THE PERSISTENCE OF EARNINGS AND EARNINGS COMPONENTS: EVIDENCE FROM ALGERIAN COMPANIES (2006-2017)

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ABSTRACT

This paper aims to explore whether earnings and earnings components (cash flows and accounting accruals) of Algerian companies are persistent and whether earnings components have different levels of persistence. The research design was based on Sloan's (1996) model, using a panel data of 20 Algerian companies for the period 2006-2017. The results indicate that earnings, cash flows and accounting accruals of studied Algerian companies are persistent, while the recorded persistence levels are substantially lower than studies in developed countries. On the other hand, previous studies suggested that cash flows are more persistent than accounting accruals, while this study finds that the differential persistence between cash flows and accounting accruals is not substantial.

KEY WORDS

Accounting quality, Earnings persistence, Cash flows, Accounting accruals, Algerian companies.

JEL CLASSIFICATION : C23, M41

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LA PERSISTANCE DES BÉNÉFICES ET DES COMPOSANTS DES BÉNÉFICES : EVIDENCE DES ENTREPRISES ALGÉRIENNES (2006-2017)

RÉSUMÉ

L'objectif de cet article est de déterminer si les bénéfices et les composants des bénéfices (flux de trésorerie et comptes de régularisation) des entreprises algériennes sont persistants, et si les composants des bénéfices présentent des niveaux différents de la persistance. L'étude expérimentale est basée sur le modèle de Sloan (1996), et a utilisé les données de panel de 20 entreprises algériennes durant la période 2006-2017. Les résultats indiquent que les bénéfices, les flux de trésorerie et les comptes de régularisation des entreprises algériennes étudiées sont persistants, tandis que les niveaux de persistance enregistrés sont inférieurs à ceux obtenus dans les études réalisées dans les pays développés. Par ailleurs, des études antérieures ont suggérées que les flux de trésorerie sont plus persistants que les comptes de régularisation, alors que cette étude a révélé que la différence entre la persistance des flux de trésorerie et la persistance des comptes de régularisation n'est pas significative.

MOTS CLÉS

Qualité du system comptable, Persistance des bénéfices, Flux de trésorerie, comptes de régularisation, Entreprises algériennes.

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استمرارية الأرباح ومكونات الأرباح:
دليل من المؤسسات الجزائرية (2006–2017)

ملخص

يهدف هذا المقال إلى استكشاف فيما إذاكانت الأرباح ومكونات الأرباح (التدفقات النقدية والمستحقات المحاسبية) للمؤسسات الجزائرية تتميز بالاستمرارية، وفيما إذاكان لمكونات الأرباح مستويات مختلفة من الاستمرارية. اعتمدت الدراسة الميدانية على نموذج Sloan (1996)، باستخدام بيانات سلسلة زمنية مقطعية، ضمت 20مؤسسة جزائرية خلال الفترة 2006-2017. أشارت النتائج إلى أن الأرباح والتدفقات النقدية والمستحقات المحاسبية للمؤسسات الجزائرية المدروسة تتميز بالاستمرارية، في حين كانت مستويات الاستمرارية المسجلة أقل بكثير من تلك المسجلة في الدراسات التي أجريت في الدول المتقدمة. من ناحية أخرى، أكدت الدراسات السابقة أن التدفقات النقدية أكثر استمرارا من المستحقات المحاسبية، بينما وجدت هذه الدراسة أن فارق الاستمرارية بين التدفقات النقدية والمستحقات المحاسبية غير مهم.

كلمات المفتاحية

جودة النظام المحاسبي، استمرارية الأرباح، التدفقات النقدية، المستحقات المحاسبية، المؤسسات الجزائرية.

تصنيف جال:M41،C23

INTRODUCTION

The financial statements that published by companies are the most important channel of financial communication, and the most important mechanism of general purpose financial reporting, in order to provide common information for a wide range of users, whom cannot ask company to provide information directly for them so that their needs can be met as much as possible. According to IASB (2018), the objective of general purpose financial reporting is to provide useful financial information to the primary user group. The usefulness of financial information requires a high level of quality that can be achieved by enhancing their qualitative characteristics.

To be useful for decision-making, financial statements must provide information about the company's economic resources and claims, and the change during the period in economic resources and claims. Company cannot provide reasonably complete information about its financial performance without identifying and measuring its economic resources and the claims (IASB, 2018). Considering that the statement of profit or loss is the main source of information about the financial performance of a company in the period, earning quality is a determinant of financial information quality, and thus its usefulness for decision-making.

The primary focus of financial reporting is information about a company's financial performance provided by the measures of earnings and its components. Investors, creditors and others who are concerned with assessing the company's future cash flows and its ability to generate favorable cash flows leads primarily to an interest in information about earnings, in order to assess management's stewardship, which represent an input needed in making resource allocation decisions (FASB, 1978; IASB, 2018).

Problem statement

Algeria has worked hard for developing accounting practices and improving the quality of accounting system, to ameliorate the quality of financial statements. This orientation is the result of the radical changes known on the economic and institutional level since the

beginning of the 90's, through the shift from socialism to capitalism. It is also motivated by the developments in international accounting, and the increasing trend towards the standardization of accounting practices at the international level.

The previous transformations have obligated the Algerian authorities to revise and update the National Accounting System (PCN) that reflects the socialist phase. The accounting reform in Algeria has been oriented toward the international solution, through adopting the Financial Accounting System (SCF) that adapted with International Financial Reporting Standards. The new accounting referential has included several previously unknown accounting practices, especially its high focus on measuring earnings, to provide a faithful representation of the company's financial performance.

The adoption of the Financial Accounting System in Algeria since 2010 as a result of several economic and accounting requirements, under the rising role of financial information quality, has led our study to examine the persistence of earning and its components as a proxy of earning quality in some Algerian companies.

Purpose and importance of the study

The importance of this study stems from the importance of its subject, where the properties of earnings are the main determinants of financial statements quality that represents a target of various actors in the accounting community. Carrying out the study in the Algerian environment with its particularities, it also increases the importance of study, considering the lack of studies in this field.

The objective of this study is mainly to measure the persistence of earnings in Algerian companies, and the persistence of their components, including cash flow component and accrual component, and comparing between the persistence of each component.

Research questions

The following research questions guided this study:
- Are the earnings of studied Algerian companies persistent?
- Is there a difference between the persistence of operating cash flows and accounting accruals of studied Algerian companies?

Hypotheses

The following null hypotheses weretested at 5% level of significance:

Hypothesis 1: The earnings of studied Algerian companies are not persistent.

Hypothesis 2: There is no difference between the persistence of operating cash flows and accounting accruals of studied Algerian companies.

1- THEORETICAL BACKGROUND

Managers are much concerned about meeting analysts forecasts as means to protect themselves. On the other hand, analysts are interested in how best to measure earnings quality to maximize the portfolio of investors. Therefore, it is becoming now difficult for the analysts, managers and investors in general to ignore the rising role of earnings quality in resources allocation (Lyimo, 2014). This allocation can be achieved through improving the transparency, establishing the confidence and reducing the information asymmetry in the markets. However the extant literature has not yet come to a unanimous conclusion on what earnings quality is; rather it is viewed as a conceptual term that can be defined from many different perspectives (Kamarudin and Wan Ismail, 2014).

Dechow and Schrand (2010) have classified earnings quality measures into three broad categories: properties of earnings, investor responsiveness to earnings, and external indicators of earnings misstatements. The first category is crucial because it comprises internal proxies of earnings quality and focuses primarily on financial statements (Accounting-based measures). According to Holthausen and Watts (2001, p. 9-11), this category includes several properties of

published earnings, which expected to be related with their usefulness in decision making, especially earnings persistence.

Earnings persistence is an important characteristic in order to reach an acceptable level of earnings quality, as it highly related with the relevance of financial information that refers to the fact that financial information is capable of making a difference in users' decisions, and thus helping them to make new predictions (Predictive value), confirm or correct prior predictions (Confirmatory value) or both. The predictive value and the confirmatory value as components of the relevance IASB (2018) require sustainable or core earnings in a way making reported earnings, before extraordinary items that are readily identified on the income statement, a good indicator for future earnings (Bissessur, 2008).

Dechow and Schrand (2004) defined earnings as of higher quality if they are: more persistent and less volatile, more strongly associated with future cash flows, and more strongly associated with contemporaneous stock price performance or market value. For that, earnings persistence is not a complete definition of earnings quality (Hanlon, 2005). It has long been viewed as a desirable property of earnings, as it wins much favor from financial analysts and investors when they invoke benchmarks to forecast future lifetime earnings or assess permanent earnings (Cheng and Liu, 2016).

Earnings persistence has defined as the extent to which earnings in one year predict future earnings. This concept focuses on sustainability (stability) and volatility (variance) of earnings, since persistent earnings indicate a sustainable and less volatile earnings and thus, a higher predictive ability of time-series properties of earnings (Clubb and Wu, 2014; Perotti and Wagenhofer, 2014; Licerán-Gutiérrez and Cano-Rodríguez, 2019).

Earnings persistence is a multidimensional concept that relates with other properties of earnings like earnings smoothness, conservatism, earnings management, predictive ability, and value relevance. Earnings smoothness and earnings management are expected to affect positively earnings persistence, which can deceive users of financial statements by providing virtual persistent earnings. However,

conservatism that generates much of one-time or special items is expected to penalize earnings persistence. On the other hand, earnings persistence can improve the predictive ability of earnings and cash flows and their value relevance.

The most commonly used empirical proxy for earnings persistence is the auto-regression coefficient of earnings on lagged earnings that proposed by Sloan(1996), which measures the ability of current earnings to predict a one-year ahead earnings. This model was later extended by disaggregating lagged earnings into cash flows and the main components of accruals, based on the idea that the cash-flow component of earnings has greater predictive ability than the accrual component does.

Accounting accruals and cash flows are the known two components of earnings, which have different characteristics in terms of persistence because they reflect different aspects of performance. Accounting accruals have based on several accounting principles, especially the Accrual principle, Time period principle Conservatism principle, and Matching principle. They represent the non-cash earnings, including non-paid expenses and non-received income and other accounting Adjustments. On the contrary, cash flows not affected by the accounting principles; they only based on cash basis, and include paid expenses and received income.

Studies stated that the accrued component of earning is less persistent than its cash component. Lewellen and Resutek (2019) documented two main explanations for the low persistence of accruals in the literature. The first is that subjectivity and distortions in financial reporting lead to transitory measurement error in accruals and earnings (The measurement error hypothesis). The second is that accruals are closely linked to investment and predict lower future profitability because of decreasing returns to scale, adjustment costs associated with investment, or conservatism in accounting (The investment hypothesis).

Lewellen and Resutek (2019) proposed a third explanation, suggesting that an increase in input prices raises the firm's production and inventory costs today but lowers future profits when the inventory is sold. An increase in demand leads to a temporary rise in profits and

working capital, followed by mean reversion in the variables as competition drives prices and profitability back to their long-term equilibrium levels (The product markets hypothesis). According to Lewellen and Resutek (2019), all three hypotheses imply that accruals should be negatively related to next year's profitability, but they make different predictions about the long-run behavior of profits, profitability, sales, and expenses.

Dechow and Ge (2006) emphasized that conservatism determines accounting accruals and special items recognition. Consequently, the earnings persistence of firms in different accrual level is affected. Nguyen (2013) found that in high accrual firms, earnings persistence decreases, while negative special items lead to the increase in earnings persistence when positive items make earnings persistence decrease with a larger magnitude.

Finally, Dechow et al. (2010) determine two broad streams to the earnings persistence research. The first research is motivated by the assumption that more persistent earnings will yield better inputs to equity valuation models, and hence a more persistent earnings number is of higher quality than less persistent earnings. The goal of the studies is to identify financial characteristics associated with persistent earnings. These studies are limited in their contribution to evaluating persistence as a proxy for earnings quality, because of the maintained assumption that more persistent earnings are more decision-useful for equity valuation. Therefore, the second stream of research attempts to address the broader issue of whether earning is useful for decisions in that it improves equity valuation outcomes. An important issue in this literature is the benchmark used to evaluate the equity market outcomes.

2- LITERATURE REVIEW

There is a wide relatively literature on the persistence of companies' performance measures. The early studies examined the time series properties of earnings. Ball and Watts (1972) found that annual accounting income follows a sub-martingale process, while Watts and Leftwich (1977) provided evidence suggesting that annual income

follows a random walk process. Lipe (1986) suggested that different components of earnings vary in terms of persistence.

Dechow and Dichev (2002) tried to propose a new measure of one aspect of the quality of working capital accruals and earnings, arguing that the quality of accruals and earnings is decreasing in the magnitude of estimation error in accruals. The study included 15234 firm-year observations for 1725 firms, obtained from COMPUSTAT from 1987 to 1999. It documented that observable firm characteristics can be used as instruments for accruals quality (e.g., volatility of accruals and volatility of earnings), and that the proposed measure of accruals quality is positively related to earnings persistence.

Fairfield et al. (2003) tested the conclusion of prior research providing evidence that a higher proportion of accrued versus cash earnings is associated with lower earnings performance in the subsequent period, as a result of the reversal effect of accruals on earnings, which signal to earnings management. Using 35083 firm-year observations from COMPUSTAT during 1964-1993, they found that accruals are more associated than cash flows with invested capital in denominator of profitability measure. In contrast, accruals and cash flows have no differential relation with one-year ahead operating income. The evidence is not consistent with accruals having a reversal effect on earnings. They suggested that the lower persistence of accruals versus cash flows may not be due to earnings management but may rather be due to the effect of growth on future profitability.

Francis and Smith (2005) reexamined prior studies' conclusion that accruals are less persistent than cash flows, focusing on two aspects of persistence. The first (Time specificity) refers to the fact that persistence describes how current-period shocks to income translate into next-period income. However, the second is firm-specificity. The study included 83962 firm-year observations from the COMPUSTAT database, during the period of 1962-2001. The results show that the inclusion of non-current period transactions leads to a downward (upward) bias on the persistence of accruals (cash flows). Using developed alternative measures of accruals and cash flows, the study shows that the differential persistence of cash flows over accruals is

more than 70% smaller. The evaluation of persistence using firm-specific estimations indicated that more than 85% of firms shown no evidence that accruals are less persistent than cash flows.

Dechow and Ge (2006) analyzed the effects of magnitude and sign of accruals on earnings persistence, using 63875 firm-year observations over 1988-2002, obtained from the COMPUSTAT. The results showed that the low persistence of earnings in low accrual firms is primarily driven by special items, and that special item-low accrual firms have higher future stock returns than other low accrual firms. The results also showed that special item-low accrual firms have poor past performance and declines in investor recognition (analyst coverage and institutional holdings). Special items continue to explain future returns after controlling for these factors.

Doukakis (2010) examined the persistence of earnings and earnings components after the adoption of International Financial Reporting Standards (IFRS). The study included 956 firm-year observations abstracted from DATASTREAM - WORLDSCOPE database, over the period 2002-2007. The analyses included two years before and two years after the adoption of IFRS and suggested that IFRS measurement and reporting guidelines do not seem to improve the persistence of earnings and earnings components.

Ebaid (2011) examined the persistence of earnings in Egypt, and whether it is more attributable to cash flow or accrual component of earnings. Based on74 Egyptian listed firms over 1999-2007, the study found that the earnings of Egyptian firms are persistent, although the persistence parameters are less than those documented in developed markets. The study found also that the persistence of earnings performance is attributed more to the cash flow component than to accrual component of earnings.

Tapia and Fernández (2011) examined the properties of accruals, cash flows and earnings in European private firms, starting from several hypotheses about the persistence of earnings and its components. They used available data of all non-listed European firms on the AMADEUS database, for the period 1995-2006. The findings suggested that private companies seem to behave in a different manner than the publicly traded

firms, and the differences are significant when accruals are extreme. They also suggested that the persistence of ROA relative to cash flow in European private firms follows a different pattern than in US public firms. However, differences in persistence are not significant when companies report positive versus negative earnings.

Rajizadeh and Rajizadeh (2013) examined some factors affecting earnings persistence of Tehran listed firms, including 444 firm-year observations, from 2006 to 2009. The findings revealed that operating cash flow, firm size, interest-bearing debts, and directors' independency affect directly earnings persistence. It appeared that a high cash component of earnings is accompanied by lower interest-bearing debts, and when the independence of directors is higher, the earnings persistence will be at a higher level.

Atashband et al. (2014) explored the persistence of earnings and distributed earnings and their components. For that, they selected 114 listed firms on the Tehran Stock Exchange over the period 2006-2011 and used Univariate and Multivariate Regression based on Panel data and Seemingly Unrelated Regression (SUR). The findings revealed that the net income and the distributed earnings have significantly impacted the future profitability. Furthermore, the components of the net income are directly associated with future profitability. The findings also confirmed the higher persistence of the distributed income in comparison with the aggregated net income in relation to the cash paid to the shareholders.

Artikis and Papanastasopoulos (2016) tested the persistence and pricing of the cash component of earnings in UK listed firms. Their sample included 24731 firm-year observations from 1981 to 2013. They found that the cash component of earnings is more persistent than the accrual component. Cash retained by the firm as changes in the cash balance also appears to be more persistent than accruals, whereas cash attributed to debt holders has approximately the same persistence level of accrual component.

Dimitropoulos and Koronios (2018) studied the predictability and persistence of earnings in the European football clubs and whether the UEFA's Financial Fair Play (FFP) has forced clubs to produce a more

predictable earnings stream. They investigated 109 European top-tier clubs over 2008-2016, summing up to 844 firm-year observations. Empirical evidence indicated that the cash flow component of earnings is more relevant in predicting one-year ahead earnings. The relevance of cash flow has improved after the instauration of the FFP regulation. Moreover, the abovementioned finding is more significant for the smaller league clubs, which are more in need of UEFA prize money relative to Big league clubs.

In conclusion, the prior studies have approximately followed the same methodical procedures, they interested in the correlation of future earning with current earning and its components. The results differ following the field of study and the period included, but the general trend shows that the cash component of earnings presents a high level of persistence comparing with the accrual component. This study aims at contributing in the literature about earnings quality through exploring the earnings persistence in a developing economy like Algeria, considering that the studies about earnings quality have carried out in developed and emergent economies.

3- METHOD

3.1- Model specification

Our model was based on a famous model proposed by Sloan (1996), which relates one-year ahead earnings with current earnings in auto-regression model, in order to measure earnings persistence as shown in model (1).

$$NI_{it+1} = \alpha_{it} + \beta_{it}NI_{it} + \xi_{it} \quad (1)$$

Where NI_{it} is the earnings of current period, NI_{it+1} is the earnings of subsequent period, β_{it} is the auto-regression coefficient of current earnings that measures their persistence, so the higher the coefficient β_{it}, the more the current earnings (NI_{it}) predict the one-year ahead earnings (NI_{it+1}) and thus, the greater the persistence of earnings. α_{it} is an estimate of one-year ahead earnings when current earnings take the value zero, ξ_{it} is the one-year ahead earnings that are not predicted by current earnings.

Model (1) was later extended through disaggregating current earnings into cash flows and accounting accruals, in order to measure the persistence of each component of earnings, and its contribution in earnings persistence, as shown in model (2).

$$NI_{it+1} = \gamma_{it} + \lambda_{it}CF_{it} + \delta_{it}TACC_{it} + \mu_{it} \quad (2)$$

Where CF_{it} is the operating cash flow of current period, $TACC_{it}$ is the total accounting accruals of current period, λ_{it} and δ_{it} are the auto-regression coefficients of operating cash flows and accounting accruals respectively, they measure their persistence, so the higher the coefficients λ_{it} and δ_{it}, the greater the persistence of each component (CF_{it} and $TACC_{it}$ respectively) and thus, their contribution in earnings persistence is high. γ_{it} is an estimate of the one-year ahead earnings when the cash component and the accrued component of earnings take the value zero, μ_{it} is the one-year ahead earnings that are not predicted by the cash and the accrued component of earnings.

3.2- Sample and data collection

Collecting financial data from companies in Algeria is a real challenge. For that, the study is interested in the big size Algerian companies that publish or provide publically and regularly their annual financial statements. Considering that challenge, the study included 20 big size Algerian companies [Annex 1], for 12 years (2006-2017). However the financial data of each company covered different sub-period, and thus panel data series of variables are unbalanced. Data have comprised a total of 145 firm-year observations, which decreased to 125 firm-year observations, as a result of the time delay of the dependent variable (One-year ahead earnings). The data has primarily collected via contacting the headquarters of companies, and secondly via the internet, using the COSOB's electronic sites and the electronic site of some companies.

4- RESULTS AND DISCUSSION

4.1- Descriptive statistic

Table 1 summarizes the descriptive statistics for each variable, including the 145 observations collected that concern 20 companies for 12 years. The data takes the form of unbalanced panel data because the data of each company has related to a specified sub-period during the period of 2006-2017. According to the mean, earnings (NI_{it}) of the studied companies represent 4.74% of their total assets on average, which indicates a low performance of the Algerian companies during the period. As shown in Table 1, the accounting accruals ($TACC_{it}$) of companies are more than their earnings; they represent 7.79% of the total assets on average, which may refer to earnings management practices by Algerian companies. However, the operating cash flows (CF_{it}) represent -3.05% of the total assets on average and contribute negatively in earnings.

The minimum values show that earnings and cash flows comprise several negative values, which overload their means, on the contrary of accruals that do not contain any negative values. Comparing between the mean and the median of each variable, it appears that the statistical distribution of data related to both earnings and accruals is positively skewed, while the statistical distribution of data related to operating cash flows is negatively skewed. Finally, the standard deviations indicate that operating cash flows are more dispersal than accruals and earnings respectively.

Table 1. Descriptive statisticsfor 145 firm-years observations (2006-2017).

	NI_{it}	CF_{it}	$TACC_{it}$
Mean	0.047374	-0.030482	0.077856
Median	0.043116	-0.012782	0.050221
Maximum	0.280330	0.175449	0.507970
Minimum	-0.126575	-0.507835	0.000723
Std. Dev.	0.059536	0.102937	0.084872
Sum	6.869208	-4.419923	11.28913
Observations	145	145	145

Source: Author calculation depending on E-views V10.

4.2- Correlation analysis

Table 2 presents the correlation matrix between variables. It shows a negative correlation between operating cash flows and accounting accruals that is significant at 1% level, but it is weak. Although, there are significantly at 1% level and positively high correlations between earnings, on one hand, and operating cash flows and accounting accruals, on the other hand. It should be noted that the results of correlation analysis are not decisive.

Table 2. Pearson's correlation coefficients between the variables.

Correlation Probability	NI_{it}	CF_{it}	$TACC_{it}$
NI_{it}	1.000000		

CF_{it}	0.565987	1.000000	
	0.0000	-----	
$TACC_{it}$	0.502701	-0.185816	1.000000
	0.0000	0.0000	-----

Source: Author calculation depending on E-views V10.

4.3- Unit root test

First of all, it is necessary to determine the stationary or the order of integration of the individual panel data depending on commonly used tests. For that, four unit root tests were employed in level i.e. I(0), including the three possible options (Individual intercept, Individual intercept and trend, None). The null hypothesis of all employed statistical tests assumes the presence of unit root (non-stationary), whether common process like Levin, Lin & Chu test, or individual process like other tests. Table 3 summarizes the results for each variable of the two models, which indicate the absence of unit root for all variables, as the significance levels are less than 1%, except for earnings (NI_{it}) and operating cash flows (CF_{it}) only when Im, Pesaran and Shin test is used under the individual intercept and trend option. These results suggest the stationary at level i.e. I (0) of all variables.

Table 3. Unit root test results.

	Method	NI$_{it}$		CF$_{it}$		TACC$_{it}$	
		Stat.	Prob.	Stat.	Prob.	Stat.	Prob.
Individual intercept	Null: Unit root (assumes common unit root process)						
	Levin, Lin & Chu t*	-10.08	0.000	-17.13	0.000	-15.98	0.000
	Null: Unit root (assumes individual unit root process)						
	Im, Pesaran and Shin W-stat	-4.782	0.000	-6.820	0.000	-5.78	0.000
	ADF - Fisher Chi-square	67.92	0.001	85.85	0.000	72.64	0.000
	PP - Fisher Chi-square	61.70	0.002	99.99	0.000	84.21	0.000
Individual intercept and trend	Null: Unit root (assumes common unit root process)						
	Levin, Lin & Chu t*	50.90	1.000	6.26	1.000	-28.61	0.000
	Null: Unit root (assumes individual unit root process)						
	Im, Pesaran and Shin W-stat	-1.165	0.122	-1.18	0.118	-1.68	0.047
	ADF - Fisher Chi-square	49.95	0.006	55.27	0.002	46.75	0.015
	PP - Fisher Chi-square	71.11	0.000	71.73	0.000	63.26	0.000
None	Null: Unit root (assumes common unit root process)						
	Levin, Lin & Chu t*	-9.14067	0.0000	-5.27	0.000	-7.50	0.000
	Null: Unit root (assumes individual unit root process)						
	ADF - Fisher Chi-square	99.40	0.000	98.59	0.000	76.39	0.000
	PP - Fisher Chi-square	89.78	0.000	90.77	0.000	77.70	0.000

Source: Author calculation depending on E-views V10.

4.4- Model (1) estimation

The estimation of any regression model using panel data can be made through three methods (Pooled regression; Fixed effects or Random effects), each method may provide different outputs for the estimates, which requires the trade-off between these methods to choose the valid model. Table 4 summarizes the results of model (1), which show that the Pooled Regression Model and the Random Effects Model present the same results; they suggest the significance of model (1) at 1% level and the significance of both the constant and the regression coefficient related to earnings (NI$_{it}$) at 5% level and 1% level respectively. According to these two methods, the determination coefficient of model (1) reaches 63.37%, while the constant that nears from zero reaches 0.0091. The regression coefficient related to earnings that reaches 0.7706 supports the earnings persistence hypothesis.

Table 4. Model (1)'s results using the different methods of panel data.

| | | Dependent variable: NI_{it+1} | | |
| | | Estimation method | | |
Independent variables		Pooled Regression Model	Fixed Effects Model	Random Effects Model
Constant	Coefficient	0.0091	0.0344	0.0091
	t-statistic	(2.2198)*	(5.9824)**	(2.4257)*
NI_{it}	Coefficient	0.7706	0.2523	0.7706
	t-statistic	(14.6806)**	(2.4870)*	(16.0428)**
Adj. R^2		0.6337	0.6972	0.6337
F-statistic		(215.52)**	(10.21)**	(215.52)**
Durbin-Watson		2.3357	1.8056	2.3357
S.E. of regression		0.0361	0.0328	0.0361
Sum squared residuals		0.1603	0.1002	0.1603
Log likelihood		238.81	268.18	-
Periods included		12	12	12
Cross-sections included		20	20	20
Obs.		125	125	125
* Significant at 5% level				
** Significant at 1% level				

Source: Author calculation depending on E-views V10.

Concerning the Fixed Effects Model, the results differ substantially from the results of the other two methods. Fixed Effects Model suggests that model (1) is significant at 1% level and both the constant and the regression coefficient related to earnings (NI_{it}) are significant at 1% level and 5% level respectively. The determination coefficient and the constant that reach 69.72% and 0.0344 respectively are more than those generated by the other two methods, while the regression coefficient related to earnings (NI_{it}) is less.

4.5- Model (2) estimation

Table 5 reports the results of model (2) when estimated using the three methods of panel data. These results have the same tendency of the results of model (1), which show similar results for the Pooled Regression Model and the Random Effects Model in comparison with the Fixed Effects Model. The Pooled Regression and the Random Effects suggest the significance of model (2) at 1% level with a determination coefficient of 63.11%. They suggest also the significance of both the regression coefficients at 1% level with values of 0.7707 for the coefficient related to operating cash flows (CF_{it}) and 0.7852 for the coefficient related to accounting accruals ($TACC_{it}$). In contrast, Fixed Effects suggests that model (2) and the constant are significant at 1% level, while both regression coefficients are significant at 5% level. It also suggests that the

determination coefficient and the constant are more than those recorded by the other methods (69.44% and 0.0331 respectively). However, the regression coefficients are much less than those recorded by the other methods; the coefficient reaches 0.2540 for operating cash flows (CF_{it}) and 0.2692for accounting accruals ($TACC_{it}$).

Table 5. Model (2)'s results using the different methods of panel data.

Independent variables		Pooled Regression Model	Fixed Effects Model	Random Effects Model
		Dependent variable: NI_{it+1}		
		Estimation method		
Constant	Coefficient	0.0080	0.0331	0.0080
	t-statistic	1.5546	(4.9275)**	1.6968
CF_{it}	Coefficient	0.7707	0.2540	0.7707
	t-statistic	(14.6306)**	(2.4896)*	(15.9682)**
$TACC_{it}$	Coefficient	0.7852	0.2692	0.7852
	t-statistic	(11.9736)**	(2.4128)*	(13.0683)**
Adj. R^2		0.6311	0.6944	0.6311
F-statistic		(107.07)**	(9.80)**	(107.07)**
Durbin-Watson		2.3427	1.8165	2.3427
S.E. of regression		0.0362	0.0330	0.0362
Sum squared residuals		0.1601	0.1000	0.1601
Log likelihood		238.88	268.28	-
Periods included		12	12	12
Cross-sections included		20	20	20
Obs.		125	125	125
* Significant at 5% level				
** Significant at 1% level				

Source: Author calculation depending on E-views V10.

4.6- Model selection

Testing the hypotheses requires selecting the valid model between those previously estimated. This can be made in two stages, starting with the comparison between Pooled Regression Model and Fixed Effects Model using F-test; then the comparison between Fixed Effects Model and Random Effects Model using Hausman test.

Firstly, it should be noted that F-test can be employed to test the following hypothesis:

H_0: Pooled Regression Model is valid.

H_1: Fixed Effects Model or Random Effects Modelis valid.

Apply the F-test need calculating F value (F') at degrees of freedom (N − 1) and (NT − N − K) as it shown in equation (3), and then comparing the calculated F with the F critical value that obtained from F-distribution table; if the calculated F is more than F critical value at 5% level of significance, H_0 must be rejected, and vice versa.

$$F'(N-1, NT-N-K) = \frac{(R^2_{FEM} - R^2_{PM})/(N-1)}{(1-R^2_{FEM})/(N \times T - N - K)} \qquad (3)$$

Where: F' is the calculated F, N is the number of sections, T is the number of periods, K is the number of estimated parameters, R^2_{FEM} is the determination coefficient from the Fixed Effects Model, R^2_{PM} is the determination coefficient from the Pooled Regression Model.

Table 6 presents the results of F-test, which indicates that calculated F is more than F critical value for each model; this means that model (1) and model (2) must be estimated using Fixed Effects Model or Random Effects Model, as assumed by H_1.

Table 6. F-test results.

	Model (1)	Model (2)
N	20	20
T	12	12
K	2	3
R^2_{FEM}	0.6972	0.6944
R^2_{PM}	0.6337	0.6311
F'	2.41	2.37
F critical value	1.64	

Source: Author calculation depending on E-views V10.

Secondly, the results of F-test needs applying the Hausman test to compare between Random Effects Model and Fixed Effects Model, through testing the following hypothesis:

H"$_0$: Random Effects Model is valid.

H"$_1$: Fixed Effects Model is valid.

As presented in Table 7, it appears that Hausman test is significant at 1% level for each model. Therefore, H"$_0$ must be rejected, so model (1) and model (2) must be estimated using Fixed Effects Model, as assumed by H"$_1$.

Table 7. Hausman testresults

Test Summary	Model (1)			Model (2)		
	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	35.8074	1	0.0000	35.4046	2	0.0000

Source: Author calculation depending on E-views V10.

4.7- Hypotheses Testing

The model selection criteria confirm the validity and adequacy of Fixed Effects Method to estimate both model (1) and model (2), and thus it is the most acceptable for testing the study hypotheses. The estimated parameters for each valid model are reintroduced in Table 7, which indicates the significance of earnings coefficient at 5% level and hence the persistence of earnings, which differs from Hypothesis 1. According to the earnings coefficient, a change of 10% in current earning leads to a change in the earning of next period with 2.52% in the same direction, while this change represents 69.72% from the variability of earning in the next period according to the determination coefficient.

Concerning model (2), the results indicate that operating cash flows coefficient and accounting accruals coefficient are significant at 5% level, and therefore operating cash flows and accounting accruals are persistent. However, there no wide difference between their persistence, which confirms Hypothesis 2. The results also indicate that any changes of 10% in operating cash flows or accounting accruals of the current period lead to changes in the earning of the next period with 2.54% or 2.69% respectively. These changes represent together 69.44% of the earning variability in the next period.

Table 8. The outputs of valid models

	Model (1)		Model (2)	
	Coefficient	t-statistic	Coefficient	t-statistic
Constant	0.0344	(5.9824)**	0.0331	(4.9275)**
NI_{it}	0.2523	(2.4870)*		
CF_{it}			0.2540	(2.4896)*
$TACC_{it}$			0.2692	(2.4128)*
Adj. R^2	0.6972		0.6944	
F-statistic	(10.21)**		(9.80)**	
* Significant at 5% level				
** Significant at 1% level				

Source: Author depending on the results of study

The results of this study indicate that earnings of studied Algerian companies are persistent; consequently, the earnings of any period can predict earnings of the next period. However, the persistence level measured by the regression coefficient is much less than the recorded

by the studies in developed countries, which show persistence levels more than 0.30 (Sloan, 1996; Dechow and Dichev, 2002; Fairfield et al., 2003; Francis and Smith, 2005; Dechow and Ge, 2006; Doukakis, 2010; Ebaid, 2011). This is not the case for other studies showing persistence levels less than 0.30, because of they carried out in developing countries like Atashband et al.(2014) in Iran, or they included a specific sector like Dimitropoulos and Koronios(2018) for the football clubs. On the other hand, this study indicate that the persistence of accounting accruals a little more than the persistence of operating cash flows, which differs substantially from several previous studies suggesting that cash flows are much more persistent than accounting accruals (Fairfield et al., 2003; Francis and Smith, 2005; Dechow and Ge, 2006; Ebaid, 2011).

CONCLUSION

Accounting quality is one of the main desired objectives of standardization; it can be measured by some external proxies or focusing on different financial statements items that are mainly aggregated into financial position and performance. Earnings as a measure of financial performance have frequently used to develop a set of accounting quality measures depending on proprieties of earnings and earnings components. The persistence is an attribute used in the literature to describe earnings quality as a proxy of accounting quality, it based on the association of future earnings with current earnings or their components.

Like many countries, Algeria is interested in accounting standardization since the end of 90's through some reforms, in order to improve accounting quality. In this context, the study asks the question of whether or not earnings and earnings components of Algerian companies are persistent, and whether or not cash flows and accruals have the same level of persistence.

The method of study focuses on Sloan (1996) and used a panel data of 20 Algerian companies during 12 years (2006-2017). The results suggest that earnings and earnings components of studied Algerian companies are persistent, while the recorded persistence levels are much less than those recorded by the studies in developed countries.

On the contrary of several studies suggesting that cash flows are more persistent than accruals; this study shows that accruals are more persistent than cash flows, but the differential persistence of accruals is not substantial.

These results imply that users of financial statements of Algerian companies can use prudently earnings and earnings components when making their decisions. However, they should also use other accounting items that improve the persistence of earnings and their components. Auditors must give more attention to earnings and earnings components in order to improve their quality and give more confidence to users. These results imply also using more than one proxy for accounting quality, because these proxies may provide results in different trends.

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Annexes

Annex 1. The studied Algerian companies.

N°	Company	Status	Industry
1	SCHS	Public	Cement
2	SCAEK	Public	Cement
3	ETRHB	Private	Construction
4	COSIDER	Public	Construction
5	ALTRO	Public	Construction
6	ENTP	Private	Energy
7	SONATRACH	Public	Energy
8	SONELGAZ	Public	Energy
9	ENAFOR	Public	Energy
10	ALLIANCE	Private	Finance
11	BNP Paribas El Djazaïr	Private	Finance
12	CEVITAL	Private	Food
13	NCA-Rouiba	Private	Food
14	AMOR BE NAMOR GROUP	Private	Food
15	EL AURASSI	Public	Hotel
16	SAIDAL	Public	Pharmaceutical
17	BIOPHARM	Private	Pharmaceutical
18	SPA DAHLI	Private	Real estate
19	Air Algérie	Public	Transport
20	EP-SKIKDA	Public	Transport

Source: Author

Annex 2. Data used in the study as it extracted from E-views

No.	Company	-	Year	NI_{it}	CF_{it}	$TACC_{it}$
1	1	-	5	0.064536011	0.045471	0.019065
2	1	-	6	0.06941857	0.046522	0.022896
3	1	-	7	0.084755524	0.01585	0.068905
4	1	-	8	0.118362021	0.101996	0.016366
5	1	-	9	0.109968135	0.090996	0.018972
6	1	-	10	0.112956686	0.091009	0.021948
7	1	-	11	0.116717847	-0.00763	0.124353
8	1	-	12	0.013080813	-0.08341	0.096488
9	1	-	13	-0.052988419	-0.13535	0.082357

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10	1	-	14	0.046389556	-0.01411	0.060498
11	1	-	15	0.029915563	-0.01133	0.041246
12	1	-	16	0.061364761	0.010853	0.050511
13	1	-	17	0.050681686	0.038461	0.012221
14	2	-	6	0.097857527	0.064524	0.033333
15	2	-	7	0.074949576	0.074227	0.000723
16	2	-	8	0.067544409	-0.28944	0.356986
17	2	-	9	0.062365158	-0.22884	0.291209
18	2	-	10	0.047459913	0.001728	0.045732
19	2	-	11	0.065356884	-0.19327	0.258629
20	3	-	5	0.070910454	0.042788	0.028123
21	3	-	6	0.035084488	-0.00389	0.03897
22	3	-	7	0.030097269	-0.02827	0.058372
23	3	-	8	0.038170812	0.000184	0.037987
24	3	-	9	0.058086811	0.024242	0.033845
25	3	-	10	0.071146337	0.028044	0.043102
26	3	-	11	0.124047081	0.028549	0.095498
27	3	-	12	0.039014005	-0.01347	0.052489
28	3	-	13	0.07553641	-0.02917	0.104704
29	3	-	14	0.065459229	0.013502	0.051957
30	3	-	15	0.088311784	0.076399	0.011913
31	3	-	16	0.046782508	0.016852	0.02993
32	3	-	17	0.032753601	-0.03689	0.06964
33	4	-	5	0.123370896	0.075846	0.047525
34	4	-	6	0.127777113	0.042044	0.085733
35	4	-	7	0.182139613	0.175449	0.006691
36	4	-	8	0.142241443	0.135685	0.006557
37	4	-	9	0.137887432	0.095807	0.042081
38	4	-	10	0.054616025	0.043433	0.011183
39	4	-	11	0.050504006	0.039547	0.010957
40	4	-	12	0.106497557	0.058382	0.048116
41	4	-	13	0.092450552	0.079979	0.012471
42	4	-	14	0.071676587	-0.01553	0.087211
43	4	-	15	0.048042081	-0.02611	0.074157
44	4	-	16	0.036747717	0.021669	0.015079
45	5	-	5	0.037469288	0.029385	0.008085
46	5	-	6	-0.000663334	-0.08619	0.085527
47	5	-	7	0.003388178	-0.06527	0.068661
48	5	-	8	3.78623E-05	-0.15995	0.159991
49	5	-	9	0.001522577	-0.14415	0.145676
50	5	-	10	0.000135339	-0.50783	0.50797
51	5	-	11	0.003595908	-0.12738	0.130979
52	5	-	12	0.006326137	-0.0153	0.021628
53	5	-	13	0.005229551	-0.02152	0.026754
54	5	-	14	0.003785875	-0.02392	0.027703
55	5	-	15	-0.008756292	-0.05059	0.04183
56	5	-	16	-0.016003876	-0.06654	0.050541
57	6	-	5	0.079746295	0.013572	0.066174
58	6	-	6	0.103196294	-0.07486	0.17806
59	6	-	7	0.049638873	-0.02306	0.072695
60	6	-	8	0.053170234	0.013538	0.039632
61	6	-	9	0.037014231	-0.16966	0.206677
62	6	-	10	0.03007463	-0.12714	0.157212

63	6	-	11	0.024946511	0.008939	0.016007
64	7	-	5	0.145210472	0.00234	0.142871
65	7	-	6	0.280330431	0.123323	0.157008
66	7	-	7	0.20893342	0.170042	0.038892
67	7	-	8	0.24091956	0.016424	0.224496
68	7	-	9	0.172931646	0.139273	0.033658
69	7	-	10	0.130028086	0.11513	0.014898
70	7	-	11	0.099000925	0.076517	0.022484
71	8	-	6	0.027166147	-0.16808	0.195246
72	8	-	7	0.068296196	-0.00037	0.068667
73	8	-	8	0.051473967	-0.04795	0.099429
74	8	-	9	0.016783589	-0.05746	0.07424
75	8	-	10	0.024266015	-0.05872	0.082989
76	8	-	11	0.033031448	-0.03215	0.065177
77	9	-	6	0.048397349	-0.06224	0.110642
78	9	-	7	-0.022990584	-0.1167	0.093706
79	9	-	8	0.003676622	-0.0055	0.00918
80	9	-	9	0.011901083	-0.1076	0.119504
81	9	-	10	0.022266396	-0.05419	0.076456
82	9	-	11	0.047736202	-0.25485	0.302587
83	9	-	12	0.080014834	0.064765	0.01525
84	9	-	13	0.046316939	0.041914	0.004403
85	9	-	14	0.036694307	-0.06001	0.096702
86	9	-	15	0.041744922	0.035887	0.005857
87	9	-	16	0.043116235	-0.00554	0.048661
88	9	-	17	0.022659515	-0.05247	0.075134
89	10	-	8	0.011291318	-0.06901	0.0803
90	10	-	9	0.009610865	-0.05187	0.061484
91	10	-	10	0.007809999	-0.03902	0.046825
92	10	-	11	0.008113017	-0.04721	0.055326
93	10	-	12	0.009242728	-0.05507	0.064315
94	10	-	13	0.005467184	-0.03782	0.04329
95	10	-	14	0.006531453	-0.04938	0.05591
96	10	-	15	0.005934891	-0.02916	0.035092
97	10	-	16	0.004224853	-0.02834	0.03256
98	11	-	8	0.087828587	-0.07712	0.164946
99	11	-	9	0.138450681	0.050902	0.087548
100	11	-	10	0.162889321	-0.01278	0.175671
101	11	-	11	0.120425068	-0.16111	0.281538
102	12	-	10	0.063493025	0.010621	0.052872
103	12	-	11	0.087682283	-0.08966	0.177339
104	12	-	12	0.033820876	-0.04326	0.077078
105	12	-	13	-0.054991096	-0.15631	0.10132
106	12	-	14	0.035537052	-0.01131	0.046852
107	12	-	15	0.051683325	0.048813	0.00287
108	12	-	16	0.048293554	-0.32209	0.370387
109	12	-	17	0.050418981	0.009649	0.04077
110	13	-	10	0.000752531	-0.09805	0.098798
111	13	-	11	0.008157083	-0.00479	0.012945
112	13	-	12	-0.016927295	-0.24383	0.226899
113	13	-	13	-0.032133549	-0.19333	0.161201
114	13	-	14	-0.002342495	-0.00609	0.003745
115	13	-	15	0.002156405	-0.00718	0.009333

116	13	-	16	-0.019758946	-0.03141	0.011655
117	13	-	17	-0.017007652	-0.02539	0.008384
118	14	-	10	-0.029303985	-0.03597	0.006663
119	14	-	11	-0.021064907	-0.03741	0.016342
120	14	-	12	-0.017083914	-0.32786	0.310781
121	14	-	13	-0.036880196	-0.07134	0.034457
122	14	-	14	-0.025758748	-0.09739	0.07163
123	14	-	15	-0.032727591	-0.08295	0.050221
124	15	-	10	0.060131238	-0.12984	0.189969
125	15	-	11	0.069293967	0.055707	0.013587
126	16	-	14	-0.126575454	-0.25947	0.132893
127	16	-	15	0.000243596	-0.00655	0.006798
128	16	-	16	-0.104391046	-0.21385	0.109455
129	16	-	17	0.007198362	0.003886	0.003312
130	17	-	10	0.008475101	-0.04058	0.049053
131	17	-	11	-0.041954358	-0.05898	0.017029
132	17	-	12	0.004985568	-0.00289	0.007872
133	17	-	13	0.003332697	-0.00521	0.00854
134	17	-	14	0.004643244	-0.00265	0.007296
135	17	-	15	0.004115739	-0.30276	0.306872
136	18	-	12	0.078900347	0.059605	0.019296
137	18	-	13	0.070267567	0.020824	0.049444
138	18	-	14	0.048488078	0.023475	0.025013
139	18	-	15	0.025323885	-0.06489	0.090217
140	19	-	13	0.079371119	0.076233	0.003138
141	19	-	14	0.111199985	0.074433	0.036767
142	19	-	15	0.086273925	0.059072	0.027202
143	20	-	15	0.107477523	0.004495	0.102983
144	20	-	16	0.118169322	0.055329	0.06284
145	20	-	17	0.116598456	0.091056	0.025542

Source: Author depending on data of studied companies