



# Can Inclusion in Religious Index Membership Mitigate Earnings Management?

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## Abstract

This paper investigates whether religious-based index membership is important in mitigating earnings management. Using a large sample of firms domiciled across 12 European countries, our empirical results show that firms included in the Shariah-compliant index, as a proxy for religious index, are more likely to engage in accruals manipulation *vis-a-vis* non-Shariah-compliant firms. Our results are robust using the Heckman two-stage treatment effect model, weighted least squares model, alternative earnings quality metrics and after controlling for the potential effects of home-country characteristics. Furthermore, our empirical results indicate that corporate governance of Shariah-compliant firms does not constrain managerial opportunistic behaviour in misreporting earnings, and firms that with low scores of board functions, shareholder rights and vision and strategy are more likely to engage in earnings management. Further, Shariah-compliant firms domiciled in Coordinated Market Economies are more likely to manipulate earnings than those in Liberal Market Economies. Taken together, our findings suggest that the Shariah index membership does not indicate good corporate governance that can mitigate earnings management, and it may serve as a legitimacy mechanism to conform to stakeholders' expectations. Our findings support arguments that the religious-based index membership is plausibly used as a 'label' and an impression management tool to attract investment.

**Keywords** Shariah-compliant investments · Earnings management · Financial reporting · Corporate governance

**JEL Classification** G30 · M41

## Introduction

The influence of independent agency rating on the behaviour of firms is a topical issue which has instigated growing debates in academic as well as in business community. Extant literature provides evidence regarding the impact of ratings, ethical and socially responsible investments on firms and stakeholders' behaviour and decisions (e.g., Collison et al. 2009; Chatterji and Toffel 2010; Robinson et al. 2011; Mackenzie et al. 2013; Hood et al. 2014). However, prior studies concentrate mainly on the impact of independent agency rating regards socially responsible investments. In this study, we investigate whether religion-based investment index is able to influence managerial practices in

mitigating earnings management. Religion, which broadly defined as intrinsic beliefs and values, has been proposed as potential driver in influencing moral activities (Weaver and Agle 2002; Conroy and Emerson 2004; Longenecker et al. 2004). In particular, Noreen (1988) contends that managerial opportunistic behaviour can be constrained by agency contracts as well as religious mechanism.

This paper, in particular, focuses on the relation between Shariah-compliant investments index, as a source for religious ethical code, and earnings management. Shariah-compliant investment is a growing phenomenon that designed within Islamic religious practices and laws which not only expected to operate in accordance with relevant regulations of a given jurisdiction, but also it seeks to achieve the optimisation of society welfare (Čihák and Hesse 2010; Hayat and Kraeussl 2011).<sup>1</sup> Following Dechow et al. (2010), we

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<sup>1</sup> To be considered as a Shariah-compliant firm, Muslim scholars have introduced Shariah-screening process that detects any unacceptable activities according to Shariah principles. This screening

define earnings management as the practices that influence the extent to which reported earnings accurately reflect the true underlying circumstances of a firm, and predict its future performance.

The requirements of financial ratios by the Shariah index, to consider a firm as Shariah-compliant, may play a significant role to reduce managerial incentives of Shariah-compliant firms to engage in earnings manipulation (Farooq and AbdelBari 2015). Financial ratio screening of Shariah index requires a low firm's leverage, low cash reserves, and low account receivables for a firm to be considered as Shariah-compliant. It is used to detect the non-Shariah compliant financing and earnings.<sup>2</sup> Shariah forbids the involvement in interest or the use of cash as assets and the trading of money for money (Derigs and Marzban 2008; Ashraf 2016). Thus, financial ratios aim to measure the portion of income from non-permissible activities such as trading debt on interest either as borrowers or lenders. The level of cash and cash equivalents of firms has to be compared to the tolerance level of non-permissible activities,<sup>3</sup> to determine Shariah-compliant investments and increase investors' confidence with regard to religious-based investment decisions.<sup>4</sup>

Footnote 1 (continued)

process is usually conducted by a board called Shariah supervisory boards to ensure a firm's activities to conform to the moral codes of Islam. The screening processes are set up in two groups which are (i) business compliance, and (ii) financial ratios (FTSE Russell 2019). The business compliance screening process relate to both main activities and revenue allocation of firms. That is, a firm should not engage in prohibited activities such as conventional finance (whose activities are interest-based), alcohol, weapons, arms and defence manufacturing, tobacco, non-halal food production, and some entertainment business, e.g. casinos and gambling. A firm that belongs to the legitimate industries is also examined on the terms of its revenue allocation. For instance, if a firm that has a business activity in non-halal segments, it is also considered as inappropriate according to Shariah principles. In addition, even when a firm's activities are acceptable but it engages in trade debt either as a borrower or lender is deemed unacceptable. Financial ratio is the second Shariah-screening process and it is aimed at detecting the non-Shariah compliant financing and earnings. That is, Shariah forbids interest or the use of cash as assets. In so doing, the financial ratio screening concentrates on a firm's leverage, liquidity, interest and non-permissible income.

<sup>2</sup> The following financial ratios must be met for firms to be considered Shariah-compliant (FTSE Russell 2019): (i) debt is less than 33.333% of total assets, (ii) cash and interest bearing items are less than 33.333% of total assets, (iii) accounts receivable and cash are less than 50% of total assets, (iv) total interest and non-compliant activities income should not exceed 5% of total revenue.

<sup>3</sup> The tolerance level of non-permissible activities is introduced by scholars as a result of the complexity of the existing capital market in which most of firms are involved in the trading debt owing to the existence of cash deposits, loans or credits.

<sup>4</sup> For a detailed discussion on the rationale for financial ratios please see Obaidullah (2005) and Derigs and Marzban (2008).

According to agency theory (Jensen and Meckling 1976; Eisenhardt 1989), the separation between the roles of investors (principals) and managers (agents) creates self-interest or opportunistic behaviours. The level of debt can mitigate opportunistic behaviour of managers and constrain agency problems by disciplining managers from wasting excess firm cash (Grossman and Hart 1982; Jensen 1986). Debt can be effectively used as substitute for good corporate governance in mitigating agency problem (Arping and Sautner 2010; Jiraporn et al. 2012). Accordingly, firms with low debt should be well governed, and thus opportunistic behaviour of managers to manage earnings should be reduced. Shariah-compliant firms are a particular set of such low debt and cash firms, thus Shariah-compliance may indicate good corporate governance that alleviate agency conflicts and opportunistic behaviour of managers to engage in earnings management.

Prior studies (DeFond and Jiambalvo 1994; Becker et al. 1998; Marquardt and Wiedman 2004; Chung et al. 2005) provide evidence that firms with high leverage, high cash reserves, and high account receivables are more likely to engage in earnings manipulation than those firms with low leverage, low cash reserves and low account receivables, to avoid debt covenant violation and to camouflage the impact of engaging in unprofitable projects. Therefore, financial ratio screenings of a Shariah index would lead to constrain managerial opportunistic behaviour of Shariah-compliant firms to misreport earnings. In addition, Shariah-compliant firms are subject to greater scrutiny from external institutions and investors as they request reliable and relevant information that enables them to make investment decisions in terms of both economic and religious position (Haniffa and Hudaib 2002; Ali and Al-Owaidan 2008; Wan Ismail et al. 2015). Thus, Shariah-compliant firms face a greater demand for high-quality financial reporting as a result of their Shariah status.

On the contrary, it is argued that a firm's decision to be included in Shariah-compliant index is plausibly motivated by economic factor, i.e., attracting investment, and not due to abiding to ethical principles of Shariah (Alsaadi et al. 2017). Managers may have an incentive to gain a membership in Shariah index to attract investors who interested in Shariah investments and they attempt to influence the stakeholders' perceptions relating to the firm (Hemingway and Maclagan 2004). That is, Shariah membership may be used as a 'label' to create an impression of transparency, and may also serve as a legitimizing tool, and in so doing avoiding scrutiny from stakeholders. Thus, Shariah index membership does not constrain managerial incentives in earnings management.

Empirically, previous studies (see e.g., McGuire et al. 2011; Dyreng et al. 2012; Farooq and AbdelBari 2015; Wan Ismail et al. 2015) document that religion-influenced firms are less involved in aggressive financial reporting and have higher earnings quality. On the contrary, Alsaadi et al.

(2017) find firms that are religion-influenced have lower accrual quality as compared to socially responsible firms, whereas Callen et al. (2011) find that the extent of earnings management is not related to religion. Prior studies investigating the link between religion and financial reporting behaviour focusing either on (i) the level of religious adherence in a given country (e.g., McGuire et al. 2011; Dyreng et al. 2012; Cai et al. 2018), (ii) Muslim-majority countries (e.g., Farooq and AbdelBari 2015; Wan Ismail et al. 2015), or (iii) examining the joint effect of corporate social responsibility and religion on earnings management and how managers response to ethical codes regarding earnings quality when their firms being rated as CSR or Shariah-compliant firms (e.g., Alsaadi et al. 2017). This paper attempts to fill the gap in the literature by examining the impact of the Shariah index membership on firms' earnings management through assessing whether the structure of Shariah screening may indicate better governance that alleviate agency conflict and opportunistic behaviour of managers to engage in earnings management as compared to non-Shariah-compliant in non-Muslim-majority jurisdictions.

Using a large dataset of firms domiciled in 12 European countries for the period of 2003–2017, our empirical results show that Shariah-compliant firms are more likely to manipulate earnings, implying that the religious-based index membership *does not* indicate good corporate governance that can play an important role in constraining earnings manipulation of Shariah-compliant firms. Our results are robust (i) using Heckman two-stage treatment effect to tackle the problem of sample selection bias, (ii) using weighted least squares (WLS) model to reduce the effects of heteroscedasticity, (iii) using alternative earnings quality metrics, and (iv) and after controlling for the effects of country-level characteristics. In addition, the results also suggest that corporate governance of Shariah-compliant firms does not constrain managerial opportunistic behaviour in misreporting earnings, and firms that with low scores of board functions, shareholder rights and vision and strategy are more likely to engage in earnings management. Furthermore, our results also show that Shariah-compliant firms domiciled in Coordinated Market Economies (CME) are more likely to manipulate earnings than those in Liberal Market Economies (LME). Our findings support the notion that Shariah membership does not mitigate managerial incentives in earnings management, and may be used as a 'label' to create an impression of transparency to avoid scrutiny from stakeholders.

This study contributes to existing literature in several ways. First, we add to the limited number of extant literature by focusing on the association between the Shariah investment index and the degree of earnings management. Second, unlike prior studies that extensively concentrate on the level of religious adherence in the country or Muslim-majority countries, this paper extends prior studies by examining

whether the religious-based investment index is relevant in influencing managerial behaviour to meet stakeholders' expectations by providing evidence from non-Muslim-majority jurisdictions. Third, this study assesses whether the Shariah status gained by firm would enhance their moral imperative and transparency or it is used as a strategic tool to influence the stakeholders' impressions regarding the firms' activities. Fourth, this paper also assesses whether Shariah-compliance may indicate better corporate governance that alleviate agency conflicts and opportunistic behaviour of managers to engage in earnings management. Finally, our study provides a better understanding of Shariah investment index and earnings management which may assist various stakeholders in understanding the degree of reliability and transparency of financial reporting of Shariah-compliant firms.

The remainder of this paper is organised as follows: the next section reviews the literature and develops the hypotheses. We discuss the research design, measurement of variables, and empirical models in third section. We present the main results in fourth section and additional analyses in fifth section. Final section offers concluding remarks.

## Theory and Hypotheses Development

One source of moral principles which may potentially influence corporate activities as well as financial reporting is religion (Kennedy and Lawton 1998; Weaver and Agle 2002; Conroy and Emerson 2004; Longenecker et al. 2004). The broad definition of religion is moral base that is intrinsic (Wilber and Jameson 1980) composing beliefs and values (Iannaccone 1998; Acemoglu et al. 2005; Noland 2005; Guiso et al. 2006). Religion prohibits the act of deception towards other parties. More specifically, Noreen (1988) argues that religion is one of enforcement mechanisms in enhancing moral behaviour and constraining managerial opportunistic behaviour. This paper examines the impact of inclusion in Shariah index which is based on the Islamic jurisprudence, as a source of religious-based principles, on the degree of earnings management.

Islam has a similar value to other religions in that its principles and norms guide all aspects of human life, including business activities. It treats the issue of business conducts, growth and performance as part of the broader issue of total human development, and not simply as the ultimate objective of corporations (Ebrahim and Joo 2001). In Islam, every human action (including business actions) should be directed towards achieving a good life and human wellbeing. This stresses the need for socioeconomic justice and a balance between the material and spiritual needs of all human beings. Shariah principles assert the importance of ethical responsibility by encouraging all activities that enhance

human wellbeing while prohibiting all harmful actions that might affect the welfare of the community. For example, business organisations should not engage in business activities that are prohibited in Islamic Shariah, such as selling or producing alcoholic drinks, gambling, pork and unlawful activities. Engaging in these activities may cause the risk of firms losing their stakeholders' supports which in turn negatively affect the corporations' performance. On the other hand, the investments of stakeholders should be safeguarded by managements as a result of the trust. Managers should conduct business activities in an ethical, accountable and transparent manner consistent with the principles of equity, justice and benevolence (Beekun and Badawi 2005).

Shariah-compliant investment which designed within Islamic parameters has been growing rapidly in recent years, with estimated assets of USD 1033 billion, and more than 800 managed Islamic funds (Hayat and Kraeusl 2011). Beekun and Badawi (2005) argue that the growth in Islamic-based investments is due to (i) more affluent investors are represented by Muslim countries in the world; (ii) the move towards greater Islamic trading bloc by a number of Islamic countries; (iii) the immigration of large number of Muslims population across the world; and (iv) a greater need of investment diversity, including investment based on religion, as a result of the tide of globalisation.

Shariah principles assert that business operations should not be carried out in an opaque manner, and prescribe that every aspect of these activities is disclosed to various stakeholders (Ali and Al-Owaihian 2008). That is, information disclosure about a firm's activities mitigates information asymmetry and enhances transparency as well as reduces managerial incentives in earnings manipulation (Healy and Palepu 2001; Jo and Kim 2008). This implies that a firm with full disclosure is more likely to provide a transparent corporate reporting that enable investors to make the right investment decisions. The Islamic principles enhance the concept of the full disclosure, which asserts the importance of disclosing all necessary information that assists investors in the process of decision-making (Maali et al. 2006). Such a disclosure assists various investors to determine Shariah-compliant investments and increase their confidence with regard to religious-based investment decisions. Haniffa and Hudaib (2002) indicate that the concept of full disclosure is important in Islamic laws as it provides the most reliable and relevant information which enables investors to make investment decisions in terms of both economic and religious status. Similar to other ethical principles, Shariah precepts prohibit managerial exploitation of contracted agreements as well as trust given to them including earnings manipulations. In this regards, Dadgar and Naderi (2009) argue that the equitable treatment and protection of right as well as transparent and responsible behaviour by managers play a considerable role in providing a reliable financial reporting.

From the theoretical perspective, Shariah principles assert that business activities should be carried out in a transparent manner that every aspect of these activities is clarified to various stakeholders.<sup>5</sup> In so doing, it also provides investors reliable and relevant information that enables them to make investment decisions in terms of both economic and religious position. In addition, the requirement of financial ratios by the Shariah index, to consider firms as Shariah-compliant, may play a significant role to enhance earnings quality of Shariah-compliant firms. Financial ratio screening is the second requirement of Shariah index and it aims to detecting the non-Shariah compliant financing and earnings. It requires a low leverage, low cash reserves, and low account receivables for a firm to be considered as Shariah-compliant. Shariah forbids the involvement in interest or the use of cash as assets and the trading of money for money (Derigs and Marzban 2008; Ashraf 2016). Financial ratios screening aims to determine to what extent that firms are engaging in such practices, and measure the portion of income from non-permissible activities such as trading debt on interest either as borrowers or lenders. Since the use of cash as assets or the trading of money for money are not acceptable in Islam, the level of cash and cash equivalents of firms has to be compared to the tolerance level of non-permissible activities. This tolerance level of non-permissible activities is introduced by scholars as a result of the complexity of the existing capital market in which most of firms are involved in the trading debt owing to the existence of cash deposits, loans or credits, and in order to assist investors to determine Shariah-compliant investments and increase their confidence with regard to religious-based investment decisions.

Drawing on the agency theory (Jensen and Meckling 1976; Eisenhardt 1989), this theory provides an explanation for issues inherent in the principle-agent relationship between investors and managers. It is argued that the separation between the roles of investors (principals) and managers (agents) creates self-interest or opportunistic behaviours.<sup>6</sup> That is, the incentives of capital holders are different from those of managers, and these divergences are related to the possibilities of the principals and agents to achieve

<sup>5</sup> Consistent with the Islamic accountability perspective, managers should safeguard the investors' investments as results of trust between them, and in so doing, conduct business activities in an ethical and transparent manner along the principles of equity, justice and benevolence (Beekun and Badawi 2005).

<sup>6</sup> For instance, as a result of functional division of roles between the principals and agents, managers are the company's agents whose responsibility is to achieve the corporate goals as well as balance the interests of various stakeholders. However, they are not entirely accountable for all their own decisions' outcomes. This may result in suboptimal behaviour and decisions that managers might make to serve their self-interests at the expense of other capital holders (Oh et al. 2011).



their own private goals as well as diversifying risk (Munari et al. 2010).<sup>7</sup> Good corporate governance is a vital tool to reduce conflicts among various stakeholders' interests, thus reducing the agency conflicts. Recent research argues that Shariah-compliant label may indicate good corporate governance (Hayat and Hassan 2017). Shariah-compliant firms are characterised as firms that have low debt and cash. It is argued that the level of debt and cash can mitigate opportunistic behaviour of managers and constrain agency problems by disciplining managers from wasting excess firm cash, and increasing external monitoring and takeover threats (Grossman and Hart 1982; Jensen 1986). It is suggested that debt can substitute for good corporate governance in alleviating agency conflicts (Arping and Sautner 2010; Jiraporn et al. 2012). Based on this view, firms with low debt and cash should be well governed, and thus managerial opportunistic behaviour to misreport earnings should be mitigated as well. Shariah-compliant firms are a particular set of such low debt and cash firms, and it is interesting to examine whether Shariah-compliance also indicate good corporate governance that mitigate agency conflicts and constrain managerial opportunistic behaviour to misreport earnings.

Farooq and AbdelBari (2015) argue that the financial characteristics of Shariah-compliant firms lead to constrain managerial opportunistic behaviour to misreport earnings. Prior studies provide evidence that firms with high leverage, high cash reserves, and high account receivables are more likely to manipulate earnings than firms with low leverage, low cash reserves, and low account receivables. DeFond and Jiambalvo (1994) and Becker et al. (1998) show that firms with high leverage have incentive to engage in earnings manipulations to avoid debt covenant violation. Chung et al. (2005) find that firms with high surplus cash are more likely to use earnings management through income-increasing discretionary accruals in order to camouflage the impact of engaging in unprofitable projects. Marquardt and Wiedman (2004) provide evidence that firms use account receivables to manage earnings. Consequently, firms with high account receivables are more likely to engage in earnings manipulations. Based on the above, it can be argued that financial ratio screening of Shariah index may indicate good corporate governance that assists reducing managerial incentives in earnings manipulation, as it requires that firms must have low leverage, low cash reserves, and low account receivables to be considered as Shariah-compliant. Therefore, Shariah-compliant firms have less incentives to engage in earnings management. Furthermore, Shariah-compliant firms are

subject to greater scrutiny from external institutions and investors and thus, face a greater demand for high-quality financial reporting as a result of their Shariah status (Wan Ismail et al. 2015).

Empirically, McGuire et al. (2011) and Dyreng et al. (2012) both find companies that are religion-influenced are less involved in aggressive financial reporting and have higher accrual quality, lower restatements of financial statements, lower risk of fraudulent accounting, and lower forecast errors. In similar vein, Farooq and AbdelBari (2015) and Wan Ismail et al. (2015) show that Shariah-compliant firms have lower earnings management than non-Shariah-compliant firms. Based on the above discussion, we argue that the financial ratio screening of Shariah index enhances earnings quality of Shariah-compliant firms and reduce managerial incentives to engage in earnings management. Moreover, Shariah-compliant firms face greater demands of conducting ethical activities as well as providing more transparent and reliable financial reporting. Accordingly, we expect that inclusion in the Shariah index membership mitigates managerial opportunistic behaviour to misreport earnings. Hence, we propose:

**Hypothesis 1a** Shariah-compliant firms have lower earnings management than non-Shariah-compliant firms.

Nevertheless, based on the institutional theory and the legitimacy theory, the decision of engaging in Shariah-compliant may be affected by a number of external factors including financial and competitive situation of firms, state, regulation body and pressure groups (Bansal and Roth 2000; Christmann 2000; González-Benito and González-Benito 2006; Campbell 2007; Delmas and Toffel 2010). That is, firms decide to be included in Shariah-compliant index is plausibly motivated by economic factor, i.e., attracting investment from the Islamic investors, and not due to abiding to moral and ethical principles of Shariah (Alsaadi et al. 2017). Furthermore, the decision of including firms in the Shariah index are extensively, if not purely, based on what firms disclose regarding their business activities and financial structure, with no effort to track Shariah performance across time. In similar vein, Cho et al., (2012) find that ethical index membership is far more affected by what firms say (i.e., ethical disclosure) rather than what they actually do (i.e., ethical performance). Moreover, the inclusion in Shariah-compliant index is due to firms satisfying the screening requirements rather than a conscious decision to conduct business in a Shariah-compliant manner. It is argued that the current Shariah-screening process is not fully conforming to the true spirit of Islam (El-Gamal 2006), and only concentrating on negative aspects of business activities, i.e., to ensure Shariah-compliant firms are not engaging on prohibited activities.

<sup>7</sup> The incentives and objectives of capital holders are different from those of managers, for example, managers will be concerned with a firm's total risk whereas diversified shareholders will only be concerned with a firm's systemic risk (Munari et al. 2010).

Empirically, using a country-level data, Callen et al. (2011) find that the propensity of earnings management is not related to religion. Alsaadi et al. (2017) find that socially responsible firms are less likely to manage earnings, whereas Shariah-compliant firms are more likely to engage in earnings manipulation. Hence, based on this argument we expect that inclusion in the Shariah index membership does not mitigate earnings management. Accordingly, we hypothesise that:

**Hypothesis 1b** Shariah-compliant firms have higher earnings management than non-Shariah-compliant firms.

## Research Design

### The Data

The sample used in this study covers 12 European countries for the period between 2003 and 2017. These countries are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherland, Spain, Sweden and the United Kingdom. Our initial sample is based on the FTSE All-World index and the FTSE Global Shariah index. The former is provided by the FTSE Group Ltd, whereas the latter is calculated jointly between the FTSE Group Ltd and Yasaar Limited, and it is designed to track the performance of firms whose activities are consistent with Shariah criteria. Following the literature (Girard and Hassan 2008; Ashraf 2016), this study uses the FTSE Shariah index due to its broad coverage, consistency, and reliability.<sup>8</sup> The key advantage of FTSE Shariah index is that it uses a more conservative approach to ensure the Shariah compliance by rating financial ratios limits that are measured as a percentage of total assets, while other competitors (e.g., Dow Jones and Standard and Poor's) use more volatile measures that based on 12–36 months trailing market capitalisation.<sup>9</sup> This asset-based financial screening used by FTSE Shariah index is less speculative and ensures that the determination of Shariah compliance status of firms is consistent with Shariah principles and also represents the replacement cost of assets, thus firms do not pass the screening criteria due to market price fluctuation (Obaidullah 2005; FTSE Russell 2019).

To ensure that all the sample firms are screened by Shariah processes, we construct our sample jointly using the FTSE All-World index and in the FTSE Global Shariah

index. That is all firms included in the FTSE All-World index are eligible for the FTSE Shariah index screening. The constituents are classified as Shariah-compliant firms if it is included in the FTSE Global Shariah index, while the constituents in FTSE All-World index but not in the FTSE Global Shariah index are categorised as firms that are not Shariah-compliant. Financial data are collected from the Datastream database and are matched with the sample information that is constructed based on FTSE All-World index and the FTSE Global Shariah index. Following the extant literature, firms operating in financial sector, firms with missing data, and firm-years with extreme values or insufficient information to determine the earnings management are omitted from the sample. The final sample of the study comprises 5258 firm-year observations. Table 1 shows all firm-year observations distribution across country. It indicates the highest percentage of observations is from the UK (38.23%), followed by France (14.42%) and Germany (12.99%).

### Measuring Earnings Management

A number of alternative measures have been used in the extant literature to estimate earnings management. In this paper, we use the discretionary accruals as a proxy of earnings management, a measure that has been widely used in the prior literature (Jones 1991; Dechow et al. 1995; DeFond and Subramanyam 1998; Kothari et al. 2005). Discretionary accruals are estimated using the modified Jones model adjusted for performance (Dechow et al. 1995; Kothari et al. 2005). Prior studies have discussed the merits and drawbacks of this model (Guy et al. 1996; Young 1999; Thomas and Zhang 2001; Lo 2008; Dechow et al. 2010; DeFond 2010). It is argued that, despite the disadvantage of the modified Jones model, there is no alternative model that suggests a superior solution to address the issue of estimating discretionary accruals (Botsari and Meeks 2008). Furthermore, Subramanyam (1996) claims that discretionary accruals estimated using this model are priced by the market.

This study adopts the cross-sectional approach of modified Jones models instead to the firm-specific time-series approach. In terms of detecting earnings manipulations, Bartov et al. (2000) report a better performance of the cross-sectional approach than the time-series approach. The cross-sectional approach of modified Jones model also assists to maximise the sample size and avoid the problem of survivorship bias that occurs with time-series model (DeFond and Subramanyam 1998; DeFond and Subramanyam 1998; Peasnell et al. 2005). In addition, Subramanyam (1996) shows that the cross-sectional model provides a more accurate parameter estimates than the time-series one due to the larger number of freedom degrees. Following Teoh et al. (1998), this study focuses on current discretionary accruals

<sup>8</sup> In term of the representativeness, as of 2019, the FTSE Global Shariah Index has more than 1400 Shariah compliant constituents with a market capitalization of over 17 trillion US dollars (FTSE Russell 2019).

<sup>9</sup> For a detailed discussion on the Shariah based screening criteria adopted by major index providers please see Ashraf (2016).

**Table 1** Sample distribution by country

	Full sample		Shariah firms		Non-shariah firms	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Austria	93	1.77	43	2.78	50	1.35
Belgium	139	2.64	49	3.17	90	2.42
Denmark	174	3.31	44	2.85	130	3.50
Finland	279	5.31	104	6.73	175	4.71
France	758	14.42	343	22.19	415	11.18
Germany	683	12.99	275	17.79	408	10.99
Ireland	90	1.71	34	2.20	56	1.51
Italy	258	4.91	62	4.01	196	5.28
Netherlands	238	4.53	84	5.43	154	4.15
Spain	338	6.43	80	5.17	258	6.95
Sweden	198	3.77	56	3.62	142	3.83
United Kingdom	2010	38.23	372	24.06	1638	44.13
Total	5258	100.00	1546	100.00	3712	100.00

This table presents the sample distribution by country of domicile. The sample are constructed based on the FTSE All-World index and in the FTSE Global Shariah index for the years 2003–2017, and after excluding financial firms. Shariah firms are the firms that are included in both the FTSE All-World index and the FTSE Global Shariah index; whereas Non-Shariah firms are firms that are included in the FTSE All-World index, but not in the FTSE Global Shariah index

rather than total discretionary accruals.<sup>10</sup> The total current accruals (TCA<sub>*it*</sub>) for firm *i* at year *t* is calculated as:

$$TCA_{it} = (\Delta CA_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta STDebt_{it}) \quad (1)$$

where  $\Delta CA_{it}$  is the change in current assets,  $\Delta Cash_{it}$  is the change in cash and cash equivalent,  $\Delta CL_{it}$  is the change in current liabilities, and  $\Delta STDebt_{it}$  is the change in short-term debt. Following Kothari et al. (2005) and Cheng et al. (2012), we employ the residual from an industry-specific performance adjusted of the modified Jones model as estimates of firm *i*'s discretionary accruals. The performance adjustment recommended by Kothari et al. (2005) and further supported by Cheng et al. (2012) to avoid potential misspecification in the estimation of discretionary accruals, thus enhancing the reliability of inferences from discretionary accruals estimates. This study estimates the following model:

$$\frac{TCA_{it}}{TA_{it-1}} = \alpha_0 \left( \frac{1}{TA_{it-1}} \right) + \alpha_1 \left( \frac{\Delta REV_{it} - \Delta REC_{it}}{TA_{it-1}} \right) + a_2 \left( \frac{PPE_{it}}{TA_{it-1}} \right) + a_2 \left( \frac{EARN_{it-1}}{TA_{it-1}} \right) + \epsilon_{it} \quad (2)$$

where the total current accruals (TCA) for firm *i* at year *t*,  $\Delta REV_{it}$  is the change in net revenues in year *t* from year *t* - 1,  $\Delta REC_{it}$  is the change in net receivables in year *t* from

year *t* - 1, PPE<sub>*it*</sub> is the gross property, plant and equipment for a firm *i* at year *t*, EARN<sub>*it-1*</sub> is income before extraordinary for a firm *i* from year *t* - 1, TA<sub>*it-1*</sub> is total assets for a firm *i* at the end of year *t* - 1.

The discretionary current accruals are estimated as the residual from model (2) across all sample firms sorted by industry sector and year. In this paper, we use both the absolute and signed value of current discretionary accruals as a proxy of earnings management. That is, the absolute (EM1), positive (EM1+) and negative (EM1-) values of current discretionary accruals are considered in the empirical analysis as proxies for the combined effect, income-increasing or income-decreasing earnings management, respectively (Warfield et al. 1995; DeFond and Park 1997; Klein 2002; Sun et al. 2010; Kim et al. 2012).

### Empirical Models

This study aims to investigate to what extent Shariah investment index is able to mitigate earnings management. In examining our hypotheses, we estimate the following model:

$$EM_t = \alpha_0 + \beta_1 Shariah_t + \beta_2 CG\ Scores_t + \beta_3 SIZE_t + \beta_4 Growth_t + \beta_5 Profitability_t + \beta_6 Leverage_t + \beta_7 Ownership_t + \beta_8 Big4_t + \beta_9 Age_t + \epsilon_t \quad (3)$$

where EM is either the absolute values of current discretionary accruals (EM1), the positive values of current discretionary accruals (EM1+) or the negative values of current discretionary accruals (EM1-). Shariah is an indicator variable

<sup>10</sup> Becker et al. (1998) content that, on average, managers have greater discretion over current accruals as compared to total accruals.

that takes a value of 1 if the firm is included in the FTSE Shariah Index and 0 otherwise. To avoid the issue of correlated omitted variables, other firm-specific control variables are included in this study to control for firm characteristics that could affect the extent of earnings management. In particular, we include corporate governance scores (CG Scores) in our model in order to control for its potential effects on the level of earnings management (Xie et al. 2003). We use the scores of ASSET4's corporate governance to control for the effect of CG Scores. This study also control for firm size, as prior research indicates that firm size is correlated with earnings management (Pincus and Rajgopal 2002; Roychowdhury 2006). Larger firms have more potential for engaging in earnings manipulations in order to reduce political costs or as a result of pressure that managers could face in order to report more predictable earnings (Pincus and Rajgopal 2002). We measure firm size (*SIZE*) as the natural logarithm of the market value of equity. This research also control for firm growth opportunity, as previous research shows that firm growth opportunity is associated with earnings management (Abbott et al. 2004; Roychowdhury 2006; Gargouri et al. 2010; Kim et al. 2012). Gargouri et al. (2010) argue that firm with a high growth opportunity are more likely to engage in earnings manipulation and manage earnings upwards because market reactions would be negative if sustained earnings growth did not occur. We measure firms growth opportunity (*Growth*) as market value of equity divided by book value of equity. Another control variable of this study is firm profitability (*Profitability*) and it is measured as income before extraordinary items divided by the total assets (Yip et al. 2011; Kim et al. 2012). This study also control for firm leverage (*Leverage*), measured as long-term debt scaled by total assets. Previous studies show that there firm leverage is associated with earnings manipulations (DeFond and Jiambalvo 1994; Dechow et al. 1996; Jiang et al. 2008). DeFond and Jiambalvo (1994) provides evidence that there are incentives for firm with a high leverage to engage in earnings manipulations to avoid a debt covenant violation. This study also controls for ownership concentration (*Ownership*) and measures as the percentage of closely held share as reported by Worldscope. Prior studies also argue that the extent earnings management may vary for firms that audited by the Big Four auditing firms (Kim et al. 2012). Chih et al., (2008) claim that it is harder for managers to extensively engage in earnings manipulations when their firms are audited by the Big Four auditors. Following previous studies, we also control for the Big Four Auditors (*Big4*), measured as an indicator variable that takes a value of 1 if a firm audited by Big4 auditors, 0 otherwise. This study also control for firm age, because financial reporting behaviour and inclusion of firms

in the FTSE Shariah index could change as a firm matures.<sup>11</sup> Thus, firm age (*Age*) is included in the regression model in order to control for the potential effect across different developmental stages of the business. For ease of reading, variable definitions are summarized in the "Appendix A".

We include year, industry and country fixed effects in the regressions models to account for variation across time, industries and countries. In addition, all firm-level continuous variables are winsorized at the top and bottom of one percent of their respective distributions to mitigate the influence of outliers. Furthermore, all test statistics and significant levels are estimated with firm and year levels clustered errors.

## Main Results

### Descriptive Statistics

Table 2 presents descriptive statistics of the full sample and sub-sample firms that are Shariah-compliant, and firms that are not Shariah-compliant. For the full sample, it shows that the mean of the EM1 is 0.078. The unsigned discretionary accruals (*DA*) have a mean value of 0.009, which is comparable with prior studies' findings such as Klein (2002). 29.40% of our sample firms ( $N = 1546$ ) are firms that included in the FTSE Shariah index, while the remaining ( $N = 3712$ ) are firms that are not Shariah-compliant. As for the control variables, corporate governance scores (CG Scores) range between zero and one, and has a mean of 0.622. On average, investors closely hold 25% of the outstanding shares. Profitability and *Growth* have mean values of 0.053 and 2.940, respectively, indicating that the firms in our sample experience high growth opportunities. The Table 2 also shows that around 93% of the firms in the sample are audited by the Big4 accounting firms, and that the mean value of firm age is about 23 years.

For the sub-sample firms, Table 2 shows that the mean value of discretionary accruals (*DA*) for firms that are Shariah-compliant (firms non-Shariah-compliant) is 0.015(0.007), indicating that both sample groups exhibit income-increasing accruals. The mean of absolute values of discretionary accruals (EM1) and the positive discretionary accruals (EM1+) are higher for Shariah-compliant firms (0.085 and 0.089, respectively) relative to firms that are not Shariah-compliant (0.075 and 0.071 respectively). However, the mean of negative discretionary accruals (EM1-) for the Shariah-compliant firms (-0.080) is similar to those for firms that are not Shariah compliant (-0.081). This result suggests that Shariah-compliant

<sup>11</sup> We thank an anonymous reviewer for this insight.



**Table 2** Descriptive statistics

Variable	Full sample				Min	Max	Shariah firms				Non-Shariah firms			
	N	Mean	Median	SD			N	Mean	Median	SD	N	Mean	Median	SD
DA	5258	0.009	0.005	0.146	-0.918	0.991	1546	0.015	0.004	0.165	3712	0.007	0.005	0.137
EM1	5258	0.078	0.034	0.124	0.000	0.991	1546	0.085	0.033	0.142	3712	0.075	0.035	0.115
EM1+	2998	0.076	0.033	0.128	0.000	0.991	854	0.089	0.033	0.152	2144	0.071	0.033	0.117
EM1-	2260	-0.080	-0.037	0.118	-0.918	0.000	692	-0.080	-0.033	0.130	1568	-0.081	-0.040	0.113
Shariah	5258	0.290	0.000	0.454	0.000	1.000	-	-	-	-	-	-	-	-
CG Scores	5258	0.622	0.678	0.251	0.025	0.966	1546	0.636	0.692	0.244	3712	0.616	0.672	0.253
SIZE	5258	15.364	15.294	1.409	10.574	18.598	1546	16.233	16.052	1.162	3712	15.008	14.864	1.345
Growth	5258	2.940	2.147	3.011	-3.623	20.043	1546	2.817	2.102	2.535	3712	2.990	2.175	3.185
Profitability	5258	0.053	0.046	0.070	-0.318	0.311	1546	0.056	0.049	0.069	3712	0.052	0.045	0.070
Leverage	5258	0.252	0.238	0.161	0.000	0.857	1546	0.213	0.212	0.111	3712	0.268	0.258	0.175
Ownership	5258	0.252	0.180	0.237	0.000	0.893	1546	0.254	0.167	0.255	3712	0.252	0.183	0.230
Big4	5258	0.929	1.000	0.256	0.000	1.000	1546	0.931	1.000	0.254	3712	0.929	1.000	0.258
Age (in years)	5258	23.408	21.028	13.816	7.000	35.000	1546	24.459	23.010	13.732	3712	22.978	20.279	0.13830

This table presents a summary of descriptive statistics for the study’s variables of the full sample as well as each group of Shariah-compliant firms and non-Shariah-compliant firms. The sample are constructed based on the FTSE All-World index and in the FTSE Global Shariah index for the years 2003–2017, and after excluding financial firms. Shariah firms are the firms that are included in both the FTSE All-World index and the FTSE Global Shariah index; whereas Non-Shariah firms are firms that are included in the FTSE All-World index, but not the FTSE Global Shariah index. Variables definitions are summarised in the “Appendix A”

**Table 3** Correlation matrix

	EM1	Shariah	CG scores	SIZE	Growth	Profitability	Leverage	Ownership	Big4	Age
EM1	1									
Shariah	0.037***	1								
CG Scores	-0.078***	0.037***	1							
SIZE	-0.007	0.395***	0.090***	1						
Growth	0.055***	-0.026**	0.013	0.097***	1					
Profitability	0.110***	0.028**	-0.033**	0.130***	0.433***	1				
Leverage	-0.040***	-0.156***	0.025*	0.087***	-0.068***	-0.256***	1			
Ownership	0.052***	0.005	-0.385***	-0.001	-0.043***	-0.028**	0.032**	1		
Big4	-0.047***	0.004	0.102***	-0.039***	0.043***	0.035**	-0.069***	-0.097***	1	
Age	-0.128***	0.043***	0.166***	0.145***	-0.096***	-0.040***	-0.074***	-0.268***	0.015	1

This table presents pairwise correlation for the study’s variables. The sample are constructed based on the FTSE All-World index and in the FTSE Global Shariah index for the years 2003–2017, and after excluding financial firms. Variables definitions are summarised in the “Appendix A”

\*, \*\*, \*\*\*Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively

firms are more likely to manage earnings through accruals compared to non-Shariah-complaint firms. In addition, it indicates that Shariah-compliant firms engage more in income-increasing earnings manipulation through accruals rather than income-decreasing earnings management. The mean value of CG Scores is higher for Shariah-compliant firms relative to firms that are not Shariah-compliant. In addition, Table 2 shows that Shariah-compliant firms are

larger, older, have lower leverage, and have better earnings performance than firms that are not Shariah-compliant. Furthermore, in each sample group, insiders own around 25% of the outstanding shares. The table also shows that around 93% of both Shariah and non-Shariah-compliant firms are audited by the Big4 accounting firms.

**Table 4** Regression results of the relationship between Shariah index membership and earnings management

	EM1 Coeff.	EM1+ Coeff.	EM1– Coeff.
Shariah	0.010** (0.004)	0.015** (0.006)	0.002 (0.006)
CG Scores	0.009 (0.012)	0.005 (0.020)	0.004 (0.015)
SIZE	–0.004*** (0.001)	–0.004** (0.002)	0.007*** (0.002)
Growth	0.001* (0.001)	0.001 (0.001)	–0.002** (0.001)
Profitability	0.102*** (0.031)	0.135*** (0.043)	–0.068 (0.046)
Leverage	–0.031*** (0.010)	–0.035** (0.014)	0.021 (0.017)
Ownership	0.020*** (0.007)	0.016* (0.009)	–0.016 (0.012)
Big4	–0.035*** (0.008)	–0.032*** (0.011)	–0.001 (0.013)
Age	–0.004* (0.002)	–0.005 (0.003)	0.003 (0.003)
Constant	0.242*** (0.024)	0.243*** (0.033)	–0.259*** (0.039)
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
adj. $R^2$	0.155	0.155	0.226
$F$	30.079***	15.186***	13.004***
$N$	5258	2998	2260

The definitions of the study variables are summarised in “Appendix A”. The values in parentheses are standard errors. All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year level

\*, \*\*, \*\*\*Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively

Table 3 presents pairwise correlation coefficient for the variables of the study. As shown in the table all correlation values are below the critical value 0.80 suggesting that multicollinearity is not an issue in this study.<sup>12</sup> The result indicates that Shariah is significantly and positively correlated with EM1 at the level of 1%. Thus, Shariah-compliant firms are more likely to engage in earnings manipulations through the discretionary accruals. We also observe that Shariah is significantly and positively correlated with

CG Scores, SIZE, Profitability, and Age, and negatively correlated with Leverage.

## Multivariate Results

Table 4 presents the regression results of earnings management on Shariah. Earnings management is proxied by either the absolute value (EM1), positive value (EM1+) or negative value (EM1–) of current discretionary accruals. The results show a positive association between Shariah and EM1. In particular, the estimated coefficient on Shariah is positive (0.010) and highly significant ( $p < 0.05$ ), suggesting that firms that are Shariah-compliant are more likely to manipulate earnings. Similar results are found in the regression of signed positive (EM1+) indicating that Shariah-compliant firms are more likely to engage in income-increasing earnings manipulation. However, no evidence is observed from the signed-negative discretionary accruals (EM1–) model. Our findings suggest that the Shariah Index membership does not mitigate earnings management and Shariah-compliant firms have higher earnings management than non-Shariah-compliant firms, hence accepting (rejecting) Hypothesis 1b (1a). These results are in contrast with the findings that reported by McGuire et al. (2011), Dyreng et al. (2012), Farooq and AbdelBari (2015), and Wan Ismail et al. (2015), while they are consistent with the results of Callen et al. (2011) Alsaadi et al. (2017). Our results imply that firms may use the Shariah index membership as a legitimacy mechanism to conform to stakeholders’ expectations. Consequently, our finding supports arguments that Shariah index membership is only used as a ‘label’ and impression management tool to attract investment and it does not enhance earnings quality. In addition, Shariah-compliance does not indicate good corporate governance that mitigate agency conflicts and constrain managerial opportunistic behaviour to misreport earnings.

With respect to control explanatory variables, Table 4 shows that *SIZE* has a significant and negative association with EM1 ( $-0.004$ ;  $p < 0.01$ ) and EM1+ ( $-0.004$ ;  $p < 0.05$ ), and has a significant and positive relationship with EM1– ( $0.007$ ;  $p < 0.01$ ). These results suggest that larger firms are less likely to engage in earnings manipulation. The results also show that Profitability has a significant and positive relationship with EM1 (0.102) and EM1+ (0.135) at the level of 1%, suggestion that firms with a better earnings performance are more likely to engage in earnings manipulation and income-increasing earnings management. The table also shows that Leverage is significantly and negatively associated with EM1, suggesting that firms with low leverage are more likely to engage in earnings management. We also observe that closely held ownership (*CLOSE*) is significantly and positively associated with EM1 at the significant level

<sup>12</sup> We also run the VIF factor to check for multicollinearity among explanatory variables. The untabulated results show there is no VIF above 2.0.

**Table 5** Regression results of the relationship between Shariah index membership and earnings management using Heckman two-stage treatment effect model and weighted least squares (WLS) regression

	Heckman two-stage			WLS		
	EM1	EM1+	EM1–	EM1	EM1+	EM1–
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Shariah	0.008** (0.004)	0.014** (0.006)	0.002 (0.006)	0.020** (0.010)	0.028** (0.012)	–0.005 (0.011)
CG Scores	0.001 (0.010)	0.003 (0.014)	0.003 (0.015)	0.002 (0.023)	0.016 (0.025)	0.067*** (0.023)
SIZE	–0.018** (0.009)	–0.033*** (0.012)	0.009 (0.015)	0.004 (0.004)	0.004 (0.006)	0.002 (0.004)
Growth	0.002** (0.001)	0.003** (0.001)	–0.002* (0.001)	0.006*** (0.002)	0.005* (0.003)	–0.007*** (0.002)
Profitability	0.138*** (0.039)	0.218*** (0.051)	–0.075 (0.063)	0.201** (0.102)	0.590*** (0.161)	0.156** (0.069)
Leverage	0.049 (0.046)	0.134** (0.059)	0.009 (0.076)	–0.048* (0.027)	–0.075* (0.039)	0.012 (0.026)
Ownership	0.013* (0.007)	0.010 (0.010)	–0.016 (0.012)	0.037* (0.019)	0.031 (0.023)	0.020 (0.016)
Big4	–0.000 (0.009)	–0.003 (0.012)	–0.000 (0.013)	0.009 (0.010)	0.008 (0.012)	–0.017 (0.011)
Age	–0.004 (0.003)	–0.002 (0.004)	0.002 (0.004)	0.003 (0.006)	–0.011 (0.008)	0.004 (0.004)
Inverse Mills	–0.043* (0.025)	–0.088*** (0.032)	0.006 (0.040)	– –	– –	– –
Constant	0.425*** (0.153)	0.695*** (0.199)	–0.297 (0.252)	–0.028 (0.068)	0.005 (0.091)	–0.162** (0.066)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	–	–	–
adj. $R^2$	0.188	0.181	0.226	0.232	0.154	0.311
$F$	27.460***	13.705***	12.742***	14.920***	6.083***	8.470***
$N$	5258	2998	2260	5258	2998	2260

The definitions of the study variables are summarised in “Appendix A”. The values in parentheses are standard errors. All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year level

\*, \*\*, \*\*\*Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively

of 1%, indicating that insiders-owned firms are more likely to manage earnings through accruals.

## Additional Analyses

### The Heckman Two-Stage Treatment Effect

Even though we have carefully controlled for firm-level characteristics variables that are recognised to be related to the level of earnings management, the positive associations between Shariah and EM1 that are reported in the Table 4 may be driven by other unobserved characteristics. For instance, the relationship between Shariah index membership and earnings management could be affected by the

type of ownership, societal pressure, and political pressure. In addition, these unobserved characteristics could have an effect on the relation between Shariah and earnings management, and controlling for the unobserved characteristics might yield an alternative interpretation of the link between Shariah and EM1. Therefore, to tackle the issue of self-selection, we re-estimate our models using Heckman two-stage treatment effect methods. Heckman (1976, 1979) proposed a two-stage estimation procedure that use the inverse Mills’ ration in order to consider the sample selection bias. We use the probit model to regress Shariah on the control variables in the first-stage. Then, the inverse Mills’ ratio is calculated by using the estimated parameters. In the second stage, we include the inverse Mills’ ratio as an additional explanatory variable in the OLS estimation.

Table 5 shows the second-stage regression results after including the inverse Mills' ratio in order to correct for sample selection bias. The table yields qualitatively similar results that are reported in the Table 4. In particular, it shows that the association between Shariah and EM1 as well as between Shariah and EM1+ remain positive and significant at the level of 5%. This finding is also consistent with the notion that inclusion in the Shariah index membership does not mitigate earnings management and Shariah-compliant firms have higher earnings management than non-Shariah-compliant firms (Hypothesis 1b).

### Weighted Least Squares (WLS) Model

Although we include country fixed effects in the regressions models to account for variation across countries, the positive associations between Shariah and EM1 that are reported in the Table 4 may be driven by observations from large countries. Given the high weighting of the United Kingdom (38.23%) in the main sample, it seems that the 12 European countries are unevenly represented in the sample. Consequently, to reduce the effects of heteroscedasticity, we follow Dittmar et al. (2003) and re-estimate our models using weighted least squares (WLS) regression, where the weight of each observation is the inverse of the number of observations for each country. The WLS regression ensures that the results are not biased by countries that are more heavily represented and each of the 12 European countries receives equal weight in the regression estimations.

Table 5 shows the results of WLS regression and it shows similar results that are reported in the Table 4. In particular, it shows that the association between Shariah and EM1 as well as between Shariah and EM1+ remains positive and significant at the level of 5%. This finding is also consistent with the notion that inclusion in the Shariah index membership does not mitigate earnings management and Shariah-compliant firms have higher earnings management than non-Shariah-compliant firms (Hypothesis 1b).

### Alternative EQ Measures

We also re-estimate the regression models using three alternative earnings management measures to examine whether our results are robust to these different accruals metrics. First, we use total discretionary accruals, instead of current discretionary accruals, of modified Jones model adjusted for performance (EM2). Second, we employ a modified version of the Dechow and Dichev (2002) accruals estimation errors model used by Francis et al. (2005). This model suggests that accruals quality is determined by the extent to which working capital accruals map into operating cash flow realizations in past, present and future cash flows (Francis et al. 2005). The model is based on the idea that the quality

of accruals and earnings is reduced by estimation errors in accruals and subsequent correction of these errors (Baxter and Cotter 2009). However, this model is different from the modified Jones models of discretionary accruals in that there is no attempt is made to distinguish between intentional accrual estimation errors and unintentional errors, as both errors indicate lower earnings quality (Dechow and Dichev 2002; Francis et al. 2005; Baxter and Cotter 2009). Therefore, the errors' source is not relevant in the Dechow and Dichev model. McNichols (2002) highlights a number of specific areas of weakness with this model and provide some recommendations to improve this model. For instance, the model fails to separately consider how the behaviour of discretionary accruals might affect the total accruals. She suggests that the including of the change in sales revenue and the level of property, plant and equipment to Dechow and Dichev's (2002) model decrease measurement error and therefore considerably increasing its explanatory power. These two variables are added in the study of Francis et al. (2005). Following Francis et al. (2005), we use the following cross-sectional modified model to estimate accruals quality. All variables in the equation are scaled by average total assets.

$$TCA_t = \alpha_0 + \alpha_1 CFO_{t-1} + \alpha_2 CFO_t + \alpha_3 CFO_{t+1} + \alpha_4 \Delta REV_t + \alpha_5 PPE_t + \varepsilon_t, \quad (4)$$

Where  $TCA_t$  = total current accruals in year  $t$ , i.e.  $\Delta$ current assets –  $\Delta$ current liabilities –  $\Delta$ cash +  $\Delta$ short-term debt;  $CFO_{t-1}$  = cash flow from operations in year  $t - 1$ ;  $CFO_t$  = cash flow from operations in year  $t$ ;  $CFO_{t+1}$  = cash flow from operations in year  $t + 1$ ;  $\Delta REV_t$  = change in revenues in year  $t$  from year  $t - 1$ ;  $PPE_t$  = gross property, plant and equipment at year  $t$ . The residual of the equation  $\varepsilon_t$  is an inverse measure of accruals quality. A greater residual indicates poorer accruals quality. Following the study of Baxter and Cotter (2009), we use the absolute value of the residual as a measure of accruals quality (EM\_D&D).

Finally, the third measure is based on abnormal working capital accruals model (EM\_AWCA) that is introduced by DeFond and Park (2001):

$$AWCA_t = WC_t - \left[ \left( \frac{WC_{t-1}}{S_{t-1}} \right) \times S_t \right] \quad (5)$$

Where  $AWCA_t$  = abnormal working capital accruals;  $WC_t$  = noncash working capital in the current year computed as (current assets – cash and short-term investments) – (current liabilities – short-term debt);  $WC_{t-1}$  = noncash working capital in the last year;  $S_t$  = sales in the current year;  $S_{t-1}$  = sales in the last year. Subsequently, the abnormal working capital accruals of the year are scaled by the average of total assets. The large values of abnormal working capital accruals AWCA imply poorer earnings quality. AWCA is



**Table 6** Regression results of the relationship between Shariah index membership and alternative proxies of earnings management

	EM2 Coeff.	EM_D&D Coeff.	EM_AWCA Coeff.
Shariah	0.008** (0.004)	0.007** (0.003)	0.010** (0.004)
CG Scores	0.021*** (0.007)	0.004 (0.007)	0.022*** (0.007)
SIZE	-0.003** (0.001)	-0.005*** (0.001)	-0.004*** (0.001)
Growth	0.001** (0.001)	0.003*** (0.001)	0.001* (0.001)
Profitability	0.073** (0.032)	-0.189*** (0.040)	0.102*** (0.031)
Leverage	-0.034*** (0.011)	-0.019** (0.008)	-0.031*** (0.010)
Ownership	0.016** (0.007)	0.009 (0.008)	0.020*** (0.007)
Big4	-0.036*** (0.009)	-0.010*** (0.004)	-0.035*** (0.008)
Age	-0.011*** (0.003)	-0.005*** (0.001)	-0.004* (0.002)
Constant	0.211*** (0.023)	0.173*** (0.019)	0.242*** (0.024)
Year effects	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
adj. $R^2$	0.127	0.098	0.155
$F$	29.852***	11.122***	30.079***
$N$	5258	4431	4992

The definitions of the study variables are summarised in “Appendix A”. The values in parentheses are standard errors. All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year level

\*, \*\*, \*\*\*Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively

different from the abnormal discretionary accruals of modified Jones models in that (Menon and Williams 2004): first, AWCA includes only current accruals rather than current and noncurrent components of accruals. Second, it uses firm-specific working capital from the prior period as the norm, while the abnormal accruals of modified Jones models based on a cross-sectional comparison of accruals growth of a firm with other firms’ growth in accruals in the same industry.

The observations number used in each models are different due to additional data requirements for estimating the alternative measures of earnings manipulations. Generally, these alternative models show the same results that are reported in the Table 4 using EM1. Table 6 shows that *Shariah* has significantly positive coefficients in the

regressions models of EM2 (0.008;  $p < 0.05$ ), EM\_D&D (0.007;  $p < 0.05$ ), and EM\_AWCA (0.010;  $p < 0.05$ ). These findings suggest that Shariah index membership does not have a significant effect on managerial behaviour to ensure the quality of earnings of Shariah-compliant firms.

## Home-Country Characteristics

Home-country characteristics could also explain variations in financial reporting practices (La Porta et al. 1998; Hofstede 2001; Hope 2003; Bushman et al. 2004; Atwood et al. 2012). The ways of monitoring and controlling financial markets as well as the market transparency are various among countries, which may also influence the firm’s behaviour. Prior research provides evidence regarding the significant effect of national environment on firms’ behaviour, and such environment may offer corporations with comparative incentives to engage in particular actions (Campbell 2007; Delmas and Toffel 2010; Young and Marais 2012). To ensure that our main results are not driven by firm’s home-country attributes, we control for (i) country-level disclosure scores, Disclosure, (La Porta et al. 2006); (ii) country-level governance scores, Governance, (Bushman et al. 2004); (iii) country-level scores for anti-director (investor) rights, AntiDirRight, (Atwood et al. 2012); (iv) a country’s legal system, CivCom, (La Porta et al. 1998); (v) country-level scores for concentration of ownership, OwnCon, (La Porta et al. 1998); and (vi) the country’s adoption for the international financial reporting standards, IFRS. Table 7 shows the regression results of our model after controlling for the potential effects of home-country characteristics. In general, these results are consistent with those obtained in the main analysis, i.e., these results also support the view that inclusion in the Shariah index membership is not associated with the degree of earnings quality.

## Analysis Based on the Level of Corporate Governance Scores

In this section, we empirically examine whether the association between Shariah-compliance and the level of earnings manipulations is different between firms with high corporate governance scores and others with low corporate governance scores. We also investigate this association based on five categories of corporate governance (board structure, board functions, compensation policy, shareholder rights, and vision and strategy). This study uses corporate governance scores that are provided by the Thomson Reuters Asset4 (ASSET4) database. Ziegler et al. (2009) argue that the key advantage of ASSET4 indicators is that they provide more comprehensive measures of corporate governance and extensively built from publicly available sources. Prior literature has widely used the KLD (e.g., Chatterji and Toffel 2010;

**Table 7** Regression results of the relationship between Shariah index membership and earnings management after controlling for home-country characteristics

	EM1 Coeff.	EM1 Coeff.	EM1 Coeff.	EM1 Coeff.	EM1 Coeff.	EM1 Coeff.
Shariah	0.010** (0.004)	0.009** (0.004)	0.011** (0.004)	0.009** (0.004)	0.012*** (0.004)	0.010** (0.004)
Country-level variables						
Disclosure	0.001*** (0.000)					
Governance		-0.001*** (0.000)				
AntiDirRight			0.004*** (0.001)			
CivCom				0.005 (0.004)		
OwnCon					-0.096*** (0.014)	
IFRS						0.007 (0.014)
Constant	0.168*** (0.035)	0.262*** (0.030)	0.214*** (0.026)	0.244*** (0.024)	0.253*** (0.024)	0.242*** (0.024)
Firm-level variables	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
adj. $R^2$	0.156	0.152	0.156	0.155	0.161	0.155
F	29.276***	37.459***	29.460***	29.865***	29.256***	30.079***
N	5258	5258	5258	5258	5258	5258

The definitions of the study variables are summarised in “Appendix A”. The values in parentheses are standard errors. All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year level

\*, \*\*, \*\*\*Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively

Arora and Dharwadkar 2011; Hong and Andersen 2011; Jo and Harjoto 2012; Kim et al. 2012; Lanis and Richardson 2015) or the governance index developed by Gompers et al. (2003) and the entrenchment index provided by Bebchuk et al. (2009). However, Chatterji et al. (2009) report that the KLD ratings are restricted to US firms only and do not use publicly available data optimally, as well as some indicators are poor in terms of predicting corporate governance. Furthermore, Jiraporn et al., (2012) also argue that the governance index introduced by Gompers et al. (2003) is a less comprehensive measure of corporate governance for the reason that it is based on the existence of antitakeover amendments. In addition the governance index data of Gompers et al. are available biannually and do not cover larger number of firms as compared to ASSET4 data, that are available annually and covers more than 7000 firms globally (Thomson Reuters 2019).

ASSET4 collects evaluation points for each firm based on data that is publicly available. These sources of publicly available information include firms’ website, annual reports, CSR/sustainability reports, non-governmental organisations’

websites, proxy filings and news from all major providers. These evaluation points are then used as inputs to a default equal-weighted framework to calculate key performance indicators (KPIs). Further, these KPIs are organised into five categories under the pillar of corporate governance. These five categories are: (i) board structure, which reflects a firm’s capacity to ensure a critical exchange of ideas and an independent decision-making process through an experienced, diverse and independent board; (ii) board functions, which reflects a firm’s capacity to have an effective board by setting up the essential board committees with allocated tasks and responsibilities; (iii) compensation policy, which reflects a firm’s capacity to attract and retain executives and board members with the necessary skills by linking their compensation to individual or company-wide financial or extra-financial targets; (iv) shareholder rights, which reflects a firm’s capacity to be attractive to minority shareholders by ensuring them equal rights and privileges and by limiting the use of anti-takeover devices; and (v) vision and strategy, which reflects a firm’s capacity to convincingly show and communicate that it integrates the financial, social and

**Table 8** Regression results of the relationship between Shariah index membership and earnings management based on the level of corporate governance scores

Panel A: based on the overall scores of corporate governance

	High corporate governance		Low corporate governance
	EM1		EM1
	Coeff.		Coeff.
Shariah	0.009 (0.006)		0.012* (0.007)
SIZE	-0.005*** (0.002)		-0.002 (0.002)
Growth	0.002*** (0.001)		-0.001 (0.001)
Profitability	0.041 (0.036)		0.276*** (0.053)
Leverage	-0.032** (0.013)		-0.002 (0.018)
Ownership	0.030*** (0.009)		-0.010 (0.011)
Big4	-0.033*** (0.012)		-0.027** (0.012)
Age	-0.002 (0.003)		-0.019*** (0.004)
Constant	0.247*** (0.039)		0.223*** (0.037)
Year effects	Yes		Yes
Industry effects	Yes		Yes
Country effects	Yes		Yes
adj. R <sup>2</sup>	0.189		0.046
F	17.422***		5.410***
N	2919		2339

Panel B: based on the categories of corporate governance

	Board structure		Board functions		Compensation policy		Shareholder rights		Vision and strategy	
	High	Low	High	Low	High	Low	High	Low	High	Low
	EM1	EM1	EM1	EM1	EM1	EM1	EM1	EM1	EM1	EM1
Shariah	0.008 (0.006)	0.009 (0.006)	0.007 (0.006)	0.015** (0.006)	0.009 (0.006)	0.011 (0.007)	0.008 (0.007)	0.011** (0.005)	0.006 (0.005)	0.020* (0.011)
SIZE	-0.001 (0.002)	-0.005** (0.002)	-0.004** (0.002)	-0.002 (0.002)	-0.005*** (0.002)	-0.001 (0.002)	-0.005*** (0.001)	0.001 (0.002)	-0.003** (0.001)	-0.006* (0.003)
Growth	0.002** (0.001)	0.000 (0.001)	0.001** (0.001)	0.000 (0.001)	0.001** (0.001)	0.000 (0.001)	0.001** (0.001)	0.001 (0.001)	0.001 (0.001)	0.002* (0.001)
Profitability	0.049 (0.035)	0.154*** (0.054)	0.079** (0.038)	0.130** (0.050)	0.080** (0.036)	0.144** (0.057)	0.039 (0.038)	0.204*** (0.052)	0.062* (0.034)	0.137*** (0.052)
Leverage	-0.029** (0.013)	-0.029* (0.016)	-0.037*** (0.014)	-0.015 (0.015)	-0.021* (0.012)	-0.040** (0.018)	-0.028** (0.013)	-0.029* (0.017)	-0.033*** (0.012)	-0.027 (0.019)
Ownership	0.030*** (0.011)	0.001 (0.009)	0.033*** (0.009)	-0.003 (0.010)	0.024** (0.009)	0.003 (0.010)	0.009 (0.008)	0.003 (0.010)	0.006 (0.007)	0.021 (0.013)
Big4	-0.032** (0.015)	-0.034*** (0.010)	-0.018* (0.010)	-0.053*** (0.013)	-0.031** (0.013)	-0.036*** (0.012)	-0.011 (0.008)	-0.057*** (0.015)	-0.041*** (0.010)	-0.021 (0.014)
Age	-0.004 (0.003)	-0.005 (0.004)	-0.002 (0.003)	-0.007* (0.004)	-0.003 (0.003)	-0.005 (0.004)	-0.007** (0.003)	-0.001 (0.004)	-0.000 (0.003)	-0.007* (0.004)

**Table 8** (continued)

Panel B: based on the categories of corporate governance

	Board structure		Board functions		Compensation policy		Shareholder rights		Vision and strategy	
	High	Low	High	Low	High	Low	High	Low	High	Low
	EM1	EM1	EM1	EM1	EM1	EM1	EM1	EM1	EM1	EM1
Constant	0.173*** (0.033)	0.286*** (0.036)	0.245*** (0.049)	0.200*** (0.036)	0.236*** (0.033)	0.161*** (0.035)	0.259*** (0.031)	0.178*** (0.040)	0.246*** (0.030)	0.166*** (0.044)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. $R^2$	0.179	0.136	0.183	0.132	0.183	0.124	0.150	0.154	0.161	0.136
$F$	17.141***	15.839***	18.704***	13.392***	20.127***	12.652***	14.287***	17.938***	17.166***	14.046***
$N$	2693	2565	2887	2371	3020	2238	2952	2306	3351	1907

The definitions of the study variables are summarised in “Appendix A”. The values in parentheses are standard errors. All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year level

\*, \*\*, \*\*\*Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively

environmental dimensions into its day-to-day decision-making processes.

For each model of corporate governance scores and its five categories, we divide the samples into two groups: firms with high scores (if a firm’s scores is above the overall median mark) and others with low scores (if a firm’s scores is below the overall median mark). Panel A of Table 8 shows that Shariah with low corporate governance scores coefficient is positive and significant (0.012;  $p < 0.10$ ) whereas Shariah with high corporate governance scores coefficient is also positive but insignificant. These coefficients provide evidence that Shariah-compliant firms with low corporate governance scores are more likely to engage in earnings manipulations using discretionary accruals. This finding suggests that firms membership in a Shariah index does not reduce managerial incentives in earnings manipulations, and Shariah-compliant firms with low corporate governance are more likely to manipulate earnings and use membership in a Shariah index as a legitimacy mechanism to conform to stakeholders’ expectations and attract investments.

With respect of corporate governance categories, Panel B of Table 8 shows that the coefficients of Shariah with low scores of board functions, shareholder rights and vision and strategy are positive and significant (0.015;  $p < 0.05$ , 0.011;  $p < 0.05$ , 0.020;  $p < 0.10$ , respectively). These coefficients provide evidence that Shariah-compliant firms with low scores of board functions, shareholder rights and vision and strategy are more likely to manipulate earnings through the discretionary accruals. However, there are no significant association between Shariah and EM1 for firms with high or low scores of board structure and compensation policy. This

finding suggests that firms’ membership in a Shariah index does not reduce managerial incentives in earnings manipulations, and Shariah-compliant firms with low scores of board functions, shareholder rights and vision and strategy are more likely to manipulate earnings and use membership in a Shariah index as a legitimacy mechanism to conform to stakeholders’ expectations and attract investments.

### Analysis Based on the Varieties of Capitalism

This study also empirically investigates the link between membership in a Shariah index and the degree of earnings management based on the varieties of capitalism perspective. According to Hall and Soskice (2001) countries are categorised into two groups of institutional economies: (i) Liberal Market Economies (LME) and Coordinated Market Economies (CME). LME includes the United States and United Kingdom and are characterised by active markets for control, dispersed ownership, equity financing, weak interfirm cooperation, and flexible labour markets, while CME includes Continental European Countries and are characterised by weak markets for control, ownership by large investors, long-term debt finance, strong interfirm cooperative, and rather rigid labour markets (Munari et al. 2010). Therefore, the market plays the dominant roles in the LME, whereas the business unions and associations play dominant roles in the CME. To examine the degree of earnings management between Shariah and non-Shariah-compliance firms that operates in LME and CME, we classify our sample into two groups: LME are



**Table 9** Regression results of the relationship between Shariah index membership and earnings management based on the varieties of capitalism

	LME	CME
	EM1	EM1
	Coeff.	Coeff.
Shariah	-0.009 (0.006)	0.015*** (0.006)
CG Scores	0.026 (0.018)	0.021** (0.011)
SIZE	-0.005*** (0.002)	-0.003 (0.002)
Growth	0.001 (0.001)	0.002* (0.001)
Profitability	0.143*** (0.039)	0.084* (0.050)
Leverage	-0.023 (0.014)	-0.027* (0.016)
Ownership	0.020 (0.013)	0.011 (0.009)
Big4	0.018 (0.013)	-0.035*** (0.009)
Age	-0.005 (0.003)	-0.002 (0.004)
Constant	0.195*** (0.033)	0.203*** (0.033)
Year effects	Yes	Yes
Industry effects	Yes	Yes
Country effects	No	No
adj. R <sup>2</sup>	0.259	0.131
F	19.202***	15.481***
N	2100	3158

The definitions of the study variables are summarised in “Appendix A”. The values in parentheses are standard errors. All test statistics and significant levels are estimated based on the standard errors adjusted by a two-dimensional cluster at the firm and year level

\*, \*\*, \*\*\*Indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively

firms publicly traded in the United Kingdom and Ireland, and CME are firms publicly traded in Continental European Countries (Austria, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Spain, and Sweden).

Table 9 shows that the Shariah coefficient is negative but insignificant for LME (-0.009), while it is positive and highly significant for CME (0.015;  $p < 0.01$ ). This result show that Shariah-compliant firms domiciled in CME are more likely to manipulate earnings and use membership in a Shariah index as a legitimacy

mechanism to conform to stakeholders’ expectations and attract investments than those in LME.

## Conclusion

This study examines whether inclusion in the Shariah investment index is able to mitigate earnings management of Shariah-compliant firms. Shariah precepts assert the important of providing investors with reliable and relevant information that enables them to make investment decisions in terms of both economic and religious position. However, our empirical results show that Shariah-compliant firms are more likely to manipulate earnings in comparison to those that are not Shariah-compliant. These results are robust using the Heckman two-stage treatment effect approach, weighted least squares (WLS) model, alternative earnings quality metrics as well as controlling for the potential effect of home-country characteristics. In addition, the results also suggest that corporate governance of Shariah-compliant firms does not constrain managerial opportunistic behaviour in misreporting earnings, and firms that with low scores of board functions, shareholder rights and vision and strategy are more likely to engage in earnings management. Furthermore, our results also show that Shariah-compliant firms domiciled in Coordinated Market Economies (CME) are more likely to manipulate earnings than those in Liberal Market Economies (LME).

Our results imply that Shariah investment index does not play an important role in constraining earnings manipulations. Consequently, our result supports the notion that the current Shariah-screening process does not indicate good corporate governance that can play a significant role to ensure the information quality of Shariah-compliant firms. Firms are more likely to meet the Shariah-screening requirements for the purpose of attracting investors. Another plausible explanation is the current Shariah-screening process is less transparent in providing comprehensive details regarding every aspect of the Shariah-compliance performance which is relevant to investors in assessing every aspect of compliance with underlying principles. It provides only the final outcome without clarifying various aspects that impact the decision of inclusion or exclusion of a firm from the index. This in turn would limit investors’ abilities to track the Shariah performance, and to predict the possibility of a firm’s Shariah-compliant in the future.

Our study is subject to one important caveat. The proxy measures of earnings management are computed based on some information that is reported in the firms’ financial statements (Plesko 2003; Dyreng et al. 2008), and this information may not represent the real situation of earnings management, thus the study’s results should be

interpreted with some caution. Despite this limitation, we believe that our findings provide a better understanding of firm financial reporting behaviour, and Shariah compliance that may be of interest to standard setters, regulatory bodies, investors and academics involved in the field of ethical and Islamic business. In particular, our study provides opposite findings to that documented by prior studies regarding the effect of ethical investment index on the management practices. Our findings imply that there is a need for restructuring the inclusion process into the Shariah index in a way that positively enhances managers' behaviour regarding information quality. Another implication could be that that firms' Shariah performance should be tracked across time to ensure their compliance to Shariah principles, rather than relying extensively, if not purely, on what firms disclose regarding their business activities and financial structure. For policy-makers, it is important to ensure the transparency of Shariah firms, and to ensure that Shariah compliance is based on actual plan to meet the investors' requirements, and are not intended to mislead stakeholders, especially when there is no additional external monitoring of the Shariah compliance. In particular, the credibility of Shariah compliance of firms must be assessed with caution. More importantly, the current study's findings may affect the overall perception of Shariah-compliant businesses. Apparently, compliance with the Shariah-screening process does not necessarily lead to real change in firms' behaviour regarding the quality of disclosed information. This supports the argument that we should assess transparency and positive contributions of Shariah-compliant firms as important elements, alongside the negative screening, for investors who are interested in those corporations and whose investment decisions are based on economic and religious perspectives. This may enhance a real change in Shariah-compliant firms' behaviour, rather than the symbolic adoption of Shariah codes by those firms in order to "tick the box" of the rating agency. Further research could investigate this issue by examining the effect of corporate governance attributes. Moreover, further research could examine the impact of ownership types of Shariah-compliant firms on the degree of earnings quality.

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### Compliance with Ethical Standards

**Conflict of interest** The author declares that he has no conflict of interest.

**Ethical Approval** This article does not contain any studies with human participants or animals performed by any of the authors.

## Appendix A

### Variables definitions

Variables	Description	Definition
<b>Main variables</b>		
<i>EM1</i>	The absolute value of current discretionary accruals	Discretionary accruals are calculated through the cross-sectional modified Jones model adjusted for performance
Shariah	Shariah index membership	An indicator variable that takes a value of 1 if the firm is included in FTSE Shariah Index, 0 otherwise
<b>Firm-level controls</b>		
CG scores	Corporate governance scores	The scores of Corporate Governance obtained from ASSETS's.
SIZE	Firm size	The natural logarithm of the market value of the equity
Growth	Firm growth	Market-to-book equity ratio measured as market value of equity divided by book value of equity
Profitability	Profitability	Measured as income before extraordinary items divided by the total assets
Leverage	Leverage	calculated as long-term debt scaled by total assets
Ownership	Ownership concentration	The percentage of closely held share as reported by World-Scope
<i>Big4</i>	The Big 4 auditors	An indicator variable, which takes a value of 1 when a firm is audited by the Big 4 auditors, and 0 otherwise.
Age	Firm size	The natural logarithm of the firm age in years

Variables	Description	Definition
Country-level controls		
Disclosure	Disclosure scores	Country-level disclosure scores as reported in La Porta et al. (2006). Higher scores indicate a better disclosure and a greater transparency
Governance	Governance scores	Country-level governance scores as reported in Bushman et al. (2004). Higher scores indicate a better governance and greater transparency
AntiDirRight	Anti-director rights	Country-level scores for anti-director rights as reported in Atwood et al. (2012). Higher scores indicate less director-related rights
CivCom	Civil versus common law	Country-level index for civil versus common law as reported in La Porta et al. (1998), measured as a dummy variable equal to one for civil law and zero for common law countries
OwnCon	Ownership concentration	Country-level scores for ownership concentration as reported in La Porta et al. (1998). It is computed as the average percentage of common shares owned by the three largest shareholders in the 10 largest non-financial, privately owned domestic firms in a given country. The higher the scores is the more concentrated ownership
IFRS	IFRS adoption	An indicator variable equal to one for the period of mandatory adoption of IFRS (after 2005), and zero otherwise

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