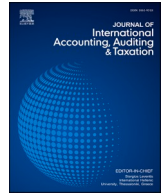Contents lists available at ScienceDirect

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Diffusion theory, economic consequences, and adoption of international standards on auditing around the world

Ibrahim Khalifa Elmghaamez [a,b], Collins G. Ntim [c,d,e], Kemi C. Yekini [f,g,*]

[a] Coventry Business School, Coventry University, Coventry, UK
[b] Faculty of Economics and Political Sciences, University of Tripoli, Tripoli, Libya
[c] Centre for Research in Accounting, Accountability and Governance (CRAAG), Department of Accounting, Southampton Business School, University of Southampton, Southampton, UK
[d] UNEC Accounting and Finance Research Center, Azerbaijan State University of Economics (UNEC), Istiqlaliyyat 6, AZ1001 Baku, Azerbaijan
[e] Department of Accounting, UDS School of Business, University for Development Studies, Tamale, Ghana
[f] Aston Business School, Aston University, Birmingham, UK
[g] Department of Accounting, Babcock Business School, Babcock University, Ilishan, Remo, Nigeria

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ABSTRACT

This paper examines the economic consequences of adopting the International Standards on Auditing (ISAs) from a diffusion of innovation theory perspective. Using a very extensive dataset with 160 countries over 20 years and generating 3,200 country-year observations, this study examines the impact of ISAs adoption on the economic consequences of adopting countries. Our findings are threefold. First, we show that *early* ISAs adoption has positively and significantly influenced three economic indicators of the adopting countries: (i) economic growth, (ii) foreign direct investment (FDI) inflows, and (iii) exchange rate. Second, our results show that *late* ISAs adoption has positively and significantly influenced two economic indicators: (i) exports and (ii) interest rates, but negatively with imports. Third, we find a significant positive association between ISAs adoption with amendments or translation and two economic indicators: (i) FDI and (ii) exchange rate, but negative with inflation. Finally, and by contrast, we find a negative link between *early* ISAs adoption, economic growth rate, and exports. Our findings have implications for theory and practice.

1. Introduction

Like the International Financial Reporting Standards (IFRS), International Standards on Auditing (ISA) aim to enhance the accountability, transparency, and efficiency of global markets and trade by encouraging countries and professional accountants to commit to a common world-wide standard and quality of auditing that can ultimately lead to harmonization, standardization, and convergence of auditing practices worldwide (Wong, 2004). As a result, many countries have adopted ISA, albeit at different times and for various reasons, since its introduction by the International Federation of Accountants (IFAC) in 1991 (Elmghaamez et al., 2020). However, several empirical studies have demonstrated that the extent and speed with which countries adopt accounting innovations, such as ISAs, is often driven by a range of social and religious factors (Boolaky & Omoteso, 2016; Boolaky & Soobaroyen, 2017; Elmghaamez & Elmagrhi, 2022). By contrast, there is limited evidence regarding the extent to which economic factors influence the

adoption of ISAs by countries worldwide.

There is much research conducted on examining the economic consequences of IFRS adoption time (Clements et al., 2010; Cormier et al., 2009; El-Helaly et al., 2020; Elmghaamez et al., 2022; Elmghaamez, 2023; Gaston et al., 2010; Platikanova & Perramon, 2012; Stent et al., 2017). However, few studies have investigated the economic consequences of ISAs adoption at the country level (Boolaky, 2012; Boolaky & Omoteso, 2016; Boolaky & Soobaroyen, 2017). Some scholars have examined the impact of ISAs adoption time on the financial market indicators (Elmghaamez et al., 2020), while others have studied the effects of national institutional factors on facilitating the adoption of ISAs (Boolaky, 2012; Boolaky & Omoteso, 2016; Boolaky & Soobaroyen, 2017). Similarly, a recent study by Elmghaamez and Elmagrhi (2022) investigated whether country characteristics influenced the timing of ISAs adoption (early vs late). However, to our knowledge, this is the first study that examines whether the timing of ISAs adoption influences the economic consequences of adopting countries. In this regard,

* Corresponding author at: Aston Business School, Aston University, Birmingham, UK.
E-mail addresses: ad0030@coventry.ac.uk (I.K. Elmghaamez), C.G.Ntim@soton.ac.uk (C.G. Ntim), k.yekini@aston.ac.uk (K.C. Yekini).

Haapamaki and Sihvonen (2019) report that there is an acute lack of research about the economic consequences of ISAs adoption time and whether there are any unintended consequences of the timing of ISAs adoption.

Consequently, this paper seeks to make two new contributions to the extant international accounting literature by examining the influence of ISAs adoption timing and extent of ISAs adoption on the economic consequences of adopting countries worldwide as it is still in its infancy. Specifically, this study addresses the following two research questions:

(i) How has the timing of ISAs adoption (early vs late) affected the economic consequences of adopting countries?

(ii) How has the extent of ISAs adoption (modification, translation, by law, only when a gap in local standards, and when statements issued under IFRS) affected the economic indicators of adopting countries?

We focus on the economic reasons that may influence countries to adopt ISAs. Specifically, we argue that adopting ISAs benefits the global stock markets, their listed firms, and the economies in which these stock exchanges operate (Elmghaamez et al., 2020; Roussey, 1996). Notwithstanding, there is still an ongoing debate about the impact that adopting high-quality auditing standards can have on the economic performance of the adopting countries. Many countries have adopted ISAs, but often without carefully considering the impact of adopting such auditing standards on their economic needs (Fraser, 2010). Therefore, this study seeks to contribute to the current academic literature on ISAs by examining and providing new empirical information on the economic consequences for countries adopting ISAs.

In this context, most prior research employed the theoretical framework suggested by institutional theory to explain the adoption and diffusion of ISAs and their consequences (Boolaky & Omoteso, 2016; Boolaky & Soobaroyen, 2017). Our study seeks to offer new insights by utilizing the Diffusion of Innovation (DOI) theoretical framework to explain the economic consequences of adopting ISAs. We contribute to the theoretical literature by employing the theoretical framework suggested by DOI theory to explain the association between ISAs adoption time, the extent, and the economic consequences for the adopting countries.

Our study is novel since, to the best of our knowledge, it is the first to examine multiple economic factors that may explain why different countries adopt ISAs at different times. Several studies have examined the economic consequences of IFRS adoption at the macro-country level (Shima & Yang, 2012; Zehri & Chouaibi, 2013; Zaidi & Huerta, 2014), but very few previous studies have examined the relationship between ISAs adoption and economic indicators, such as economic growth (Boolaky & Omoteso, 2016; Boolaky & Soobaroyen, 2017) and exports level (Boolaky & O'Leary, 2011; Boolaky & Cooper, 2015; Kellenberg & Levinson, 2019). Our study extends the existing literature in this space by including a wide range of country-level economic factors for a large sample of 160 countries and over a more extended period of 20 years. Finally, our study provides a methodological contribution by employing a new methodological approach, namely the Prais-Winston regression, correlated Panels Corrected Standard Errors (PCSEs), which control for a serial correlation of the error terms in a linear regression model with heteroskedastic errors. We argue that countries' ISAs adoption decisions can be equivalent to adopting new products and having desirable or undesirable consequences in different parts of the globe. Therefore, we contribute to the current accounting literature by including many countries and using a new methodological approach called Prais-Winston regression to correct for correlated errors in panel data.

Our findings report that *early* ISAs adoption positively and significantly influenced three economic indicators: (i) economic growth, (ii) Foreign Direct Investment (FDI) inflows, and (iii) exchange rates of adopting countries. Our results show that *late* ISAs adoption positively and significantly influenced two economic indicators: (i) exports and (ii)

interest rate, but negatively and significantly with imports of the adopting countries. However, we find a negative relationship between *early* ISAs adoption and exports. Additionally, our findings suggest a mixed pattern of associations between ISAs adoption status and economic indicators. The positive associations between ISAs adoption and FDI, exchange rate, exports, and imports indicate the potential benefits of ISAs adoption in countries that implemented ISAs without amendments or translation. These findings align with expectations, as ISAs are expected to facilitate international trade and attract foreign investment. However, the negative association between ISAs adoption with amendments or translation and the inflation rate seems to contradict expectations. One possible interpretation is that the amendments or translation process may introduce complexities or inefficiencies that negatively impact the inflation rate.

Overall, the DOI theory suggests that innovations or new ideas spread through a population over time. In this context, the findings show that early adoption of ISAs positively impacts economic growth, FDI inflows, and exchange rates, thus supporting innovation spreading and influencing these economic indicators. However, the negative relationship between early ISAs adoption and exports contradicts the DOI theory's expectation that early adopters would benefit in terms of exports. It implies that adopting ISAs might not have translated into immediate export gains for early adopters.

The rest of the paper is structured as follows. The next section presents the theoretical and empirical literature review alongside the hypothesis's development. This is followed by research methodology, data analysis and interpretation, and a brief conclusion.

2. Literature review: Theory, empirics, and hypotheses development

Many prior studies have focused on the economic benefits of IFRS adoption (Shima & Yang, 2012; Zehri & Chouaibi, 2013; Zaidi & Huerta, 2014), while there has been less interest in studying the economic consequences of adopting ISAs (Fraser, 2010; Haapamaki & Sihvonen, 2019; Mennicken, 2008). Nevertheless, a few prior studies have examined the economic benefits of ISAs adoption, although these have observable limitations, including (i) employing a few economic indicators (Abdolmohammadi & Tucker, 2002; Boolaky & Omoteso, 2016); (ii) being descriptive, or lacking an overarching theoretical framework to explain the extent of ISAs' adoption (Boolaky & O'Leary, 2011; Boolaky & Cooper, 2015); (iii) using a less robust auditing and reporting standards measure (Boolaky et al., 2013; Boolaky & Cooper, 2015); (iv) using cross-sectional rather than longitudinal data (Boolaky & O'Leary, 2011); and (v) sampling a limited number of countries (Boolaky & Soobaroyen, 2017). Our study departs from much of the existing auditing literature in this space by adopting the lens of the DOI theory and large-scale 20-year longitudinal data drawn from 160 countries to investigate the economic effects of ISAs' adoption on a wide range of country-level economic factors. Thus, our study seeks to contribute to this literature by addressing most limitations of these studies.

Some theories have been previously employed to examine the economic consequences of ISAs adoption. These include institutional theory (Boolaky & Soobaroyen, 2017), Hofstede's cultural theory (Boolaky & O'Leary, 2011; Boolaky & Omoteso, 2016), and classification theory (Boolaky et al., 2013; Boolaky & Cooper, 2015). Although these theories are appropriate to employ in explaining the adoption decisions of countries, they often fail to fully consider the economic, financial, and time pressures that may motivate a country to adopt accounting and auditing innovations, such as IFRSs and ISAs (El-Helaly et al., 2020; Elmghaamez et al., 2022). Under this context, other scholars (Dayyala et al., 2020; Grecco & Geron, 2016) have suggested applying the DOI theory. The DOI theory assumes that adopters of innovations (e.g., new accounting and auditing standards) by different actors (e.g., companies and countries) might be early or late depending on their economic

situation and financial needs (Dayyala et al., 2020). In this case, and unlike traditional theories, such as Hofstede's cultural theory and institutional theory that are based mainly on socioeconomic reasoning, the DOI theory can effectively take both time and socioeconomic factors pressures into account in explaining adoption decisions by different countries (El-Helaly et al., 2020).

2.1. Conceptual and theoretical framework

Fig. 1 shows the conceptual framework of this study and explains the theoretical and empirical relationships between our dependent/outcome, independent, and control variables. It presents the two primary focuses of the paper. First, it captures the effect of timing (i.e., early versus late) of ISAs adoption on economic growth and FDI inflows. Second, it presents the extent of ISAs adoption, from non-adoption to adoption without amendments, on international trade (exports and imports), exchange rate, inflation rate and interest rate. Concerning theoretical framing, some previous studies sought to explain the economic advantages of ISAs' adoption by employing institutional theory (e.g., Boolaky & Cooper, 2015; Boolaky & Soobaroyen, 2017), while other scholars have employed economic classification theory to explain the economic development of adopting international auditing standards (Boolaky & O'Leary, 2011; Boolaky et al., 2013; Boolaky & Cooper, 2015). However, it has been suggested that the DOI theory can better explain the economic consequences of ISAs' adoption (Grecco & Geron, 2016; Elmghaamez et al., 2020). In particular, the DOI theory has a competitive advantage over traditional theories, such as institutional theory, with its unique ability to capture both time and socio-economic motivations for adopting ISAs by countries.

Thus, we employ the theoretical framework suggested by DOI theory, which implicitly assumes a causal relationship between adopting ISAs and the economic consequences of adopting countries. Accordingly, we suggest that countries may adopt ISAs for different reasons. For example, some countries may adopt ISAs early to attract more foreign investments by showing they have adopted high-quality auditing standards. Others may adopt ISAs to enhance their international trade by importing goods and services to countries with similar auditing standards.

Consistent with prior studies, we argue that adopting accounting/auditing innovation (IFRS and ISAs) can be explained using the DOI theory (El-Helaly et al., 2020; Elmghaamez et al., 2020, 2022). Innovations require long periods before they can be widely adopted by potential users (Rogers, 2003). Similarly, the adoption of ISAs introduced in 1991 has significantly increased in different countries. This is because ISAs adoption has been substantially influenced by adopters' country-level characteristics alongside the potential benefits and costs of ISAs adoption.

DOI theory posits that innovations are communicated among members of a social system through specific channels and over time (Rogers, 2003). In addition, DOI theory states that adopting innovations may lead to anticipated or unanticipated financial and economic consequences (Rogers, 2003). Therefore, the expected outcomes are primarily direct and desirable, whereas unexpected effects are often indirect and undesirable (Rogers, 2003). Based on DOI theory, adopters with strong networks and effective communication channels with peers are likelier to be early adopters of innovations (Rogers, 2003). Therefore, the economic benefits of adopting innovations count on the strength of network effects among adopting countries (Ramanna & Sletten, 2014). Drawing on the DOI theory, we classify adopters of innovations into five groups, consistent with their first-time adoption: (i) innovators, (ii) early adopters, (iii) early majority, (iv) late majority, and (v) non-adopters (Rogers, 2003; El-Helaly et al., 2020; Elmghaamez & Elmagrhi, 2022). The DOI theory argues further that adopters' economic indicators are one of the main factors that have significantly influenced the diffusion of innovations among countries (Wejnert, 2002; Zanello et al., 2016). For example, Wong (2004) reported that adopting high-quality accounting
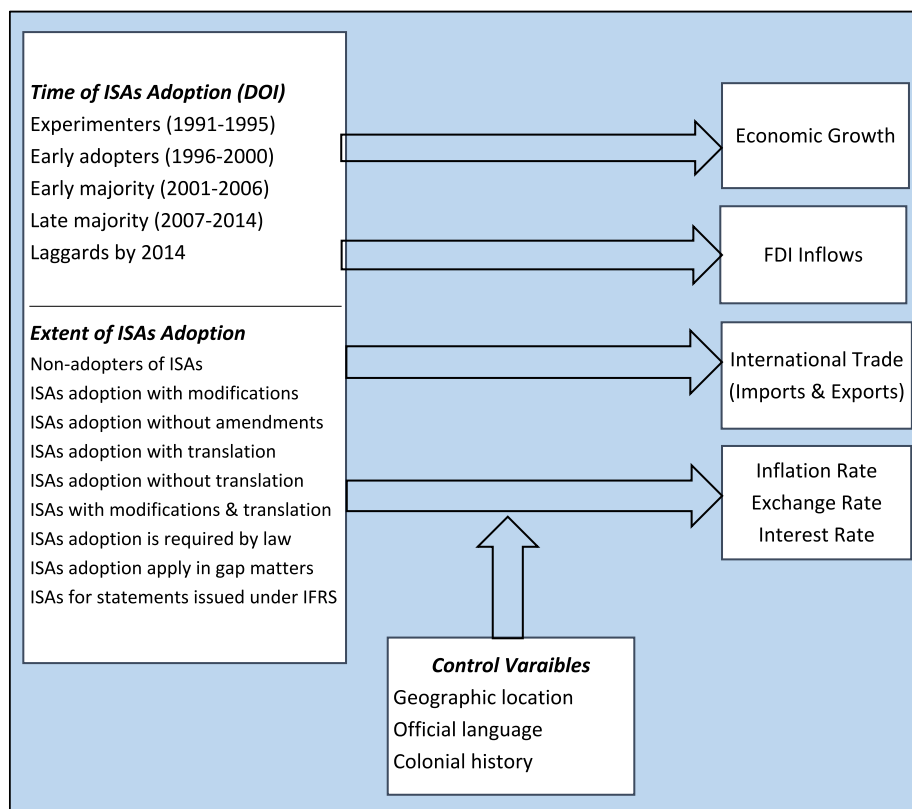

Fig. 1. The Conceptual framework.

and auditing standards is critical to enhancing the countries' economic growth since it can boost the trust of local and foreign investors.

Consequently, the DOI theory postulates that late adopters are more risk-averse than early adopters of innovations, who tend to accept relatively higher risks in the form of a faster adoption (Rogers, 2003). In this regard, it has been argued that a country's economic situation may help determine its readiness to accept high-risk tolerance by adopting new standards to improve its economic situation. For instance, countries with weak economic situations tend to accept high risks by adopting new standards to improve their current economic situation. In contrast, countries with strong economic performance tend to be risk-averse due to loss aversion when facing potential gain or loss decision situations (Taran et al., 2015). Furthermore, Rogers (2003) stated that lower-risk innovations with higher economic benefits are likely to be adopted more rapidly than higher-risky innovations.

Dayyala et al. (2020) examined the diffusion channels of IFRS using Rogers' adopter categorizations suggested by DOI theory to understand the influence of the country-level characteristics on IFRS adoption. Their findings document that IFRS adoption is significantly affected by internal effects through the communication channel between countries alongside external forces through vertical communication from a centralized body, the International Accounting Standards Board (IASB). Their findings have two relevant implications for our study. First, we can also employ DOI theory to provide new insights into similar phenomena, namely, the diffusion of ISAs. DOI theory can explain the impact of internal influence on ISAs' adoption worldwide through country-level factors. Second, external forces can also affect country-level factors through communication with the IFAC.

Using the adoption categories suggested by DOI theory, Elmghaamez et al. (2020) document empirical evidence that ISAs' adoption has resulted in several negative financial market consequences for the adopting countries. Their findings have important/direct implications for our study using DOI theory to examine similar phenomena: the economic consequences of early ISAs adoption. According to DOI theory, risk-takers are more prone to receive adverse outcomes due to the high risk of adopting innovations before attempting to understand their effect without taking sufficient steps to contain the risk (Rogers, 2003). Therefore, we argue that risk-takers (countries) who adopt accounting innovations (ISAs) early might obtain adverse economic outcomes due to the high risk they face from adopting innovations.

2.2. Empirical literature review and hypotheses development

Prior literature argues that obtaining the intended benefits of IFRS adoption depends on the timing of IFRS adoption for adopting countries and their national characteristics. For example, Stent et al. (2017) investigated the motivations for the timing of IFRS adoption. They found significant differences between early and late adopters regarding the adoption benefits and the cost measures. Early adopters are market leaders. In comparison, late IFRS adoption is motivated by unfavorable consequences and uncertainty. Platikanova and Perramon (2012) studied the impact of the first-time adoption of IFRS on liquidity in the European Union (EU) market. They reported that the first-time adoption of IFRS increased comparability between EU countries by enhancing their financial reporting quality and improving market liquidity. Gaston et al. (2010) studied the impact of mandatory first-time IFRS adoption on financial reporting in Spain and the United Kingdom (UK). Their results reveal that first-time IFRS adoption had a significant negative effect on financial reporting in Spain, but an insignificant impact on financial reporting in the UK. Cormier et al. (2009) examined the value-relevance of the first-time adoption of IFRS in French firms in 2005 and found that it enhanced the quality of their financial statements.

Using data from 61 countries with data through 2009, Clements et al. (2010) examined why some countries adopted IFRS while others did not. Their findings indicate that the timing of IFRS adoption is significantly associated with the country's size. Hence, larger countries with well-

established reporting standards are less likely to adopt IFRS faster than smaller countries. Elmghaamez et al. (2022) investigated the effects of IFRS adoption time on stock market performance and found a positive link between the late mandatory IFRS adoption and European stock market integration. Additionally, they found a significant negative relationship between early IFRS adoption and four specific financial market indicators: (i) stock market trading volumes, (ii) stock market capitalization, (iii) market turnover, and (iv) market return. Stent et al. (2017) report a significant association between IFRS adoption and ISAs. In this regard, Elmghaamez et al. (2020) found a significant positive association between ISAs adoption for financial reporting prepared under IFRS and four financial market indicators: (i) stock market financial integration, (ii) stock market capitalization, (iii) stock market return, and (iv) stock price volatility. Given the prior evidence on the effect of the timing of IFRS adoption on the financial and economic consequences of adopting countries (Clements et al., 2010; Cormier et al., 2009; El-Helaly et al., 2020; Elmghaamez et al., 2022; Gaston et al., 2010; Platikanova & Perramon, 2012; Stent et al., 2017), we argue that the timing of ISAs adoption can also affect the economic factors of adopting countries.

2.3. The economic consequences of ISAs' adoption

Few empirical studies have examined the impact of ISAs adoption on the economic growth rate of adopting countries (Abdolmohammadi & Tucker, 2002; Boolaky & Omoteso, 2016; Boolaky & Soobaroyen, 2017). For instance, Abdolmohammadi and Tucker (2002) used Gross National Product (GNP) per capita as their sole measure of a country's economic growth and found that countries with larger per capita numbers of accountants and auditors in setting auditing standards had greater GNP per capita.

Using data from 50 countries from 2009 to 2012, Boolaky and Omoteso (2016) investigated the impact of Gross Domestic Product (GDP) growth on ISAs' adoption and found a positive and significant association between the two variables. However, several limitations have arguably impaired Boolaky and Omoteso's (2016) findings. First, the sample had only 50 countries due to data availability problems. Second, the study's time horizon from 2009 to 2012 was relatively short. Third, they included only one economic indicator, GDP growth rate, as an independent variable. Fourth, they employed a combination of different regression techniques, including the ordinary least squares (OLS), multinomial, and logistic regressions with the categorical dependent variables, leading to an arguably spurious finding.

Although Boolaky and Soobaroyen (2017) found a significant relationship between ISA adoption and the three institutional pressures: (i) coercive, (ii) mimetic, and (iii) normative isomorphisms, several limitations affected their study. First, their study time horizon was relatively very short, from 2009 to 2012. Second, the sample selected covered only 89 countries worldwide that had adopted ISAs. Thirdly, they only included as an independent variable one economic indicator, import penetration, whereas they included GDP growth rate as a control variable. Consequently, they find no significant relationship between ISAs adoption and the economic growth level in a country.

However, according to DOI theory, although some social and religious beliefs might determine the diffusion of innovations, the contributions made by adopted innovations can considerably enhance the economic growth of the adopting countries (Moreno & Surinach, 2014). Drawing on DOI theory, adopting innovations can eventually improve the economic growth of adopting nations, particularly in developing countries (Zanello et al., 2016). Hence, this study posits the following research hypothesis:

H1: The time and extent of ISAs adoption have a positive impact on the level of economic growth.

The current literature on ISAs adoption also lacks studies on the

impact of such adoption on other economic indicators, such as FDI inflows of the adopting countries. Therefore, to properly position our study in that context, we explored the literature on the impact of IFRS adoption on each economic indicator. Results from the studies on IFRS and FDI inflows are mixed. Most of these studies show a significant positive relationship between IFRS adoption and FDI inflows in both developed and developing countries (Gordon et al., 2012; Marquez-Ramos, 2011; Pricope, 2017), while a few others show a negative relationship (Nnadia & Soobaroyen, 2015; Zehri & Chouaibi, 2013). DOI theory suggests that local countries adopt innovations to attract foreign investors and improve their resources, such as FDI. A country's openness can positively attract FDI and influence accounting innovation diffusion (Zanello et al., 2016). This study suggests the following research hypothesis:

H2: The time and extent of ISAs adoption have a positive impact on the level of FDI inflows.

The influence of ISAs' adoption on exports of goods and services has been studied by a few scholars using small samples, often over a short period. Prior studies have shown mixed results when they used the strength of auditing and reporting standards in a country as a dependent variable rather than adoption categories of ISAs(Boolaky & O'Leary, 2011; Boolaky & Cooper, 2015; Kellenberg & Levinson, 2019). For instance, Boolaky and Cooper (2015) employed a survey conducted by the World Economic Forum (WEF) to determine the strength of auditing standards. Using a sample of 72 countries (41 European and 31 Asian), the study reports a positive and significant association between the auditing standards strength and export trading in Asia. However, using the same WEF survey, Boolaky and O'Leary (2011) examined the strength of auditing standards in 28 countries worldwide and found no significant relationship between the strength of auditing standards and export levels.

The impact of ISAs adoption on import and export levels has not been previously studied. Therefore, we reference numerous prior studies that examine the relationship between IFRS adoption and import levels. Most of these studies find a significant increase in import levels between trading countries following IFRS adoption (Archambault & Archambault, 2009; Judge et al., 2010; Gordon et al., 2012; Shima & Yang, 2012). However, Pricope (2017) reports a negative and significant association between IFRS adoption and import levels. We suggest that these mixed findings might be influenced by the smaller sample sizes used in previous empirical studies. According to the DOI theory, international trade can be impacted by the diffusion of innovations, ensuring that all countries develop relatively. Barriers, however, can affect the adoption rate and lead to varying outcomes. For example, countries in the early stages of development may grow by adopting innovations, while those in later stages may grow by creating their own innovations (Santacreu, 2015). Based on this, we propose the following research hypothesis:

H3: The time and extent of ISAs adoption have a negative impact on the level of international trade.

Contingency theory posits that IFRS adoption can enhance the economic development of countries, such as by reducing the inflation rate, but only if international accounting standards have been modified to fit the local environment and satisfy their specific needs (Larson & Kenny, 1995). Therefore, from a contingency theory perspective, full IFRS adoption would positively influence emerging stock market development and maintain capital market stability (Othman & Kossentini, 2015). Othman and Kossentini (2015) also emphasized the importance of using a contingency theory perspective to explain the economic effects of IFRS adoption. They indicated that partial IFRS adoption might not achieve the expected economic consequences due to the potential conflation of accounting standards nationally.

Similarly, signaling theory posits that countries conjecture that IFRS adoption enhances financial reporting quality and disclosure, which can lead to increased FDI inflows for the adopting country. However, this economic development depends on other factors, such as the exchange rate, inflation, and the level of corruption in the country. Nevertheless, economic factors, such as inflation rate, exchange rate, and political stability, might affect investors' decisions. Drawing on signaling theory, countries with less developed capital markets are more prone to adopt IFRS as a signal to attract foreign capital. However, inflation levels and exchange rates may hinder IFRS adoption. Hence, countries with higher inflation levels and larger capital markets are more hesitant to adopt IFRS due to the potential conversion costs (Shima & Yang, 2012). Therefore, we argue that incorporating contingency and signaling theories could complement the insufficiency of DOI theory to explain the association between ISA adoption and some economic factors, such as inflation and exchange rates.

Prior research found mixed results on the association between IFRS adoption (IAS 29) and inflation rates (Agustini, 2016; Archambault & Archambault, 1999, 2009; El-Helaly et al., 2020). The impact of ISAs adoption on the inflation rate has not been empirically investigated. Hence, further research is needed to clarify these relationships. This can be documented by considering the timing of ISAs adoption by various countries and the other external factors that may affect the economic conditions, such as interest rates, purchasing power, and inflation rate. In this regard, Herbert and Tsegba (2013) indicated that several external factors have contributed to international differences in accounting and auditing standards among countries, such as economic development, inflation, tax method, and a country's legal system. Effendi and Agustini (2015) reported that although IFRS adoption can improve financial reporting quality, it might increase the cost of capital in countries with high inflation rates. This is because investors expect higher returns on investments with higher risk due to high inflation rates, increasing the cost of capital. Qatawneh (2013) stated that a country's level of inflation shapes the accounting and auditing standards adopted by the country. This is because investors will impose more pressure on companies to disclose the rising prices due to inflation. However, El-Helaly et al. (2020) found no significant association between early IFRS adoption and the change in inflation rates of non-EU countries.

Some previous IFRS studies find a positive and significant correlation between IFRS adoption and inflation rates (Archambault & Archambault, 2009; Arsoy & Gucenme, 2009). However, other scholars reported a negative and significant association between the two variables (Shima & Yang, 2012). Yim (2020) argued that the inflation rate measured by the wholesale price index has significantly increased post-mandatory IFRS adoption due to inconsistencies between local accounting standards and regulatory standards, which increased banks' cost of equity in Europe. Based on DOI theory, adopting innovations can lead to the achievement of enhanced economic performance for the adopting country, and thus, leads to low and stable inflation rates in the country, limiting the use of a multi-currency financial system (Park & Choi, 2019).

Similarly, the influence of ISAs' adoption on foreign exchange rate fluctuation has not been empirically examined. Therefore, we rely on studies that explore the association between IFRS adoption and foreign exchange rates. Most IFRS studies show a positive and significant correlation between exchange rate changes under IFRS and the equity market value (Ashbaugh & Pincus, 2001), while Goodwin et al. (2008) report a negative and significant association under IAS 21 and the equity market value. DOI theory posits that reducing the exchange rate positively affects innovation adoption, particularly in countries with more significant information flow. In contrast, exchange rate volatility harms the adoption rate due to the risk and uncertainty affecting a country's economic performance (Souto & Resende, 2018).

Likewise, the effect of ISAs adoption on the interest rate of the adopting countries has not been empirically investigated. Therefore, we rely on IFRS research that examined the association between IFRS

adoption and the interest rate level. The few studies that exist on IFRS adoption and the level of interest rate risk have shown mixed results. Some IFRS research shows a positive and significant association between IFRS adoption and the interest rate of adopting countries (Chen et al., 2015; Zhang, 2008), while others find a negative and significant relationship (Gordon et al., 2012).

Additionally, DOI theory suggests that the competitive benefits of innovations can explain the gradual diffusion of innovations worldwide, and higher adoption costs with higher interest rates could discourage innovation adoption. Therefore, this study posits the following hypothesis:

H4: The time and extent of ISAs adoption positively impact the level of inflation, foreign exchange volatility, and interest rates.

3. Research methodology

3.1. Sample selection

Our study has 3,200 observations for 160 countries from 1995 to 2014. Our sample is the largest used in any ISAs adoption study and represents 81 % of the 196 countries. This enhances the generalizability and reliability of our empirical results compared to previous studies (Yilmaz, 2013).

DOI theory proposes five main groups as follows: (i) experiments, (ii) early adopters, (iii) early majority, (iv) late majority, and (v) laggards. Our ISAs adoption categories are consistent with the classification of ISAs employed by Elmghaamez and Elmagrhi (2022) and Elmghaamez et al. (2020). As suggested by DOI theory, they divided the ISAs adoption categories into five according to their first-time adoption to coincide

with global events related to auditing standards. The date of first-time adoption is a country's first ISAs adoption event regardless of the extent of adoption (voluntary or mandatory). Table 1 shows our sample classification based on the first-time adoption of ISAs.

Specifically, the categorization years for the five adoption groups (each with its own dummy variable) are based on the most significant world events and global financial crises that happened in the world since the issuance of ISAs by the International Auditing and Assurance Standards Board (IAASB) in 1991. The experimenter's group (*EXPERIMENTER*) represents those countries that adopted ISAs in the first five years from 1991 to 1995. The early adopter group (*EARLYADOPTER*) represents those countries that adopted ISAs during and after the 1997 Asian financial crisis from 1996 to 2000. The early majority group (*EARLY MAJORITY*) represents those countries that adopted ISAs after the Enron scandal from 2000 to 2006. The late majority group (*LATE-MAJORITY*) represents countries that adopted the ISAs from 2007 to 2014 after the European Parliament issued Directive 2006/43/EC3 on statutory audits. The laggards' group (*LAGGARD*) represents those countries that had not adopted ISAs by 2014. Directive 2014/56/EU2 was issued in 2014, which requires statutory auditors and audit firms in EU countries to carry out statutory audits in compliance with the ISAs.

All variables are defined and explained in Table 2. This includes the abbreviations and the proxies used for the dependent variables (i.e. the country-level economic indicators), the independent variables (the ISAs' adoption categories), the ISAs' adoption extent (the basis of ISA adoption by jurisdiction provided by IFAC), and several control variables.

Consistent with previous research (Elmghaamez et al., 2020; Elmghaamez et al., 2022; Ramanna & Sletten, 2014), we include as control variables the three social factors of geographical place, language, and colonial history. According to DOI theory, the adoption of innovations

Table 1
The ISAs adoption categories for 160 countries over the period from 1995 to 2014.

Experimenters (1991–1995)	Early adopters (1996–2000)	Early majority (2001–2006)		Late majority (2007–2014)		Laggards (non-adopters up to 2014)
Jordan	Armenia	Azerbaijan	Philippines	Argentina	Morocco	Afghanistan
Malta	Bangladesh	Bahrain	Russia	Albania	Namibia	Algeria
Netherlands	Denmark	Bosnia & Herzegovina	Serbia	Australia	Nigeria	Angola
Peru	Dominican Republic	Bolivia	Singapore	Austria	Pakistan	Burkina Faso
Slovenia	El Salvador	Bulgaria	South Africa	Barbados	Portugal	Burundi
Sri Lanka	Fiji	Cambodia	Tanzania	Belgium	Rwanda	Cape Verde
	France	Cameroon	Turkey	Belize	Saudi Arabia	Central AfricanRepublic
	Georgia	Canada	Ukraine	Benin	Senegal	Chad
	Kenya	Chile	UK	Botswana	Sierra Leone	Colombia
	Latvia	China	Vietnam	Brazil	Swaziland	Congo, Democratic
	Lesotho	Costa Rica	Zambia	Brunei Darussalam	Switzerland	Congo, Republic
	Macedonia	Czech Republic		Burma	Sweden	Cuba
	Moldova	Ecuador		Cote d'Ivoire	Tajikistan	Ethiopia
	Mongolia	Guyana		Croatia	Togo	Gabon
	Paraguay	Haiti		Cyprus	Thailand	Gambia
	Poland	Hong Kong		Dominica	Tunisia	Germany
	Romania	Hungary		Egypt	UAE	Guinea
	South Korea	Iraq		Estonia	Venezuela	Guinea-Bissau
	Trinidad & Tobago	Ireland		Finland	Zimbabwe	Laos
	Uganda	Jamaica		Ghana		Libya
	Uruguay	Kazakhstan		Greece		Mali
		Kyrgyzstan		Guatemala		Mauritania
		Lebanon		Honduras		Mozambique
		Lithuania		Iceland		Niger
		Luxembourg		India		North Korea
		Malawi		Indonesia		Oman
		Mauritius		Iran		Qatar
		Montenegro		Italy		Somalia
		Nepal		Japan		Sudan
		New Zealand		Kazakhstan		Suriname
		Nicaragua		Kuwait		Syria
		Norway		Liberia		Tonga
		Panama		Madagascar		USA
		Papua New Guinea		Malaysia		Yemen
				Mexico		
6 countries	**21 countries**	**45 countries**		**54 countries**		**34 countries**

Table 2
The definitions of the dependent, independent, and control variables used in this study and their data sources.

Variables	Definitions and measures	Data Sources
Dependent variables		
ECONGROW (%)	Economic growth is the change of GDP at market prices from one year to the next and is based on constant local currency. Then, a country's constant local price of GDP is converted into constant 2010 US Dollars to produce constant price GDP aggregates. The GDP growth data for all years are based on constant 2010 prices.	The World Bank (WB) national accounts data and Organisation of Economic Cooperation and Development (OECD) National Accounts, available at https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG
FDI (%)	Foreign direct investments are the net inflows of new investments from foreign investors. The net inflows of new foreign investments include the sum of equity capital and the other long-term and short-term capital divided by the GDP.	WB, International Debt Statistics, OECD GDP estimates, and the International Monetary Fund (IMF), available at https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS
EXPORT ($)	International trade measured by the export of goods and services represents the total market value of goods and services produced in a country and shipped to other countries measured in current US dollars.	WB national accounts data and OECD National Accounts, available at https://data.worldbank.org/indicator/NE.EXP.GNFS.CD
IMPORT ($)	International trade measured by imports of goods and services represents the volume of all goods and services received from other countries, including transport and shipping services measured in current US dollars.	WB and IMF Website,, available at https://data.worldbank.org/indicator/BM.GSR.GNFS.CD
INFLR (%)	The inflation rate refers to overall increases in the general level of core prices for goods and services, which reduces the purchasing power of a country's local currency. generally measured by a consumer price index (CPI) to determine the annual percentage change of the prices for goods and services over time.	WB and IMF Website, available at https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG
EXCHR ($)	The official exchange rate is the annual average of local currency units based on monthly averages relative to the US dollar (USD). The official exchange rate is a fixed exchange rate system determined by national authorities where a national currency is tied to the value of the USD. The floating exchange rate is a flexible exchange rate subject that constantly fluctuates due to market forces' supply and demand.	WB, IMF, and the International Financial Statistics (IFS), available at https://data.worldbank.org/indicator/PA.NUS.FCRF
INTEREST (%)	The real interest rate is the percentage of lending interest rates adjusted for the inflation rate. The data of real interest rates are measured by deducting the expected annual inflation rate from the annual nominal (market) interest rate.	WB and the International Financial Statistics, available at https://data.worldbank.org/indicator/FR.INR.RINR
Independent variables		
Groups based on Timing of ISAs adoption (*ISAAC*) *EXPERIMENTER EARLYADOPTER EARLYMAJORITY LATEMAJORITY LAGGARD*	Dummy variables coded 1 whenExperimenters of ISAs (1991—1995)Early adopters of ISAs (1995–2000)Early majority of ISAs (2001–2006)Late majority of ISAs (2007–2014)Laggards of ISAs (after 2014)	Reports on the Observance of Standards and Codes (ROSCs) from WB, available at https://www.worldbank.org/ifa/rosc_aa.html
Extent of ISAs adoption (*ISAAS*) *NONADOPTER AMEND NOAMEND WITHTRANSL NOTRANSL AMENDandTRANSL LAWREQUIRE GAPinRULES IFRSREQUIRE*	Dummy variables coded 1 whenNon-adopters of ISAs (laggards)ISAs are adopted with amendments (modifications)ISAs are adopted without amendmentsISAs are adopted with translationISAs are adopted without translationISAs are adopted with modifications & translationISAs are required by the country's lawISAs only apply in gap mattersISAs adopted for statements issued under IFRS	IFAC Action Plan Template available at https://www.ifac.org/system/files/compliance-assessmentROSCs from WB, available at https://www.worldbank.org/ifa/rosc_aa.html
Control variables		
Geographic Regions *EUROPE AMERICAS CENTRALSOUTHASIA EASTASIAPACIFIC MENA AFRICA*	Dummy variables coded 1 whenThe country is in EuropeThe country is anywhere in the Americas (North, Central, South, Caribbean)The country is in Central & South AsiaThe country is in East Asia & the PacificThe country is in the Middle East & North AfricaThe country is in Sub-Saharan Africa	WB website, the classification of all countries by the continental regions, available at https://www.worldbank.org/en/where-we-work
Official Country Language *ENGLISH FRENCH SPANISH ARABIC GERMAN RUSSIAN OTHERLANG*	Dummy variables coded 1 whenEnglish is an official language in the countryFrench is an official language in the countrySpanish is an official language in the countryArabic is an official language in the countryGerman is an official language in the countryRussian is the official language in the countryOther languages are official in the country	The World Factbook website of the Central Intelligence Agency (CIA), available at https://www.cia.gov/library/publications/the-worldfactbook/fields/2098.html

Table 2 (*continued*)

Variables	Definitions and measures	Data Sources
Colonial History	Dummy variables coded 1 when	The World Factbook website of CIA,, available at https://www.cia.gov/library/publications/the-worldfactbook/fields/2088.html
NEVERCOLONY	Never colonized countries	
UKCOLONY	Countries colonized by the British Empire	
FRENCHCOLONY	Countries colonized by France	
SPANISHCOLONY	Countries colonized by Spain	
PORTUGALCOLONY	Countries colonized by Portugal	
DUTCHCOLONY	Countries colonized by the Dutch	
GERMANCOLONY	Countries colonized by Germany	
RUSSIANCOLONY	Countries colonized by RussiaCountries colonized by other colonial	
OTHERCOLONY	powers	
D08-09	Dummy variables for the crisis period years, where 1 = 2008 and 2009, and 0 otherwise	

Note: All data sources were accessed on October 3, 2016.

can be highly influenced by the environmental context of the adopters, such as geographical location, language, and political situations (Wejnert, 2002). For geographic location, we create six dummy variables to represent the major areas of Europe, the Americas (both North and South), Central and South Asia, Eastern Asia and the Pacific, the Middle East and North Africa (MENA), and Sub-Saharan Africa.

Many factors can hinder the adoption of the ISAs, such as auditing regulations, the systems, and the official language of the adopting countries. Similarly, the harmonization of ISAs is significantly affected by diversity in several social factors, including language, beliefs, demands, and expectations from auditors and clients (Mennicken, 2008). Although translating accounting innovations is the best solution for non-English-speaking countries, the impact of the English translation quality is a challenge in adopting accounting and auditing standards (Holthoff et al., 2015). For language, we create seven dummy variables to represent an official language in a country as English, French, Spanish, Arabic, German, Russian, and Other.

The United Kingdom (UK) delivered its social and cultural values to its colonies, including legal, economic, language, and professional practices. Hence, most former UK colonies only adopted the international accounting and auditing standards because the UK adopted these standards (Tyrrall et al., 2007). Network effects might also occur due to geographic and colonialism influences. Therefore, countries in the same region are more prone to adopt similar accounting innovations. We created six dummy variables to represent various regions: Europe, Americas, Central and South Asia, East Asia and Pacific, Middle East and North Africa, and Africa. Likewise, colonized countries are more likely to imitate their former colonizer opting for the same accounting innovations (Ramanna & Sletten, 2014). We created nine dummy variables to represent the former colonial power that ruled a country: United Kingdom, France, Spain, Portugal, the Netherlands, Germany, Russia, Other, and Never Colonized.

We also used a year dummy variable for the financial crisis period of 2008 to 2009 (*D08-09*) to control the effect of the financial crisis on the economic performance of the adopting countries in our sample.

3.2. Data collection method

The data used to measure all variables are from reliable sources. The country-level economic indicators were collected from the World Bank and the International Monetary Fund (IMF) websites. Data relating to ISAs adoption time are gathered from the Report on the Observance of Standards and Codes (ROSC) provided by the World Bank and the IMF. The second explanatory variable (the extent of ISAs adoption) was collected from the 'Basis of ISAs Adoption by the Jurisdiction' website provided by the IFAC. Finally, the control variables (social factors) included in our study are gathered from the World Factbook website established by the Central Intelligence Agency (CIA) of the United States (US) federal government.

3.3. Data analysis technique and model specification

Since the nature of all our dependent variables (economic indicators) is continuous, the multiple linear regression model is the best statistical method that estimates the cause-and-effect relationship between the outcome variables (economic indicators) and the explanatory variables, namely, the categories and extent of ISAs' adoption. Accordingly, Eq. (1) shows the multiple linear regression model employed to examine the effects of the ISAs' adoption categories on the economic consequences of the adopting countries. While Eq. (2) presents the multiple linear regression, the model used to investigate the effects of the ISAs adoption extent on the economic consequences, which are specified below in the following form:

$$ECISAs_{it} = \alpha + \beta_1 ISAAC_{it} + \sum_{i=1}^{3} \beta_i CONTROLS_{it} + \varepsilon_{it} \quad (1)$$

$$ECISAs_{it} = \alpha + \beta_1 ISAAS_{it} + \sum_{i=1}^{3} \beta_i CONTROLS_{it} + \varepsilon_{it} \quad (2)$$

where *ECISAs_{it}* is the economic consequences of adopting the ISAs for a country (i) in a year (t), which involves a wide range of country-level economic indicators, including economic growth (*ECONGROW*), FDI (*FDI*), exports (*EXPORT*), imports (*IMPORT*), inflation rate (*INFLR*), exchange rate (*EXCHR*), and real interest rate (*INTEREST*). Also, *α* is the constant term, and *β_i* are the coefficients on the independent variables. *ISAAS_{it}* include the five adopter categories of *EXPERIMENTER*, *EARLYADOPTER*, *EARLY MAJORITY*, *LATEMAJORITY*, and *LAGGARD*. *ISAAS_{it}* include the extent of adopting ISAs using the following classifications: (i) non-adopters of ISAs (*NONADOPT*); (ii) ISAs are adopted with modifications (*AMEND*); (iii) ISAs are adopted without amendments (*NOAMEND*); (iv) ISAs are adopted with translation (*WITHTRANSL*); (v) ISAs are adopted without translation (*NOTRANSL*); (vi) ISAs are adopted with modifications and translation (*AMENDandTRANSL*); (vii) the country law requires ISAs (*LAWREQUIRE*); (viii) ISAs only apply in matters not regulated by the local standards (*GAPinRULES*), and (ix) financial statements issued under IFRS must be audited using ISAs (*IFRSREQUIRE*). *CONTROLS_{it}* are the three social factors geographic region, country language, and colonial history controlled in the model, in addition to the dummy year of crisis (*D08-09*), and *ε_{it}* refers to the error term for the country (i) in a year (t).

4. Empirical results

4.1. Descriptive analysis

Table 3 shows the descriptive statistics of the country-level economic variables. The means for economic growth range from −9.82 to 25.89. The highest levels of economic growth are for the late majority group (25.89), followed by the non-adopters of ISAs (24.69). The highest mean

Table 3
A summary of descriptive statistics of the country-level economic variables.

Variables	ISAAC	Mean	Standard Deviation	Variance	Minimum	Maximum
ECONGROW (%)	EXPERIMENTER	3.90	4.84	23.40	−9.82	12.66
	EARLYADOPTER	4.24	5.94	35.25	−12.43	17.98
	EARLYMAJORITY	4.54	6.01	36.15	−15.74	23.96
	LATEMAJORITY	3.62	6.04	36.52	−15.21	25.89
	LAGGARD	4.67	6.47	41.82	−17.68	24.69
FDI (%)	EXPERIMENTER	4.69	12.65	159.96	−26.23	38.89
	EARLYADOPTER	5.35	9.34	87.15	−20.57	32.16
	EARLYMAJORITY	7.92	10.57	111.72	−30.40	35.16
	LATEMAJORITY	3.20	10.10	101.94	−33.87	39.62
	LAGGARD	0.97	11.65	135.82	−27.04	32.30
EXPORT ($)	EXPERIMENTER	1.59	1.28	1.65	0.09	4.98
	EARLYADOPTER	0.88	1.54	2.37	1.87	5.19
	EARLYMAJORITY	1.40	1.59	2.54	1.61	7.00
	LATEMAJORITY	1.34	1.74	3.02	3.43	5.33
	LAGGARD	0.13	2.04	4.17	3.75	7.39
IMPORT ($)	EXPERIMENTER	1.66	1.31	1.72	0.03	5.00
	EARLYADOPTER	0.96	1.61	2.59	1.62	5.48
	EARLYMAJORITY	1.45	1.64	2.68	1.70	6.56
	LATEMAJORITY	1.36	1.86	3.45	3.56	5.67
	LAGGARD	0.03	2.17	4.73	4.63	8.37
INFLR (%)	EXPERIMENTER	−0.76	6.36	40.44	−15.42	14.74
	EARLYADOPTER	2.30	7.78	60.57	−17.60	23.78
	EARLYMAJORITY	2.20	9.10	82.75	−25.64	31.07
	LATEMAJORITY	0.43	8.96	80.32	−30.36	28.10
	LAGGARD	1.63	10.57	111.65	−24.82	32.82
EXCHR ($)	EXPERIMENTER	−9.84	25.92	671.95	−55.95	25.84
	EARLYADOPTER	9.47	22.43	503.15	−59.25	55.17
	EARLYMAJORITY	5.89	27.89	777.87	−67.91	82.44
	LATEMAJORITY	6.60	25.00	625.09	−75.75	71.84
	LAGGARD	13.98	25.95	673.64	−83.83	63.87
INTEREST (%)	EXPERIMENTER	4.77	17.16	294.62	−30.46	45.79
	EARLYADOPTER	13.28	18.40	338.74	−40.79	61.92
	EARLYMAJORITY	7.01	19.24	370.00	−51.67	65.04
	LATEMAJORITY	6.88	19.67	368.97	−46.05	76.99
	LAGGARD	10.65	22.83	521.16	−59.41	52.53

is for the non-adopters (4.67), followed by the early majority group (4.54), which indicates that countries exhibit the highest levels of economic growth in the early majority category. This result supports H1, which assumes that countries with higher economic growth are more likely to more quickly and extensively adopt ISAs. This adoption may reduce information asymmetry and enhance their economic growth swiftly. However, some countries with strong economic growth, like the US, may resist ISAs adoption due to the high transition costs for US companies. These findings are roughly comparable to the figures reported by Boolaky and Omoteso (2016) and Boolaky and Soobaroyen (2017).

Table 3 shows that the means for FDI range from −20.57 to 39.62. The late majority group noted the highest levels of FDI (39.62). The highest average is for the early majority group (7.92), followed by the early adopter's group (5.35), which indicates that countries in the early majority category exhibit the highest levels of FDI. This result supports H2, which suggests that countries with higher levels of FDI inflows are more likely to accelerate the speed and extent of ISAs adoption. This adoption may attract more foreign investors and enhance their FDI inflow. This result aligns with the findings reported by Boolaky and Soobaroyen (2017), Gordon et al. (2012), and Lungu et al. (2017).

Table 3 reports that the means for the exports and imports range from 0.09 to 7.39 and 0.03 to 8.37, respectively. The highest levels of exports (7.39) and imports (8.37) are for the non-adopter group. The

lowest average levels of exports (0.88) and imports (0.96) is for the early adopters group. This result supports H3, which suggests that countries with lower levels of exports and imports are more likely to hasten the speed and extent of ISAs adoption as this adoption may enhance the export and import levels post the adoption of ISAs by adopting countries. This result is consistent with prior findings (Boolaky & O'Leary, 2011; Boolaky & Cooper, 2015).

Table 3 indicates that the range of means for inflation is −30.36 to 32.82, for exchange is −83.83 to 82.44, and for interest rates is −59.41 to 76.99. The highest inflation levels were noted for the non-adopter group (23.82), while the highest exchange rates were for the early majority group (82.44). In contrast, the late majority group noted the highest interest rates (76.99). The highest average of inflation (2.30) and interest rates (13.28) is for the early adopter's group (2.30) and (13.28), which indicates that countries exhibit the highest levels of inflation and interest rates in the early adopter's category. This result further supports H4, which suggests that countries with higher levels of inflation and interest rates are more likely to hasten the speed and extent of ISAs adoption as this adoption may reduce the inflation and interest rates levels after the adoption of ISAs by adopting countries and attract more investors. This result aligns with the findings reported by past studies (Boolaky & O'Leary, 2011; Boolaky & Cooper, 2015). However, Table 3 shows that the highest average exchange rate is for the non-adopters group (13.98), followed by the early adopter group (9.47),

indicating that countries exhibit the highest exchange rates in the laggard and early adopter categories. This result supports H4, which suggests that countries with higher exchange rates are more likely to hasten the adoption speed and extent of ISAs. This adoption may reduce the exchange rate volatility of adopting countries.

4.2. Results and discussion

This section presents the findings of the impact of the speed/timing and extent of ISAs adoption on country-level economic factors. We used the laggard's group as a base group.

4.2.1. Testing the OLS statistical assumptions

We are concerned about whether our results are affected by choosing OLS for our primary analysis rather than other regression techniques. Therefore, we re-run our main regressions in Eqs. (1) and (2) using OLS regression while controlling for the three social factors of geographical region, official language, and colonial history to assess the assumptions of OLS regression models. We tested the four critical assumptions of OLS regression models: multicollinearity, autocorrelation, heteroskedasticity, and unit root. Our OLS regression diagnostics show that our OLS regression assumptions were violated. Therefore, we employed the Prais-Winsten regression method because it does not require a normality assumption to estimate valid coefficients. The Prais-Winston regression with corrected standard errors (PCSEs) controls for a serial correlation of the error terms in a linear regression model with heteroskedastic errors. According to Dickey and Pantula (1987), the first difference estimator can mitigate the series stationary in the panel data and control for unobserved variables that might lead to biased estimates. Hence, the first difference approach is only used with GDP, exports, and imports OLS regression models since they have non-stationary panel data.

4.2.2. The Prais-Winston results of ISAs adoption time and economic consequences

Table 4 shows Prais-Winston regression results examining the effects of ISAs' adoption time on the economic consequences of adopting countries. We argue that our regression models have high explanatory power since we have achieved p-values for the F-test with less than 1 % across all models.[1]

Table 4 shows the results of PCSE regression to examine the impact of ISAs' adoption time on the economic consequences of the adopting countries. The 0.782 coefficient of the early majority ISAs adoption is positively and significantly associated with the economic growth of the adopting countries at a 5 % level. Moreover, the 1.521 coefficient of the experimenters of ISAs adoption is positively and significantly associated with the economic growth of the adopting countries at a 5 % level. This result supports the DOI theoretical suggestion, which assumes that although the DOI can be influenced by some country-level factors of the adopting countries, the relative economic benefits gained by adopting these innovations can eventually improve the economic growth of the adopting countries (Moreno & Surinach, 2014). Moreover, countries with similar characteristics are more prone to follow each other by adopting the same innovations to obtain intended outcomes by

enhancing their economic situations (Rogers, 2003). This finding is in line with H1 and consistent with the previous empirical research (Boolaky & Omoteso, 2016; Boolaky & Soobaroyen, 2017).

In line with H2, Table 4 shows that the 2.730 coefficient on the early majority of ISAs adoption is positively and significantly linked with the FDI inflow of the adopting countries at a 1 % level. Furthermore, the 7.617 coefficient on the experimenters of ISAs adoption is positively and significantly associated with the FDI of the adopting countries at a 1 % level. This result supports the findings reported by previous IFRS studies (Marquez-Ramos, 2011; Gordon et al., 2012; Pricope, 2017; Elmghaamez, 2023). This result also supports the DOI theory, which assumes that economic openness can attract more foreign investors, thus enhancing its FDI inflows (Zanello et al., 2016). However, Table 4 shows a negative and significant association between the early adopter group of ISAs who embraced ISAs earlier and the FDI inflows. This is consistent with the results reported by some scholars (Zehri & Chouaibi, 2013; Nnadia & Soobaroyen, 2015). This finding aligns with the DOI theory, which assumes that risk-takers who adopt innovations early are more prone to receive adverse outcomes. This might happen due to the high risk of adopting innovations before attempting to understand their effect without taking sufficient steps to contain the risk (Rogers, 2003). This finding supports the DOI theory, suggesting that early adopters and the early majority play a crucial role in promoting the DOI and attracting FDI. However, the negative association between early adopters of ISAs and FDI inflows highlights the potential risks of early adoption without fully understanding the implications of adopting these innovations (Taran et al., 2015).

According to ISA (315), the auditor's responsibility is to assess the risks related to external factors affecting the entity, such as the economic conditions, interest rates and availability of financing, and inflation or currency revaluation. Arguably, ISAs adoption can explicitly improve the economic conditions of the adopting countries and enhance the exchange and interest rates of the adopting countries, which supports the DOI theory that countries with high exchange rate volatility are more prone to adopt innovations to reduce the risk and uncertainty that can affect the country's economic performance (Souto & Resende, 2018). Consistent with H4, Table 4 shows that the coefficient (3.150; P < 0.026) indicates that countries with high levels of exchange rates are more likely to adopt ISAs more quickly than countries with low exchange rates. This is consistent with the findings stated by previous IFRS studies (Ashbaugh & Pincus, 2001). This result supports the assumption made by the DOI theory that countries with high exchange rate volatility are more prone to adopt innovations to reduce the risk and uncertainty of adopting innovations that can affect the country's economic performance (Souto & Resende, 2018).

Table 4 provides evidence that countries adopting ISAs at later times experienced higher interest rates. This finding aligns with previous IFRS studies (Zhang, 2008; Chen et al., 2015). DOI theory suggests that countries with high exchange rate volatility are more likely to adopt innovations to reduce the risk and uncertainty associated with adopting innovations that may affect their economic performance (Souto & Resende, 2018). This result also supports the idea that countries with similar characteristics are more likely to adopt the same accounting innovations and simultaneously reduce information asymmetry among trading parties (Rogers, 2003).

Consistent with H3, Table 4 reports that countries that adopted ISAs late have experienced higher export levels. In comparison, they experienced lower levels of imports. Also, the coefficients of late ISAs adopting countries are positively and significantly associated with the exports (−11.632) and imports (−16.049) at a 5 % level. This result suggests that adopting ISAs could potentially boost a country's export levels while lowering its import levels. This is consistent with the DOI theory, which suggests that countries with similar characteristics (lower levels of imports and exports) are more likely to adopt the same accounting innovations, such as ISAs, at the same time to reduce information asymmetry among trading parties (Rogers, 2003).

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[1] Hagquist and Stenbeck (1998) state that a low R^2 does not imply a poor fit for a regression model. Even with low R^2 values, researchers can conclude the impact of predictor variables if the regression assumptions are not violated and there are statistically significant predictors. The discussed models, despite having R^2 values below 20%, have some significant explanatory variables. However, violations were found in the OLS regression models, leading to Prais-Winston regression with corrected standard errors (PCSEs) to address serial correlation and heteroscedastic errors. Eisenhauer (2009) suggests that if the F-test p-value is below 1%, the model has significant explanatory power. Thus, larger sample sizes or fewer explanatory variables reduce the required explanatory power to achieve the given significance level.

Table 4
The results of PCSEs regression models examining the effects of ISAs adoption time on the economic consequences of the adopting countries.

Dependent variables	ECONGROW		FDI		EXPORT		IMPORT		INFLR		EXCHR		INTEREST	
PCSEs	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t
Adoption categories														
EXPERIMENTER	1.521**	(0.022)	7.617***	(0.002)	58.714	(0.127)	−12.120	(0.134)	−2.673***	(0.000)	−13.967***	(0.000)	−5.251**	(0.047)
EARLYADOPTER	−1.058**	(0.029)	−2.734**	(0.012)	−15.377	(0.163)	12.724	(0.804)	0.276	(0.715)	3.150**	(0.026)	4.584***	(0.002)
EARLYMAJORITY	0.782**	(0.019)	2.730***	(0.000)	16.103*	(0.089)	52.964	(0.292)	1.157***	(0.006)	0.675	(0.630)	1.367	(0.131)
LATEMAJORITY	0.625	(0.215)	3.044***	(0.000)	−11.632**	(0.045)	−16.049**	(0.046)	0.058	(0.927)	0.047	(0.983)	2.845	(0.146)
Dummy 08–09														
D08-09	−3.461***	(0.001)	0.144	(0.900)	−15.547*	(0.061)	−21.113*	(0.057)	1.385	(0.488)	−0.116	(0.868)	1.987	(0.503)
Control Variables														
Geographical region														
EUROPE	−4.465***	(0.000)	4.702***	(0.003)	−49.400	(0.943)	12.599	(0.166)	−7.787***	(0.000)	−24.297***	(0.000)	−12.064***	(0.000)
AMERICAS	−4.522***	(0.000)	−0.329	(0.819)	81.121*	(0.056)	19.488*	(0.067)	−3.832***	(0.002)	−17.706***	(0.000)	−1.643	(0.436)
CENTRALSOUTHASIA	−1.300	(0.135)	−2.519*	(0.088)	−80.000	(0.874)	80.114	(0.136)	−3.034**	(0.018)	−12.617***	(0.0000)	−1.291	(0.357)
EASTASIAPACIFIC	−1.276**	(0.027)	0.584	(0.535)	33.370*	(0.069)	31.590*	(0.063)	−5.988***	(0.000)	−12.601***	(0.0000)	−8.347***	(0.000)
MENA	−1.967	(0.192)	−7.066	(0.101)	14.625*	(0.023)	41.826*	(0.058)	−0.171	(0.923)	19.576***	(0.000)	−29.027***	(0.000)
Official language														
ENGLISH	−1.872***	(0.001)	4.957***	(0.000)	−84.897	(0.233)	−49.570	(0.925)	−5.455***	(0.000)	−18.112***	(0.000)	−0.557	(0.725)
FRENCH	−3.279***	(0.000)	−3.428***	(0.002)	19.362	(0.717)	−21.217	(0.143)	−7.532***	(0.000)	−16.197***	(0.000)	6.856**	(0.038)
SPANISH	4.303**	(0.010)	3.701***	(0.002)	−16.588	(0.132)	−32.453*	(0.061)	0.557	(0.514)	10.088***	(0.000)	3.273	(0.460)
ARABIC	−1.147	(0.502)	4.550	(0.278)	−25.089**	(0.030)	−67.586*	(0.060)	−6.193***	(0.003)	−54.822***	(0.000)	14.338***	(0.001)
GERMAN	−1.563**	(0.011)	0.436	(0.721)	34.903	(0.247)	−37.363	(0.224)	−6.210***	(0.000)	−10.449***	(0.000)	3.711	(0.244)
RUSSIAN	−2.964**	(0.033)	1.559	(0.454)	−18.456	(0.162)	−11.239	(0.222)	5.278***	(0.003)	−4.668*	(0.067)	−4.356	(0.344)
Colonial history														
NEVERCOLONY	−0.974**	(0.036)	−0.750	(0.408)	30.522*	(0.078)	38.952*	(0.082)	−3.367***	(0.000)	−1.824	(0.404)	−5.196***	(0.000)
UKCOLONY	0.758	(0.235)	0.648	(0.692)	−16.469	(0.582)	15.992*	(0.079)	1.734*	(0.087)	−3.438	(0.214)	−2.333	(0.156)
FRENCHCOLONY	1.033	(0.367)	6.213***	(0.002)	−77.084*	(0.062)	−51.382*	(0.065)	−2.352**	(0.030)	24.704***	(0.000)	1.885	(0.558)
SPANISHCOLONY	−3.185**	(0.038)	−0.423	(0.756)	−61.060*	(0.056)	−14.162*	(0.074)	−0.154	(0.890)	−12.309***	(0.000)	−3.049	(0.455)
PORTUGALCOLONY	0.834	(0.280)	6.182***	(0.002)	−91.696*	(0.058)	−13.925*	(0.061)	−3.669**	(0.045)	−23.166***	(0.000)	3.261	(0.162)
DUTCHCOLONY	1.210*	(0.083)	8.757**	(0.043)	−21.892	(0.142)	20.282	(0.303)	3.473**	(0.002)	10.887***	(0.000)	−5.692**	(0.040)
GERMANCOLONY	0.145	(0.890)	−4.122*	(0.083)	−38.631	(0.123)	72.091	(0.518)	6.637***	(0.000)	2.109	(0.455)	−7.158***	(0.005)
RUSSIANCOLONY	1.889***	(0.009)	5.211***	(0.000)	11.040	(0.135)	10.715*	(0.062)	0.899	(0.554)	−20.117***	(0.000)	5.004***	(0.009)
Constant	6.399***	(0.000)	−3.051*	(0.079)	105.881**	(0.050)	139.185*	(0.054)	6.814***	(0.000)	25.169***	(0.000)	9.033***	(0.004)
Number of observations	3200		3200		3200		3200		3200		3200		3200	
Wald chi2, Prob > chi2	270.850***	(0.000)	564.580***	(0.000)	166.730***	(0.000)	105.850***	(0.000)	641.070***	(0.000)	218.150***	(0.000)	998.070***	(0.000)
R-squared	0.126		0.115		0.099		0.124		0.125		0.212		0.111	

Note: Statistical significance level (p-values) display in parentheses.
*** p < 0.01.
** p < 0.05.
* p < 0.10.

We control for the variables of geographical location, official language, and colonial history. The results showed that European countries that adopted ISAs had higher FDI and lower economic consequences such as economic growth, inflation rate, exchange rate, and interest rate. Overall, countries in the Americas (North, Central, and South America combined) had higher international trade but lower economic growth, inflation, and exchange rates after adopting ISAs. Central and South Asian countries had lower inflation and exchange rates. East Asian and Pacific countries had higher exports and imports, but lower economic growth. Middle Eastern and North African countries had higher exports, imports, and exchange rates, but lower interest rates after adopting ISAs.

The country's official language also affected the economic consequences of ISA adoption. English-speaking countries had higher FDI and lower economic consequences. French-speaking countries had lower economic consequences across several indicators. Spanish-speaking countries had higher economic growth and exports, but lower imports. Arabic-speaking countries had lower levels of imports and economic consequences. German-speaking countries had lower economic consequences while Russian-speaking countries had higher inflation but lower economic growth and exchange rates.

The study also found that colonial history impacted economic consequences. Countries never colonized had higher exports and imports, but lower economic consequences. Countries colonized by the UK had higher GDP, imports, and inflation. Countries colonized by France had higher levels of FDI and exchange rates but lower levels of exports, imports, and inflation. Countries colonized by Spain had lower economic consequences across several indicators. Countries colonized by Portugal had higher FDI but lower levels of exports, imports, and economic consequences. Countries colonized by the Netherlands had higher levels of economic consequences, but also higher FDI and international trade. Countries colonized by Germany had higher inflation, but lower FDI, exports, and imports. Countries colonized by Russia had higher economic growth, FDI, and imports, but lower exchange rate volatility.

4.2.3. The Prais-Winston results of the extent of ISAs adoption and economic consequences

Table 5 presents the results of the Prais-Winston regression analysis examining the impact of the extent of ISAs adoption on the economic outcomes of adopting countries. The findings reveal that various types of ISA adoption have different impacts on distinct economic indicators. Specifically, the table reports the results of the analysis of seven dependent variables (*ECONGROW, FDI, EXPORT, IMPORT, INFLR, EXCHR,* and *INTEREST*) using eight of the proxies for the independent variable of ISAs adoption extent (*AMEND, NOAMEND, WITHTRANSL, NOTRANSL, AMENDandTRANSL, LAWREQUIRE, GAPinRULES*, and *IFRSREQUIRES*).

We find that the adoption of ISAs with amendments (*AMEND*) has a positive relationship with the economic indicators of FDI (*FDI*) and exchange rates (*EXCHR*). The role of institutions in the DOI theory can explain this result. High-quality institutions can provide a stable environment for economic activity, encouraging foreign investment. The adoption of ISAs with amendments demonstrates a commitment to enhancing financial reporting practices, which can increase the confidence of foreign investors in the local market.

However, we also find a negative relationship between ISAs adoption with amendments (*AMEND*) and interest rates (*INTEREST*), indicating that an increase in *AMEND* leads to a decrease in interest rates. The negative relationship between *AMEND* and interest rates (*INTEREST*) could be explained by several factors. First, adopting ISAs with amendments could increase audit quality and the reliability of financial statements, which could enhance the confidence of lenders and investors and subsequently lead to lower perceived risk in financial transactions. This increased confidence could result in a lower risk premium being demanded by lenders, which could translate into lower interest rates. Second, adopting ISAs with amendments could signal a commitment by the adopting country to improve its financial reporting and corporate

governance practices, which could improve the overall health of the financial system and lead to more stability. This greater stability could lead to lower interest rates as lenders and investors are less concerned about the risk of default. However, the exact reasons for this negative relationship may depend on a range of factors, including the specific context and characteristics of the countries involved (Elmghaamez & Elmagrhi, 2022).

Similarly, the study finds a positive relationship between the adoption of ISAs without amendments (*NOAMEND)* and the economic indicators of exports (*EXPORT*) and imports (*IMPORT*). This positive result can be attributed to the role of transparency in promoting trade. Transparency in financial reporting can increase trust and confidence in the market, facilitating international trade. The positive relationship between the adoption of ISAs without amendments (*NOAMEND* and exports (*EXPORT*) and imports (*IMPORT*) could be explained by the role of transparency in promoting trade. For example, when financial statements are transparent and reliable, it reduces the uncertainty and risk for international traders and investors, who can then make more informed decisions about engaging in trade with the country. This increased confidence can lead to more significant trade inflows, which in turn can boost both exports and imports. Moreover, adopting ISAs without amendments can signal a commitment to transparency and high-quality financial reporting, which can help build trust and confidence in the financial system. This, in turn, can promote more significant trade flows and facilitate international business transactions. These positive relationships may also be influenced by other factors, such as the overall economic and political environment of the adopting country, as well as the trading partners involved (Elmghaamez & Elmagrhi, 2022).

Our study finds a positive relationship between the adoption of ISAs with translation (*WITHTRANSL*) and both *FDI* and *EXCHR*. The positive effect of *WITHTRANSL* on FDI can be linked to the role of language in promoting transparency and communication. In multilingual countries, translating financial statements into a common language can make it easier for foreign investors to understand the company's financial position, increasing their confidence in the market. However, we also find a negative relationship between *WITHTRANSL* and the two economic indicators of inflation rate (*INFLR*) and interest rate (*INTEREST*).

The negative effect of ISA adoption with amendments and translation (*AMENDandTRANSL*) on the inflation rate can be explained by the additional costs associated with compliance. Adopting ISAs with amendments and translation can require significant investment in training and technology, increasing costs for companies and increasing prices and inflation.

For the remaining variables, negative relationships were observed. For example, countries that adopted ISAs and prepared their reports under IFRS experienced a negative relationship with FDI. The negative relationship between the adoption of ISAs and the preparation of financial reports under IFRS with FDI could be due to several reasons. First, IFRS adoption and ISA implementation could lead to increased transparency and disclosure, which can uncover issues or challenges in a company's financial performance. This increased scrutiny may discourage foreign investors, who might perceive the increased risk in investing in the adopting country. Second, IFRS adoption and ISA implementation could also increase compliance costs for firms, which may impact their profitability and competitiveness. This could discourage foreign investors from investing in the country, leading to a negative relationship between ISA adoption and FDI.

Similarly, *GAPinRULES* ISAs adoption showed a negative relationship with interest rates (*INTEREST*). The negative effect of ISAs adoption in *GAPinRULES* on *INTEREST* can be linked to the complexity of compliance. When companies are faced with multiple reporting standards, it can increase the costs and challenges associated with compliance, which can reduce the adoption of ISAs. The negative relationship between *GAPinRULES* with interest rates (*INTEREST*) could be because ISA adoption when *GAPinRULES* could lead to a higher cost of

Table 5
The results of PCSEs regression models examining the effects of ISAs adoption extent on the economic consequences of the adopting countries.

Dependent variables	ECONGROW		FDI		EXPORT		IMPORT		INFLR		EXCHR		INTEREST	
PCSEs	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t
The ISAs Extent														
AMEND	0.664	(0.338)	2.636***	(0.007)	−13.510	(0.979)	−67.777	(0.430)	−0.982	(0.326)	1.736**	(0.026)	−3.139*	(0.077)
NOAMEND	1.230	(0.200)	1.595	(0.212)	17.148**	(0.015)	59.478**	(0.060)	−1.497	(0.328)	0.642	(0.476)	−4.299	(0.187)
WITHTRANSL	0.204	(0.777)	2.105**	(0.013)	−77.589	(0.324)	−51.291	(0.427)	−2.356*	(0.064)	1.408*	(0.083)	−4.979**	(0.047)
NOTRANSL	2.409	(0.210)	5.936***	(0.000)	−18.042	(0.729)	−85.290	(0.877)	−8.422***	(0.001)	3.794	(0.244)	5.202	(0.307)
AMENDandTRANSL	−0.478	(0.543)	−1.146	(0.375)	−38.698	(0.595)	−60.524	(0.442)	−3.007**	(0.010)	0.520	(0.437)	1.635	(0.390)
LAWREQUIRE	−0.486	(0.530)	0.229	(0.890)	17.510	(0.582)	−22.572	(0.959)	−1.960**	(0.050)	0.014	(0.986)	−3.344	(0.106)
GAPinRULES	−1.935	(0.129)	−3.429	(0.278)	−40.382	(0.264)	11.335	(0.737)	0.355	(0.859)	1.342	(0.312)	−4.780*	(0.068)
IFRSREQUIRES	−1.534	(0.673)	−10.367***	(0.001)	−13.292	(0.732)	64.251	(0.881)	−4.289	(0.251)	3.354	(0.455)	10.308	(0.325)
Dummy 08–09														
D08-09	−3.488***	(0.001)	0.063	(0.955)	−162.232*	(0.056)	−216.220*	(0.060)	1.575	(0.411)	−0.147	(0.827)	2.320	(0.421)
Control Variables														
Geographical region														
EUROPE	−3.399***	(0.000)	6.260***	(0.000)	−16.200	(0.152)	−19.883	(0.765)	−7.752***	(0.000)	−24.328***	(0.000)	−10.444***	(0.000)
AMERICAS	−3.938***	(0.000)	0.469	(0.745)	98.067*	(0.060)	30.863*	(0.067)	−3.695***	(0.005)	−17.156***	(0.000)	−0.678	(0.748)
CENTRALSOUTHASIA	−0.506	(0.525)	−1.127	(0.430)	−20.252*	(0.076)	−75.131	(0.277)	−2.443**	(0.041)	−12.002**	(0.002)	0.046	(0.980)
EASTASIAPACIFIC	−0.896	(0.134)	0.412	(0.702)	21.210	(0.125)	16.635	(0.153)	−5.104***	(0.000)	−12.005***	(0.000)	−7.858***	(0.000)
MENA	−1.356	(0.338)	−5.090	(0.238)	−14.774*	(0.064)	−31.153	(0.384)	−0.204	(0.911)	18.344***	(0.000)	−29.370***	(0.000)
Official language														
ENGLISH	−1.634***	(0.003)	5.031***	(0.000)	−21.346	(0.686)	11.101	(0.162)	−5.518***	(0.000)	−17.814***	(0.000)	−0.068	(0.965)
FRENCH	−3.214***	(0.000)	−5.303***	(0.000)	12.020*	(0.075)	14.462**	(0.046)	−7.945***	(0.000)	−16.197***	(0.000)	5.414	(0.101)
SPANISH	3.640**	(0.035)	2.784**	(0.026)	−17.754*	(0.080)	−29.248*	(0.055)	1.072	(0.289)	12.920***	(0.000)	8.220	(0.140)
ARABIC	−1.426	(0.382)	1.950	(0.651)	14.920*	(0.070)	13.163*	(0.062)	−6.024***	(0.004)	−53.504***	(0.000)	14.148***	(0.001)
GERMAN	−1.801***	(0.007)	0.010	(0.994)	10.596*	(0.080)	75.132*	(0.070)	−6.938***	(0.000)	−9.575***	(0.000)	3.893	(0.215)
RUSSIAN	−1.863	(0.164)	3.311*	(0.068)	30.864	(0.696)	−68.690	(0.914)	4.572***	(0.005)	−7.267**	(0.013)	−5.663	(0.238)
Colonial history														
NEVERCOLONY	−0.892*	(0.058)	−0.359	(0.681)	146.971	(0.140)	174.801	(0.168)	−4.022***	(0.000)	−3.346	(0.108)	−6.268***	(0.000)
UKCOLONY	1.028*	(0.073)	1.246	(0.443)	−208.830*	(0.074)	−115.586*	(0.087)	1.459*	(0.092)	−5.737**	(0.033)	−3.648**	(0.015)
FRENCHCOLONY	1.299	(0.208)	7.204***	(0.000)	−321.478*	(0.069)	−184.950	(0.103)	−2.904**	(0.013)	23.361***	(0.000)	−1.740	(0.543)
SPANISHCOLONY	−2.322	(0.130)	1.691	(0.201)	−989.636*	(0.060)	−281.256*	(0.071)	−0.687	(0.572)	−16.472***	(0.000)	−9.947*	(0.047)
PORTUGALCOLONY	0.796	(0.265)	4.853**	(0.014)	−287.724*	(0.085)	−271.933*	(0.092)	−4.888***	(0.008)	−24.905***	(0.000)	−2.258	(0.312)
DUTCHCOLONY	1.087	(0.107)	8.410*	(0.074)	−445.159*	(0.053)	−229.556**	(0.031)	2.765**	(0.018)	10.533***	(0.000)	−10.069***	(0.001)
GERMANCOLONY	0.638	(0.476)	−3.372	(0.160)	−422.782*	(0.076)	−272.223*	(0.084)	5.857***	(0.000)	−0.495	(0.858)	−9.060***	(0.000)
RUSSIANCOLONY	1.567**	(0.041)	5.680***	(0.000)	−214.10	(0.473)	167.451	(0.489)	1.974	(0.145)	−19.493***	(0.000)	4.781**	(0.013)
Constant	6.345***	(0.000)	−1.125	(0.507)	225.277*	(0.084)	677.080	(0.316)	8.249***	(0.000)	26.185***	(0.000)	14.799***	(0.000)
Number of observations	3200		3200		3200		3200		3200		3200		3200	
Wald chi2, Prob > chi2	653.99***	(0.000)	879.06***	(0.000)	162.65***	(0.000)	107.45***	(0.000)	790.98***	(0.000)	285.17***	(0.000)	304.84***	(0.000)
R-squared	0.126		0.104		0.106		0.110		0.132		0.189		0.110	

Note: Statistical significance level (p-values) display in parentheses.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.10$.

compliance and potentially lower profits, which could lead to reduced investment and borrowing demand. This, in turn, could lead to a decrease in interest rates as lenders reduce their rates to encourage borrowing. However, the reasons for these negative relationships may depend on various factors, such as the specific context of the countries involved, the characteristics of the financial reporting environment, and the quality of financial statements (Elmghaamez, 2023).

The ISAs adoption by law (*LAWREQUIRE*) has a negative relationship with the inflation rate (*INFLR*). The negative effect of ISA adoption by law on *INFLR* can be linked to the importance of voluntary adoption in promoting a culture of transparency. When companies adopt ISAs voluntarily, it signals a commitment to high-quality financial reporting and transparency. When ISAs adoption is mandated by law, companies may feel less incentivized to go beyond the minimum requirements, which can lead to lower levels of transparency.

Overall, the regression analysis provides insights into the relationships between the variables and helps identify the factors that influence various economic indicators. The effects are not always straightforward and depend on the specific type of adoption and economic indicator being considered. The results highlight the importance of considering the context and specificities of each country when assessing the benefits and costs of ISA adoption (Elmghaamez, 2023). Table 6 shows all variables related to both ISAs adoption timing and ISAs adoption extent, as well as their expected directions and received results.

The results reported in Table 5 can be linked to the DOI theory. The positive and significant association between the extent of ISAs adoption and FDI, exports, and imports supports the DOI theory, as it implies that countries that adopt ISAs with specific characteristics (e.g., amendments, translation) are more likely to experience positive economic consequences, such as increased FDI and trade (Rogers, 2003).

On the other hand, the negative and significant association between the extent of ISAs adoption and inflation rates and interest rates suggests that some countries that adopt ISAs may experience negative economic consequences, such as increased inflation and interest rates. This finding also supports the DOI theory, implying that potential adopters should consider these potential negative consequences before adopting ISAs. Overall, these findings suggest that the adoption of ISAs may have differential economic consequences for different countries, depending on the characteristics of their adoption and their economic context (Rogers, 2003).

4.2.4. Additional analysis

We utilized time lag-1 to detect any presence of autocorrelation that may occur mainly in time series data. The results are presented in

Tables 7 and 8, which demonstrate that lagged dependent variables can change the sign of some coefficients, indicating that the time series data does not have a lagged effect. Thus, our main regression models exhibit robust estimates of the effects of independent variables. Table 7 presents the outcomes of lag-1 autocorrelation estimations to examine the impact of ISAs adoption time on the economic consequences of the adopting countries, while Table 8 presents the outcomes of lag-1 autocorrelation estimations to investigate the impact of ISAs adoption extent on the economic consequences of the adopting countries.

5. Conclusion

Few empirical studies have investigated the impact of ISA adoption on economic and financial consequences (Boolaky & Omoteso, 2016; Boolaky & Soobaroyen, 2017; Elmghaamez et al., 2020). This paper uses the DOI theory with one of the most extensive datasets to examine the economic consequences of early ISA adoption. The dataset comprises 160 countries over 20 years, with 3,200 observations and a wide range of macro-level economic indicators.

In summary, the results indicate that the early adopter of ISAs (*EARLYADOPTER*) has a negative and statistically significant impact on economic growth (*ECONGROW*) and FDI (*FDI*), but a positive and statistically significant impact on the interest rate (*INTEREST*) and exchange rate (*EXCHR*). The early majority adopter (*EARLYMAJORITY*) has a positive and statistically significant impact on economic growth (*ECONGROW*), FDI, and inflation rate (*INFLR*). In contrast, it has a negative and statistically significant impact on exchange rates (*EXCHR*). Finally, the late majority adopters (*LATEMAJORITY*) have a positive and statistically significant impact on FDI but a negative and significant impact on the level of exports (*EXPORT*) and imports (*IMPORT*).

Regarding the ISA adoption extent, we find that countries that adopted ISAs with amendments (*AMEND*) experienced higher FDI inflows and exchange rates. Countries that adopted ISAs without amendments (*NOAMEND*) experienced higher import and export levels. Moreover, countries that adopted ISAs with translation (*WITHTRANSL*) experienced higher FDI inflows and exchange rates. On the other hand, countries that applied ISAs only when *GAPinRULES* experienced lower interest rates. Surprisingly, the study finds that ISA adoption negatively and significantly affected the inflation rate of countries that adopted ISAs with translation and amendments and those required by law.

This study provides several contributions to the existing literature regarding the effects of ISAs' adoption on the economic performance of adopting countries. First, this paper offers a theoretical contribution to the extant theories that explain the economic benefits of ISAs adoption

Table 6
The expected sign and received results for all variables for both ISAs timing and extent.

Variable	Expected sign	Received Result
ISAs Timing		
ExperimenterEXPERIMENTER	+	Positive association with economic growth and FDI inflow, negative significant association with inflation, exchange volatility, and interest rate.
Early AdopterEARLYADOPTER	+	Negative association with economic growth and FDI inflow, positive significant association with exchange volatility and interest rate.
Early MajorityEARLYMAJORITY	+	Positive association with economic growth, FDI inflow, exports, and inflation rate.
Late MajorityLATEMAJORITY	–	Negative association with exports and imports.
LaggardLAGGARD	+	No significant association with economic indicators
ISAs Extent		
AMEND	+	Positive association with FDI and exchange volatility, negative association with inflation rate
NOAMEND	+	Positive association with exports and imports
WITHTRANSL	+	Positive association with FDI and exchange volatility, negative association with inflation and interest rates
NOTRANSL	+	Positive association with FDI, negative association with inflation rate.
AMENDandTRANSL	+	Negative association with inflation rate.
LAWREQUIRE	+	Negative association with inflation rate.
GAPinRULES	+	Negative association with interest rate.
IFRSREQUIRES	+	Negative association with FDI inflows.

Table 7

The results of lag-1 autocorrelation estimations examining the effects of ISAs adoption time on the economic consequences of the adopting countries.

Dependent variables	ECONGROW		FDI		EXPORT		IMPORT		INFLR		EXCHR		INTEREST	
	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t
Adoption categories														
EXPERIMENTER	0.432	(0.522)	6.296*	(0.067)	0.188	(0.608)	0.146	(0.695)	−2.497*	(0.073)	−15.461*	(0.071)	−2.783	(0.578)
EARLYADOPTER	−0.474	(0.423)	−2.623	(0.146)	−0.523*	(0.078)	−0.516*	(0.098)	−0.004	(0.998)	5.567	(0.308)	5.184**	(0.030)
EARLYMAJORITY	0.866*	(0.087)	4.004***	(0.003)	0.104	(0.668)	0.117	(0.645)	1.274	(0.228)	0.457	(0.913)	0.074	(0.972)
LATEMAJORITY	0.038	(0.951)	1.495	(0.310)	0.469	(0.346)	0.532	(0.323)	−0.892	(0.490)	−0.888	(0.847)	4.225	(0.271)
Dummy 08–09														
D08-09	0.237	(0.718)	8.421***	(0.000)	1.041***	(0.000)	1.223***	(0.000)	−0.829	(0.258)	8.325***	(0.000)	−9.635***	(0.000)
Control Variables														
Geographical region														
EUROPE	−4.470***	(0.000)	3.226	(0.155)	1.822***	(0.000)	1.978***	(0.000)	−7.270***	(0.000)	−24.052***	(0.000)	−14.987***	(0.000)
AMERICAS	−4.021***	(0.000)	−0.467	(0.851)	0.821	(0.293)	0.852	(0.322)	−4.089*	(0.064)	−21.047***	(0.001)	−1.309	(0.782)
CENTRALSOUTHASIA	−0.559	(0.595)	−3.699	(0.148)	1.242***	(0.008)	1.533***	(0.002)	−2.003	(0.273)	−14.468	(0.103)	−4.462	(0.400)
EASTASIAPACIFIC	−1.188	(0.229)	1.377	(0.561)	1.759***	(0.001)	1.734***	(0.002)	−7.486***	(0.000)	−13.700**	(0.023)	−10.492***	(0.003)
MENA	−1.191	(0.414)	−6.111***	(0.001)	1.904***	(0.000)	1.940***	(0.000)	0.527	(0.884)	7.481	(0.579)	−29.723***	(0.000)
Official language														
ENGLISH	−1.725*	(0.070)	5.469**	(0.017)	0.333	(0.386)	0.375	(0.359)	−3.759***	(0.009)	−17.051***	(0.002)	0.089	(0.973)
FRENCH	−3.641***	(0.000)	−1.269	(0.642)	0.712*	(0.073)	0.616	(0.140)	−6.913***	(0.003)	−18.937***	(0.008)	7.744	(0.113)
SPANISH	1.575	(0.191)	4.257*	(0.099)	0.489	(0.350)	0.579	(0.293)	0.290	(0.829)	7.535	(0.446)	−3.894	(0.255)
ARABIC	−1.061	(0.464)	5.580**	(0.015)	0.167	(0.735)	0.109	(0.828)	−8.587**	(0.024)	−48.706***	(0.001)	16.797**	(0.013)
GERMAN	−1.498**	(0.028)	2.643	(0.318)	0.915	(0.189)	0.782	(0.280)	−5.998***	(0.000)	−12.069	(0.108)	5.316*	(0.087)
RUSSIAN	−2.202**	(0.022)	1.732	(0.620)	0.029	(0.960)	−0.249	(0.649)	4.696*	(0.078)	3.717	(0.755)	−4.645	(0.544)
Colonial history														
NEVERCOLONY	−1.320	(0.101)	0.094	(0.966)	1.861***	(0.000)	1.883***	(0.000)	−4.448***	(0.003)	−2.863	(0.642)	−6.372**	(0.044)
UKCOLONY	0.147	(0.880)	−0.078	(0.977)	−0.161	(0.692)	−0.275	(0.512)	−0.087	(0.961)	−5.857	(0.291)	−4.365	(0.240)
FRENCHCOLONY	0.782	(0.395)	3.648	(0.145)	−0.691*	(0.087)	−0.681	(0.103)	−2.070	(0.408)	25.543***	(0.000)	−0.032	(0.995)
SPANISHCOLONY	−0.965	(0.421)	−0.123	(0.964)	0.200	(0.714)	0.096	(0.864)	−0.849	(0.654)	−4.575	(0.697)	0.345	(0.939)
PORTUGALCOLONY	0.364	(0.789)	6.676**	(0.041)	0.312	(0.678)	0.204	(0.808)	−3.736	(0.268)	−20.352**	(0.014)	3.237	(0.712)
DUTCHCOLONY	0.936	(0.124)	2.700	(0.653)	0.210	(0.748)	0.154	(0.835)	2.125	(0.307)	14.338	(0.294)	−7.423*	(0.098)
GERMANCOLONY	0.566	(0.773)	−7.648**	(0.027)	−1.663***	(0.004)	−1.598***	(0.004)	3.702	(0.106)	4.206	(0.686)	−13.375**	(0.045)
RUSSIANCOLONY	1.672**	(0.026)	8.230***	(0.001)	−0.850**	(0.022)	−0.967***	(0.009)	−0.935	(0.605)	−16.006**	(0.032)	3.332	(0.334)
Constant	6.586***	(0.000)	−6.256**	(0.018)	−1.246***	(0.009)	−1.380***	(0.008)	15.718***	(0.000)	23.701***	(0.002)	14.709***	(0.014)
Number of observations	3200		3200		3200		3200		3200		3200		3200	
F Value, Prob > F	15.540***	(0.000)	17.380***	(0.000)	46.360***	(0.000)	71.780***	(0.000)	31.890***	(0.000)	11.170***	(0.000)	8.500***	(0.000)
R-squared	0.189		0.211		0.522		0.524		0.271		0.389		0.225	

Note: Statistical significance level (p-values) display in parentheses.

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.10$.

Table 8
The results of lag-1 autocorrelation estimation examining the effects of ISAs adoption extent on the economic consequences of the adopting countries.

Dependent variables	ECONGROW		FDI		EXPORT		IMPORT		INFLR		EXCHR		INTEREST	
	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t	Coef.	P > t
The ISAs Status														
AMEND	0.429	(0.541)	1.984	(0.220)	−0.125	(0.718)	−0.089	(0.812)	1.666**	(0.050)	5.558	(0.216)	2.656	(0.302)
NOAMEND	1.536	(0.119)	2.369	(0.298)	0.728*	(0.088)	0.748*	(0.077)	−0.259	(0.869)	3.402	(0.487)	3.155	(0.326)
WITHTRANSL	0.106	(0.840)	1.828	(0.122)	0.191	(0.482)	0.184	(0.520)	−0.288	(0.772)	1.296	(0.769)	3.058	(0.305)
NOTRANSL	0.237	(0.900)	5.053*	(0.060)	−0.612*	(0.065)	−0.854**	(0.023)	−6.504***	(0.003)	8.443	(0.548)	13.681***	(0.003)
AMENDandTRANSL	−0.679	(0.326)	1.774	(0.451)	−0.277	(0.276)	−0.139	(0.558)	−0.915	(0.501)	−0.752	(0.863)	4.202*	(0.068)
LAWREQUIRE	−0.225	(0.720)	1.782	(0.317)	−0.146	(0.631)	−0.215	(0.505)	−0.182	(0.869)	−3.357	(0.574)	2.534	(0.351)
GAPinRULES	−3.633**	(0.031)	−9.985***	(0.002)	1.060*	(0.056)	1.153**	(0.049)	−5.523	(0.120)	8.830*	(0.078)	−3.105	(0.327)
IFRSREQUIRES	2.374	(0.228)	−10.535***	(0.002)	−0.867	(0.181)	−0.247	(0.616)	−1.542	(0.681)	−11.107	(0.127)	−2.820	(0.821)
Dummy 08–09														
D08-09	0.119	(0.872)	7.265***	(0.000)	1.011***	(0.000)	1.179***	(0.000)	−0.792	(0.335)	6.790***	(0.003)	−11.811***	(0.000)
Control Variables														
Geographical region														
EUROPE	−4.075***	(0.000)	4.917**	(0.041)	2.009***	(0.000)	2.174***	(0.000)	−7.422***	(0.000)	−24.364***	(0.000)	−14.352***	(0.001)
AMERICAS	−3.774***	(0.000)	0.267	(0.907)	0.890	(0.219)	0.925	(0.249)	−3.829*	(0.091)	−20.789***	(0.001)	−0.952	(0.848)
CENTRALSOUTHASIA	−0.428	(0.658)	−2.600	(0.331)	1.198***	(0.007)	1.521***	(0.001)	−1.458	(0.429)	−15.011*	(0.098)	−4.332	(0.432)
EASTASIAPACIFIC	−0.986	(0.310)	2.269	(0.356)	1.782***	(0.001)	1.769***	(0.002)	−6.870***	(0.000)	−13.711**	(0.026)	−10.233***	(0.005)
MENA	−1.004	(0.486)	−5.357***	(0.002)	2.275***	(0.000)	2.307***	(0.000)	0.012	(0.997)	6.433	(0.640)	−29.087***	(0.000)
Official language														
ENGLISH	−1.775*	(0.056)	5.878**	(0.012)	0.429	(0.264)	0.469	(0.248)	−4.274***	(0.002)	−17.648***	(0.002)	0.690	(0.806)
FRENCH	−3.684***	(0.000)	−2.136	(0.430)	0.579	(0.171)	0.455	(0.308)	−6.566***	(0.004)	−17.561**	(0.016)	7.307	(0.126)
SPANISH	1.242	(0.313)	2.780	(0.349)	0.509	(0.262)	0.583	(0.224)	−0.496	(0.743)	8.064	(0.434)	−2.259	(0.633)
ARABIC	−1.140	(0.454)	5.002**	(0.014)	−0.193	(0.663)	−0.264	(0.532)	−8.041**	(0.032)	−47.508***	(0.001)	15.647**	(0.026)
GERMAN	−1.770**	(0.019)	1.905	(0.540)	0.723	(0.322)	0.579	(0.440)	−5.811***	(0.000)	−12.500*	(0.094)	5.683**	(0.047)
RUSSIAN	−1.929**	(0.018)	4.187	(0.247)	0.433	(0.402)	0.066	(0.897)	4.073	(0.142)	3.620	(0.753)	−4.914	(0.523)
Colonial history														
NEVERCOLONY	−1.325*	(0.091)	0.427	(0.839)	1.929***	(0.000)	1.934***	(0.000)	−4.546***	(0.004)	−4.007	(0.524)	−6.267*	(0.055)
UKCOLONY	0.077	(0.936)	0.019	(0.994)	−0.048	(0.897)	−0.164	(0.670)	−0.518	(0.767)	−7.301	(0.192)	−4.707	(0.218)
FRENCHCOLONY	0.796	(0.399)	4.045	(0.116)	−0.516	(0.196)	−0.516	(0.223)	−2.528	(0.297)	23.948***	(0.001)	−1.144	(0.833)
SPANISHCOLONY	−0.666	(0.581)	2.182	(0.508)	0.291	(0.587)	0.203	(0.723)	−0.522	(0.780)	−6.186	(0.612)	−0.955	(0.868)
PORTUGALCOLONY	0.130	(0.924)	5.477*	(0.088)	0.189	(0.799)	0.040	(0.961)	−3.880	(0.232)	−20.632***	(0.009)	0.863	(0.921)
DUTCHCOLONY	0.805	(0.232)	2.359	(0.719)	0.426	(0.554)	0.347	(0.671)	1.441	(0.468)	13.101	(0.332)	−8.392*	(0.088)
GERMANCOLONY	0.578	(0.765)	−7.359**	(0.025)	−1.420**	(0.025)	−1.358**	(0.026)	2.987	(0.179)	2.310	(0.829)	−14.336**	(0.037)
RUSSIANCOLONY	1.672**	(0.019)	7.851***	(0.002)	−0.779**	(0.029)	−0.882**	(0.013)	−0.204	(0.910)	−14.637**	(0.039)	3.571	(0.299)
Constant	6.831***	(0.000)	−4.419*	(0.068)	−1.058**	(0.014)	−1.131**	(0.013)	15.703***	(0.000)	24.555***	(0.001)	18.803***	(0.000)
Number of observations	3200		3200		3200		3200		3200		3200		3200	
F Value, Prob > F	14.430**	(0.022)	20.770***	(0.000)	40.690***	(0.000)	62.890***	(0.000)	29.400***	(0.000)	14.790***	(0.000)	9.780***	(0.000)
R-squared	0.192		0.187		0.521		0.520		0.275		0.385		0.219	

Note: Statistical significance level (p-values) display in parentheses.

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.10$.

by employing a new theoretical framework suggested by DOI theory that has not yet been applied in an international auditing context. Second, our paper contributes to the current empirical literature to study the economic benefits of ISAs adoption by examining the effect of ISAs adoption on a wide range of economic indicators rather than including just a few economic factors as previous research did. Finally, unlike most prior ISAs studies that used small samples over a short period, this paper has selected a large sample selected which covers 160 countries for 20 years to examine the impact of ISAs adoption on the economic consequences of the adopting countries.

Our findings have significant implications for various stakeholders. For policymakers, regulators, standard-setters, and governments, the study highlights the importance of ensuring that any adoption of ISAs is designed and implemented in a way that balances the benefits and costs. They should consider how each form of adopting ISAs impacts economic growth, FDI inflows, exchange rates, and international trade. For example, countries implementing ISAs without amendments or translation overall had positive economic outcomes. However, countries adopting ISAs with amendments or translations had more negative economic results, which suggests that sometimes measures might need to be taken to mitigate any adverse effects. The potential trade-offs between mandatory and voluntary ISAs adoption should also be considered. The findings suggest that voluntary adoption may be more effective in promoting a culture of transparency and high-quality financial reporting, which could lead to positive economic outcomes, such as increased FDI and lower inflation rates.

The study provides insights into ISA adoption's potential benefits and costs for practitioners. Companies should carefully consider the impact of adopting ISAs on their operations, compliance costs, and potential impact on economic indicators. They should also work to ensure they have the necessary resources and expertise to implement ISAs effectively. Another implication is that practitioners should consider the potential costs and challenges associated with complying with ISAs. The negative relationship between ISA adoption when there are gaps in rules and interest rates suggests that companies may face higher compliance costs and increased challenges when required to comply with multiple reporting standards. Therefore, practitioners should consider ways to minimize these costs and challenges, such as using technology and automation to streamline compliance.

Our findings contribute to DOI theory by providing empirical evidence on the impact of early and late ISAs adoption on economic indicators. This expands our understanding of the diffusion and adoption of international standards across different countries. However, the negative relationship between early ISAs adoption and exports challenges the assumption that early adoption always leads to positive outcomes in international trade. This finding calls for further exploration and refinement of theoretical models to better comprehend the complexities of ISAs adoption and its effects on trade.

While this study contributes significantly to the literature on the economic effects of ISAs adoption, some limitations should be acknowledged. However, these also help academia by leading to suggestions for future research. First, the study only considered eight economic indicators at the macro-country level. Future research could explore the impact of other economic indicators, such as wage rate, unemployment, employment rates, money supply, and producer price index, on ISAs adoption. Second, the sample size was limited to the first 20 years of ISAs adoption. Future research could expand the sample size and consider different classification regimes. Third, we focused on the economic consequences of ISAs adoption at the macro-country level and did not control for institutional factors that could affect adoption, such as government regulations, investor protection, education policies, and regulatory and legal enforcement. Relatedly, researchers should explore whether any of these institutional variables act as moderating factors that may influence the relationship between ISA adoption and economic outcomes. Fourth, our study did not consider the risks and costs associated with ISAs adoption at the micro-firm level. Future research could

consider these factors and provide valuable insights for policymakers and practitioners. Fifth, it is recommended to extend the analysis to specific sectors or industries that are highly regulated or require specific types of information disclosure to further explore the impact of ISAs adoption on different economic sectors. Sixth, it is recommended to examine the impact of cultural factors on ISAs adoption and effectiveness by exploring the relationship between language proficiency, attitudes towards technology, and the extent of ISAs adoption in different countries. Seventh, future studies could examine the impact of economic factors such as trade policies and market conditions on the effectiveness of ISAs adoption, particularly in different regions. Finally, the findings suggest that further research is needed to understand better the mechanisms through which ISA adoption affects economic outcomes, such as through increased transparency and improved financial reporting quality. By taking a more holistic approach to study the impact of ISAs adoption on the economic consequences, researchers can better understand the factors that influence the effectiveness of these standards in different contexts.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Ibrahim Elmghaamez is an Accounting Lecturer at Coventry Business School. He previously served as an Assistant Lecturer in Accounting within the Faculty of Economics and Political Sciences at the University of Tripoli/Libya. He was also awarded MSc in Accounting and Finance from De Montfort University/UK in 2014, as well as a PhD in Accounting from the University of Huddersfield/UK in 2019. His research interests include but are not limited to, internal auditing, corporate governance, environmental and social responsibility, and the adoption of international accounting and auditing standards. He is a member of the Academic Support Programme in Research Excellence (ASPIRE) at Coventry University/UK. Elmghaamez is well-published in leading international journals, including the Managerial Auditing Journal., International Journal of Business Governance and Ethics, and International Journal of Disclosure and Governance.

Collins Ntim is a Professor of Accounting at the Centre for Research in Accounting, Accountability and Governance (CRAAG), Department of Accounting, Southampton Business School, University of Southampton, UK. He also holds visiting professorships in accounting at Taylor's University, Malaysia, University of Development Studies, Ghana; and Azerbaijan State University of Economics (UNEC), Azerbaijan. He has a PhD in accountancy (University of Glasgow, UK), as well as a professionally qualified chartered accountant (CPA, Australia). He has previously served as the Head of Department of

Accounting, associate dean for education, and Deputy Head of School for Research and Enterprise. He has published extensively in the accounting, finance, business and management journals focusing on accounting, finance, governance and development research interests. His work has generated significant research income, as well as cited widely, including by academics, policy-makers and the media. He has consulted widely for several organisations, such as the Financial Reporting Council, UK and World Bank. Collins is the current Vice President of the British Accounting and Finance Association and also served as a Unit of Assessment 17 (Business and Management Studies) full sub-panel member for the 2021 UK Research Excellence Framework (REF).

Kemi Yekini is a Professor of Accounting at the Aston Business School, University of Aston, Birmingham, UK. She holds an Adjunct Professor in Accounting role with Babcock Business School, University of Babcock, Nigeria. She is a professionally qualified chartered accountant with a PhD in Accounting. Her research focuses mainly on aspects of corporate disclosure practices from an interdisciplinary perspective, with an interest in the transparency and quality of corporate disclosures, CSR communications and corporate governance. Her research has produced high-quality outputs widely published in reputable national and international journals focusing on accounting, governance and management-related topics. She has produced several doctoral graduates and consulted and engaged in knowledge exchange with industries in her research area. She serves as editor, guest editor and editor-in-chief for reputable journals and currently reviews for highly ranked academic journals. She has presented her work at reputable national and international conferences across the globe.