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The effects of mandatory IFRS adoption on financial analysts' forecast: Evidence from Jordan

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Abstract: This paper examines the effect of the mandatory adoption of International Financial Reporting Standards (IFRS) on the ability of financial analysts to forecast earnings accurately in Jordan during the period 2002–2013. The methodology involved the use of a panel data model and the regression with temporal "dummy" variables in order to test the hypotheses formulated for the study. The research findings show after mandatory IFRS adoption has improvements in the ability of analysts to forecast earnings (decrease in error and dispersion). These findings are evidence of an improvement in earnings quality of Jordan listed firms after the collective requirement to adopt IFRS. The evidence from the study also shows the debate on the desirability of the current move towards one global set of accounting standards as results are robust to several changes in model specifications. The study contributes to the previous finding dealing with the additional quality informational content stemming and, more specifically the quality of earnings from mandatory of IFRS adoption. The originality of this study consists primarily in the use of a long analysis period following the implementation of IFRS that should reduce divergences between analysts, causing a decrease in earnings forecast error and dispersion. Therefore, this study examines only the Jordan context; it's interesting for future research to study the effect of IFRS mandatory adoption for several countries, especially in emerging market.

ABOUT THE AUTHOR

Najeb Masoud is a career academic, specializing in Accounting and Finance. He joined the Aqaba University of Technology as an assistant professor in Accounting and Dean of Scientific Research after two years in Accounting and Finance in Middle East University Business School in 2013 after three years at the University of Al-Zaytoonah, where he was a University lecturer in Accounting and Finance. He also has a range of papers to his credit in several fields across accounting, corporate social responsibility, auditing and firm finance.

PUBLIC INTEREST STATEMENT

Most countries in the world have adaptation of accounting standards used in preparing the financial statements. This usually states in a more generic fashion that the local accounting practices and harmonizing it with that of the International Financial Reporting Standards (IFRS)—formerly International Accounting Standards (IAS). In the case of IFRS, from 1997 onwards, upon the issuance of Companies Law No. 22 for the year 1997, Jordan started to fully adopt the full version of IFRS standards in 2005 (then called International Accounting Standards) without amendments. Truly, given the particularity of the Jordan context, this study seeks to establish if the adoption of IFRS on financial analysis' ability to translate accounting information into forward looking information. In particular, to study the impact of IFRS adoption on the accuracy and dispersion of analysts' earnings forecasts.

1. Introduction

Previous international accounting research has focused on developed countries, particularly Europe and northern America, while Jordan (and the Middle Eastern region) has been neglected due to recent changes in its analyses of economic and accounting regulatory environments. Because financial accounting information is so vital to investors, analysts and other interested parties formal reporting standards, which are called as General accepted Accounting Principles (GAAP), have been established. In recent years, financial accounting and reporting standards in the United States are established primarily by the Financial Accounting standards Board (FASB). Therefore, not all countries follow the same accounting and reporting standards. For instance, accounting practices in the United Kingdom differ from those in the United States, and those in the United States differ from those in Japan and those in Japan differ from those in emerging market. Today, the standard-setting body responsible for this convergence effort is the International Accounting Standards Board (IASB). In many ways, this organization functions like the FASB. In 2002, the FASB and IASB signed the Norwalk Agreement, formalizing their commitment to convergence of US and international accounting standards. The standards being developed and promoted by the IASB are called International Financial Reporting Standard (IFRS).

Hence, starting from 1 January 2005, the European Community Regulation 1606/2002 required companies listed in regulated European markets to adopt the IFRS by firms in all the member of the European Union (EU) with the ultimate goal of increasing transparency and quality of financial reporting standards (Masoud, 2014). While more and more countries switch to IFRS as their mandatory accounting standards, in the early 1990s, and despite the differences between Western and Islamic accounting, Jordanian listed firms responded to the 1997 Company Law and the 2002 Securities Law (No. 76) requirements in applying IAS/IFRS and introduced the governance-policy framework. In 2004, there were several amendments to the Securities Law, especially in article 14, which asserted the adoption of International Financial Reporting Standards (IFRS) by all Jordanian companies (Al-Akra, Jahangir Ali, & Marashdeh, 2009).

However, the impact of IFRS adoption must also be evaluated on an individual country basis, due to differences in stable legal framework, institutional and accounting environment around the time of IFRS adoption (Djatej, Gao, Sarikas, & Senteney, 2009). The effect of IFRS in Jordan may be different to other authorities with different institutional features and thus should be investigated independently of other countries. In addition, Jordan accounting regulation is interesting due to the differences between Jordan JACPA, classified as a continental accounting model, and IFRS, closer to an Anglo-Saxon accounting model and continental accounting systems. In this regard, the institutional development of accounting practices in Jordan allows us to test whether mandatory adoption of IFRS, which is generally perceived to be more transparent, increases the comparability of reported accounting numbers across firms, regulators and other users of financial reporting. Furthermore, one can generalize the results of his study to all most all firms of MEAN region because the mandatory adoption of IFRS was widespread in 2005 when they became legally required.

Prior to the new focus of studies examining whether the effect of adoption of IFRS is mandatory or voluntary (Barth, Landsman, & Lang, 2008; Clarkson, Hanna, Richardson, & Thompson, 2011; Daske, 2006; Iatridis, 2010; Kargin, 2013; Tsoligkas & Tsalavoutas, 2011), many studies occur in a setting where IFRS is used in different contexts (Agnes Cheng, Lee, & Yang, 2013; Chandrapala, 2013; Cuijpers & Buijink, 2005). More recent studies have confirmed the improvement in the descriptive power of the accounting numbers following the adoption of IFRS (Barth et al., 2008; Bartov, Goldberg,

& Kim, 2005; Iatridis, 2010; Jermakowicz, Prather-Kinsey, & Wulf, 2007; Landsman, Maydew, & Thornock, 2012; Salameh, 2013). Escaffre and Sefsaf (2010) concluded that the effect of adopting IFRS on the quality of accounting numbers depends on institutional factors in each country, which is confirmed by Zogning (2013). This result may be attributed to the existence of additional information under IFRS. Academics researchers also rely extensively upon the analyst forecasts in studies covering such topics as earnings management, and the pricing of accounting information (i.e. Burgstahler & Dichev, 1997; Dechow, Ge, & Schrand, 2010; Degeorge, Patel, & Zeckhauser, 1999; Easton & Monahan, 2005; Ettredge, Richardson, & Scholz, 2002; Matsumoto, 2002; Skinner & Sloan, 2002). A better understanding of the determinants of forecast accuracy helps investors and accounting researchers to choose more accurate earnings forecasts. Especially to investors it helps in identifying analysts whose forecasts are generally more accurate. In contrast, If analysts' forecast accuracy differs predictably, and if the capital markets recognize these differences, then more accurate proxies for earnings expectations can be created by applying larger weights to the forecasts of more accurate analysts. Accordingly, a large stream of earnings forecasting literature (Brown, 2001; Clement, 1999; Keung, Lin, & Shih, 2010) identifies systematic differences in analysts' earnings forecasts that explain differences in forecast accuracy.

The present study aims to contribute on the effects of adoption of IFRS by investigating changes in accounting quality of Jordan listed firms around the time of adoption. An empirical investigation in particular is needed to assess the impact of IFRS adoption on the accuracy and dispersion of analysts' earnings forecasts. So, the principal research question of interest is: Does the mandatory IFRS adoption improve the ability of analysts to forecast earnings reflected by a higher accuracy and lower dispersion in the Jordan context? Indeed, the implementation of IFRS should provide financial analysts with more detailed knowledge of accounting financial information, decreasing earnings forecast error and dispersion. In this view, earnings accounting information and more general financial statement give investors and analysts the key information they need when it is more useful to decision-makers about a firm. Thus, we focus on a particularly important of mandatory IFRS adoption on financial analysts. Analysts can be regarded as sophisticated users of financial statements and as intermediaries between firms and investors (Clement & Tse, 2003; Gleason & Lee, 2003; Park & Stice, 2000; Schipper, 1991). Therefore, investors can benefit from more accurate earnings forecasts in their investment decisions (Loh & Mian, 2006). Also earnings forecast accuracy is of concern to analysts because their career prospects and rewards are affected by forecast accuracy (Hong & Kubik, 2003; Mikhail, Walther, & Willis, 1999; Ramanna, 2008). As a result, the period after the adoption of IFRS is especially significant for analysis of the impact of the changes on the accuracy of analysts' earnings forecasts as expected to reflect the quality of the earnings information reported by the company and more specifically, on the quality of future earnings (forecast dispersion) is, however well be sensitive to the level of earnings quality to the market's response.

Our study should be of interest to both academics and capital market participants and contributes to the extant accounting literature in the following ways. In the first place, we add to the recent accounting literature on the effects of mandatory IFRS on analysts' forecast properties. Previous studies focus on either the effect of IFRS on earnings quality or on changes in the properties of earnings (e.g. earnings management) or on investor responsiveness to earnings. Our study takes a different perspective and examines the effects of IFRS on analysts' forecasts issuance on the quality of analysts' own research output (i.e. the accuracy of their earnings forecasts) and their career outcomes. As such, we contribute to the emerging literature on the impact of analysts' forecasts. However, our analysis differs from previous research. Instead of investors' responses, we focus on analysts' use of the accounting information. Our paper is closely related to previous papers by Schipper (1991), Barker and Imam (2008) and Jiao, Koning, Mertens, and Roosenboom (2012) who suggest that analysts use financial statement information, most notably earnings, to predict a firm's future earnings. Specifically, we provide evidence when forecasts are more narrowly focused on earnings, the implications of how the investors' may respond to market information other than for future earnings are better understood. We also document this using analysts' forecasts rather than the properties of earnings measures to infer earnings quality has the advantage as it captures changes in the use of

the earnings information for decision-making process. Secondly, as far as we are aware, this is the first study in the Jordan capital market of the association between mandatory IFRS adoption and analysts' earnings forecasts. Third, the transition year is excluded which can generate biased results by the effect of learning and understanding of these new standards introduced. In this sense, our study contributes to the previous research by analysing the impact of IFRS on the information content of earnings after the mandatory adoption on 2005 in the Jordan context provides information to financial analysts, regulators and other users of financial information on the causes and consequences of IFRS adoption for the purpose of earnings forecasting.

The research findings show improvements in the ability of analysts to forecast earnings (decrease in error and dispersion) after mandatory IFRS adoption. These findings are evidence of an improvement in earnings quality of Jordan listed firms after the collective requirement to adopt IFRS. The evidence from the study also shows the debate on the desirability of the current move towards one global set of accounting standards as results are robust to several changes in model specifications.

The rest of this paper is structured as follows. Section 1—Introduction, Section 2—IFRS adoption, analyst forecast and Jordan corporate context, Section 3—Theoretical framework, Section 4—Empirical literature review and hypotheses development, Section 5—Research design, Section 6—Empirical findings and discussion, and Section 7—Summary and conclusion.

2. IFRS adoption, analyst forecast and Jordan corporate context

As mentioned previously, many countries have their own standards for financial reporting or may follow the standard that big countries use, such as United States Generally Accepted Accounting Principles ("U.S. GAAP" or "GAAP") or Europe as their financial accounting and reporting regime. The criticism surrounding GAAP's use was that GAAP fostered an environment where corporations could structure transactions that merely comported with GAAP's bright-line tests but nonetheless were not steeped in economic reality (Newman, 2014). Then, there's a rapid change. At the time of writing, almost of the 143 jurisdictions, 119 (83% of the profiles) require IFRS Standards for all or most domestic publicly accountable entities (listed companies and financial institutions) in their capital markets (IFRS, 2016) because it increases harmonization of accounting practices and improves the information environment. Jordan started to fully adopt the full version of IFRS Standards since 1997, upon the issuance of Companies Law No. 22 for the year 1997. Full IFRS Standards are required by regulation for public shareholding companies regulated by the Jordanian Securities Commission, for financial institutions regulated by the Central Bank of Jordan and for insurance companies regulated by the Jordanian Insurance Commission. These reforms led to improved disclosure quality.

The aim of mandatory adoption of IFRS was to increase the amount of information disclosed in firms' financial statements and at the same time to reduce the available accounting options. A firm's financial statements provide various financial information that are an important source for analysts' forecasts (Barker & Imam, 2008; Barron, Byard, & Kim, 2002; Schipper, 1991). Although, many studies investigate the relationship between firms' aggregate disclosure and analysts decision-making in the process. For instance, Lang and Lundholm (1996) find that increased disclosure levels are associated with higher analyst coverage and forecast accuracy, and lower forecast dispersion and variability of forecast revisions. Also in academic research, it has been found that firm-level disclosures are positively associated with forecast accuracy of analysts (Hope, 2003). Similarly, some studies suggest that increased disclosure quality (Ball, 2006; Barth et al., 2008; Glaum, Schmidt, Street, & Vogel, 2013; Hope, 2003) and increased comparability (Bae, Tan, & Welker, 2008; Horton, Serafeim, & Serafeim, 2013; Tan, Wang, & Welker, 2011) contribute to the improved analyst forecast accuracy around mandatory IFRS adoption. Armstrong, Guay, and Weber (2010) find an increase in share prices around the date of IFRS adoption in Europe and attribute this improvement to increased comparability of financial information. This result was attributed to the existence of additional information under IFRS. In the Jordan-setting studies, Cotter, Tarca, and Wee (2012) evidence that reliability and accuracy of forecasts based on the financial statements are improved as a result of using IFRS adoption.

Indeed, given the particularity of the Jordan context, this paper focuses on this environment. According to the regulators, it is necessary to provide a framework at the international level for the publication of financial information in order to properly assist in decision-making. Depending on how earnings quality is measured, the analysts use financial statements as input for their research models to calculate forecasted earnings. One of the most important information used by analysts is earnings forecasts as reported by the firm (Barker & Imam, 2008). As a result, the accuracy of analysts' decision-making as reflected in their earnings forecasts is expected to affect the quality of the firm's financial reports. Similarly, the extent to which analysts have different expectations of future earnings (forecast dispersion) will be sensitive to the level of earnings quality. In particular, our study suggests that the switch to IFRS adoption in Jordan firms has been beneficial, considering the improvement in the decision-making by financial analysts.

3. Theoretical framework

There are two theoretical frameworks used in this paper to explain the effect of adoption of IFRS on the properties of analysts' forecasts, namely factors affecting analyst forecast accuracy and dispersion. These are agency theory and signalling theory. Agency theory, therefore, makes a number of predictions regarding the behaviour of managers. Jensen and Meckling (1976, p. 308) define the agency relationship as "an agency relationship as a contract under which one or more persons (the principal[s]) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent". Agents correspond to managers, whereas principals correspond to shareholders from a company's perspective. It would suggest that by adopting IFRSs, the agency theory considers the firm as organisational form searching to reduce agency conflicts and costs involved (Jensen & Meckling, 1976). Based upon agency theory, disseminating high quality accounting and financial information is commonly used by firms to reduce agency costs. Colasse (2006) shows that the IFRS conceptual framework acknowledges investors as privileged financial users. Instead of investors' responses, we focus on analysts' use of the accounting information, namely financial analysts' forecasts.

Signalling Theory describes, in essence, that alleviate problems due to the existence of information asymmetry in the capital markets (Akerlof, 1970). Morris (1987) and Sun, Salama, and Hussainey (2010) argue that there are several similarities between agency theory and signalling theory. To reduce this information asymmetry, firms can use signals to reduce the information asymmetry between the firms and their investors. These signals are sent out in order to provide the investors with more information (Spence, 1974). Firms that choose to not voluntarily apply IFRS also send out a signal about their ambitions (Campbell & Hentschel, 1992; Dumontier & Raffournier, 1998; Moon, 2008), that would lead to more transparent financial reports and reduce the information asymmetry between informed and uninformed investors (Armstrong et al., 2010; Jiao et al., 2012). That's why signalling prospects can be considered as explaining the agency theory assumptions. Thus, the IFRS adoption and enforcement could be considered as positive signal to the stakeholders as information disclosed under international standards is of high quality and improves analysts' earnings forecasts.

Given that by measuring investor response to earnings, some prior research document numerous capital benefits of IFRS adoption including reduced cost of capital and improved liquidity (Daske, Hail, Leuz, & Verdi, 2012; Li, 2010), greater analyst following and reduced analyst forecast dispersion (Horton & Serafeim, 2010; Tan et al., 2011), more accurate information will be available to analysts which might lead to an improvement in analysts' earnings forecasts accuracy (Seng Cheong, Kim, & Zurbruegg, 2010; Tong, 2007).

Following this theoretical framework, it is clear that analysts' decision-making as reflected in their earnings financial analysts' forecasts is affected by the quality of the firm's financial information. Accordingly, analysts are among the most important users of financial statements and allow us to evaluate the effects of the Jordan context mandatory switch to IFRS.

4. Empirical literature review and hypotheses development

This study contributes to this empirical literature with a different approach that attempts to verify the impact of IFRS on the informational content of earnings through their impact on the financial analysts' forecasts. Along with the adoption of IFRS, previous study on the impact of IFRS on earnings forecast error and dispersion can be placed into two main categories: studies focusing on (1) voluntary IFRS adoption and, (2) mandatory IFRS adoption. The first studies in this line of research refer to countries that adopted IFRS voluntarily (e.g. France, Germany, Italy and Switzerland, among others) and the empirical evidence has provided mixed results. For instance, Ashbaugh and Pincus (2001) find that earnings forecasts of analysts are smaller for firms that adopted IFRS than from those that are committed to local GAAP. Supporting this idea, Hope (2004) observes from a sample of 18 firms in different countries that the accuracy of earnings forecasts increases where the available accounting alternatives are more restricted.

The second group after IFRS adoption in 2005 by firms appears to be a strategic decision based on improvements in analyst forecast accuracy around mandatory IFRS adoption, and research suggests that mandatory IFRS adoption is associated with lower analyst forecast errors (Byard, Li, & Yu, 2011; Horton et al., 2013; Tan et al., 2011). Previous academic research argues that the adoption of IFRS will improve comparability of financial information because it increases harmonization of accounting practices and improves the information environment across firms and countries (e.g. Ashbaugh & Pincus, 2001; Bae et al., 2008). While some studies suggest improved accuracy of analysts' forecasts after the adoption of IFRS (Bae et al., 2008; Brown, Preiato, & Tarca, 2009; Horton et al., 2013; Wang, Young, & Zhuang, 2008), some research suggests that the improved accuracy is at least partially attributable to the increase in the quantity of financial information which attends IFRS adoption (Ball, 2006; Barth et al., 2008; Hope, 2003). Others suggest that the increased analyst forecast accuracy is attributable to increased cross-firm comparability from IFRS adoption (Bae et al., 2008; Cascino & Gassen, 2015; Horton et al., 2013; Tan et al., 2011). De Franco, Kothari, and Verdi (2011) show that comparability reduces earnings forecast error and forecast dispersion. It is of interest that Lang, Maffett, and Owens (2010) find a worldwide trend towards greater comparability, which applies for mandatory IFRS adopters as well. Perhaps, more significant is that Neel (2015) finds that the improvements in accuracy and dispersion are restricted to firms that experience an improvement in comparability.

Prior research has also investigated the significances of mandatory IFRS adoption on analyst forecasts errors. Byard et al. (2011) find that analyst forecast errors and dispersion are significantly reduced around mandatory IFRS adoption. According to this view, Jiao et al. (2012) study the impact of the mandatory adoption of IFRS on analysts' forecasts in Europe. The result shows that the forecasts become more accurate and less dispersed after the adoption of the new accounting standards. Ashbaugh and Pincus (2001) find that analysts' forecast accuracy improves when firms adopt international accounting standards and that this effect is more pronounced when the difference with the previously used local standard is greater. Furthermore, Tan et al. (2011), who investigate the impact of IFRS in 25 countries, illustrate that the quality of the forecasts of financial analysts is improved only for foreign analysts attracted by the adoption of these standards.

The analyst's outputs are informative to investors due to their publication which led to a market reaction that results in the observation of abnormal returns on the publication day or on the following day (Frankel, Seethamraju, & Zach, 2008). Additionally, the financial analyst is considered responsible for partial reduction in the asymmetry through his publication. Given the important role of financial analysts' forecasts in decision-making, the international accounting standards are expected to improve forecasts of financial analysts. It is predicted that the mandatory adoption of IFRS in Jordan is positively associated with analysts' earnings forecast accuracy. Bae et al. (2008) studied 6,888 foreign analysts in 6,169 firms from 49 countries from 1998 to 2004 and concluded that accounting differences between countries represent a very high cost for financial analysts. Choi, Kwak, and Gong (2013) investigate the accuracy of analysts, forecasts for IFRS adoption between 2003 and 2007 in the UK and state that value relevance is significantly higher under IFRS. Tan et al. (2011) find

that foreign analyst forecast errors decrease from the pre- to the post-IFRS adoption period, and Horton et al. (2013) provide further empirical evidence of a general decrease in analyst forecast errors from the pre- to the post-IFRS adoption period. Choi et al. (2013) find that the improvements in accuracy and dispersion are less pronounced for the initial post-IFRS period.

Following this literature, it is clear that the question relating to the impact of IFRS on financial analysts' forecasts was subject of controversies. Accordingly, the value relevance of financial statements improve under IFRS, more accurate information will be available to analysts which might lead to an improvement in analysts' earnings forecasts accuracy (Seng Cheong et al., 2010; Tong, 2007), we also attempt to verify whether financial analysts need time to understand the changes from local accounting principles to IFRS.

Our first objective in this research is to investigate the impact of IFRS mandatory adoption on analysts' earnings forecasts in Jordan a code law country. To achieve this objective, we assume that IFRS mandatory adoption helps analysts in forecasting future earnings. Given that the mandatory of IFRS adoption can be expected to be positively associated with analysts' earnings forecasts accuracy when the quality of the financial statement information increases. Thus, our first hypothesis is:

H1: The financial analysts' forecasts errors more accurate after the mandatory adoption of IFRS in Jordan

Some of the arguments related to the suggestions that mandatory IFRS adoption reduces analysts' forecast error are also valid for a reduction in forecast dispersion. This argument is consistent with the empirical evidence that analyst forecast dispersion decreases after IFRS adoption (Horton et al., 2013; Preiato, Brown, & Tarca, 2012). In the same direction, Byard et al. (2011) find that analyst forecast errors and dispersion are significantly reduced around mandatory IFRS adoption. Cotter et al. (2012) examine a sample of Australian firms, finding that IFRS improved analysts' earnings forecasts and that there were no significant changes in forecast dispersion in the year of IFRS adoption. Consequently, it is supposed that changes in forecast error dispersion around IFRS adoption are consistent with the improvement in financial statement-based forecast accuracy around the mandatory IFRS adoption.

From an agency perspective and based on previous research evidence, it is supposed that the mandatory adoption of IFRS in Jordan is negatively associated with the degree of disagreement among analysts is lower after the adoption of IFRS assuming that IFRS has increased financial statement quality and comparability. Thus our second hypothesis is:

Therefore, the second hypothesis is:

H2: The financial analysts' forecasts dispersion decreases after the mandatory adoption of IFRS in Jordan

This perspective, however, there are some of reasons why hypotheses H1 and H2 might not be accepted. Thus, Cuijpers and Buijink (2005) support the idea that analysts need time to understand financial statements under the new standards. They find that recent adopters have higher forecast dispersion and lower analyst following than early adopters. Another study by Jermakowicz et al. (2007), Barth et al. (2008), and Landsman et al. (2012), who report that high earnings volatility after mandatory IFRS adoption can increase analysts' earnings forecast error.

Following this literature, the objective of the adoption of IFRS in the developing country like Jordan was expected to improve the functioning of capital markets and gives more transparent, more rigorous and more detailed information. Thus, it should improve the quality of financial analysts' forecasts in decision-making process, which is affected by the quality of the firm's financial reports.

5. Research design

5.1. Sample and data

To conduct this empirical study, the sample consists of 66 firms (service and industrial) over "a period of 12-years" listed on the Amman Stock Exchange (ASE) in terms of market capitalization between 2002 and 2013. The study excludes financial and insurance firms because that might bias the results of research. The examination of the impact of IFRS taking one country as sample aims to eliminate any biases associated with the use of international samples and to avoid the effect of differences in institutional environments before adopting IFRS.

This study spreads over 12 years from 2002 to 2013, while removing the transition year of the mandatory adoption of IFRS. Although, several researchers consider the transition year, the first year of mandatory adoption of IFRS begging in 2005 (Jiao et al., 2012; Jones & Finley, 2011). Others consider the year of transition the year prior to the year of the mandatory adoption of IFRS in 2004 (Saadi, 2010). The third part of research has considered the two years 2004 and 2005 as transition years (Li, 2010). As such, the year 2004 considered as a transition year is excluded, which was a year of comparative financial statements where various firms had practiced a two sets of accounting books. Since analyst forecast is defined as the average of available earnings forecasts at any time. To test the dispersion of financial analysts' forecasts, the firm must be necessarily followed by at least two analysts. In the analyst earnings forecast, we only retain the final consensus forecast before the announcement of annual earnings as this forecast is made based on all the available information in the market and is the most informative. For the dispersion, we eliminate observations with only one analyst following because the dispersion of analyst forecasts will be zero by definition in these cases.

The data-set for analysts' earnings forecasts and the other variables used in the study are obtained from the Jordanian annual Public Shareholding Companies Guide and corporate annual reports databases. In particular, the analysis of 11 years allows researcher to take into account changes in standards (from JACPA to IFRS) and to stand back from each accounting standards (two JACPA-year and nine-year IFRS). This could allow researcher to reduce any biases in third period of standards (2004) related to the period of learning and understanding of IFRS that can differentiate one firm from another. In addition, the total number of observations varies according to the forecast horizon and ranges between 520 and 392, for the first model consists of 520 observations, and for the second model consists of 392 observations.

5.2. Model and variables measures

To examine whether the effect of IFRS adoption on the accuracy and dispersion of financial analysts' forecasts in Jordan, running a panel data regression with temporal "dummy" variables in order to test the hypotheses formulated for this study. Following previous researcher's Lang and Lundholm (1996), Ashbaugh and Pincus (2001), Hope (2003), and Beretta and Bozzolan (2008), we use the reverse of accuracy, namely forecast error, to measure the accurateness of forecasts. Forecast error (FE$_{t,i}$) is calculated as the absolute difference between the EPS forecast and the actual EPS value, scaled by the share price of firm. Thus, the share price is used as a deflator to facilitate comparison of analysts' earnings forecast error and dispersion (Byard et al., 2011; Lang & Lundholm, 1996). The following formula describes the accuracy of analyst forecasts:

$$FE_{t,i} = \left|(FEPS_{t,i} - AEPS_{t,i})\right|/P_{t-1,i} \tag{1}$$

where FEPS$_{t,i}$ the EPS forecast made by analysts during the 12-month period before the fiscal year-end for firm i in year t, and AEPS$_{t,i}$ represents the real earnings per share of firm i in year t. $P_{t-1,i}$ is the stock price of firm i at the end of year t. A positive forecast error (FE > 0) indicates that managers have underestimated the profits disclosed in the pessimistic forecast, while a negative forecast error (FE < 0) indicates an optimistic forecast with actual profits below forecasted profits. *Forecast dispersion* refers to the absolute value of the difference between the highest forecast and the lowest

forecast, scaled by the stock price of firm at the end of year. The share price is used as a deflator to facilitate comparison across firms of analysts' forecast error and dispersion. The following formula describes the dispersion of analyst forecasts:

$$\text{Disp(EPS)}_{t,i} = \left| \text{Forecast}_{H,t,i} - \text{Forecast}_{L,t,i} \right| / P_{t-1,i} \tag{2}$$

The following regression model is used to investigate the relationship of analysts' forecast errors and dispersion before and the mandatory adoption of IFRS.

$$\text{FE(or Disp)}_{t,i} = \beta_0 + \beta_1 \text{IFRS}_t + \beta_2 \text{Size}_{t-1,i} + \beta_3 \text{NANAL}_{t-1,i} + \beta_4 \Delta \text{EPS}_{t-1,i} + \beta_5 \text{Loss}_{t-1,i}$$
$$+ \beta_6 \text{Decline}_{t-1,i} + \beta_7 \text{StdROE}_{t-1,i} + \beta_8 \text{Growth}_{t-1,i} + \varepsilon_{t,i} \tag{2}$$
$$t = 2002, 2003, \dots, 2013 \qquad i = \text{firm } 1, 2, \dots, 66$$

The dependent variables are forecast errors (FE) and dispersion (Disp) for firm i and year t, respectively. As may be seen, Table 1 provides the definitions and measurement of all the variables analysed or understood empirically as a clearly defined entity compared to one or several other pervious empirical research focusing on adoption of IFRS and its effect on financial analysts' forecasts. IFRS is the indicator variable that captures the changes in accounting standards following the IFRS mandatory adoption in year after 2005. The key coefficient of interest, $\beta1$, captures the difference in financial analysts' forecasts between the test and control firms, and therefore, the effect of mandatory IFRS adoption on analysts' forecasts accuracy. If IFRS adoption improves the accuracy of analysts' forecasts, then $\beta1$ would have significantly negative value.

In line with previous literature, some explanatory variables were also considered as control variables (Equation (3)): Firm size (Size) is measured as the natural log of a firm's market capitalization at the end of year $t-1$ (Ashbaugh & Pincus, 2001; Jiao et al., 2012). For instance, large firms are expected to provide more additional information than their smaller peers (Barron et al., 2002) and because they may have higher disclosure levels (Lang & Lundholm, 1993; Welker, 2005), which in turn lead to reducing analysts' earnings forecast error and dispersion (Lang & Lundholm, 1996).

Table 1. Definitions and measurement of variables		
COD	**Variables**	**Definition and measurement**
FE	Forecasts' error	Analyst forecasts' error for firm i and year t
Disp	Forecasts' dispersion	Analyst forecasts' dispersion for year *t*
IFRS	International Financial Reporting Standards	Is a dummy variable, which equals to1 if firm *i* adopted the IFRS in year *t* after 2005 and 0 otherwise
Size	Firm size	Is measured by the natural logarithm of the total market capitalization at the end of year *t*-1. This variable controls for the effects of firm size
NANAL	Analyst forecasts	Is measured as the natural logarithm of the number of annual analyst forecasts for year *t*
ΔEPS	Earnings per share	Absolute value of the change in earnings of firm *i* between *t*−1 and *t*
Loss	Loss-making firms	Is a dummy variable, which equals to1 if firm *i* reports negative earnings for the year t, and 0 otherwise
Decline	Decline	Is a dummy variable, which equal to 1 if the result of year t is less than that of the year *t*−1, 0 otherwise
StdROE	Firm performance volatility	Is measured by the standard deviation of ROE based on the five years before year *t*
Growth	Firm growth	Is measured as the annual percentage change in total revenue, averaged over the five years ending with the forecast year
$\varepsilon_{t,i}$		Residual for firm *i* at time *t*

Note: Presents and defines the different variables used in this study.
Source: Authors' computation.

Moreover, firm size could inherently affect firms' risk (Botosan, 1997, 2006; Francis, Nanda, & Olsson, 2008; Gebhardt, Lee, & Swaminathan, 2001; Poshakwale & Courtis, 2005), because large firms are expected to be more solvent than small ones. Since firm size could reduce or increase analysts forecast error, no sign is predicted for this variable (Hodder, Hopkins, & Wood, 2008).

Number of analysts Forecasts (NANAL) is another variable that is associated with a firm's disclosure levels and may have an impact on the forecasts quality (Byard et al., 2011; Jiao et al., 2012; Lang & Lundholm, 1996). No sign is predicted for analyst forecast since increased analyst following may lead to more aggressive forecasts, or may merely be a function of the increased size of the firms followed (Gu & Wu, 2003). Lys and Soo (1995) argue that there is more competition among analysts when the number of analysts increases. They find that the number of analysts following a firm is positively associated with forecast accuracy and negatively associated with the dispersion of financial analysts' forecasts. Earnings per share (EPS) measure changes in earnings due to factors unrelated to IFRS. Thus, forecasts of firm's earnings with more variable results are less accurate and more dispersed. Similar to previous studies, Lang and Lundholm (1996) predict a decline in EPS forecast accuracy when there are major changes in earnings. The variable EPS changes takes into account the fact that Forecast error and dispersion tend to be higher when the announced EPS is negative or significantly decreased.

The variable LOSS designed whether the analysts are more likely to have issued forecasts that are found to have been especially optimistic when the firm reports negative earnings (Herrmann, Hope, & Thomas, 2008) in which loss forecasts are less reliable than profit forecasts (Brown, 2001). Similarly, Coën and Desfleurs (2010) confirm that it is easier for analysts to forecast profits as losses calculations and increases profits rather than decreases. Decline is a binary variable which takes into account the fact that the result of the year *t* has been increased or decreased compared to result of the year *t*−1. Byard et al. (2011) results show analyst earnings forecast errors decline significantly, but only in countries with a strong legal environment. This finding supported Bissessur and Hodgson (2012) who also found a significant decline in analyst forecast errors post-IFRS in Australia. Indeed, these two variables are expected to be positively associated with the forecast error and dispersion. Firm performance volatility (StdROE) represents the standard deviation in ROE forecasts for firm *i* calculated in the five years before the forecast year to proxy for the performance volatility of firms. It is associated with accuracy of forecasts for a firm with more volatile performance is lower and the dispersion is higher (Jiao et al., 2012). The dispersion and the error increase with the increase in this value (Lang & Lundholm, 1996). In this respect, it is difficult to predict a profit when firm performance is volatile.

The last control variable is the firm growth (Growth) which is calculated as the annual percentage change in total revenue, averaged over the five years ending with the forecast year (Hodder et al., 2008), is not predicted since they could either increase or decrease forecast error. Gu and Wang (2005) argue that analysts facing economic resources constraints have less ability to forecast the earnings of high information complexity firms. It is expected that greater forecast errors occur when firms are diversified or have low growth options.

6. Empirical findings and discussion

6.1. Descriptive statistics
Descriptive statistics of numeric and dichotomous variables are presented, respectively, in Table 2 for the forecast error sample (Panel A) and the dispersion sample (Panel B). Panel A reveals that mean FE of the overall sample is positive for earnings accuracy forecasts (0.436). Positive signs (FE > 0) indicate that, on average, managers underestimate actual earnings. As for dispersion (Panel B), there is a similar result. These may indicate that IFRS adoption creates more opportunities for managers to conduct earnings management. Compared to other variables in both samples (forecast error and dispersion), the mean of all other independent variables is not greatly different.

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Table 2. Descriptive of numeric and dichotomous. Panel A and B report the descriptive statistics of numeric and dichotomous the sample for the accuracy and dispersion test, respectively

Variables	Descriptive of numeric				Descriptive of dichotomous		
	Mean	Std. dev.	Min	Max	Modalities	Frequency	%
Panel A: Error of financial analysts' forecasts							
FE	0.436	1.289	17.911	3.301			
Size	3.028	0.661	1.772	5.110			
NANAL	0.055	0.081	0.002	1.044			
ΔEPS	0.042	0.066	0.001	0.531			
StdROE	2.491	7.292	0.019	90.559			
Growth	0.349	0.291	0.001	1.192			
IFRS					1	409	78.65
					0	111	21.35
Loss					1	88	16.92
					0	432	83.08
Decline					1	165	31.73
					0	355	68.27
Panel B: Dispersion of financial analysts' forecasts							
Disp	0.487	0.792	0.101	5.216			
Size	3.346	0.574	1.800	5.110			
NANAL	0.053	0.075	0.001	0.986			
ΔEPS	0.042	0.070	0.001	0.531			
StdROE	2.706	8.313	0.019	90.559			
Growth	0.502	0.205	0.244	1.182			
IFRS					1	296	75.51
					0	96	24.49
Loss					1	55	14.03
					0	337	85.97
Decline					1	126	32.14
					0	266	67.86

Note: The description of the variables is provided in Table 1.

Source: Authors' computation.

Table 3 presents the simple correlations between the different variables of the first, and the second model. For the pairs of independent variables, the IFRS dummy is positively associated with firm size and negatively associated with the volatility of firm performance (StdROE) with statistical significance at the 1% level in both samples (Panels A and B). Furthermore, the correlations between the independent variable paired with the dependent variables are reported in Table 3. Panel A reports that forecast error is negatively correlated with the IFRS dummy. This suggests that forecasts are more accurate after the mandatory adoption of IFRS. The other finding is that the forecast error is negatively correlated with firm size, decline, firm performance volatility and growth, consistent with previous findings that analysts' forecasts are more accurate for large firms (Lang & Lundholm, 1996), and positively associated with analyst forecasts, variation in EPS and loss-making firms. As can be seen in Panel B, the dispersion is negatively associated with IFRS dummy and statistically significant effect on analyst forecast dispersion at the 1% level. Dispersion is positively and significantly associated with firm size, variation in EPS, loss-making firms, decline, standard deviation of EPS, firm performance volatility and growth.

Table 3. Summary of the correlation matrix of the accuracy, and dispersion									
Variables	**FE**	**IFRS**	**Size**	**NANAL**	**ΔEPS**	**Loss**	**Decline**	**StdROE**	**Growth**	**VIF**
Panel A: Error of financial analysts' forecasts									
FE	1.000									
IFRS	−0.372***	1.000								1.65
Size	−0.347***	0.085***	1.000							1.45
NANAL	0.120**	−0.412***	0.550***	1.000						1.26
ΔEPS	0.077	−0.0650	−0.037	−0.045	1.000					1.17
Loss	0.020	−0.218***	−0.039	−0.086	0.165***	1.000				1.16
Decline	−0.016	−0.080	−0.020	−0.018	0.136***	0.102***	1.000			1.11
StdROE	−0.009***	−0.033	0.025	−0.048	0.298***	0.139***	0.079**	1.000		1.07
Growth	−0.267***	0.241***	0.052	−0.106**	0.082	−0.001	0.121**	0.015	1.000	1.05
Variables	**Disp**	**IFRS**	**Size**	**NANAL**	**ΔEPS**	**Loss**	**Decline**	**StdROE**	**Growth**	
Panel B: Dispersion of financial analysts' forecasts									
Disp	1.000									
IFRS	−0.410***	1.000								1.47
Size	0.265***	0.099***	1.000							1.39
NANAL	−0.189**	−0.341***	0.462***	1.000						1.21
ΔEPS	0.158***	−0.293***	0.119	−0.017	1.000					1.20
Loss	0.129***	−0.175***	−0.019	−0.076	0.139***	1.000				1.15
Decline	0.103***	−0.142***	−0.041	0.009	0.118***	0.030	1.000			1.10
StdROE	0.338***	−0.321***	0.038	−0.061	0.224***	0.115***	0.120**	1.000		1.08
Growth	0.088**	0.300*	0.155	−0.122**	0.077	−0.059	0.151**	0.018	1.000	1.06

Source: Authors' computation.

*Significant level at 10%, 2-sides.

**Significant level at 5%, 2-sides.

***Significant level at 1%, 2-sides.

In addition, Table 3 also shows that the correlations for the two models are relatively lower than 0.9 which indicate that multicollinearity is not likely to be an issue in the regression analyses. Overall, the variables used, have a value of Variance Inflation Factors (VIFs) less than 10, limit suggested by Gujarati (1995) and Kennedy (1998), which shows that multicollinearity does not pose a problem to our regression analyses.

6.2. Empirical results

Table 4 present univariate statistics of the variables for the analyst forecast error (Panel A) and dispersion (Panel B) on the estimation of Equation (3). The results presented in Panel A show that the analyst forecast error is a negatively associated with IFRS mandatory adoption (−0.415) and statistically significant (*p*-value > is 0.029). These results show that the mandatory adoption of IFRS in 2005 leads to a significant reduction in the forecast error. Similarly, Byard et al. (2011) find that analysts' earnings forecast errors decrease following the adoption of IFRS. Panel B reports that analyst forecast dispersion is negatively associated with IFRS mandatory adoption (−0.159) and statistically significant (*p*-value > is 0.033). The reported results suggest that, the forecasts are more accurate and less dispersed after the adoption of IFRS. The empirical results are consistent with those reported by Cotter et al. (2012) who find that forecast accuracy improves after the adoption of IFRS in Australia. This result supports research hypothesis H1 and H2.

The results in Panel A show that the firm size has a positive and significant effect on analyst forecast error ($b = 1.050$, *p*-value < 0.01), the number of analysts following (measured by NANAL) has a negative and significant effect on analyst forecast error ($b = −2.065$, *p*-value < 0.01). However, the

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Table 4. Summary of the regression results				
Variables	**Coefficient**	**Std. Error**	**t-statistic**	**p-value > |t|**
Panel A: Error of financial analysts' forecasts				
IFRS	−0.415	0.156	−2.31	0.029**
Size	1.050	0.290	7.06	0.000***
NANAL	−2.065	0.769	−2.68	0.000***
ΔEPS	1.660	1.203	1.41	0.196
Loss	0.230	0.161	1.82	0.077*
Decline	0.011	0.094	0.08	0.804
StdROE	0.012	0.015	0.19	0.861
Growth	0.622	0.170	3.19	0.012**
Cons	−5.330	0.712	−6.31	0.000***
R^2	0.1572			
F-statistic	12.29			
Sig	0.000			
Panel B: Dispersion of financial analysts' forecasts				
IFRS	−0.159	0.070	−2.22	0.033**
Size	−1.503	0.110	−8.21	0.000***
NANAL	1.130	0.462	2.19	0.020**
ΔEPS	0.623	0.591	0.88	0.298
Loss	0.193	0.231	0.71	0.498
Decline	0.032	0.064	0.55	0.690
StdROE	0.071	0.010	1.06	0.040**
Growth	0.533	0.214	2.39	0.010**
Cons	3.640	0.544	8.59	0.000***
R^2	0.3310			
F-statistic	20.09			
Sig	0.000			

Source: Authors' computation.

*Significant level at 10%, 2-sides.

**Significant level at 5%, 2-sides.

***Significant level at 1%, 2-sides.

results reflect the decrease in analyst following decreases in the accuracy of earnings forecasts. In addition, Panel B reports a positive and significant effect of the number of analysts on analyst disagreement (*b* = 1.130, *p*-value < 0.05), the firm size has a negative and significant effect on analyst forecast error (*b* = −1.503, *p*-value < 0.01). The results are consistent with the proposition that the size is negatively associated with the forecast dispersion which can be explained by the higher possibility of large firms to access further information (Maghraoui & Dumontier, 2008), and the dispersion of analyst forecast goes up when there are more analysts providing forecasts. The results related to the mandatory adoption of IFRS reveal that the greater understanding of IFRS leads to lower forecast error on the part of financial analysts.

The results in Panel A and B control variables show that although both standard deviation of EPS and loss-making firms (Loss) have a positive and insignificant effects on both the analysts earnings forecast error and analyst dispersion following a firm, respectively. This result confirms that accuracy of analyst forecasts is lower in loss-making firms and those displaying significant changes in earnings in two consecutive years, as these are the most difficult firms to earnings forecast. This result is consistent with Cotter et al. (2012). Finally, most of the explanatory variables in the

regression analysis for the analyst forecast error and dispersion are positive and are in agreement with the interpretation of the firm reports among analysts.

Regardless of the robustness of these panel regressions, we check the robustness of the results described above, we follow the literature (see, e.g. Diether, Malloy, & Scherbina, 2002) which focus on the relative standard error of analyst forecasts as another proxy for dispersion. In much of the analysis above, we calculated the standard deviation of the analyst forecasts divided by the product of the square root of the number of analysts following the firm and the absolute value of the average earnings forecast. The regression results again show that analyst dispersion decreased in the years following IFRS adoption when we use this alternative dispersion measure.

Overall, the findings are consistent with our previous results found by (Brown et al., 2009; Byard et al., 2011; Cotter et al., 2012; Horton et al., 2013; Wang et al., 2008), showing that the adoption of IFRS increased the ability of analysts to forecast earnings and decreased analyst dispersion.

7. Summary and conclusion

The main objective of this study is to investigate the impact of mandatory IFRS adoption in Jordan on the accuracy and dispersion of financial analysts' forecasts. In particular, the study focuses on the possible benefits of mandatory IFRS adoption for financial analysts covering firms in terms of information capture and the associated improvement in their earnings forecasts. For this purpose, the sample of service and industrial shareholding firms listed on ASE in Jordan during the period 2002–2013. Based on this idea, it is considered that financial analysts' earnings forecasts provide an opportunity to evaluate the impact of IFRS adoption on the quality of earnings as reflected in the characteristics of analyst forecasts.

The results from regression analysis suggest that analysts' earnings forecast dispersion decreases from the moment of mandatory IFRS adoption period. Moreover, the regression results show that when firms produce their financial statements following IFRS there is evidence to show increased accounting comparability and better quality financial information (Jiao et al., 2012), financial analysts are able to make more reliable earnings forecasts, thereby reducing analysts' forecast error in the IFRS adoption period. Horton et al. (2013) document an overall decrease in forecast errors after the mandatory adoption of IFRS in several countries. The evidence from the study also shows the debate on the desirability of the current move towards one global set of accounting standards as results are robust to several changes in model specifications.

The originality of this study consists first in analysing the impact of mandatory IFRS on the information content of earnings using the accuracy and dispersion of analysts' earnings forecasts and second in taking a long analysis period from 2002 to 2013 as a period of study. This eliminates all bias related to the learning of these standards.

This study focuses on the effects of mandatory IFRS adoption on the accuracy of financial analysts' earnings forecasts in Jordan. Although, the study suggests that transition process to IFRS has been beneficial for analysts following Jordanian firms, considering the improvement in the decision-making by financial analysts. In addition, the increase in forecast accuracy and decrease in forecast dispersion in the adoption year could result from additional effort and attention from preparers and analysts in producing, explaining and understanding that IFRS improves the quality of firms'. Regulators also should pay particular attention to the implications of any changes in the technical methods used to converge local accounting standards with international accounting standards. Therefore, the results of this study are of interest to the current discussion on the mandatory of IFRS adoption. However, the results can be extended to other emerging countries as the Jordan accounting system is similar to the systems in MENA countries, as well as other countries applying globalization of accounting standards measurement, recognition and presentation rules for financial reporting.

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