THE IMPACT OF ADOPTION OF THE XBRL ON THE DEVELOPMENT OF STOCK MARKETS

Wafa Sassi[1], Hakim Ben Othman[2] and Khaled Hussainey[3*]

[1]University of Manouba, Tunisia
[2]American University of Malta, Malta
[3]Portsmouth Business School,
Portsmouth University, United Kingdom

ABSTRACT

The paper examines the impact of adoption of the eXtensible Business Reporting Language (XBRL) on the development of stock markets using a large international sample. Our analysis was based on panel estimation techniques for 18 countries for a period of 20 years from 2000 to 2019. Our analysis provided empirical evidence that the adoption of the XBRL has a negative impact on the development of stock markets. This implies that strict policies are needed for the successful adoption of the XBRL and also a mechanism is needed to ensure that stakeholders understand the value of the information provided by the XBRL formatted financial reports.

Keywords: XBRL, development of capital markets, panel estimation techniques, cross-countries study

ARTICLE INFO

Article History:
Received: 4 February 2021
Accepted: 16 March 2021
Published: 31 August 2021

* Corresponding Author: Khaled Hussainey. E-mail: Khaled.Hussainey@port.ac.uk

INTRODUCTION

Due to the increased use of technology, many companies have set up their websites to publish relevant information to stakeholders. However, the literature argues that information published on companies' websites is not very different from information disclosed in reports in a hard-copy format (Yoon, Zo, & Ciganek, 2011). It suffers from problems of efficiency, accuracy, and transparency (Troshani & Lymer, 2010), and also it does not satisfy stakeholders' needs.

Gunn (2007) argued that the information production and distribution process involves information movements from one system to another, for a variety of different purposes. Therefore, the multiplication of the manual steps of re-keying and reorganization of information requires a lot of work and increases potential errors. This could affect both the reliability and credibility of financial statements.

According to Vasarhelyi, Chan, and Krahel (2012), the users' acquisition of relevant data to make relevant decisions may be hinder by the large volume of data available on the Internet. A user who needs to analyze financial information is required to search for corporate financial statements. He/she then needs to search for the desired information in these statements or other data sources and summarise them in a spreadsheet or using another program for the decision-making process (Johannesburg Stock Exchange, 2010). This process requires considerable time and effort and is linked to potential risks. The users of financial reports find difficulties in accessing the information on company websites with the HTML or PDF version as this requires significant time-consuming work including cutting and pasting of data from a file to a file (Janvrin & No, 2012). Rezaei (2013) stated the automation of data extraction and analysis could be difficult because of the inconsistency in accounting terms and report formats. It is also difficult to make a side-by-side comparison of two different companies' financial reports due to the inconsistent names for the same reporting item (XBRL US, 2012). Moreover, he also stated that current business reports are prepared in one language, mostly in English.

In a response to the above criticism of the current reporting model, the eXtensible Business Reporting Language (XBRL) was introduced

(Debreceny et al., 2010). The XBRL was developed due to the weaknesses of traditional reporting (Ilias et al., 2020). XBRL is a member of the family of languages based on XML, or Extensible Markup Language, which is a standard for digital business reporting. It is managed by XBRL International, which is a not-for-profit consortium of over 600 organizational members from different countries (www.xbrl.org).

XBRL is defined as "*business computer language that provides a standardized protocol for computers to exchange and process financial data with no human intervention*" Cong, Hao, and Zou (2014; pp. 181). Stakeholders can easily find, extract, and analyse the data with analytical applications when companies use XBRL formatted financial reports and financial data is represented using tags (Janvrin & No, 2012). Proponents of the XBRL argued that it could reduce data acquisition costs through (1) the automation of the data collection; (2) providing a large set of data to users than those provided by data aggregators (Blankespoor, Miller, & White, 2014). They also argued that the XBRL assists users in comparing information over years and across industries. So adoption of the XBRL offers potential benefits. These include data collection automation, faster extraction and handling of data, cost-saving, improved quality of information and decision-making (KPMG, 2008; Kim, Lim, & No, 2012; Srivastava & Liu, 2012; Birt, Muthusamy, & Bir, 2017; Ra & Lee, 2018; Blankespoor, 2019).

Given its advantages, the XBRL is rapidly developing in the world and it has been used for many purposes. For example, it has been adopted to meet the information needs of different government agencies such as the regulatory authorities, tax authorities, and banking regulators. Hence, to improve the quality of information for the decision-making process, several countries mandate the adoption of the XBRL (e.g. China and the United States).

Although some studies demonstrated that the adoption of the XBRL is very beneficial and has positive consequences (Hodge, Kennedy, & Maines, 2004; Tan & Shon, 2009; Yoon, Zo, & Ciganek, 2011; Chen, 2012; Bai, Sakaue, & Takeda, 2014; Markelevich, Shaw, & Weihs, 2015; Tzu-Yi et al., 2016; Blankespoor, 2019; Kumar, Kumar, & Dilip, 2019; Rahwani et al., 2019), there is still a need to examine the its usefulness at the country level (Nobre & Carvalho, 2011; Steenkamp & Nel, 2012). For example, Cong,

Hao, and Zou (2014) provided empirical evidence that XBRL adoption improves stock market efficiency.

Some studies explored the cost of XBRL implementation. They showed that the adoption of the XBRL creates new problems especially during the early years of the adoption (Boritz & No, 2004; Boritz & No, 2008; Debreceny et al., 2010; Janvrin & No, 2012; Selim, 2012; Roohani & Zheng, 2013). Liu, Yao, et al. (2014) stated that the adoption of XBRL is a costly decision. The cost of XBRL-based financial reporting includes infrastructure and training costs. It also includes the cost of the software as well as implementation costs (Debreceny et al., 2005). Other studies (Boritz & No, 2008; Debreceny et al., 2010) argued that the existence of errors in the XBRL filings is one of the major concerns by potential users. Janvrin and No (2012) also found that the process of tagging and taxonomy extension is extremely time-consuming. Besides, they found that XBRL is not an easy task to understand and use and knowledgeable service providers are required for successful adoption. They found that both prepares and users of XBRL formatted financial reports should be kept up-to-date with the developments of taxonomies and technology to ensure a successful implementation of XBRL.

Further, firms are allowed to create their taxonomy extensions using XBRL. This could eliminate one of the important objectives of the adoption of XBRL, which is the comparability (Boritz & No, 2008). Li and Nwaeze (2015) found that XBRL extensions in the early phases of the adoption of XBRL impact negatively companies' information environment and impact positively companies' information environment at later phases of the XBRL adoption. Li and Nwaeze (2015) argued that companies acquire, over time, more skill and sophistication in their extension practices and extensions become more consistent, comparable, and precise.

Other studies found mixed empirical results regarding the potential benefits of XBRL adoption. For example, although several studies found that the adoption of XBRL decreases information asymmetry, increases analysts' forecast accuracy, reduces the cost of capital, and improves firms' stock liquidity (Bai, Sakaue, & Takeda, 2014; Hao, Zhang, & Fang, 2014; Liu, Wang, & Yao, 2014; Liu, Luo, & Wang, 2017; Felo, Kim, & Lim, 2018"ISSN" : "14670895", "abstract" : "In 2010 the SEC began requiring

registered firms to provide detail-tagged footnote information in XBRL (eXtensible Business Reporting Language; Ra & Lee, 2018) other studies found the opposite findings (Blankespoor, Miller, & White, 2014; Liu, Luo, et al., 2014; Liu, Yao, et al., 2014).

To complement the above literature, we studied the consequences of the adoption of the XBRL. We examined the impact of XBRL adoption on stock market development. Prior research on the consequences of XBRL adoption focused on companies in a single country. To the best of our knowledge, our paper provides the first empirical evidence on the consequences of XBRL at the country-level. Moreover, we provide new evidence on the joint impact of XBRL and International Financial Reporting Standards (IFRS) at the country-level on stock market development. Our analysis is based on 18 economies from 2000 to 2019. Our analysis shows that mandatory adoption of the XBRL has a negative impact on the development of stock markets. It also shows that XBRL and IFRS adoption in a country together does not lead to a development in its stock market.

Our paper is organised as follows. In Section 2, we present the relevant literature and we develop our research hypotheses. In Section 3, we discuss our method. In Section 4 we report our findings. Section 5 is our conclusion.

LITERATURE REVIEW AND HYPOTHESES

Literature Review

One of the global changes in the financial information environment was the introduction of the IFRS and XBRL (Shan & Troshani, 2016). Such a rich information environment could improve the efficiency of the stock markets (Zamroni & Aryani, 2018). Steenkamp and Nel (2012) argued that investors' demand for more transparency, accurate, accessible, and relevant information are one of the main drivers for the adoption of the IFRS and the XBRL. Sudalaimuthu and Haraiharan (2011) argued that the adoption of the IFRS and the XBRL could enable greater efficiency and control over-reporting as both of them standardize financial reporting to promote transparency and to improve the quality and comparability of financial reports.

The literature examined the impact of the IFRS on the development of capital markets (Zeghal & Mhedhbi, 2012; Klibi & Kossentini, 2014; Ben Othman & Kossentini, 2015; Emudainohwo, 2020). A consistent finding across these studies was that the adoption of the IFRS has a positive impact on the development of emerging markets.

Several studies provide evidence on the benefits of the use of the IFRS. Consistent findings across these studies were that the adoption of the IFRS improves a firm's stock liquidity, reduces the cost of capital, and improves corporate performance (Daske, Leuz, & Verdi, 2008; Persakis & Iatridis, 2017; Ozkaya, 2018; Wook-bin & Yuk, 2018). Hope, Jin, and Kang (2006) argued that if firms adopted the IFRS, the quality of their financial reports will increase and hence the capital market will gain a better reputation and hence attract more foreign investments. This is in line with a considerable literature which shows that the XBRL plays an important role in improving the quality of information (Efendi, Park, & Subramaniam, 2010; Yoon, Zo, & Ciganek, 2011; Srivastava & Liu, 2012; Vasarhelyi, Chan, & Krahel, 2012; Wang & Gao, 2012; Enachi, 2013; Kim, Li, & Liu, 2014; Birt, Muthusamy, & Bir, 2017; Ashoka & Abhishek, 2018). For example, Ashoka and Abhishek (2018) found that the adoption of the XBRL improves the quality of the financial reports. The XBRL ensures the homogeneity of financial reports, facilitates comparison, and ensures the relevance, reliability, and transparency of financial information. They also found that the XBRL offers the possibility for companies to implement an integrated reporting system and to fulfill the requirements of various regulatory authorities of environmental disclosure in their annual reports. This is consistent with Birt, Muthusamy, and Bir (2017) who found that the XBRL provides relevant, understandable, and comparable information. They also found that users can easily learn and use the XBRL in the decision-making process.

Enachi (2013) argued that the XBRL would help to attain the qualitative characteristics of information as defined by the IASB and the FASB (i.e. relevance, comparability, verifiability, timeliness, and understandability). This can be done by reducing significant errors in financial reports; clarifying the content of financial reports for different users; reducing the time needed for the preparation of financial reports and providing opportunities to make comparisons between accounting numbers between companies and over years. Wang and Gao (2012) also showed that the use of XBRL improves

the quality of the information provided to stakeholders as XBRL financial reports become more accessible, are more accurate, timely, and have a consistent format.

Many empirical studies examined the role of the adoption of XBRL for shareholders (Premuroso & Bhattacharya, 2008; Tan & Shon, 2009; Yoon, Zo, & Ciganek, 2011; Kim, Lim, & No, 2012; Peng, Shon, & Tan, 2011; Bai, Sakaue, & Takeda, 2014; Hao, Zhang, & Fang, 2014; Kim, Li, & Liu, 2014; Tan & Shon, 2009; Shan & Troshani, 2014; Felo, Kim, & Lim, 2018; Blankespoor, 2019). For example, Yoon et al. (2011) found that XBRL adoption improves the searching capability of investors and reduces information asymmetry. They concluded that XBRL could reduce the time and cost to circulate information on the stock markets and would improve transparency, comparability, and hence the quality of financial reports. Premuroso and Bhattacharya (2008) also indicated that XBRL adoption reduces information asymmetry.

Blankespoor (2019) found that following the adoption of XBRL, US companies increase their quantitative footnote disclosures. She argued that the adoption of the XBRL helped in reducing processing costs for users. For example, the XBRL makes possible for market participants to do additional processing of the information. It allows them to receive a large amount of information at a lower cost. Peng, Shon, and Tan (2011) indicated that XBRL adoption could encourage companies to engage less in earnings manipulations and improve the quality of financial statements. They found that, after the implementation of XBRL, the level of total accruals is lower than the total accruals before the implementation of XBRL. They concluded that the XBRL reduces information acquisition costs and improves the ability to detect earnings management.

The adoption of the XBRL has several advantages for financial analysts (Zhang, Riordan, & Weinhardt, 2013; Liu, Wang, & Yao, 2014; Felo, Kim, & Lim, 2018). Financial analysts provide an intermediate role in the stock markets by bridging significant gaps in the information held by firms and investors (Clatworthy & Lee, 2018). As a result, they help in reducing information asymmetry (Hussainey et al., 2003; Farooq & Satt, 2014; Yao & Liang, 2019). They can provide new information to participants in the stock market and resolve inefficiencies in governance mechanisms (Farooq

& Satt, 2014). For example, in China, information asymmetry is relatively high; so analysts' forecasts become an important source for investors for predicting corporate future performance (Yao & Liang, 2019). Liu, Wang, and Yao (2014) provide evidence that the mandatory adoption of the XBRL positively affects analyst following and the accuracy of their forecasts. The literature also showed that the adoption of the XBRL reduces the time required for manual tasks or for waiting for additional data from data intermediaries (e.g., information consolidators) and this leads to the ability to provide timely decisions (Liu, Wang, & Yao, 2014).

Rogothman (2012) argued that XBRL adoption reduces corporate risks, the cost of capital, and improves stock price performance. Similarly, Hao, Zhang, and Fang (2014) provided empirical evidence that the adoption of XBRL affects negatively the cost of equity capital. Hao, Zhang, and Fang (2014) identified three reasons through which XBRL adoption could negatively affect the cost of capital: (1) through improved information transparency; (2) through reducing transaction costs for companies and (3) through increasing liquidity and decreasing risk. Liu, Luo, and Wang (2017) found that XBRL adoption reduces information asymmetry and increased stock liquidity. Cong, Hao, & Zou (2014) also found that XBRL adoption improved stock market efficiency. In a recent study, Sassi, Ben Othman, and Hussainey (2020) provided empirical evidence that the mandatory adoption of XBRL enhances companies' stock liquidity and this effect was more pronounced in civil law countries than in common law countries.

We examined whether XBRL adoption improves stock market development. Our paper fills an important research gap by providing empirical evidence on whether XBRL adoption affects stock market development.

Research Hypotheses

Based on the above-mentioned research, we concluded that the adoption of the XBRL could improve the quality of financial reports, reduce information asymmetry and earnings management and increased analysis following and the accuracy of analysts' earnings forecasts. This contributes to improving investors' decision-making process. For example, Wang, Wen, and Seng (2014) argued that the XBRL could be used as a method

of external monitoring function. The improved transparency as the XBRL helps external users of corporate reports to better understand company performance. This suggested that the adoption of the XBRL system could encourage investors to be active in stock markets. This could lead to an improvement in stock market liquidity and a reduction in the cost of capital. This could positively affect stock market development. Based on the above discussion, we hypothesised that:

H1: The mandatory adoption of the XBRL positively affects stock market development.

The literature has examined the consequences of IFRS adoption and provided evidence that IFRS improves stock market development (Dumontier & Maghraoui, 2006; Daske, Leuz, & Verdi, 2008; Naser, Al-khatib, & Karbhari, 2002; Persakis & Iatridis, 2017; Ozkaya, 2018; Wook-bin & Yuk, 2018). In our research, we tested to see if the adoption of the XBRL and IFRS together provide higher improvements in the stock market development than the adoption of each of them. We, therefore, hypothesised that:

H2: Stock market development is improved by the interactive effects of the adoption of the XBRL and IFRS.

METHODOLOGY

Our Sample

Our analysis was based on 18 countries that had adopted the XBRL for stock market regulators. Table 1 shows the list of these countries, the year of XBRL adoption, and the source of this information. Our study covered a period of 20 years, from 2000 to 2019. The countries included in our analysis were the following: India, United States, Canada, Peru, Singapore, Israel, China, Chile, Indonesia, South Korea, Japan, Malaysia, Spain, Belgium, Australia, United Arab Emirates, Saudi Arabia, and South Africa. The first country that adopted the XBRL in our sample is China in 2004. We collected information on the adoption of XBRL from different sources. These included the XBRL International website (https://www.

xbrl.org/), research papers (such as Peng, Shon, & Tan, 2011; Yoon, Zo, & Ciganek, 2011; Bai, Sakaue, & Takeda, 2014; Markelevich, Shaw, & Weihs, 2015; Liu, Luo, & Wang, 2017), reports published by members of the XBRL International organization (such as O'Kelly, 2010) and the Ministry of Corporate Affairs of India website (www.mca.gov.in/XBRL).

Table 1: Countries Adopting XBRL

Country	Year of Adoption	Source
India	From 2011	www.mca.gov.in/XBRL www.xbrl.org
United-States	2005	www.xbrl.org
Canada	From 2007	www.xbrl.ca
Peru	From 2012	Sathuragiri (2018)
Singapore	2007	O'Kelly (2010) www.xbrl.org Chen (2012)
Israel	2008	www.xbrl.org Markelevich, Shaw and Weihs (2015)
China	2004	O'Kelly (2010) www.xbrl.org Peng, Shon and Tan (2011)
Chile	2010	O'Kelly (2010) www.xbrl.org
Indonesia	2015	Zamroni and Aryani (2018)
South Korea	2007	O'Kelly (2010) Yoon, Zo and Ciganek (2011) www.xbrl.org
Japan	2007	Bai, Sakaue and Takeda (2014) O'Kelly (2010) www.xbrl.org
Malaysia	2018	www.xbrl.org
Spain	2005	O'Kelly (2010) www.xbrl.org
Belgium	2007	Liu, Luo and Wang (2017) www.xbrl.org
Australia	2010	Chen (2012)
United Arab Emirates	2014	www.xbrl.org
Saudi Arabia	2015	www.xbrl.org
South Africa	2009	O'Kelly (2010)

The World Bank website was used to collect data of our dependent variable stock market development and the following control variables: stock market liquidity, the development of the banking sector, the level of investment, macroeconomic stability, and economic growth. Information about the adoption of IFRS is collected from Deloitte's website (http://www.iasplus.com) and PwC web site (www.pwc.com). We collected the data about the legal system from the factbook.

Model Development

We used a panel data model, which has two dimensions: one for individuals generally indicated by the index i (in our model represents the countries) and t for time (for our study the period covers twenty years, from 2000 to 2019). We used the following econometric models: (Table 2 shows the definitions of the variables):

$$SMD_{it} = \alpha + \beta_1 ADOPXBRL_{it} + \beta_2 EGR_{it} + \beta_3 MES_{it} + \beta_4 INV_{it} + \beta_5 BANK_{it} + \beta_6 LIQUI_{it} + \beta_7 LEGSYST_{it} + \beta_8 ADOPIFRS_{it} + YEAR\ EFFECT + \varepsilon_{it}$$

$$SMD_{it} = \alpha + \beta_1 ADOPIFRSXBRL_{it} + \beta_2 EGR_{it} + \beta_3 MES_{it} + \beta_4 INV_{it} + \beta_5 BANK_{it} + \beta_6 LIQUI_{it} + \beta_7 LEGSYST_{it} + YEAR\ EFFECT + \varepsilon_{it}$$

Table 2: Variables Definition and Measurements

Variable	Definition and measurements
The dependant variable	
SMD	Stock market development measured by market capitalisation to GDP
The independent variable	
ADOPXBRL	The adoption of XBRL is a dichotomous variable coded by 1 for the years of adoption of XBRL; 0 otherwise for the years before the adoption of XBRL
The control variables	
EGR	Economic growth measured by the percentage of annual variation of the GDP
MES	Macroeconomic stability measured by the annual change in inflation
INV	Level of investment measured by the ratio of gross fixed capital formation to GDP

BANK	The level of development of the bank sector measured by the amount of credit accorded to the private sector divided by GDP
LIQUI	Stock market liquidity measured by the value traded which is the ratio of total value traded to GDP
ADOPIFRS	The adoption of IFRS is a dichotomous variable that takes the value one for years of adoption of IFRS and zero for the years of non adoption of IFRS
LEGSYST	The legal system is a dichotomous variable that takes the value one if a country has a common law legal system and zero if a country has a civil law legal system
YEAR EFFECT	dummy variables which take the value of 1 if it is the given year and zero otherwise

Dependent Variable

Stock market development (SMD): We measured SMD by market capitalization as a percentage of gross domestic product (GDP). This measure has been used by several researchers (Demirguç-Kunt & Maksimovic, 1998; Levine & Zervos, 1998; Garcia & Liu, 1999; Ben Naceur, Ghazouani, & Omran, 2007; Yartey & Adjasi, 2007; Billmeier & Massa, 2009; Cherif & Gazdar, 2010; Kemboi & Tarus, 2012). We chose this measure for two reasons. First, it is a good indicator since it is less arbitrary than other individual measures and indexes of stock market development (Billmeir & Massa, 2009; Cherif & Gazdar, 2010). Second, the information is freely available on the World Bank website. Besides, Demirguc-Kunt and Levine (1998) showed that stock market development measures are highly correlated with the market capitalization to GDP.

Independent Variable

XBRL adoption (ADOPXBRL) is a dichotomous variable coded by 1 for the years of the adoption of XBRL and 0 otherwise.

Control Variables

Following prior research, we included a number of control variables. The first control variable was Economic growth (EGR): It is widely supported by the literature that there is a causal relationship between financial development and EGR (Garcia & Liu, 1999; Ben Naceur, Ghazouani, & Omran, 2007). Ben Naceur, Ghazouani, and Omran (2007, p. 481) argued,

"*Economic growth makes the development of financial intermediation system profitable, and the establishment of an efficient financial system permits faster economic growth*". Ben Othman and Kossentini (2015) found that stock market development had a positive impact on economic growth. Following Ben Othman and Kossentini (2015), we measured EGR by the annual change in GDP.

The second control variable was macroeconomic stability (MES). Yartey (2008) argued that MES motivates investors to participate more in the stock market. The literature showed that the investment environment is predictable in a stable economy (Kemboi & Tarus, 2012) and that the higher the volatility of the economy the less incentive for investors to participate in the stock market. Consistent with previous studies (Garcia & Liu, 1999; Ben Naceur, Ghazouani, & Omran (2007; Billmeier & Massa, 2009; Ben Othman & Kossentini, 2015), we used the annual change in inflation as a measure of MES.

Level of investment (INV): Investment is one of the key determinants of stock market development. Zeghal and Mhedhbi (2012) argued that INV depends on the level of savings and it contributes to capital market development by supplying the required capital. The literature (e.g., Billmeier & Massa, 2009) provided evidence that the level of savings and investment positively affects stock market development. Following prior research (Billmeier & Massa, 2009; Cherif & Gazdar, 2010; Zeghal & Mhedhbi, 2012), we measured INV by the ratio of gross fixed capital formation to GDP.

The level of development of the banking sector (BANK): The banking sector is one of the key determinants of stock market development as it gives investors liquidity and facilitating savings (Kemboi & Tarus, 2012). Many showed a positive impact of the level of development of the banking sector on stock market development (Demirguc-Kunt & Levine, 1998; Garcia & Liu, 1999; Ben Naceur, Ghazouani, & Omran, 2007; Yartey, 2008). In our study, we used the amount of credit offered to the private sector divided by GDP as a proxy for BANK.

Stock market liquidity (LIQUI): LIQUI is defined as '*the ease and speed at which agents can buy and sell securities*" (Garcia & Liu, 1999, p. 41; Yartey, 2008, p. 16). LIQUI enables investors to alter their portfolios

quickly and cheaply and therefore makes investment less risky and facilitates investment projects (Levine, 1991; Ben Naceur, Ghazouani, & Omran, 2007; Yartey, 2008). Kemboi and Tarus (2012) argued that liquid markets improve resource allocation and encourage more investment. Following prior research (Ben Naceur, Ghazouani, & Omran, 2007; Yartey, 2008), we measured LIQUI as the ratio of total value traded to GDP.

The adoption of the IFRS (ADOPIFRS): Hope et al. (2006) argued that IFRS adoption improves the quality of financial reports; disclosure policies and enhances the integration of domestic markets into world markets, and therefore accelerates economic growth. Many studies found a positive impact of the adoption of IFRS on stock market development (e.g., Zeghal & Mhedhbi, 2012; Klibi & Kossentini, 2014; Ben Othman & Kossentini, 2015; Emudainohwo, 2020). In our research, we used a dummy variable equals 1 for companies which adopted the IFRS and 0 otherwise.

The legal system (LEGSYST): La Porta et al. (1998) showed that countries that protect more minority shareholders belong from common-law legal origin. According to Gomez (2016), the legal environment has a significant effect on the countries' business activities as investors seek for places where contracts are enforced and clear. Poor compliance with contracts can influence investors' willingness to commit their wealth to fund projects. Klibi and Kossentini (2014) found that the legal system affects stock market development. In our paper, we use a dummy variable that is equal to one for countries from the common-law origin and zero for countries from the civil-law origin.

The year effect was included as a dummy variable, which took the value of 1 if it is the given year and zero otherwise. ε is the margin of error.

RESULTS AND INTERPRETATIONS

Descriptive Analysis

Table 3 presents the descriptive analysis. Panel A presents the descriptive analysis for the continuous variables. We found that market capitalization (SMD) varied across our sample. The market capitalization

was on average 91.143 with a standard deviation of 52.117 and varied between a minimum of 14.333 and a maximum of 276.600 for the period before the adoption of the XBRL. For the period after the adoption of the XBRL, the market capitalization was on average 103.349 with a standard deviation of 64.985 and varied between a minimum of 17.579 and a maximum of 352.156.

Additionally, there was a large variability in the countries of the sample for the following control variables: EGR, MES, INV, BANK and LIQUI for the period before and after the adoption of the XBRL.

The variables were compared between the pre-adoption and the post-periods of XBRL using the Mann–Whitney test. This test was applied because of the non-normality of our variables. We checked the normality using the Shapiro-Wilk test. The results of the Mann-Whitney test show a significant difference for all the variables.

Panel B reports the descriptive analysis of dummy variables. It shows that 53.06% represented country-year observations in which XBRL was adopted by companies. It also shows that most countries have a civil law legal system (57.89). For the adoption of the IFRS, Panel B shows that 67.23% represents country-year observations in which the IFRS was adopted by companies.

Table 3: Descriptive Statistics

Panel A: Distributional statistics of continuous variables				
Before the adoption of XBRL				
Variable	**Mean**	**Std Dev**	**Minimum**	**Maximum**
SMD	91.143***	52.117	14.333	276.600
EGR	4.564***	2.760	-5.242	11.242
MES	3.194***	2.866	-1.124	13.108
INV	23.831***	4.785	15.150	38.257
BANK	88.517***	45.962	17.910	212.268
LIQUI	57.285***	60.423	1.414	372.259
After the adoption of XBRL				
SMD	103.349	64.985	17.579	352.156
EGR	3.241	2.973	-5.416	14.525
MES	2.397	2.014	-2.093	10.907
INV	25.341	6.220	17.324	44.518
BANK	113.813	45.290	32.309	206.670
LIQUI	78.986	66.120	0.702	355.519

Panel B: Descriptive statistics of dichotomous variables			
		Number of country-year	Percentage of country-year
ADOPXBRL	0	169	46.94
	1	191	53.06
LEGSYST	0	220	57.89
	1	160	42.11
ADOPIFRS	0	149	39.21
	1	231	60.79

Variables definition :
SMD: stock market development measured by market capitalization as a percentage of GDP; EGR: Economic growth measured by the annual change in GDP; MES: Macroeconomic stability measured by the annual change in inflation; INV: Level of investment measured by the ratio of gross fixed capital formation to GDP; Bank: The level of development of the bank sector measured by the amount of credit accorded to the private sector divided by GDP; LIQUI: Stock market liquidity measured by the ratio of total value traded to GDP; ADOPXBRL: the adoption of XBRL measured by 1 for the years of adoption of XBRL; 0 otherwise for the years before the XBRL adoption; LEGSYST: legal system measured by one if the country is from a common-law origin and zero if it is from a civil-law origin; ADOPIFRS: the adoption of IFRS measured by 1 for the years of adoption of IFRS and 0 for the years of non adoption of IFRS

*** indicates difference significant at 1% level as per Mann–Whitney test.

Correlation Analysis

Table 4 shows that the adoption of the XBRL is negatively correlated with the development of the stock markets, which is inconsistent with prior literature and our research hypothesis. We also checked for the multicollinearity problem. The correlations between the independent variables was less than 80% suggesting that we did not have a multicollinearity problem in our model (Gujarati, 2003). Table 5 confirms this result using the Variance Inflation Factor (VIF). The table shows that VIF values did not exceed 5 and the tolerance values were lower than 0.1 (Groebner et al., 2008).

Table 4: Correlation Matrix for All Variables in Regressions

	ADOPXBRL	EGR	MES	INV	BANK	LIQUI	LEGSYST	ADOPIFRS
ADOPXBRL	1.000							
EGR	-0.208***	1.000						
MES	-0.045	0.214***	1.000					
INV	0.082	0.391***	0.159***	1.000				
BANK	0.275***	-0.329***	-0.234***	-0.0008	1.000			
LIQUI	0.111*	-0.052	-0.082	0.195***	0.629***	1.000		
LEGSYST	0.538***	-0.106*	-0.057	0.020	0.023	0.067	1.000	
ADOPIFRS	-0.081	0.053	0.114*	-0.168***	0.195***	0.215***	-0.020	1.000

ADOPXBRL: the adoption of XBRL measured by 1 for the years of adoption of XBRL; 0 otherwise for the years before the XBRL adoption; EGR: Economic growth measured by the annual change in GDP; MES: Macroeconomic stability measured by the annual change in inflation; INV: Level of investment measured by the ratio of gross fixed capital formation to GDP; Bank: The level of development of the bank sector measured by the amount of credit accorded to the private sector divided by GDP; LIQUI: Stock market liquidity measured by the ratio of total value traded to GDP; LEGSYST: legal system measured by one if the country is from a common-law origin and zero if it is from a civil-law origin; ADOPIFRS: the adoption of IFRS measured by 1 for the years of adoption of IFRS, 0 otherwise.

***and * indicates difference significant at 1% level and 10% level

Table 5: The Variance Inflation Factor (VIF) Test

	ADOPXBRL	EGR	MES	INV	BANK	LIQUI	LEGSYST	ADOPIFRS	Mean VIF
VIF	1.59	1.61	1.20	1.61	1.84	1.42	1.27	1.41	1.49
Tolerance	0.628	0.622	0.831	0.620	0.544	0.704	0.784	0.710	
Please refer to Table 4 for the definition of the variables									

Empirical Results and Discussions

We started our analysis by checking the homogeneity of our sample data. We used the Chow test. The null hypothesis is the absence of any individual effect. The result led us to reject the null hypothesis and to confirm the presence of a specific effect (fixed or random) in the model. We found a value of 62.52 and it is significant at the 1 percent level. Thus, heterogeneity across countries was confirmed. Thereafter, to specify the nature of the individual effect, we used the Hausman test. In general, this test is performed to decide on the use of fixed or random effects. A value of 9.74 was found with a p-value of 0.9984. This result led us to choose the random effect model.

Breusch-Pagan test was also conducted to detect the problem of heteroscedasticity. The result of this test (a value of 1114.83 and it is significant at the 1 percent level) confirmed the presence of the heteroscedasticity problem. In addition, we tested for the presence of serial correlation using the Wooldridge autocorrelation test for panel data. The result of the test indicates the presence of a problem of autocorrelation. For that, we used the command "xtgls" to correct for heteroscedasticity and serial correlation for the random effect model.

Table 6 presents our empirical findings. We found a significant and negative impact of the adoption of the XBRL on stock markets development at the 5% level. This indicated that the adoption of the XBRL is not relevant to the development of stock markets. Therefore, our first hypothesis (H1) was rejected. This result suggests that the disadvantages of XBRL outweigh its advantages. Our findings are consistent with the literature on the disadvantages of XBRL adoption. For example, Harris and Morsfield (2012) found that investors and analysts question the reliability of XBRL data. They also found that many users of information see the XBRL only as a legal requirement that is a burden instead of a tool to leverage electronic

data. Brands (2013) also found that the XBRL is not up to the expectations of investors and analysts in USA and the decision to mandate the adoption of XBRL in 2009 in USA always faces criticism The author argued that the XBRL will continue to be criticised until stakeholders become aware that it is a communication channel that could help them in their decision making by providing them the required information in an electronic format that could be efficiently analysed. Rawashdeh and Selamat (2013) argued that the adoption of innovation like the XBRL requires that all the segments of society have a clear understanding of its benefits. If users are not conscious about the benefits of the XBRL, they are more likely to reject its use due to the lack of perceived needs. Ghani, Said, and Muhammad (2014) surveyed a number of accountants and found that 55% of the respondents preferred the PDF format, while 29% preferred the HTML format and 16% preferred the XBRL. Zamroni and Aryani (2018) argued that XBRL requires more effort to be learned due to its complexity. Users should involve significant costs if they want to get the benefits of XBRL technology.

Some studies also found that XBRL increases information asymmetry and the cost of capital and decreases liquidity (Blankespoor, Miller, & White, 2014; Liu, Luo, et al., 2014; Dhole, Lobo, Mishra, & Pal, 2015; Zamroni & Aryani, 2018). For example, Liu, Luo, et al. (2014) found that mandatory adoption of the XBRL positively affects the cost of capital and transaction costs because of the uncertainty related to new technology (e.g. the difficulty of its use). Dhole et al. (2015) also found that comparability declined after mandating the XBRL. They argued that companies that use more extension taxonomies and more discretionary accounting practices have less comparability. Furthermore, they found that, after the XBRL mandate, there is no change in the value relevance of earnings. All these contributed to making the adoption of the XBRL irrelevant for the development of stock markets despite its advantages.

As for the control variables, we found that the coefficient on economic growth to be positive and significant at the 10 % level and this is consistent with prior research which found that economic growth contributes to stock market development (Ben Othman & Kossentini, 2015; Garcia & Liu, 1999). We also found that the level of development of the banking sector had a positive and significant impact on the development of the stock markets. This finding is in line with the finding of Ben Othman and Kossentini (2015) who

indicated that the banking sector plays a considerable role in determining stock market capitalization. Surprisingly, we also found that the level of investment had a negative and significant impact on the development of the stock markets, which contradicts our expectations. Hence, the level of investment is not a determinant of stock market development. Some literature supports this unpredicted finding. For example, Ben Naceur, Ghazouani, and Omran (2007) argued that the investment rate is not a good predictor of market capitalization. Zeghal and Mhedhbi (2012) also found that the level of investment had no significant effect on stock market development. We also found that the legal system was positive and significant at the 1% level. This was consistent with prior research such as Klibi and Kossentini (2014) who found that in common law countries, the level of investor protection is relatively high and, this encourages investors to actively participate in the stock market, and this could lead to an improvement in the development of the stock market. Finally, we found that the coefficients on macroeconomic stability and the adoption of the IFRS were insignificant, suggesting that these variables had no impact on stock market development.

Table 6: Regression Results: Testing H1

Variables	Coefficients	Significance (p-value)
ADOPXBRL	-8.286	0.030**
EGR	0.941	0.070*
MES	0.439	0.526
INV	-0.788	0.074*
BANK	0.270	0.000***
LIQUI	0.124	0.000***
LEGSYST	41.236	0.000***
ADOPIFRS	6.399	0.136
Constant	30.415	
YEAR EFFECT	Included	

ADOPXBRL: the adoption of XBRL measured by 1 for the years of adoption of XBRL; 0 otherwise for the years prior to the XBRL; EGR: Economic growth measured by the annual change in GDP ; MES: Macroeconomic stability measured by the annual change in inflation; INV: Level of investment measured by the ratio of gross fixed capital formation to GDP; Bank: The level of development of the bank sector measured by the amount of credit accorded to the private sector divided by GDP; LIQUI: Stock market liquidity measured by the ratio of total value traded to GDP; LEGSYST: legal system measured by one if the country is from a common-law origin and zero if it is from a civil-law origin; ADOPIFRS: the adoption of IFRS measured by 1 for the years of adoption of IFRS and 0 for the years of non adoption of IFRS

*** significant at 1% level ; ** significant at 5 % level ; * significant at 10% level

Our second hypothesis (H2) examined whether the effect of the adoption of the XBRL and IFRS jointly had an effect on stock market development. The results as presented in Table 7 show that the impact of the use of the XBRL and the adoption of the IFRS on stock market development was not significant. Therefore, our second hypothesis was rejected. A possible explanation for this result is that the adoption of the XBRL was not viewed as a good tool to disclose financial information and did not necessarily improve the quality of financial reporting.

For the control variables, we found that economic growth, level of investment, the level of development of the banking sector, stock market liquidity and the legal system had a significant impacts on stock market development.

Table 7: Regression Results: Testing H2

Variables	Coefficients	Significance (p-value)
ADOPIFRSXBRL	-1.308	0.734
EGR	1.044	0.040**
MES	0.646	0.345
INV	-0.819	0.071*
BANK	0.249	0.000***
LIQUI	0.133	0.000***
LEGSYST	41.711	0.000***
Constant	30.994	
YEAR EFFECT	Included	

ADOPIFRSXBRL: the adoption of IFRSXBRL measured by 1 for the years of the jointly adoption of XBRL and IFRS; 0 otherwise; EGR: Economic growth measured by the annual change in GDP ; MES: Macroeconomic stability measured by the annual change in inflation; INV: Level of investment measured by the ratio of gross fixed capital formation to GDP; Bank: The level of development of the bank sector measured by the amount of credit accorded to the private sector divided by GDP; LIQUI: Stock market liquidity measured by the ratio of total value traded to GDP; LEGSYST: legal system measured by one if the country is from a common-law origin and zero if it is from a civil-law origin

*** significant at 1% level ; ** significant at 5 % level ; * significant at 10% level

Additional Analysis

Capital markets are one of the important factors in the economic development of a country. Their role is seen in the optimal allocation of resources among the different economic sectors and between companies within each sector (Ben Othman & Zeghal, 2008). The nature of capital markets will influence the information requirements of investors

(Archambault & Archambault, 2003). According to Zehri and Chouaibi (2013), the quality of financial information is important for the development and efficiency of capital markets. The capital market relies on timely, accurate and comprehensive business information for the allocation of capital resources (Shanmuganathan, 2016).

Hence, we expected that well-developed stock markets are more likely to adopt the XBRL. We used the pooled logistic regression given that the dependent variable (ADOPXBRL) is a dichotomic variable that takes the value of one or zero. Table 8 displays the results. We found that stock market development does not influence the decision to adopt the XBRL. This insignificant relationship between the stock market development and the adoption of the XBRL may be due to the lack of knowledge of the benefits of the XBRL. These countries, with well-developed stock markets, might consider XBRL adoption as a costly decision that does not add too much value for the stock market participants.

Table 8: Regression Results: Additional Analysis

Variables	Coefficients	Significance (p-value)
SMD	-0.007	0.150
EGR	-0.002	0.981
MES	-0.109	0.298
INV	0.078	0.216
BANK	0.020	0.012**
LIQUI	0.014	0.023**
LEGSYST	-1.021	0.071*
ADOPIFRS	1.588	0.008***
Constant	-1.467	
YEAR EFFECT	Included	

SMD: stock market development measured by market capitalization as a percentage of GDP; EGR: Economic growth measured by the annual change in GDP ; MES: Macroeconomic stability measured by the annual change in inflation; INV: Level of investment measured by the ratio of gross fixed capital formation to GDP; Bank: The level of development of the bank sector measured by the amount of credit accorded to the private sector divided by GDP; LIQUI: Stock market liquidity measured by the ratio of total value traded to GDP; LEGSYST: legal system measured by one if the country is from a common-law origin and zero if it is from a civil-law origin; ADOPIFRS: the adoption of IFRS measured by 1 for the years of adoption of IFRS and 0 for the years of non adoption of IFRS

*** significant at 1% level ; ** significant at 5 % level ; * significant at 10% level

Robustness Check

The robustness of our primary results was considered in terms of the global financial crises. The financial crisis contributes to increase the uncertainty and the information asymmetry, while the adoption of XBRL helps to reduce the problem of information asymmetry (Bai, Sakaue, and Takeda, 2014). We dropped the 2008 data to eliminate the influence of the 2008 global financial crisis. The (untabulated) results are consistent with our main finding.

CONCLUSION

The purpose of the study was to examine the association between the adoption of XBRL and stock market development using a sample of 18 countries from 2000 to 2019. Despite the benefits of the XBRL, we found that the adoption of the XBRL had a negative impact on stock market development. One of the possible interpretations of this unexpected finding is given by Cong Hao, and Zou (2014: pp. 182) who argue that:

> *"Despite the technological advantages of XBRL, many argue that its capacity to improve market efficiency may be limited by the cost of learning the technology, implementing the infrastructure, and making the transition from human to computer processing. Additionally, the cost may differentiate between the market participants who possess superior IT resources and analytic capacities and those who do not, thus creating a disparity of information-processing ability. This disparity could lead to greater information asymmetry between the participants and reduce liquidity, thereby reducing market efficiency".*

Cong Hao, and Zou (2014) suggest that there is a potential dark side of the XBRL as it could reduce market efficiency and hence stock market development. Hence, the adoption of the XBRL is not a factor that helped the development of the stock market. The value of XBRL adoption is hindered mainly by the lack of knowledge on the benefits of the XBRL and by the uncertainty associated with the development and implementation of the innovation. This finding implies that value realization of the technological

advantages of the XBRL could take time due to necessary adjustments and fine-tuning (Liu, Luo et al., 2014).

Our findings offer implications for standard developers, regulators, and users. The XBRL needs to be adopted with stricter policies. For example, according to Ball (2006), the XBRL needs to be implemented and adopted with more care and controle. The application of the XBRL should be governed by rigorous internal controls. New assessments may be required of the management assertions included within and related to the XBRL report. In addition, users of the information also need to understand what is being represented by the XBRL information properly, and the best way to analyse this information (Ball, 2006).

This study has some limitations. First, our sample was limited to 18 countries. Further research could include other countries and reexamine the impact of the XBRL on the development of stock markets. It would be interesting to extend this study by introducing other variables (e.g. the quality of corporate governance) that may influence the development of capital markets. Finally, further research could also examine other economic consequences of the adoption of the XBRL such as its potential impact on credit ratings and corporate tax aggressiveness.

REFERENCES

Archambault, J. J., & Archambault, M. E. (2003). A multinational test of determinants of corporate disclosure. *The International Journal of Accounting, 38*(2), 173-194.

Ashoka, M. L., & Abhishek, N. (2018). Impact of XBRL reporting on the quality of financial reporting system in India. *Review of Research*, *8*(1), 1–9.

Bai, Z., Sakaue, M., & Takeda, F. (2014). The impact of XBRL adoption on theinformation environment: Evidence from Japan. *The Japanese Accounting Review, 4*, 49-74.

Ball, I. (2006). XBRL, Automation, and enhancing the credibility of financial reporting and auditing. In *Annual XBRL International Conference Philadelphia* (Vol. 14).

Ben Naceur, S., Ghazouani, S. & Omran, M. (2007). The determinants of stock market development in the Middle-Eastern and North African region. *Managerial Finance, 33*(7), 477-489.

Ben Othman, H., & Kossentini, A. (2015). IFRS adoption strategies and theories of economic development: Effects on the development of emerging stock markets. *Journal of Accounting in Emerging Economies, 5*(1), 70-121.

Ben Othman, H., & Zeghal, D. (2008). A study of corporate governance disclosure and its country-level determinants in the emerging markets. *Research in Accounting in Emerging Economies*, *8*(3), 125–155.

Birt, J. L., Muthusamy, K., & Bir, P. (2017). XBRL and the qualitative characteristics of useful financial information. *Accounting Research Journal, 30*(1), 107–126.

Billmeier, A., & Massa, I. (2009). What drives stock market development in emerging markets — Institutions, remittances, or natural resources?. *Emerging Markets Review, 10*(1), 23-35.

Blankespoor, E. (2019). The impact of information processing costs on firm disclosure choice: Evidence from the XBRL mandate. *Journal of Accounting Research, 57*(4), 919-967.

Blankespoor, E., Miller, B. P., & White, H. D. (2014). Initial evidence on the market impact of the XBRL mandate. *Review of Accounting Studies, 19*(4), 1468-1503.

Brands, K. (2013). XBRL: Does the SEC XBRL mandate meet investor expectations?. *Strategic Finance, 94*(10), 56-58.

Boritz, J. E., & No, W. G. (2004). Assurance reporting for XML-based information services: XARL (Extensible Assurance Reporting Language). *Canadian Accounting Perspectives, 3*(2), 207–233.

Boritz, J. E., & No, W. G. (2008). The SEC's XBRL voluntary filing program on EDGAR: A case for quality assurance. *Current Issues in Auditing*, *2*(2), A36–A50.

Chen, Y. C. (2012). A comparative study of e-government XBRL implementations: The potential of improving information transparency and efficiency. *Government Information Quarterly, 29*(4), 553-563.

Cherif, M., & Gazdar, K. (2010). Institutional and macroeconomic determinants of stock market development in MENA region: New results from a panel data analysis. *International Journal of Banking and Finance, 7*(1), 139-159.

Clatworthy, M., & Lee, E. (2018). Financial analysts' role in valuation and stewardship. *Accounting and Business Research, 48*(1), 1–4.

Cong, Y., Hao, J., & Zou, L. (2014). The impact of XBRL reporting on market efficiency. *Journal of Information Systems*, *28*(2), 181-207.

Daske, H., Hail, L., Leuz, C., & Verdi, R. (2008). Mandatory IFRS reporting around the world: Early evidence on the economic consequences. *Journal of Accounting Research, 46*(5), 1085-1142.

Debreceny, R., Farewell, S., Piechocki, M., Felden, C., & Gräning, A. (2010). Does it add up? Early evidence on the data quality of XBRL filings to the SEC. *Journal of Accounting and Public Policy*, *29*(3), 296-306.

Debreceny, R. S., Chandra, A., Cheh, J. J., Guithues-Amrhein, D., Hannon, N. J., Hutchison, P. D., ... & Mascha, M. (2005). Financial reporting in XBRL on the SEC's EDGAR system: A critique and evaluation. *Journal of Information Systems*, *19*(2), 191-210.

Demirgüç-Kunt, A., & Maksimovic, V. (1998). Law, finance, and firm growth. *The Journal of Finance, 53*(6), 2107-2137.

Dhole, S., Lobo, G. J., Mishra, S., & Pal, A. M. (2015). Effects of the SEC's XBRL mandate on financial reporting comparability. International *Journal of Accounting Information Systems, 19*, 29-44.

Dumontier, P., & Maghraoui, R. (2006). Adoption volontaire des IFRS, asymétrie d'Information et fourchettes de prix : L'Impact Du Contexte Informationnel. *Comptabilité - Contrôle - Audit*, *12*(2), 27–47.

Efendi, J., Park, J. D., & Subramaniam, C. (2010). Do XBRL reports have incremental information content? – An empirical analysis. Available at SSRN: https://ssrn.com/abstract=1671723.

Enachi, M. (2013). XBRL and financial Reporting Transparency. *Broad Research in Accounting, Negotiation, and Distribution, 4*(1), 10-19.

Emudainohwo, O. B. (2020). IFRS and stock exchange development in sub-Saharan Africa: A logistic model. *Innovations, 17*(3), 397-407.

Farooq, O., & Satt, H. (2014). Does analyst following improve firm performance? Evidence from the MENA region. *Corporate Ownership & Control*, *11*(2), 157–166.

Felo, A. J., Kim, J. W., & Lim, J. H. (2018). Can XBRL detailed tagging of footnotes improve financial analysts' information environment?. *International Journal of Accounting Information Systems, 28*, 45-58.

Garcia, V. F., & Liu, L. (1999). Macroeconomic determinants of stock market development. *Journal of applied Economics, 2*(1), 29-59.

Ghani, E. K., Said, J., & Muhammad, K. (2014). Enhancing corporate governance via XBRL: Preparers' perception on compatibility expectation. *Procedia-Social and Behavioral Sciences, 145,* 308-315.

Gomez, L. (2016). *How does rule of law affect firm performance? – Comparing the effect of rule of law in companies located in countries with different level of development.* Working Paper.

Groebner, D. F., Shannon, P. W., Fry, P. C., & Smith, K. D. (2008). *Business statistics: A decision-making approach.* Upper Saddle River, NJ: Prentice-Hall.

Gujarati, D. N. (2003). *Basic econometrics* (4th ed.). New York: McGraw-Hill.

Gunn, J. (2007). XBRL: Opportunities and challenges in enhancing financial reporting and assurance processes. *Current Issues in Auditing, 1*, 36–43.

Hao, L., Zhang, J. H., & Fang, J. B. (2014). Does voluntary adoption of XBRL reduce cost of equity capital?. *International Journal of Accounting and Information Management, 22*(2), 86–102.

Harris, T. S., & Morsfield, S. G. (2012). *An evaluation of the current state and future of XBRL and interactive data for investors and analysts.* Available at https://academiccommons.columbia.edu/doi/10.791 6/ D8CJ8NV2 (accessed on 25 December 2020)

Hodge, F. D., Kennedy, J. J., & Maines, L. A. (2004). Does search-facilitating technology improve the transparency of financial reporting?. *The Accounting Review, 79*(3), 687-703.

Hope, O. K., Jin, J., & Kang, T. (2006). Empirical evidence on jurisdictions that adopt IFRS. *Journal of International Accounting Research, 5*(2), 1-20.

Hussainey, K., Schleicher, T., & Walker, M. (2003). Undertaking large-scale disclosure studies when AIMR-FAF ratings are not available: The case of prices leading earnings. *Accounting and Business Research, 33*(4), 275-294.

Ilias, A., Ghani, E. K., Baidi, N., & Abdul, R. (2020). XBRL adoption: An examination of the Malaysian business reporting system (MBRS). *Humanities*, *8*(2), 202-214.

Janvrin, D. J., & No, W. G. (2012). XBRL implementation: A field investigation to identify research opportunities. *Journal of Information Systems, 26*(1), 169-197.

Johannesburg Stock Exchange (2010). XBRL: The digital reporting evolution. Available at www.jse.co.za/Libraries/X-Filing-Brochure/ XBRL_bro chure.sflb.ashx (accessed 13 January 2011).

Kemboi, J. K., & Tarus, D. K. (2012). Macroeconomic determinants of stock market development in emerging markets: Evidence from Kenya. *Research Journal of Finance and Accounting*, *3*, 57-68.

Kim, J., Li, B., & Liu, Z. (2014, May). Who benefits more from XBRL adoption? Evidence from breadth of ownership. A paper presented at the *2014 Journal of Accounting Research Conference.*

Kim, J. W., Lim, J. H., & No, W. G. (2012). The effect of first wave mandatory XBRL reporting across the financial information environment. *Journal of Information Systems, 26*(1), 127-153.

Klibi, M. F., & Kossentini, A. (2014). Does the adoption of IFRS promote emerging stock markets development? Evidence from MENA countries. *International Journal of Accounting, Auditing and Performance Evaluation, 10*(3), 279-298.

KPMG. (2008). A primer on XBRL, the Extensible Business Reporting Language. Available at http://www.kpmg.com/Global/en/WhatWeDo/SpecialInterests/XBRL/Documents/19303

Kumar, P., Kumar, S. S., & Dilip, A. (2019). Effectivness of the Adoption of the XBRL Standard in the Indian Banking Sector. *Journal of Central Banking Theory and Practice, 8*(1), 39-52.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy, 106*(6), 1113-1155.

Levine, R. (1991). Stock markets, growth, and tax policy. *The Journal of Finance, 46*(4), 1445-1465.

Levine, R., & Zervos, S. (1998). Capital control liberalization and stock market development. *World Development, 26*(7), 1169-1183.

Li, S., & Nwaeze, E. T. (2015). The association between extensions in XBRL disclosures and financial information environment. *Journal of Information Systems, 29*(3), 73-99.

Liu, C., Yao, L. J., Sia, C. L., & Wei, K. K. (2014). The impact of early XBRL adoption on analysts' forecast accuracy-empirical evidence from China. *Electronic Markets, 24*(1), 47-55.

Liu, C., Luo, X. R., Sia, C. L., O'farrell, G., & Teo, H. H. (2014). The impact of XBRL adoption in PR China. *Decision Support Systems*, *59*, 242-249.

Liu, C., Luo, X. R., & Wang, F. L. (2017). An empirical investigation on the impact of XBRL adoption on information asymmetry: Evidence from Europe. *Decision Support Systems, 93,* 42-50.

Liu, C., Wang, T., & Yao, L. J. (2014). XBRL's impact on analyst forecast behavior: An empirical study. *Journal of Accounting and Public Policy, 33*(1), 69-82.

Liu, Y. C. A., Hsu, A. C., & Li, Y. Y. (2014). The effect of information disclosure on corporate performance. *Information Technology Journal, 13*(13), 2079–2092.

Markelevich, A., Shaw, L., & Weihs, H. (2015). The Israeli XBRL adoption experience. *Accounting Perspectives, 14*(2), 117-133.

Naser, K., Al-Khatib, K., & Karbhari, Y. (2002). Empirical evidence on the depth of corporate information disclosure in developing countries: The case of Jordan. *International Journal of Commerce and Management*, *12*(3), 122-155.

Nobre, C., & Carvalho, N. (2011). XBRL in Brazil: Current status and prospects. *Focus On America: Brazil, 1*, 17-19.

O'Kelly, C. (2010). XBRL adoption update. Available at: https://blog pfm. imf.org/files/XBRL%20Adoption%20Update%20April%202010.pdf

Ozkaya, H. (2018). Effect of mandatory IFRS adoption on cost of debt in Turkey. *Business and Economics Research Journal, 9*(3), 579-588.

Peng, E. Y., Shon, J., & Tan, C. (2011). XBRL and accruals: Empirical evidence from China. *Accounting Perspectives, 10*(2), 109-138.

Persakis, A., & Iatridis, G. E. (2017). The joint effect of investor protection, IFRS and earnings quality on cost of capital: An international study. *Journal of International Financial Markets, Institutions and Money, 46,* 1-29.

Premuroso, R. F., & Bhattacharya, S. (2008). Do early and voluntary filers of financial information in XBRL format signal superior corporate governance and operating performance?. *International Journal of Accounting Information Systems, 9(*1), 1-20.

Ra, C. W., & Lee, H. Y. (2018). XBRL adoption, information asymmetry, cost of capital, and reporting lags. *iBusiness, 10*(03), 93–118.

Rawashdeh, A., & Selamat, M. H. (2013). Critical success factors relating to the adoption of XBRL in Saudi Arabia. *Journal of International Technology and Information Management, 22*(2), 49–69.

Rahwani, N. R., Sadewa, M. M., Qalbiah, N., Mukhlisah, N., & Nikmah, N. (2019). XBRL based corporate tax filing in Indonesia. *Procedia Computer Science, 161*, 133-141.

Rezaei, Z. (2013). XBRL: A new language for financial reporting. *International Research Journal of Applied and Basic Sciences, 6*(4), 437–442.

Roohani, S. J., & Zheng, X. (2013). Determinants of the deficiency of XBRL mandatory filings. *International Research Journal of Applied Finance, 4*(3), 502-518.

Sassi, W., Othman, H. B., & Hussainey, K. (2021). The impact of mandatory adoption of XBRL on firm's stock liquidity: A cross-country study. *Journal of Financial Reporting and Accounting, 19*(2), 299-324.

Sathuragiri, K. (2018). *XBRL around the world.* Available at https://www.datatracks.eu/blog/xbrl-around-the-world/

Shan, Y. G., & Troshani, I. (2014). Does XBRL benefit financial statement auditing?. *Journal of Computer Information Systems, 54*(4), 11-21.

Shan, Y. G., & Troshani, I. (2016). The effect of mandatory XBRL and IFRS adoption on audit fees: Evidence from the Shanghai Stock Exchange. *International Journal of Managerial Finance*, *12*(2), 109–135.

Shanmuganathan, M. (2016, December). Influences of XBRL & IFRS on Business Reporting — Canada. In *2016 Future Technologies Conference (FTC)*.

Steenkamp, L. P., & Nel, G. F. (2012). The adoption of XBRL in South Africa: An empirical study. *The Electronic Library*, *30*(3), 409–425.

Sudalaimuthu, S., & Haraiharan, R. (2011). The role of XBRL and IFRS in financial reporting. *International Journal of Multidisciplinary Research, 1*(4), 89-106.

Srivastava, R. P., & Liu, Q. (2012). Special issue of JIS on XBRL. *Journal of Information Systems, 26*(1), 97-101.

Selim, S. P. (2012). The roadmap to successful XBRL adoption. The XBRL power newsletter: A Quarterly Review of XBRL News, Events & Technology Across the Globe.

Tan, C., & Shon, J. (2009, April). XBRL and its financial reporting benefits: Capital market evidence. In *The International Conference at The University of Kansas, Lawrence*.

Troshani, I. & Lymer, A. (2010). Translation in XBRL standardization. *Information Technology & People*, *23*(2), 136–164.

Tzu-Yi, F., Fengyi, L., Shih-Hsuan, C., & Kwo-Liang, C. (2016). Does XBRL adoption imporve information asymmetry. Evidence from Taiwan public companies. *Journal of Global Economics*, *4*(1), 1–11.

Vasarhelyi, M. A., Chan, D. Y., & Krahel, J. P. (2012). Consequences of XBRL standardization on financial statement data. *Journal Of Information Systems*, *26*(1), 155–167.

Wang, Z., & Gao, S. S. (2012). Are XBRL-based financial reports better than non-XBRL reports? A quality assessment. *International Journal of Economics and Management Engineering, 6*(4), 511-516.

Wang, T., Wen, C. Y., & Seng, J. L. (2014). The association between the mandatory adoption of XBRL and the performance of listed state-owned enterprises and non-state-owned enterprises in China. *Information & Management, 51*(3), 336-346.

Wook-Bin, L., & Yuk, J. H. (2018). Effect of the IFRS adoption on the cost of capital: Evidence from Korea. *Journal of Applied Business Research, 34*(2), 209-216.

XBRL US (2012). XBRL challenge: An open source application development competition. Available at http://xbrl.us/research/documents/challenge whitepaper.pdf

Yao, S., & Liang, H. (2019). Analyst following, environmental disclosure and cost of equity: Research based on industry classification. *Sustainability, 11*(2), 300.

Yartey, C. (2008). *The determinants of stock market development in emerging economies: Is South Africa different?* (International Monetary Fund Working Paper WP/08/32) (African Department). Available at https://www.imf.org/external/pubs/ft/wp/2008/wp0832.pdf

Yartey, C. A., & Adjasi, C. K. (2007). *Stock market development in Sub-Saharan Africa: Critical issues and challenges* (International Monetary Fund Working Paper WP/07/209). Available at https://www.imf.org/external/pubs/ft/wp/2007/wp07209.pdf

Yoon, H., Zo, H., & Ciganek, A. P. (2011). Does XBRL adoption reduce information asymmetry ?. *Journal of Business Research*, *64*(2), 157–163.

Zamroni, M., & Aryani, Y. A. (2018). Initial effects of mandatory XBRL adoption across the Indonesia stock exchange's financial information environment. *Jurnal Keuangan dan Perbankan, 22*(2), 181-197.

Zeghal, D., & Mhedhbi, K. (2012). Analyzing the effect of using international accounting standards on the development of emerging capital markets. *International Journal of Accounting & Information Management*, *20*(3), 220–237.

Zehri, F., & Chouaibi, J. (2013). Adoption determinants of the International Accounting Standards IAS/IFRS by the developing countries. *Journal of Economics Finance and Administrative Science, 18*(35), 56-62.

Zhang, S. S., Riordan, R., & Weinhardt, C. (2013). Interactive data: Technology and cost of capital. In *Accounting Information Systems for Decision Making* (pp. 233-247). Springer, Berlin, Heidelberg.

Web Sites

www.xbrl.org
www.mca.gov.in/XBRL
www.xbrl.ca