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Earnings management, audit quality, and cost of debt: evidence from a Central Asian economy

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Abstract

Purpose – This study aims to examine the effects of earnings management and audit quality on cost of debt of listed companies in Kazakhstan. The study also investigates the effects of audit quality on earnings management and whether the relationship between earnings management and cost of debt is affected by audit quality in the context of a given emerging economy.

Design/methodology/approach – The study sample consists of public companies listed in the Kazakhstan Stock Exchange (KASE) from 2011 to 2016, and all data were obtained from audited financial statements and annual reports downloaded from the webpage of KASE. The study uses the cross-sectional ordinary least squares technique to test the impact of audit quality and earnings management on cost of debt.

Findings – The collected empirical evidence shows that earnings management is negatively related to cost of debt. The findings also indicate that higher audit quality leads to a lower cost of debt. However, the results suggest that audit quality has no impact on earnings management and that the effect of earnings management on cost of debt is not different for the companies audited by the Big Four and for the companies audited by other audit firms.

Practical implications – The findings of the study can be of interest to policy-makers, regulators, investors and practitioners in emerging markets with an institutional environment similar to that of Kazakhstan.

Originality/value – The study throws more light on the impact of earnings management and audit quality on cost of debt in Kazakhstan, representing the Central Asian region. This study also extends the current literature by providing empirical evidence that the relationship between earnings management and cost of debt is not affected by audit quality.

Keywords Emerging markets, Kazakhstan, Cost of debt, Earnings management, Audit quality

Paper type Research paper

1. Introduction

Earnings management is gaining increased attention among policy-makers, investors, practitioners and academics, because the credibility of financial information leads to better performance (Akhigbe *et al.*, 2013), improve a firm's value (Zimmerman, 2013) and reduce its cost of capital (Karjalainen, 2011). In other words, earnings management hides a firm's true performance from stakeholders, diminishes the quality of accounting information and consequently affects cost of capital. Therefore, earnings management plays an important role in assessing a firm's credit rating and determining its cost of debt (Carmo *et al.*, 2016). While there have been extensive studies examining earnings management in the context of developed markets, empirical studies exploring the extent of earnings management practices in emerging economies are quite few. Li *et al.* (2014) examine earnings management practices

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in emerging markets such as Brazil, Russia, India and China and investigate the relationship between country level governance mechanisms and earnings management among those countries. Other studies typically focus on the relationship between earnings management and other external and internal factors, but provide limited evidence on the effects of earnings management and audit quality on cost of debt in the context of emerging markets. As noted by Kabir *et al.* (2011), smaller emerging markets that attempt to improve their regulations and regulatory systems for better investment climate have not been widely analyzed and studied. In this regard, the present study fills this void by investigating the effects of earnings management and audit quality on cost of debt in the emerging market of Kazakhstan.

Emerging markets are a large component of the world economy (Ma and Ma, 2017), because their potential economic growth has been attracting a substantial amount of business investments throughout the world over the past decades (Li *et al.*, 2014). However, the quality of accounting information disclosed by business organizations in these markets is often considered inaccurate and unreliable. For example, in 2011, several Chinese companies were delisted from the US stock exchange markets because of their questionable financial reporting practices. Later, some Russian and Chinese companies withdrew their applications for listing in the US market because of strict reporting requirements and high information demands from investors. Moreover, large audit firms have also raised concerns regarding the credibility of accounting information provided by companies operating in emerging economies (Li *et al.*, 2014). As noted by Mahmood and Orazalin (2017), information asymmetry is high in emerging markets, and therefore, investors are often unaware of the quality of financial information and the extent of corporate reporting practices in such markets. As suggested by Li *et al.* (2014), future research of earnings management should also focus on emerging economies because earnings management practices seem to be more pervasive in those markets owing to their specific institutional characteristics and current transitions to free market economies. Therefore, this study examines the relationship between earnings management and cost of debt and investigates whether that relationship is affected by audit quality in the context of emerging markets such as Kazakhstan. The findings of the study can be of interest to policy-makers, regulators, business organizations and financial institutions in emerging markets with an institutional environment similar to that of Kazakhstan.

Kazakhstan is an emerging economy in Central Asia and located in the heart of Eurasia. It is the ninth largest country in the world by its territory and one of the top 15 countries with the world's biggest oil reserves. Since gaining independence in 1992, Kazakhstan has undergone substantial policy reforms and transitional changes from a traditional planned economy to a free market economy. Among the former USSR transition economies, Kazakhstan is the second largest economy after Russia and is viewed as the economic, political and financial hub of Central Asia. Currently, Kazakhstan is pursuing economic integration policies with regional and global economic organizations and planning to participate in bilateral, multilateral and international forums (Mahmood and Mostafa, 2018). The recent establishment of the Eurasian Economic Union, including Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia is an indication of the future economic policy of Kazakhstan. However, the capital market of Kazakhstan is still in its developing stage and facing certain challenges such as poor law enforcement capability, distorted and inaccurate market information, weak governance regimes and investor protection, weak banking regulation and supervision and low accountability and transparency (OECD, 2017; Omarkhanova *et al.*, 2016; Standard and Poor's, 2016). As noted by Johannesson *et al.* (2012), business organizations in emerging markets such as Kazakhstan should improve corporate

governance practices to attract more international investors. In other words, global investors that are interested in emerging markets focus on transparency and accountability, governance regimes and the credibility of financial reporting practices. As noted by Mahmood and Orazalin (2017), the importance of corporate disclosures and the credibility of accounting information disclosed by companies in Central Asian countries have received relatively less attention compared to other developed and emerging economies worldwide.

This study makes several contributions to the existing literature. It brings further light on the impact of earnings management and audit quality on cost of debt in the context of Kazakhstan, representing Commonwealth of Independent States (CIS) and Central Asian regions. The results of the study show that earnings management has economic consequences for Kazakhstani companies and managers engage in earnings management to influence cost of debt. In this regard, this study adds to the current literature suggesting how information asymmetry between borrowers and lenders tends to be mitigated by the credibility of financial information. The study is also extending the current literature by providing empirical evidence that the effect of earnings management on cost of debt is not different between companies audited by the Big Four and companies audited by other audit firms. According to the mainstream conclusion of previous studies, audit quality improves the credibility of financial information, which lowers cost of debt. In this regard, the results of this study may seem unusual. We argue, with our empirical evidence, that the lack of influence of audit quality on the relation between earnings management and cost of debt is probably an inherent phenomenon of emerging markets such as Kazakhstan. In particular, fast growing companies with relatively weak corporate governance regimes, weak investor protection, a highly volatile capital market, weak banking regulation and supervision, and low accountability and transparency explain the lack of influence of audit quality on earnings management practices in Kazakhstan. Therefore, identifying unique features and specific characteristics of emerging markets would rich the existing emerging market literature.

The rest of the paper is organized as follows. Section 2 describes the institutional environment. Section 3 discusses the literature and develops hypotheses. Section 4 describes sample, data resources and research methodology. Findings, analysis and discussion are presented in Section 5. Finally, Section 6 offers conclusions.

2. Institutional background
2.1 The stock market and financial reporting in Kazakhstan
The capital market of Kazakhstan has become an increasingly important driver of Kazakhstan's economy since the establishment of KASE in 1993. Located in the city of Almaty, KASE includes several markets such as foreign currency, government securities, equity securities, corporate debt securities, repo transactions and derivatives markets. Currently, there are more than 153 public companies listed in KASE, and the KASE index is represented by eight companies from the banking, telecommunications and energy industries. The capital market of Kazakhstan is considered unique compared to other industrialized markets. The portion of corporate issuers representing the manufacturing sector of KASE is relatively small, while banking, natural resources, oil and gas and service sectors are the key representatives of the stock exchange, thus indicating that the country's economic growth significantly depends on its natural resources and the banking sector. The capital market of Kazakhstan is still characterized by low liquidity of financial instruments, underdeveloped stock and corporate bond exchange markets, inaccurate market information, weak investor protection and poor law-enforcement capability (OECD, 2017; Omarkhanova et al., 2016). The market for corporate bonds is "dead" because debt securities

issued by public companies are not in demand in the market (Maratova, 2014). Currently, public companies listed in KASE mainly rely on loans from commercial banks and other financial institutions (BNEWS, 2017). Therefore, this study focuses on the private debt market of Kazakhstan.

After the collapse of the USSR, Kazakhstan was one of the first CIS countries to introduce and promulgate its national accounting standards. The transition to international accounting standards in Kazakhstan started in 1995, when "the Law on Accounting" was initially promulgated. The law required business organizations to apply Kazakhstani accounting standards in the preparation of financial statements. Therefore, public companies began reporting in accordance with the national accounting standards which were developed based on International Financial Reporting Standards (IFRS). However, the national accounting standards allowed for more flexibility in reporting choices and were not strictly enforced. Moreover, the successful implementation of economic reforms and the integration of the country's economy into the world market have attracted high levels of foreign investments, thus increasing the demand for transparency and accountability. All these changes, needs and reforms prompted an early adoption of IFRS, especially for publicly traded companies (Amanova *et al.*, 2016).

In 2002, the "Law on Accounting and Financial Reporting" replaced the initial "Law on Accounting" of 1995. The new law required transition from national accounting standards to IFRS for all companies except for small entities. In particular, the law presented three-tier accounting and financial reporting systems for business organizations in Kazakhstan. The first tier organizations, which are mainly micro entities, need to apply simple tax-based rules. The second tier organizations, which include small and medium organizations, are required to disclose in accordance with national accounting standards. The third-tier enterprises, mainly publicly listed companies, are required to apply IFRS. The adoption of IFRS was first implemented by financial institutions starting from January 1, 2003, and then followed by public companies from January 1, 2005, and finally by all other companies starting from January 1, 2006. However, there were delays with the actual date of transition to IFRS because of lack of qualified specialists in accounting and auditing, the absence of training centers and the resistance of companies to switch to new standards (Kapayeva, 2008).

2.2 Characteristics of the audit market in Kazakhstan

Auditing in Kazakhstan has a relatively short history. The Declaration of Independence of Kazakhstan on December 16, 1991, proved crucial in the subsequent development of the accounting and auditing profession. The formation and development of the audit market in Kazakhstan began in early 1990s when a self-supporting audit enterprise "Kazakhstan audit" was organized by the Kazakh Council of Ministers and operated under the Ministry of Finance. In 1992, "Kazakhstan audit" became a major independent audit company which nowadays provides auditing and assurance services to different forms of organizations (Shakirova, 2016). Currently, there are two accredited professional auditing organizations: the Chamber of Auditors, established in 1993 and the Collegium of Auditors, established in 2007. The Chamber of Auditors became a full member of the International Federation of Accountants in 2009 and received an accreditation as a professional organization of auditors in 2008. It is a non-profit organization consisting of 77 audit firms (associate members) and 396 certified professional auditors (full members). The Chamber has primary activities such as supporting and promoting the auditing profession, managing and providing educational and professional development opportunities for its members, strengthening audit quality through quality assurance

review systems, promoting international auditing standards and instituting a code of ethics and conducting investigative and disciplinary activities. The collegium of auditors is a professional auditing organization established by audit firms and auditors in accordance with the Law "On Auditing Activities" issued on November 20, 1998. Its overall mission is to ensure that audit firms and auditors comply with professional auditing standards and the code of ethics, provide mentoring and professional development for auditors and regain public trust in the auditing profession in Kazakhstan.

The Big Four firms emerged in the audit market of Kazakhstan only after 1991. EY (formerly known as Ernst & Young) was the first international auditing organization to open an office in 1992. Later, between 1992 and 1996, Deloitte, KPMG and PWC entered the audit market, followed by other international audit firms such as Baker Tilly, BDO international, Grant Thornton, Kreston International and Moore Stephens. However, market concentration in Kazakhstan is relatively lower than in developed markets. For example, the audit market in the developed markets such as the EU, UK and USA is mainly dominated by the Big Four, with market shares of 83 per cent, 97 per cent and 85 per cent, respectively (Huber, 2011). Currently, both the Big Four and local audit firms constitute the major providers of audit and assurance services in Kazakhstan. In comparison with other emerging markets such as India (39 per cent), China (14 per cent) and Russia (43 per cent) (Houqe *et al.*, 2017; Huber, 2011), the market share of the Big Four in Kazakhstan was approximately 65 per cent in March 2017 (Kim, 2017).

Developing the accounting and auditing profession is one of the leading factors influencing the national competitiveness of Kazakhstan in the global market (Amanova *et al.*, 2016). As mentioned earlier, Kazakhstan was among the first CIS countries to adopt IFRS and the Law "On Auditing Activities", which established the concept of auditing standards. Therefore, the accounting and auditing system in Kazakhstan is more advanced than that in other CIS countries. However, it has been argued that although there have been substantial reforms and regulatory frameworks in Kazakhstan to monitor and control the accounting and auditing environment, monitoring does not seem to be as effective as it should be (Amanova *et al.*, 2016). Moreover, the auditing profession worldwide has come under scrutiny over the past few decades because of high-profile audit scandals. As a result, the audit market of Kazakhstan has faced significant economic challenges over the past few years. In recent years, the audit market fell on average by 33 per cent because of the financial crisis of 2007-2008 and the total market revenue in US dollars declined by about 77 per cent (Kim, 2017). Additionally, the devaluation of the Kazakhstani tenge (local currency) and the recent decline in oil prices had a negative impact on the market.

Because of the fast growing but highly volatile capital market with relatively poor corporate governance regimes, weak investor protection, a lack qualified auditing professionals and current economic conditions in the market, it is presumed that the Big Four and local audit firms face the same economic challenges and incentives. The market share of local audit firms is increasing because of their competing services at relatively lower prices (Kim, 2017). Therefore, auditing and assurance services provided by the Big Four and other audit firms in Kazakhstan may not be substantially different in terms of audit quality. Moreover, to attract investors, promote positive impression among stakeholders, obtain less costly financing and comply with corporate regulations, Kazakhstani public companies may hire the Big Four audit firms for impression management purposes. As argued by Merkl-Davies and Brennan (2007), firms with greater resources are likely to hire Big Four auditors for impression management purposes, because these firms are more visible to the market.

3. Literature review and hypotheses development

The agency theory asserts that managers do not always act in the best interests of lenders in debt contracting, thus creating potential conflicts of interests and information asymmetry and giving a rise to the agency costs of debt (Jensen and Meckling, 1976). In this context, corporate disclosures including financial reports play an important role in mitigating information asymmetry and reducing agency conflicts between agents and principals (Cormier *et al.*, 2010; Shivakumar, 2013). Prior research documents that earnings are better predictors of future cash flows than current operating cash flows because accruals shift the recognition of operating cash flows over time to mitigate mismatching and timing issues inherent in cash flows and, therefore, are more informative about future operating cash flows (Dechow and Dichev, 2002; Ghosh and Moon, 2010). Higher-quality accounting information reduces information asymmetries and lenders reward high-quality financial reporting by setting lower interest rates (Ghosh and Moon, 2010; Vander Bauwhede *et al.*, 2015).

From the signaling theory perspective, managers have incentives to disclose more information to the capital market to gain investor confidence, improve the marketability of their shares and affect cost of capital (Healy and Palepu, 2001; Mahadeo *et al.*, 2011). As argued by Diamond and Verrecchia (1991) and Vurro and Perrini (2011), the transparency of financial information mitigates information asymmetry and reduces a firm's financing cost. This is consistent with the argument that lenders assess more accurately the performance, financial stability and default risks of borrowers based on the quality of accounting information, in particular, on earnings to determine interest rates (Carmo *et al.*, 2016). In other words, when defining the contractual terms of a loan, accounting information is used to mitigate information asymmetry and adverse selection by assessing liquidity, solvency and default risks of borrowers. Thus, it is assumed that higher quality financial information is likely to reduce cost of debt. The negative relationship between accruals quality and cost of debt has been documented in prior studies (Aldamen and Duncan, 2013; Francis *et al.*, 2005; Karjalainen, 2011).

However, opportunistic managers are likely to engage in earnings management to provide positive information about the firm's future prospects and reduce cost of debt by inflating earnings around the time of the credit rating (Demirtas and Rodgers Cornaggia, 2013). Prior research provides evidence that reported earnings are less informative to stakeholders when the incentive to manipulate accounting information is high because earnings management reduces the quality of financial reporting (Ghosh and Moon, 2010; Marquardt and Wiedman, 2004). Firms with private debt have more incentives to engage in earnings management to reduce the likelihood of debt covenant violations when debt is high (Dichev and Skinner, 2002). Thus, the quality of accounting information is low when the level of private debt is high because managers are more likely to use accounting choices and estimates that do not reflect their firms' underlying economic performance to avoid costly covenant violations (Ghosh and Moon, 2010). By examining the relationship between earnings management and cost of debt, this study sheds light on whether the private debt market is fooled by earnings management practices of Kazakhstani companies or not.

According to the agency theory, external auditing is one of the effective control mechanisms to monitor managers and provide a reasonable assurance on the credibility of financial information (Jensen and Meckling, 1976; Watts and Zimmerman, 1983). As noted by Becker *et al.* (1998) and Chung *et al.* (2003), the external auditing significantly improves the quality of financial information and reduces the probability of earnings manipulation by mitigating managerial opportunism. Most prior studies advocate that financial information is more reliable and relevant from companies audited by large international audit firms than

that of companies audited by other audit firms (Teoh and Wong, 1993; Becker *et al.*, 1998). This is consistent with the notion that high-quality external auditing improves the quality of financial information, which in turn, reduces cost of debt (Karjalainen, 2011; Persakis and Iatridis, 2015).

3.1 Earnings management and cost of debt

Information risk represents a set of different risks that investors may face as a result of receiving inadequate, poor and inaccurate accounting information which is used in making investment decisions (Bhattacharya *et al.*, 2003). In other words, information risk is the probability that accounting information that is pertinent to decision-making is either not available (information asymmetry) or is of poor quality (imprecise accounting information), or both. Because information risk is reflected in interest rates, firms with low quality financial information bear a higher cost of debt than firms with high quality financial information (Carmo *et al.*, 2016). In this regard, financial information enables lenders to assess a firm's default risk and predict its future earnings and cash flows (Karjalainen, 2011). Thus, banks assess the quality of accounting information more accurately in determining the cost of debt, because higher accruals quality is likely to reduce information risk. Because debt affects managerial incentives and accounting implications of the company, the relationship between debt and earnings quality depends on accruals quality (Ghosh and Moon, 2010). Therefore, lenders assess information risk in determining interest rates and firms that report lower quality accounting information tend to have a higher cost of debt than companies disclosing higher quality financial information (Carmo *et al.*, 2016).

Prior studies on the relationship between earnings management and cost of debt in the context of developed and developing markets provide mixed results. Using a large sample of firms over the period 1970-2001, Francis *et al.* (2005) find that poorer accruals quality is associated with higher cost of debt. Similarly, Bharath *et al.* (2008) document that higher accounting quality leads to a lower cost of debt in case of US companies. However, Gray *et al.* (2009) find no association between discretionary accruals and cost of debt and conclude that the heavily reliance of Australian companies on private debt reduces information risk and consequently the effect of earnings management on cost of debt. Ghosh and Moon (2010) conclude that firms that are heavily dependent on debt financing bear higher borrowing costs from lower earnings quality because the benefits from avoiding debt covenant violations exceed the higher costs of borrowing. They also find a non-monotonic association between debt and earnings quality. Carmo *et al.* (2016) report a negative relationship between earnings quality and cost of debt, thus concluding that Portuguese private companies have incentives to improve accounting information quality to affect cost of debt.

In the case of emerging markets, Nardi and Nakao (2009) find a positive relationship between earnings management and cost of debt for publicly traded Brazilian companies. Houqe *et al.* (2017) examine the effect of earnings management on cost of capital for the Indian market and reveal that group companies with lower earnings management have lower cost of capital than stand-alone companies. Overall, based on the discussion above, it is not clear whether the relationship between earnings management and cost of debt is positive or negative in this study. However, given weak banking regulation and supervision, low accountability and transparency, weak credit analysis and poor risk management by commercial banks in the capital market of Kazakhstan (Standard and Poor's, 2016), it is assumed that companies have stronger incentives to manage earnings to reduce cost of debt. Thus, the following hypothesis is constructed:

H1. The cost of debt of Kazakh public companies is negatively related to earnings management. That is, higher earnings management leads to a lower cost of debt.

3.2 Audit quality and cost of debt

Prior research studies indicate that higher audit quality is associated with decreased cost of debt. Minnis (2011) investigates the impacts of external audits on cost of debt for the US market and provides evidence that higher audit quality lowers cost of debt and that banks place more weights on the quality of audit when determining interest rates, because they believe that external audits improve the credibility of accounting information. Using data of privately held companies in Finland, Karjalainen (2011) finds a negative association between audit quality and cost of debt capital, thus indicating that firms audited by the Big Four bear a lower cost of debt than other firms. Similarly, Houqe *et al.* (2017) reveal that high audit quality, attributable to assurance services by the Big Four, decreases cost of capital for the Indian market. These findings support the notion that higher audit quality improves the quality of accounting information, mitigates information asymmetries and reduces cost of debt (Karjalainen, 2011; Pittman and Fortin, 2004).

Given the above discussion, it is assumed that companies audited by the Big Four bear a lower cost of debt than those audited by other audit firms. Thus, the following hypothesis is developed:

H2. The cost of debt of Kazakh public companies is negatively related to audit quality. That is, higher audit quality leads to a lower cost of debt.

3.3 Audit quality and earnings management

From the agency theory perspective, high quality audit is an effective governance mechanism to assess internal control systems, provide reasonable assurance on the quality of corporate disclosures and mitigate agency costs (Jensen and Meckling, 1976; Watts and Zimmerman, 1983). As proposed by DeAngelo (1981), larger audit firms have more incentives to maintain their reputation as providers of high quality assurance services than smaller audit firms, and therefore audit quality improves with the size of an audit firm. In other words, higher audit quality serves as an effective tool to constrain earnings management practices because the client's reputation may suffer if financial reporting misstatement is detected (Becker *et al.*, 1998; Francis and Wilson, 1988). The effectiveness of external auditing and its ability to deter earnings management depends on audit quality (Becker *et al.*, 1998). In other words, higher audit quality is more likely to detect accounting manipulations and reporting errors in contrast to lower audit quality. Consistent with this notion, a number of prior studies have documented a negative association between audit quality and earnings management (Becker *et al.*, 1998; Chen *et al.*, 2011; Francis, 2004). However, some studies conclude that high audit quality is less effective in constraining earnings management practices in case of emerging markets (Habbash and Alghamdi, 2017; Kabir *et al.*, 2011).

Based on the discussion and the findings of most prior studies, it is assumed that earnings management is lower in companies with higher audit quality than companies with lower audit quality. Therefore, the following hypothesis is developed:

H3. The level of earnings management is negatively related to audit quality. That is, higher audit quality constrains earnings management practices of Kazakh public companies.

3.4 Audit quality, earnings management and cost of debt

High-quality audits provided by large and independent auditors improve the credibility of financial information (Becker *et al.*, 1998; Teoh and Wong, 1993) and reduce cost of debt (Karjalainen, 2011; Minnis, 2011; Pittman and Fortin, 2004). Higher audit quality is associated with fewer information asymmetries between a firm and its stakeholders (Chen *et al.*, 2011). In other words, audit quality increases the credibility of accounting information, which in turn, reduces information asymmetries between managers and lenders by allowing outsiders to assess the credibility of financial information. Karjalainen (2011) provides evidence that both the Big Four audits and accruals quality are value relevant in the pricing of debt capital for Finnish firms. Chen *et al.* (2011) conclude that non-state-owned firms that hire large audit firms exhibit greater reduction both in earnings management and cost of capital than state-owned firms that employ large audit firms in China. Similarly, Houqe *et al.* (2017) conclude that higher audit quality deters earnings management and reduces cost of capital in case of Indian companies. However, Francis and Wang (2008) and Maijoor and Vanstraelen (2006) argue that the Big Four audit firms are less inclined to provide high quality assurance services in markets with lower level of enforcement and weaker investment protection. Consistent with this view, Kabir *et al.* (2011) provide evidence that Big Four auditors do not have a positive impact on the quality of accounting information for the emerging market of Bangladesh because of weak investment protection and low regulatory regimes.

Based on the discussion and the findings of most prior studies, it is assumed that higher audit quality improves the credibility of financial information, which in turn, reduces cost of debt. Therefore, the following hypothesis is proposed:

H4. Audit quality influences the relationship between earnings management and cost of debt. That is, the effect of earnings management on cost of debt is different between companies audited by the Big Four and companies audited by other audit firms.

4. Data and methodology

4.1 Sample and data collection

The initial sample consisted of all public companies listed in KASE from 2010 to 2016. The data were obtained from audited financial statements downloaded from companies' corporate websites and financial reports available on the webpage of KASE (www.kase.kz). Financial institutions were excluded from the sample because of their different accounting implications and unique industry characteristics and regulations. Further, small and medium sized companies with insufficient accounting data for the given time period of six years were eliminated from the sample. This selection approach resulted in a sample of 73 non-financial companies that are listed in the KASE and operating in four major industries, including manufacturing, service, mining, and petroleum. Because negative shareholder equity indicates a firm's severe financial constraints and may distort statistical results, it is suggested that observations with negative equity should be removed (Jaggi and Lee, 2002). Therefore, after eliminating observations with negative equity values, the final sample consists of 364 firm-year observations for the period 2010-2016.

4.2 Research model

To test *H1* and estimate the effects of earnings management and other determinants on cost of debt, we use the following cross-sectional OLS regression model:

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4.2 1. Model 1

$$
\begin{aligned}
COD_{i,t} = {} & \beta 0 + \beta 1(EM_{i,t-1}) + \beta 2(IC_{i,t-1}) + \beta 3(LIQR_{i,t-1}) \\
& + \beta 4(COL_{i,t-1}) + \beta 5(LEV_{i,t-1}) + \beta 6(ROA_{i,t-1}) \\
& + \beta 7(AGE_{i,t-1}) + \beta 8(SIZE_{i,t-1}) + \sum\nolimits_{(k=1)}^{4} \beta i(INDK) \\
& + \sum\nolimits_{n=2010}^{2016} \beta j(YEARn) + \varepsilon it
\end{aligned}
$$

where $COD_{i,t}$ – the cost of debt of firm i in year t and measured as the ratio of interest expense of year t to average debt; $EM_{i,t-1}$ – earnings management measured as the absolute value of discretionary accruals (DAC) under the Kothari model (Kothari *et al.*, 2005) and the absolute value of discretionary accruals (MDAC) under the modified Jones (Dechow *et al.*, 1995) model; $IC_{i,t-1}$ – an interest coverage ratio, estimated as earnings before interest, taxes, depreciation and amortization (EBITDA) divided by interest expense; $LIQR_{i,t-1}$ – a liquidity ratio, estimated as current assets divided by current liabilities; $COL_{i,t-1}$ – a proxy for assets that can be pledged as collateral by a company and calculated as property, plant and equipment (PPE) divided by total assets; $LEV_{i,t-1}$ – a leverage ratio and is calculated as total debt divided by total assets; $ROA_{i,t-1}$ – is a return on assets, measured as net income divided by total assets; $AGE_{i,t-1}$ – firm age; $SIZE_{i,t-1}$ – firm size, measured as the natural logarithm of total assets. All independent variables are lagged one year, because banks determine interest rates based on accounting information obtained from financial reports of the previous year (Carmo *et al.*, 2016).

H2 is intended to test whether higher audit quality leads to a lower cost of debt. To evaluate this hypothesis, we estimate the following model:

4.2.2. Model 2

$$
\begin{aligned}
COD_{i,t} = {} & \beta 0 + \beta 1(AUDIT_{i,t}) + \beta 2(IC_{i,t-1}) + \beta 3(LIQR_{i,t-1}) \\
& + \beta 4(COL_{i,t-1}) + \beta 5(LEV_{i,t-1}) + \beta 6(ROA_{i,t-1}) \\
& + \beta 7(AGE_{i,t-1}) + \beta 8(SIZE_{i,t-1}) + \sum\nolimits_{(k=1)}^{4} \beta i(INDK) \\
& + \sum\nolimits_{n=2010}^{2016} \beta j(YEARn) + \varepsilon it
\end{aligned}
$$

where, $AUDIT_{i,t}$ – a dummy variable that takes a value of one if financial statements of the company are audited by the Big Four, and otherwise zero. In general, this model tests the impact of audit quality on earnings management practices. All other variables are the same as in the first model.

H3 posits that higher audit quality constrains earnings management. To test this hypothesis, we use the following model:

4.2.3. Model 3

$$
\begin{aligned}
EM_{i,t} = {} & \beta 0 + \beta 1(AUDIT_{i,t}) + \beta 2(LEV_{i,t}) + \beta 3(AGE_{i,t}) + \beta 4(SIZE_{i,t}) \\
& + \sum\nolimits_{(k=1)}^{4} \beta i(INDK) + \sum\nolimits_{n=2010}^{2016} \beta j(YEARn) + \varepsilon it
\end{aligned}
$$

where, $EM_{i,t}$ – earnings management measured as the absolute value of discretionary accruals (DAC) under the Kothari model (Kothari *et al.*, 2005) and the absolute value of discretionary accruals (MDAC) under the modified Jones (Dechow *et al.*, 1995) model; $AUDIT_{i,t}$ – a dummy variable that takes a value of one if financial statements of the company are audited by the Big Four, and otherwise zero. Following prior studies (Ahmad-Zaluki *et al.*, 2011; Jiang *et al.*, 2008; Klein, 2002; Xie *et al.*, 2003), we include several possible indicators of earnings management such as leverage, firm age and firm size as control variables. In particular, leverage is included because highly leveraged firms are more likely to manage earnings to avoid debt covenant violations (Jiang *et al.*, 2008; Klein, 2002). Firm age is controlled because older and more established firms with a sound business model have a lower level of information asymmetry and therefore are less likely to engage in earnings management (Ahmad-Zaluki *et al.*, 2011). Firm size is also included because smaller firms that operate with less scrutiny tend to report higher levels of discretionary accruals (Xie *et al.*, 2003). In general, this model tests the impact of audit quality on earnings management practices.

H4 tests whether audit quality influences the relationship between earnings management and cost of debt. To evaluate this hypothesis, we introduce in the second model an interaction *AUDIT*EM* between audit quality and earnings management, yielding the following model:

4.2.4 Model 4

$$
\begin{aligned}
COD_{i,t} = {} & \beta 0 + \beta 1(AUDIT_{i,t}) + \beta 2(EM_{i,t-1}) + \beta 3(AUDIT, t-1 * EM_{i,t-1}) \\
& + \beta 4(IC_{i,t-1}) + \beta 5(LIQR_{i,t-1}) + \beta 6(COL_{i,t-1}) + \beta 7(LEV_{i,t-1}) \\
& + \beta 8(ROA_{i,t-1}) + \beta 9(AGE_{i,t-1}) + \beta 10(SIZE_{i,t-1}) \\
& + \sum\nolimits_{k=1}^{4} \beta i(IND) + \sum\nolimits_{n=2010}^{2016} \beta j(YEAR) + \varepsilon it
\end{aligned}
$$

where, $AUDIT_{i,t} * EM_{i,t-1}$ – an interaction variable between the AUDIT variable and earnings management ($EM_{i,t-1}$). In general, this model tests whether the effect of audit quality on cost of debt is different between companies audited by the Big Four and companies audited by other audit firms. All other variables are the same as in the first model. To account for heteroscedasticity and serial correlation, we run cross-sectional OLS regressions based on robust standard errors clustered by firm. Thus, the estimated coefficients are not biased by heteroscedasticity and serial correlation of residuals.

4.3 Measurement of cost of debt

To measure the cost of debt (COD) level for each company, we use a proxy for cost of debt proposed by Carmo *et al.* (2016) and Karjalainen (2011). In particular, we estimate the cost of debt by calculating an interest rate for each year. For example, the cost of debt for firm *i* in year *t* is calculated as interest expense for year *t* divided by the average interest bearing debt outstanding during year *t* and multiplied by 100. Therefore, the COD variable is expressed in percentage terms and varies between 0 and 100 per cent.

4.4 Measurement of earnings management

There is a large body of earlier literature that has examined earnings management using abnormal accruals, measured as a prediction from accruals models (Dechow *et al.*, 1995; Jones, 1991; Kasznik, 1999; Kothari *et al.*, 2005). However, there is no conclusive evidence on

which accruals estimation model provides a best measure of accruals quality (Gul *et al.*, 2009). Most prior studies (Chen *et al.*, 2011; Houqe *et al.*, 2017; Karjalainen, 2011) suggest the modified Jones model (Dechow *et al.*, 1995) to measure discretionary accruals. However, Kothari *et al.* (2005) argue that a performance adjusted-matched approach to measure accruals quality is superior to other models in terms of power and specification. Prior studies (Chang and Sun, 2009; Chen and Wang, 2011; Jaggi *et al.*, 2009; Sun *et al.*, 2010) suggest that the Kothari model (Kothari *et al.*, 2005) that is adjusted for a performance-matched firm's discretionary accruals based on ROA and industry membership mitigates heteroscedasticity, lack of power and misspecification issues. We use the performance adjusted discretionary model (Kothari *et al.*, 2005) and the modified Jones model (Dechow *et al.*, 1995) to derive the measure of earnings management.

Total accruals (TA$_{it}$) are measured as the difference between earnings before extraordinary items and discontinued operations and cash flows from operating activities. To measure earnings management, we obtain discretionary accruals which are the residuals of the following models:

The modified Jones model (Dechow *et al.*, 1995) parameters are estimated as follows:

$$\frac{TA_t}{A_{t-1}} = \alpha_1 \left(\frac{1}{A_{t-1}}\right) + \alpha_2 \left[\frac{(\Delta REV_t - \Delta REC_t)}{A_{t-1}}\right] + \alpha_3 \left(\frac{PPE_t}{A_{t-1}}\right) + \varepsilon_{i,t}$$

where:

TA_t – total accruals, measured as the difference between earnings before extraordinary items and discontinued operations and operating cash flows from activities; A_{t-1} - total assets at the end of year $t - 1$; ΔREV_t – the difference in operating revenues in year t and year $t - 1$; ΔREC_t – the difference in net receivables between year t and year $t - 1$; PPE_t – property, plant and equipment at the end of year t.

In the performance-adjusted discretionary model proposed by Kothari *et al.* (2005), total accruals are estimated as:

$$\frac{TA_t}{A_{t-1}} = \alpha_1 \left(\frac{1}{A_{t-1}}\right) + \alpha_2 \left[\frac{(\Delta REV_t - \Delta REC_t)}{A_{t-1}}\right] + \alpha_3 \left(\frac{PPE_t}{A_{t-1}}\right) + \alpha_4 \left(\frac{ROA}{A_{t-1}}\right) + \varepsilon_{i,t}$$

where:

ROA_t – return on assets in year t and other variables are the same as in the previous equation. The only adjustment to the modified Jones model (Dechow *et al.*, 1995) is an adjustment for a performance-matched firm's discretionary accruals based on ROA and industry membership.

Because managers might manage their earnings using either income-increasing accruals or income-decreasing accruals, we take the absolute value of discretionary accruals to assess the extent of earnings management. This approach is consistent with previous studies that use absolute values of discretional accruals as a measure for a mixed effect of upward or downward earnings management practices (Barth *et al.*, 2008; Gabrielsen *et al.*, 2002). Absolute values of discretionary accruals treat both income-increasing and income-decreasing accruals symmetrically, and high values of discretionary accruals suggest low quality earnings (Gul *et al.*, 2009). Thus, two earnings management variables are the absolute discretionary accruals (DAC) obtained from the Kothari model (Kothari *et al.*, 2005) and the absolute discretionary accruals (MDACC) obtained from the modified Jones (Dechow *et al.*, 1995) model.

4.5 Measurement of audit quality
As mentioned previously, assurance services provided by the Big Four are associated with higher quality audits and therefore lead to more transparent and reliable corporate disclosure practices. Francis and Wilson (1988) conclude that larger international audit firms are associated with more established brand name reputation and therefore provide higher quality auditing services to maintain their reputation. As suggested by DeAngelo (1981), audit quality increases with the size of an audit firm because larger international audit firms have stronger incentives to safeguard their independence and objectivity. Prior research supports this notion that the Big Four audit firms provide higher quality audits as reflected in lower discretionary accruals (Becker *et al.*, 1998; Francis and Wilson, 1988). Therefore, audit quality (AUDIT) is measured as a dummy variable that takes a value of one if financial statements of the company are audited by Big Four auditors.

4.6 Measurement of other variables
Based on prior studies (Carmo *et al.*, 2016; Chen *et al.*, 2011; Houqe *et al.*, 2017), we incorporate several control variables, commonly used in earnings management literature to control for potentially confounding effects of specific factors related to cost of debt. In particular, the explanatory variables used in the analyses are an interest coverage ratio (IC), estimated as earnings before interest, taxes, depreciation and amortization divided by interest expense; a liquidity ratio (LIQ), estimated as current assets divided by current liabilities; assets pledged as collateral (COL), measured as property, plant and equipment divided by total assets; a leverage ratio (LEV), calculated as total debt divided by total assets; a return on equity (ROA), measured as net income divided by total assets; firm age (AGE), measured as the number of years since the foundation of the company; firm size (SIZE), estimated as the natural log of total assets. IC is included as a control variable because a firm's greater ability to make interest payments leads to a lower cost of debt (Stanisic *et al.*, 2016). LIQ is an important determinant of firms' cost of debt because firms with higher liquidity have better coverage of outstanding debt and therefore lower cost of debt (Oikonomou *et al.*, 2014). COL measures a firm's ability to pledge collateral which may reduce cost of external financing and increase debt capacity (Benmelech and Bergman, 2009). LEV is included because an increase in the proportion of debt in a firm's capital structure increases the credit risk, thus leading to higher interest rates (Anderson *et al.*, 2003). ROA may also affect cost of debt as firms with better profitability are likely to bear less default risk and therefore have lower cost of debt (Margaritis and Psillaki, 2010). AGE is included as a control variable because more mature firms are likely to have lower interest rates because of their better credit histories and long standing relationships with lenders (Diamond, 1989; Karjalainen, 2011). SIZE is included as larger companies tend to have a lower cost of debt because of lower perceived risk (Bachoo *et al.*, 2013; Houqe *et al.*, 2017). Definitions and measurements of all variables are presented in Table I.

5. Findings and discussion
Table II presents descriptive results and *t*-values of discretionary accruals for each year and each industry. The reported *t*-statistics show that the mean values of discretionary accruals are statistically significant from zero for all years and industries. These results indicate that Kazakhstani public companies misrepresent their accounting results either by increasing earnings to hide their true financial performance and communicate their superior position to the market or, on the contrary, decreasing earnings to pay less taxes and contributions. This finding is consistent with the notion that earnings management is more pervasive in

Variables	Acronym	Operationalization
Cost of debt (%)	COD	Interest expenses for year t divided by the average interest-bearing debt in the beginning and end of year t and multiplied by 100
Earnings management	EM	Discretionary accruals (DAC) measured as residuals under the Kothari *et al.* (2005) model and discretionary accruals (MDAC) measured as residuals under the modified Jones model (Dechow *et al.*, 1995)
Audit quality	AUDIT	Dummy variable that takes a value of one if financial statements of the company are audited by the Big Four; otherwise, zero
Interest coverage ratio	IC	Earnings before interest, taxes, depreciation and amortization divided by interest expenses
Liquidity ratio	LIQR	Current assets divided by current liabilities
Assets pledged as collateral	COL	Property, plant and equipment divided by total assets
Leverage ratio	LEV	Total debt divided by total assets
Return on assets	ROA	Earnings after tax divided by total assets
Firm age	AGE	Number of years since the foundation of the company
Firm size	SIZE	The natural logarithm of total assets

Table I.
Research variables definition/measurement

	Obs.	Mean	Median	SD	t	p-value
Panel A: year						
DAC – 2016	71	0.416	0.299	0.552	6.344***	0.000
DAC – 2015	67	0.475	0.333	0.743	5.238***	0.000
DAC – 2014	61	0.367	0.335	0.245	11.706***	0.000
DAC – 2013	60	0.445	0.333	0.735	4.685***	0.000
DAC – 2012	53	0.384	0.305	0.608	4.596***	0.000
DAC – 2011	52	0.277	0.262	0.174	11.464***	0.000
TOTAL	364	0.399	0.314	0.564	13.498***	0.000
Panel B: industry						
DAC – mining of natural resources	58	0.661	0.309	1.076	4.677***	0.000
DAC – oil, gas and energy	90	0.361	0.286	0.554	6.172***	0.000
DAC – manufacturing companies	123	0.337	0.354	0.193	19.390***	0.000
DAC – service companies	93	0.354	0.305	0.372	9.186***	0.000
TOTAL	364	0.399	0.314	0.564	13.498***	0.000

Table II.
Descriptive statistics of DAC estimations by year and industry

Notes: ***, ** and *indicate significant levels 1, 5 and 10 per cent, respectively; DAC: discretionary accruals

emerging markets (Li *et al.*, 2011, 2014), especially in countries with weak investor protection and legal enforcement (Burgstahler *et al.*, 2006; Leuz *et al.*, 2003).

Table III displays the descriptive statistics of all other variables. The mean values for interest coverage, liquidity and leverage ratios are 37.06, 3.07 and 0.41, respectively. The mean value of ROA is 1.72 per cent, with a standard deviation of 18.07 per cent, and it varies between −92.51 per cent and 58.41 per cent. The reported statistics for AUDIT indicate that 65.30 per cent of companies are audited by the Big Four audit firms. The average age of the sampled companies is twelve years and ranges from 1 to 40 years, thus indicating that after

	Obs.	Mean	Median	SD	Min.	Max.	Q25%	Q75%	Central Asian economy
COD (%)	438	7.350	7.126	4.554	0.000	44.820	4.431	9.650	
IC	438	37.063	4.464	214.766	−66.448	3,157.815	1.029	12.067	
LIQR	438	3.071	1.174	13.851	0.000	258.279	0.698	2.175	
COL	438	0.447	0.481	0.288	0.000	0.941	0.185	0.698	
LEV	438	0.414	0.307	0.581	0.000	7.377	0.159	0.509	
ROA (%)	438	1.728	3.445	18.070	−92.51	58.41	−1.518	8.643	
AGE	438	12.251	12.000	6.039	1.000	40.000	8.000	16.000	
SIZE	438	17.487	17.243	2.150	10.846	23.835	16.006	18.700	
Dichotomous variables		*Yes(1)*	*No (0)*						
AUDIT (%)	438	65.30	34.70						

Notes: COD: the cost of debt; IC: the interest coverage ratio; LIQR: the liquidity ratio; COL: the assets pledged as collateral; LEV: the leverage ratio; ROA: return on assets; AGE: firm age; SIZE: firm size; AUDIT: auditor type

Table III.
Descriptive statistics of the variables

gaining independence in 1991, Kazakhstan has become a relatively new emerging market in the Eurasian continent.

Table IV reports descriptive statistics for COD and DAC on the basis of audit quality. For companies audited by the Big Four, the mean (median) value for COD is 6.477 per cent (6.369 per cent) compared with companies audited by non-Big Four audit firms 8.993 per cent (9.058 per cent). The *t*-statistic shows that the difference in means of COD is significant, thus indicating that companies audited by non-Big Four audit firms are riskier than those audited by the Big Four. The mean values for DAC show that companies audited by the Big Four exhibit slightly higher earnings management than companies audited by non-Big Four audit firms. However, the difference in means of DAC is insignificant.

Table V presents Pearson correlations among variables for the period 2011-2016. The results show that DAC, as predicted, is negatively correlated with COD, at the 1 per cent significance level, suggesting that there is a linear relationship between these variables. Similarly, the correlation between COD and AUDIT is negative and statistically significant, thus supporting our initial expectations. The correlations among the independent variables are not high (the highest correlation is between LEV and ROA at −0.477). As suggested by Pallant (2007), multicollinearity is present if a correlation coefficient exceeds a threshold

		COD (%)	DAC
	Mean	6.477	0.414
Big Four audit firms	Median	6.369	0.378
	SD	3.464	0.411
	Mean	8.993	0.368
Non-Big Four audit firms	Median	9.058	0.185
	SD	5.764	0.79
Difference in means (*t*-statistics)		5.697***	0.601
	Mean	7.35	0.399
Total	Median	7.126	0.314
	SD	4.554	0.564

Notes: COD: the cost of debt; DAC: the absolute value of discretionary accruals measured as residuals under the Kothari *et al.* (2005) model

Table IV.
Descriptive statistics of cost of debt and earnings management by audit quality: Big Four vs non-Big Four audit firms

	COD	DAC	IC	LIQR	COL	LEV	ROA	AGE	SIZE	AUDIT
COD	1									
DAC	−0.168**	1								
IC	−0.093	−0.053	1							
LIQR	−0.090	0.200**	0.016	1						
COL	−0.003	0.030	0.006	−0.175**	1					
LEV	−0.080	0.242**	−0.128*	−0.053	−0.210**	1				
ROA	0.058	−0.200**	0.130*	0.017	0.144**	−0.477**	1			
AGE	−0.008	−0.099	0.017	−0.038	0.135*	−0.089	0.115*	1		
SIZE	−0.169**	−0.116*	0.104*	0.082	0.249**	−0.205**	0.140**	−0.122*	1	
AUDIT	−0.289**	0.038	−0.102	−0.039	0.411**	−0.009	0.099	0.134*	0.430**	1

Table V.
Pearson correlations among variables (N = 364)

Notes: COD: the cost of debt; DAC: discretionary accruals; IC: the interest coverage ratio; LIQR: the liquidity ratio; COL: assets pledged as collateral; LEV: the leverage ratio; ROA: return on assets; AGE: firm age; SIZE: firm size; AUDIT: auditor type; **Correlation is significant at the 0.01 level (two-tailed); *Correlation is significant at the 0.05 level (two-tailed)

value of 0.700. The results show that none of the correlations among explanatory variables exceeds this threshold value, thus indicating the absence of multicollinearity in our analyses.

Table VI summarizes regression results of cost of debt on earnings management variables and other explanatory variables. The estimated coefficients of DAC and MDAC are negative and statistically significant with COD. These findings support our initial hypothesis that there is a negative relationship between earnings management and cost of debt for public companies in Kazakhstan. This empirical evidence is consistent with the finding of Bharath *et al.* (2008) that companies manipulate earnings to affect their cost of

	Expected sign	COD (Model 1)	COD (Model 2)
DAC	−	−1.024*** (−2.85)	
MDAC	−		−0.978*** (−3.07)
IC	−	−0.0025* (−1.98)	−0.0025* (−1.97)
LIQR	−	−0.0176** (−2.60)	−0.0184** (−2.82)
COL	−	0.435 (0.37)	0.425 (0.36)
LEV	+	−0.573* (−1.66)	−0.617* (−1.61)
ROA	−	−0.0072 (−0.56)	−0.0073 (−0.57)
AGE	−	−0.0029 (−0.05)	−0.0024 (−0.04)
SIZE	−	−0.601*** (−3.53)	−0.598*** (−3.51)
Industry effects	?	*Included*	*Included*
Year effects	?	*Included*	*Included*
Constant	?	19.60*** (6.00)	19.56*** (6.00)
N		364	364
F-statistic		7.39***	7.33***
R-sq. (%)		14.16	14.11

Table VI.
Regression analysis

Notes: This table presents regression results of the cost of debt on earnings management variables under the Kothari model (Model 1) and the modified Jones model (Model 2), as well as other explanatory variables. Detailed definitions of dependent variables and explanatory variables are presented in Table I. Robust *t*-statistics clustered by firm are shown in parentheses; ***,** and *indicate significant levels 1 per cent, 5 per cent, and 10 per cent, respectively

debt. Overall, the results suggest that managers engage in earnings management to influence cost of debt in the context of Kazakhstan. In markets with limited sources of borrowings, managers have stronger incentives to manage earnings to reduce cost of debt (Diamond, 1991). Moreover, weak banking regulation and supervision, low accountability and transparency, weak credit analysis and poor risk management by commercial banks in Kazakhstan might provide more incentives for lending companies to engage in earnings management to affect cost of borrowing. In this regard, the findings suggest that companies borrowing from the private debt market have more incentives to use accounting discretion to affect cost of debt in the context of emerging markets such as Kazakhstan.

The reported coefficients of IC and LIQR show that interest coverage and liquidity ratios are negatively related to cost of debt. This expected association is similar to that reported by Carmo *et al.* (2016) and supports the notion that companies with higher liquidity make interest payments on outstanding debts easily and therefore bear a lower cost of debt. The estimated coefficients of LEV show that leverage is negatively associated with the cost of debt at the 10 per cent significance levels. This finding indicates that highly levered firms bear a lower cost of debt and is similar to findings reported in prior studies (Francis *et al.*, 2005; Minnis, 2011). As argued by Minnis (2011), the negative relationship between leverage and cost of debt is explained by the fact that most indebted companies, holding larger amounts of funding, obtain bank loans with lower interest rates because of economies of scale.

With regard to firm size, the variable SIZE is negatively related to the cost of debt in both models at the 1 per cent significance levels. These findings indicate that larger companies obtain bank loans at lower interest rates. This empirical evidence is consistent with prior studies such as Houqe *et al.* (2017) that there is a negative association between firm size and cost of debt. However, the estimated ROA coefficients show that there is no statistically significant association between profitability and cost of debt. These findings suggest that firm profitability has no impact on cost of debt and banks price default risks and determine interest rates irrespective of borrowers' profitability levels.

Table VII summarizes regression results of cost of debt on audit quality and other explanatory variables. The estimated coefficient of AUDIT shows that there is a negative and significant association between audit quality and cost of debt. This finding indicates that companies audited by the Big Four firms bear a lower cost of debt than those audited by other audit firms in the context of Kazakhstan. This evidence supports the findings of Karjalainen (2011) and Minnis (2011) that high audit quality, attributable to assurance services by the Big Four, decreases cost of debt capital.

Table VIII reports regression results of earnings management on audit quality and other explanatory variables. The reported coefficients of AUDIT from both models are insignificant. Hence, there is no evidence that higher audit quality serves as an effective tool to deter earnings management practices of Kazakh public companies. These results are consistent with the findings of Habbash and Alghamdi (2017) and Kabir *et al.* (2011) that assurance services provided by the Big Four are less effective in constraining earnings management practices. The estimated coefficients of LEV are positive and significant, thus indicating that highly indebted companies exhibit higher earnings management in Kazakhstan. This evidence is consistent with the findings of Chen *et al.* (2011) and Houqe *et al.* (2017) that financial leverage is positively associated with earnings management.

Table IX presents regression results of cost of debt on earnings management, the AUDIT variable, an interaction between AUDIT and earnings management and other explanatory variables. Although the estimated coefficients of AUDIT are negative and significant, the

	Expected sign	COD
AUDIT	−	−2.946*** (−3.55)
IC	−	−0.00304*** (−3.68)
LIQR	−	−0.0253** (−2.23)
COL	−	1.626 (1.66)
LEV	−	−0.0680 (−0.18)
ROA	+	0.00157 (0.16)
AGE	−	0.0825* (1.84)
SIZE	−	−0.125* (−1.68)
Industry effects	?	*Included*
Year effects	?	*Included*
Constant	?	10.32** (3.24)
N		438
F-statistic		5.30***
R-sq. (%)		17.25

Table VII.
Regression analysis

Notes: This table presents regression results of the cost of debt on the AUDIT variable and other explanatory variables. AUDIT takes the value of one if a sampled firm is audited by a Big Four audit firm. Robust *t*-statistics clustered by firm are shown in parentheses; ***, ** and *indicate significant levels 1, 5 and 10%, respectively

	Expected sign	DAC (Model 1)	MDAC (Model 2)
AUDIT	−	0.119 (1.33)	0.123 (1.35)
LEV	+	0.157** (2.21)	0.124** (1.93)
AGE	−	−0.0138 (−1.63)	−0.0139 (−1.65)
SIZE	−	−0.0205 (−0.85)	−0.0190 (−0.78)
Industry effects	?	*Included*	*Included*
Year effects	?	*Included*	*Included*
Constant	?	0.636 (1.29)	0.627 (1.28)
N		364	364
F-statistic		3.75***	3.43***
R-sq. (%)		11.21	9.05

Table VIII.
Regression analysis

Notes: This table presents regression results of earnings management variables under the Kothari model (Model 1) and the modified Jones model (Model 2) on the AUDIT variable and other explanatory variables. AUDIT takes a value of one if a sampled firm is audited by a Big Four audit firm. Robust *t*-statistics clustered by firm are shown in parentheses; ***, ** and *indicate significant levels 1, 5 and 10%, respectively

coefficients of the variables AUDIT*DAC and AUDIT * MDAC are insignificant. Hence, there is no evidence that audit quality significantly influences the relationship between earnings management and cost of debt, thus indicating that the negative relationship between earnings management and cost of debt holds regardless of audit quality. In other words, the effect of earnings management on cost of debt is not different between companies audited by the Big Four and companies audited by other audit firms. These findings indicate that although lenders take into account the fact that a company is audited by the Big Four when determining the interest rate, in fact, audit quality has no impact on accruals quality. Overall, the results support the notion that the Big Four audit firms are less inclined

	Expected sign	COD (1)	COD (2)
AUDIT	−	−2.946*** (−3.03)	−3.018*** (−3.16)
DAC	−	−0.985*** (−2.79)	
AUDIT* DAC	+	−0.447 (−0.63)	
MDAC	−		−0.979*** (−2.83)
AUDIT* MDAC	+		−0.249 (−0.42)
IC	−	−0.0036*** (−3.27)	−0.0035*** (−3.29)
LIQR	−	−0.0149* (−1.62)	−0.0154* (−1.66)
COL	−	2.098* (1.66)	2.048* (1.64)
LEV	+	−0.118 (−0.25)	−0.203 (−0.47)
ROA	−	0.0102 (0.75)	0.0105 (0.77)
AGE	−	−0.0004 (−0.01)	0.0001 (0.00)
SIZE	−	−0.159 (−0.87)	−0.155 (−0.86)
Industry effects	?	*Included*	*Included*
Year effects	?	*Included*	*Include*
Constant	?	12.94*** (4.03)	12.93*** (4.05)
N		364	364
F-statistic		5.79***	5.86***
R-sq. (%)		16.33	16.19

Notes: This table presents regression results of cost of debt on earnings management variables under the Kothari model (Model 1) and the modified Jones model (Model 2), the AUDIT variable, an interaction between AUDIT and earnings management, and other explanatory variables. AUDIT takes a value of one if a sampled firm is audited by a Big Four audit firm. AUDIT*DAC is an interaction between the auditor type (AUDIT) and earnings management (DAC). AUDIT*MDAC is an interaction between the auditor type (AUDIT) and earnings management (MDAC). Robust *t*-statistics clustered by firm are shown in parentheses. ***; ** and *indicate significant levels 1, 5 and 10%, respectively

Table IX.
Regression analysis

to provide high quality assurance services in markets with lower level of enforcement and weaker investment protection (Francis and Wang, 2008; Maijoor and Vanstraelen, 2006).

The lack of influence of audit quality on the relation between earnings management and cost of debt is probably an inherent phenomenon of emerging markets with weak investment protection and poor regulatory frameworks such as Kazakhstan. In particular, a fast growing but highly volatile capital market with relatively poor corporate governance regimes, weak investor protection and poor regulatory frameworks explain the lack of influence of audit quality on earnings management practices in Kazakhstan. Another potential explanation of these findings is that companies hire the Big Four audit firms to promote a positive impression among stakeholders that their financial information is of high quality compared to that of other companies audited by non-Big Four, when in fact this may not be the case. As noted by Merkl-Davies and Brennan (2007), larger firms with greater resources and higher financial capacity are likely to hire the Big Four for impression-management purposes. Therefore, to attract investors, promote positive impression among stakeholders, obtain less costly financing and comply with corporate regulations, Kazakhstani public companies are likely to hire the Big Four audit firms for impression management purposes.

5.1 Additional analyses
We conduct an additional analysis to examine whether audit quality influences income-increasing and income-decreasing earnings management practices. Therefore, in addition to absolute values of discretionary accruals, we use signed residuals from the Kothari model (Kothari *et al.*, 2005) to capture the mixed effects of earnings management. Table X reports

	Expected sign	(DAC +) subsample (Model 1)	Expected sign	(DAC –) subsample (Model 2)
AUDIT	−	−0.172 (−0.68)	+	−0.261 (−1.63)
LEV	+	0.214* (1.67)	+	0.136*** (3.05)
AGE	−	−0.046* (−1.81)	+	0.004 (0.75)
SIZE	−	−0.631 (−0.55)	+	0.012 (0.64)
Industry effects	?	*Included*	?	*Included*
Year effects	?	*Included*	?	*Included*
Constant	?	1.728 (0.83)	?	0.323 (0.89)
N		78		286
F-statistic		4.52***		5.90***
R-sq. (%)		25.68		16.35

Table X.
Regression analysis

Note: This table presents regression results of earnings management variables under the Kothari model (DAC) on the AUDIT variable and other explanatory variables. Earnings management is measured by income-increasing (DAC+) and income-decreasing (DAC–) earnings management practices. AUDIT takes a value of one if a sampled firm is audited by a Big Four audit firm. Robust *t*-statistics clustered by firm are shown in parentheses. ***, ** and *indicate significant levels 1, 5 and 10%, respectively

regression results estimated separately for income-increasing (DAC+) and income-decreasing (DAC–) earnings management. The estimated coefficients of (DAC+) and (DAC–) are negative and statistically insignificant. These results assert that audit quality has no constraining effect on income-increasing and income-decreasing earnings management. The results also support the lack of influence of audit quality on the relationship between earnings management and cost of debt, reported in Table IX. Collectively, these findings suggest that assurance services provided by the Big Four have no impact on accruals quality of their clients in Kazakhstan. The results also show that earnings management increases with LEV, thus indicating that highly leveraged companies in general have more incentives to manage their financial performance.

We perform an additional analysis to determine whether our main results are robust to an alternative measure of earnings management. Therefore, consistent with other recent studies (Becker *et al.*, 1998; Carmo *et al.*, 2016; Houqe *et al.*, 2017; Xie *et al.*, 2003), we use the Jones (1991) model to proxy for earnings management to confirm the results in the main analyses. The estimated coefficients (not reported but available upon request) show qualitatively similar results reported in Tables 6, 7, 8 and 9, thus indicating that the main results are not affected by the use of an alternative proxy for earnings management.

To confirm the main results, we also conduct additional analyses to test to the sensitivity of the results to the presence of potential outliers in the COD variable. In particular, we perform additional regressions by eliminating outliers at the 5 per cent from both tails of the distribution. The estimated models provided qualitatively similar results that support the reported statistics from the initial models (not reported but available upon request). In addition to the correlation analysis, we performed the variance inflation factor (VIF) tests to detect possible multicollinearity issues in our analyses. Chatterjee *et al.* (2000) suggest that multicollinearity becomes an issue if a VIF value exceeds a threshold value of 10. The obtained VIF values are less than 10, thus indicating the absence of multicollinearity within independent variables (not reported but available upon request).

6. Conclusions

This study extends the existing emerging market literature by examining the impacts of earnings management and audit quality on cost of debt in the context Kazakhstan. The study also investigates the effects of audit quality on earnings management and whether the relationship between earnings management and cost of debt is affected by audit quality. The results show that earnings management is negatively related to cost of debt and suggest that managers engage in earnings management to influence cost of debt. The results also indicate that higher audit quality leads to lower cost of debt. However, the results suggest that higher audit quality has no impact on earnings management and the effect of earnings management on cost of debt is not statistically different between companies audited by the Big Four and companies audited by other audit firms. These findings indicate that although banks pay more attention to the fact that a company is audited by the Big Four when determining the interest rate, audit quality itself has no impact on accruals quality. Therefore, the results reinforce prior literature suggesting that a higher audit quality reduces cost of debt, but cast doubt on the moderating effect of audit quality on the relationship between earnings management and cost of debt in the context of emerging markets such as Kazakhstan.

The findings of the study suggest that companies have incentives to engage in earnings management to affect their cost of borrowing. Therefore, the findings have implications for regulators, policy-makers and standard setters seeking to improve the credibility of financial reporting, mitigate information asymmetry and control managerial opportunism. Although, the findings show that higher audit quality lowers a cost of capital, the relationship between earnings management and cost of debt is not affected by audit quality, thus indicating that audit quality has no impact on earnings management. Hence, regulators, policy-makers and professional auditing organizations may wish to revisit their reforms and policies to improve the audit market, and auditors should consider the quality of their services aiming to obtain reasonable assurance whether accounting information is relevant and reliable for users of financial information. Furthermore, the findings suggest that financial institutions should improve credit-risk management practices and asses the creditworthiness and default risks of borrowers by demanding high quality accounting information, irrespective of whether financial statements of borrowers are audited the Big Four or other audit firms. The findings also suggest that commercial banks should consider other underlying factors such as solvency, liquidity, leverage and firm size when determining interest rates. Finally, the findings have important implications for regulators, policy-makers, standard setters and professional organizations in their continuous efforts to improve banking regulation and supervision, develop the accounting and auditing profession by enhancing auditors' independence and improving their competence, promote continuous professional education in accounting and auditing and solve other issues related to the accounting and auditing profession in emerging markets such as Kazakhstan.

The study has several limitations which provide new possible avenues for future research. First, we examine earnings management practices of non-financial listed companies in Kazakhstan. Because financial institutions play an important role in the operation of any economy, future research examining earnings management practices of banks, pension funds, insurance and investment companies would provide more research opportunities in the context of emerging markets. Second, we focus on earnings management and use abnormal accruals to measure earnings management practices. Therefore, it would be relevant to extend the study focusing on earnings quality measures such as conservatism, earnings persistence and earnings predictability in future research. Finally, the study is limited to one country. Hence, future research could explore earnings management practices across companies from other CIS countries and emerging markets.

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Despite the limitations discussed above, the findings of this study extend the earnings management literature and provide relevant implications for policy-makers, regulators, investors and business organizations in the context of emerging markets such as Kazakhstan.

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