis et al. [17], consider that this rapid transformation of results into cash flow, is at best captured by the model of Dechow and Dichev [20]. The DD model (2002) suggests that the quality of accruals is assessed by the degree of association between the change in total current accruals with cash flows from past, present and future periods. However, we will use the modified DD model (2002) as proposed by McNichols [21] to determine discretionary accruals. This model states that beyond cash flows, the change in net sales and the proportion of tangible fixed assets are variables important in forecasting with respect to currents accruals:

$$CUACC_{i,t} = ß_0 + ß_1 CFO_{i,t-1} + ß_2 CFO_{i,t} + ß_3 CFO_{i,t+1} + ß_4 ASi,t + ß_5 Asset_{i,t} + \varepsilon_{i,t}.$$

Where:

$CUACC_{i,t}$*:* the amount of current accruals of firm i for year t, calculated as follows: Δ *CAit* - Δ *CLit* - Δ *LIQit* +Δ *DEBit.*

Where:

Δ **CAit***:* change in current assets between t - 1 and t;

Δ **CLit***:* change in current liabilities;

Δ **LIQit***:* change in liquidity t - 1 and t;

Δ **DEBit***:* change in current debts between t - 1 and t;

$CFO_{i,t-1}$, $CFO_{i,t}$ *and* $CFO_{i,t+1}$*:* cash flow from operations for the years t-1, t and t + 1,

$AS_{i,t}$: change in annual sales between t-1 and t;

$Asset_{i,t}$: the proportion of tangible fixed assets in year t.

In this model, the absolute value of the residuals is used as a proxy the quality of accruals (QACC). We will multiply this value by (−1), so that a higher value corresponds to a better quality of the accruals, and therefore, of the accounting results. The quality of accounting information is therefore assumed to be inversely proportional to the company's propensity to manage the accounting result.

3.3.2 Measure of accounting conservatism

At the level of the current research, we are going be interested in an attribute of accounting result, namely accounting conservatism. In fact, a more conservative accounting result, allocates to governance organs to exert a better control on the managerial decisions, and thus to reduce ex-ante their incentives and their qualifications in order to undertake non-profitable investments. Yet, we will specifically be interested in conditional conservatism. According to Gively, and Haynes [22], there are two types of conservatism: conditional and unconditional. Unconditional conservatism results in under-evaluation of the accounting value of net assets since the start of the economic activity of the company, because of the selection beforehand, of accounting conservatism methods. While under-evaluation of assets led by the conditional conservatism is attributable to the delay of accountability between latent losses and gains. As we prepare to show that through asymmetric recognition

of gains and losses, this form of conservatism endorses a role of control on the activities of managers, namely those that are reattached to the investment decision. We will use the accumulation of non-current accruals, in view of apprehending the degree of conservatism for every company-year.

The current measure was initially developed by Givoly and Haynes [22] and then repeated by several authors [19, 23]. These latter argue that the underlying intuition behind resorting to this measure lies in the fact that it captures caution and vigilance such as the trends of accountants to require more auditing so as to recognize the good news in terms of financial statements and manage to anticipate bad news. In fact, non-current accruals comprise accounting posts subject to the application of the precaution principle, such as: provisions, change effects at the level of accounting estimation methods, losses on asset disposals, impairment of assets, etc.

Though these rubrics must be mandated by the Generally Accepted Accounting Principles, both the schedule and size of these loads/expenses, are left to the discretion of the managers, which makes them largely subject to their discretion and therefore constitutes a measure of accounting conservatism [24].

Non-current accruals *NCUACC* are measured by the difference between total accruals (net outcome– operating cash flow) as well as current accruals.

We will estimate the size of *NCUACC* over a period of 3 years, ranging from t-2 to t. To better facilitate the interpretation, we will multiply this value by (−1). Thus, positive values are synonymous with conservative accounting practices.

3.4 The control variables

Consistent with past studies such as Verdi [3], Biddle et al. [15] and Chen et al. [6] following control variables are applied for this study:

MTBi$_{,t}$ = we retain the Market ratio to book as the first measure of growth opportunities. It was measured by Denis [25] via the rapport between the market value and the accounting value of proper capitals (*Market to book ratio*).

XCE$_{i,t}$ = done by Biddle et al. [15] we will include the sales growth as an additional measure of growth opportunities. It was measured by the variation of the company turnover between the year t and t-1.

SIZE$_{i,t}$ = logarithm of the total accounting asset. The firm size equally represents an explicative factor of investment expenditure, since it can have an impact on the access to external capitals.

DEBT$_{i,t}$ = ratio total debt divided by the total asset. With reference to Myers [26] the financial shift can lead to under-investment caused by the over-indebtedness problem.

3.5 Model specification

To test our hypothesis on whether accounting information quality in year t affects investment decisions in year t + 1, we estimate a model that connects inefficiency of investment with the various measures of the quality of accounting information and a set of control variables. We will estimate a logistic regression in order to take counts the binary nature of our dependent variable, which predicts the likelihood that a firm will belong to one of the two groups.

This specification considers simultaneously, but separately, the probability of on and under-investment. The model to be tested is as follows:

$$\text{InvestIneff}_{i,t+1} = \beta_0 + \beta_1\ \text{ACCOUNQUA}_{i,t} + \sum \beta_j\ \text{CONTR}_{i,t} + \varepsilon_{i,t+1} \qquad (2)$$

Where,

$InvestIneff_{i,t+1}$: Inefficiency of investment represents over or under-investment which is a binary variable that takes the value of 1(0) if the residuals of the model (1) are positive (negative), 0(1) otherwise.

$ACCOUNQUA_{i,t}$: the measurement of the quality of financial information, as described below.

$\mathbf{CONTR}_{i,t}$: different control variables, as defined previously.

4. Analysis of results

4.1 Descriptive analysis

Table 2 shows that Tunisian companies have a poor quality of their accounting results compared to other countries. Indeed, the average of their accruals is around (−0.0322), this level is lower than that detected by Francis et al. [18] in the American context (−0.0442). At the same time, it appears from **Table 1** that Tunisian companies exhibit an average level NCUACC of (0.008), revealing that they practice low conservative accounting compared to the average value (0.01) detected by Xu et al. [19] on the Chinese market.

4.2 Multivariate analysis

Before moving to multivariate analysis, it is first important to evaluate the multicollinearity by using Variance Inflation Factor (VIF), and the results show that VIF values are also relatively small and there is no multicollinerity issue among variables (**Table 3**).

Table 4 presents the multivariate results in panels testing the relationship between the quality of the accounting result and the probability of under and overinvestment. The Logit model applied to panel data can be estimated using a fixed or random effect. If the estimation of fixed effects is adopted, the constant is treated as an unobservable characteristic specific to firm i in correlation with the other variables in the model.

Since the dependent variable is binary and the specific effect must be eliminated, only companies that have changed status from one period to another are taken into account in the estimate, which implies the exclusion of observations which have not changed over time [22].

On the other hand, if the estimate adopted follows a random effect, the constant is considered as a non-observable random variable and not correlated with the other variables, which allows it to be integrated into the model [27]. So for these reasons,

Variable	Average	Gap Type	Minimum	Maximum
QACC	−0.032	0.352	−0,511	2.987
CONSV	0.008	0.073	−0.244	−1.205
MTB	1.886	2.217	−0.431	14.566
XCE	0.4178	0.755	−3.236	1.490
SIZE	16.566	0.998	16.258	22.314
DEBT	0.722	4.534	0.033	0.927

Table 2.
Descriptive statistics of variables.

	Tolerance	VIF
QACC	0.993	1.020
CONSV	0.991	1.009
MTB	0.981	1.007
XCE	0.972	1.022
SIZE	0.934	1.042
DEBT	0.993	1.004

Table 3.
Tolerance values and VIF without bias.

we opted to adopt the random effect model so as not to exclude observations that do not vary over time. Before interpreting our results, it is important to note that the prediction quality of our models is very strong (90%) and this, for the different specifications selected. The models also have very good overall significance, insofar as the likelihood ratio test (LR test) is significant at the 1% level.

It is possible to note in **Table 4** that the quality of the accruals increases the probability of underinvestment, while it has no significant impact on the probability of overinvestment. Our results can, however, be explained by the contextual specificities of the Tunisian market as well as the behavior of the Tunisian investor. Thus, we can first argue that the low quality of financial information displayed on average by Tunisian companies may explain our results.

In fact, according to the descriptive statistics, Tunisian firms display on average a lower quality of their accruals in comparison to American or Chinese firms. A priori, this level of quality does not seem sufficient enough in the eyes of the Tunisian investor, to constitute a means making it possible to attenuate the levels of asymmetry of information with regard to the firm, to reduce its cost of capital. Then, we can invoke the behavioral dimension of the Tunisian investor in the explanation of our results. Indeed, the latter may not have enough confidence in the accuracy of the financial information conveyed through the accounting results, so that it cannot reduce the levels of information asymmetry towards the firm. On the contrary, for the Tunisian investor, publicly disclosed financial information would increase the levels of information asymmetry, since the latter does not consider such information as a reliable source of information and would have more confidence in information collected on its own and through private channels. In fact, Loukil and Yousfi, (2012) [28] recently noted that the Tunisian investor has no confidence in the public information disclosed by companies and would have more confidence in private information. The authors specifically found that only private information reduces the levels of information asymmetry on the Tunisian stock market. As for accounting conservatism, it remains to have no effect on the probability of over and under investment. Such a result is contradictory to that found by Xu et al., (2012) [19] on the Chinese market, but can be explained by the low conservative accounting practiced by Tunisian companies in comparison to Chinese companies.

Furthermore, the results tell us that neither the quality of the accruals nor the accounting conservatism have a significant effect on overinvestment decisions. We can explain our results by the fact that the low level of accruals displayed on average by Tunisian firms, does not allocate to financial information to take on a governance role, to reduce the agency costs associated with the control of managers and to improve the selection process investment projects. In other words, the role of governance granted to accounting conservatism is conditioned by a set of control mechanisms, which are lacking in the Tunisian context.

	UNDINVEST		OVERINVET	
	QACC	CONSV	QACC	CONSV
ACCOUNQUL	0.341 (2.26)**	0.351 (0.33)	−0.915 (−0.29)	−1.419 (−0.41)
MTB	−0.656 (2.35)***	−0.735 (−2.34)***	0.735 (2.51)***	0.709 (2.53)**
XCE	−0.67 (−1.82)***	−0.654 (−1.75)*	0.789 (1.72)*	0.603 (1.57)*
SIZE	−5.489 (4.16)***	5.769 (4.31)***	−5.06 (−4.21)***	5.863 (−3.73)***
DEBT	0.332 (0.22)	0.321 (−0.12)	−0.009 (−0.03)	−0.614 (−0.41)
Constant	−91.123 (−2.86)***	−91.560 (−3.28)***	94.861 (4.00)***	93.312 (3.43)***
Log likelihood	−55.881	−53.635	−57.019	−54.361
LR test	25.73***	23.43***	23.37***	21.03***
Quality of Prediction	91.42%	90.24%	89.68%	91.45%
Specific Effect	Random	Random	Random	Random

*Coefficient significatif à 10%.
**Coefficient significatif à 5%.
***Coefficient significatif à 1%.

Table 4.
Results of the estimation of the relationship between the quality of accounting results and the probability of under-investment and over-investment.

With regard to control variables, the results show that the MTB, Cash-Flow and liquid assets ratios increase (decrease) the probability of overinvestment (underinvestment). While the size of the firm decreases (increases) this probability. As for the debt ratio, this variable persists in having no significant effect on the probability of over and under investment. These different results are similar to those found by Biddle et al. [19].

5. Conclusion

This study focuses on the importance of the quality of accounting information quality on the investors' decisions making. Indeed, prior studies state that better financial information, contributes to making better investment decisions, as it reduces the level of information asymmetry. This finding can be explained by the fact that high-quality financial information facilitates the process of monitoring managers because, by reducing existing asymmetries, it inhibits opportunistic behavior, ensuring the rights of both shareholders and creditors. We are extending this current of research to the context of emerging market, particularly Tunisia, because of the importance of its challenges for businesses. In order to test our hypotheses, we have used two attributes of the quality of accounting results, namely: conditional conservatism and the quality of accruals.

The results of this study indicate that the quality of the accruals increases the likelihood of underinvestment. We attribute such a result to the lack of confidence that the Tunisian investor places in the accounting information vehicled through the

accounting results. On the other hand, the results reveal that the quality of accruals has no effect in reducing the probability of overinvestment. The low level of accruals displayed on average by Tunisian firms could explain such a result.

Furthermore, we reveal that accounting conservatism has no significant effect and therefore cannot constitute a lever for action in improving the investment decisions of Tunisian companies. We can explain these results by the fact that the Tunisian firms practice a weak conservative accounting so that this level is not sufficient to allow this attribute of the result to assume an informational role allowing to attenuate the problems of asymmetry of information present between the firm and its capital providers.

Our findings suggest that countries, especially emerging markets, can benefit from improved financial information quality. Hence, these countries should take initiative to improve their market infrastructures such as adopting better accounting standards and encourage greater disclosure as well as enhancing the role of enforcement agencies. In addition to this, these findings could be of interest to the international organizations such as "World Bank" and "International Monetary Fund", whose missions are to aid countries with developing and transitional economy, and improve living conditions of their citizens. It is likely that more efficient investments will lead to better allocation of capital and resources and this may lead to higher social welfare. One limitation of this paper is that the relationship between accounting information quality and capital investment choice may differ with the different development stage of the industry. Maybe this issue is an important topic for future research.

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Conflict of interest

The author declares no conflict of interest.

Notes

1. There are two types of conservatism: Conditional and unconditional. Unconditional results in under-evaluation of the accounting value of net assets since the start of the economic activity of the company, because of the selection beforehand, of accounting conservatism methods (Givoly et al.; 2007). While under-evaluation of assets led by the conditional conservatism is attributable regarding the delay of accountability between latent losses and gains.

2. *QACC* = measure of the quality of accruals, as estimated according to the model of Dechow and Dichev (2002); *CONSV* = measure of conservatism by means of non-current Accruals; *MTB* = market to book ratio (market value of equity compared to accounting value); *XCE* = Rate of sales growth of year t, measured by the variation of the firm's turnover between the year t and t-1;

SIZE = logarithm of the total accounting assets of the firm; *DEBT* = total debts reported to the accounting value of the total asset.

3. The **Table 3** presents the results of estimates of panel logistic regression with random effects. The dependent variable is based on the unexplained level of investment. *UNDINSVT* = Firms classified among those which underinvest; *OVERINVST.*

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