

INTELLIGENCE, INSTITUTIONS, A CULTURE OF SECRECY AND EARNINGS MANAGEMENT

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Abstract

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This paper proposes novel insights at the intersection of psychology and corporate governance at the country-level. Research in psychology shows that intelligence and economic development are associated with good institutions. Although research in corporate governance regularly exhibits a negative association of good institutions and earnings management, increased cognitive ability likely is crucial to fulfill the complicated task of managing earnings. Cultural factors regularly relate to managers' value systems and hence might influence their stance on earnings management. Therefore, this paper controls for the mitigating effect of a secretive cultural disposition on the relation between intelligence and earnings management in a multivariate analysis.

Keywords: National Intelligence, Institutions, National Culture, Earnings Management.

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1. INTRODUCTION

In past decades, a vast line of accounting research developed around the notion that institutions matter in the formation and disclosure of corporate earnings. While the earnings number itself may, at best, be a single and rather a backwards-looking piece of information on a given firm, it is economically meaningful as a myriad of implicit and explicit contracts are written on it (Armstrong et al., 2010). In order to extract direct and indirect private benefits, managers have incentives to deviate from true earnings and report a managed earnings figure (Healy & Wahlen, 1999; Watts & Zimmerman (1986)).

Managing earnings requires high levels of cognitive ability, higher-order thinking skills and sophistication in properly exercising accounting options and flexibility which are provided by a constantly changing set of rules and regulations (Springer & Borthick, 2007). This requires decision makers to combine and process many different and intertemporarily varying pieces of information. Indicators of high cognitive ability are the number of information signals which can be incorporated into decision making before it comes to information overload (Chewning & Harrell, 1990) and the handling of unstructured problems (Jones & Davidson, 2007). Experience mitigates some of the

negative effects of high task complexity and information load through more efficient information selection, but not on information processing itself (Simnett, 1996). As such, achieving a certain earnings figure in a given period might be a rather trivial undertaking. Yet, the inevitable accrual-reversal process makes it crucial to keep potentially unintended future consequences in mind. For instance, while a certain choice of depreciation method might increase this period's depreciation expenditures and hence reduce taxable income, the firm will inevitably experience lower future depreciation expenditures and increased future taxable profits. Moreover, cognitive ability is also crucial to defend one's accounting choices if they come under scrutiny by third parties, such as auditors, tax authorities, financial analysts, and credit officers. Therefore, I attempt to explore the relation between earnings management and intelligence on a cross-country level.

The rest of the paper is organized as follows. The following section provides a review of the literature and outlines the research question. Section 3 presents the estimation strategy and describes the data. Section 4 presents univariate as well as multivariate results. The following Section 5 shows a whole range of robustness tests while Section 6 discusses limitations and concludes.

2. LITERATURE REVIEW AND RESEARCH QUESTION

Much of the literature on cross-country differences in earnings management (Leuz et al., 2003) suggests that high-quality institutions might mitigate the aforementioned association of intelligence with the level of earnings management. As such, Weede & Kämpf (2002) find a positive association of national intelligence, institutional improvements and GDP growth.¹ More specifically, Jones (2011) reports a positive association of intelligence and institutional quality, Salahodjaev (2015) finds that as national intelligence increases also a country's banking sector tends to grow and become more sophisticated, countries act more environmentally sustainable (Salahodjaev, 2016), exhibit lower levels of corruption (Potrafke, 2012), and lower dispersion of life satisfaction (Nikolaev & Salahodjaev, 2016). Along similar lines, certain institutional features such as a functioning legal system that enforces outside investors' claims (Leuz et al., 2003), a high-quality public audit environment and a high degree of accounting enforcement (Brown et al., 2014) seem to deter earnings management.

Gray (1988) posits that managers with a cultural disposition to secrecy over transparency will prefer sharing information with the smallest possible number of share- and stakeholders. As some societies are more secretive than others, it is highly likely that these will have developed institutions and accounting systems more prone to deception and thus information-garbling earnings management. Indicative of this trend, Hope et al. (2008) find that companies located in more secretive countries are less likely to choose high-quality external auditors which regularly would be associated with reducing information asymmetries. Moreover, Geiger & van der Laan Smith (2010) show that survey participants from more secretive societies are more accepting of larger information asymmetries and more earnings management.

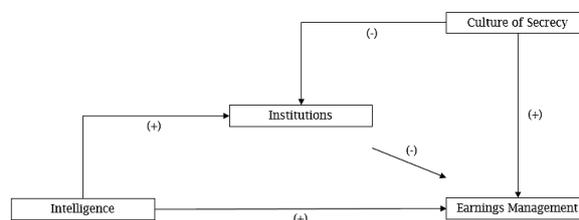
A small line of literature employs settings similar to the one brought forward in this paper. More specifically, Kallunki et al. (2017) show that higher IQ Swedish auditors deliver higher audit quality as proxied by going-concern accuracy, audit fees and income-increasing abnormal accruals. Nonetheless, we still do not know whether intelligence is able to (partly) explain the cross-country differences in the level of earnings management. But if this result is transferable to other jurisdictions, this might work against any findings in my setting.²

Cumulatively, whether cognitive ability has the hypothesized incrementally positive association with earnings management controlling for economic development, good economic institutions, and a secretive national culture, remains an empirical question. Figure 1 summarizes these relationships.

RQ: Controlling for economic development, institutional quality, and a secretive national culture, is there a positive association of average national cognitive ability (i.e., intelligence) with national earnings management practices?

My results address two important gaps in the literature. First, they present initial evidence that cognitive ability spills over onto financial reporting behaviour by simultaneously analyzing systematic cross-country differences in intelligence, institutions, culture and earnings management. Apparently, earnings management is facilitated through increased intelligence. This result holds after controlling for a culture of secrecy which in turn is regularly associated with less transparent financial reporting and a more opaque accounting information environment. Second, accounting -as the "language of business" certainly an institution in its own rightness to be overlooked when one considers economic effects of intelligence (cf., Lynn & Vanhanen (2012) for a comprehensive review of the cross-country intelligence literature). These results provide novel insights for a wide range of societal stakeholders, such as investors, regulators and employees.

Figure 1. The hypothesized nexus between intelligence, institutions, a cultural disposition of secrecy and earnings management



3. DATA AND ESTIMATION STRATEGY

In the following paragraphs, I present the variables of interest, controls and the estimation strategy. Data are collected exclusively from publicly available sources (cf., Appendix A). Table 1 presents descriptive statistics for unranked inputs. The full dataset is available in Appendix B.

Earnings Management. As it is impossible to conduct intelligence tests at the firm-level on a large scale, this study builds on national earnings management data for 31 countries compiled by Leuz et al. (2003). The index value for each the country is based on its average rank of four earnings management proxies. These include two measures capturing the effects of earnings smoothing (EM1 and EM2), one measure comparing the magnitude of total accruals with operating cash flows (EM3) and a fourth measure controlling for small loss avoidance (EM4). Lower ranks are associated with more informative financial reporting whereas higher ranks indicate more opaque accounting practices.

National Intelligence. I employ national average IQ data gathered by Lynn & Meisenberg (2010).³ Each country's value is based on a meta-analysis of numerous studies. In the present study, the average national IQs range from 72 (South Africa) to 108 (Hong Kong and Singapore) with a median of 99. While national IQ averages might be rather rough estimates of sophistication in the application of earnings management, research exhibits that other input-oriented factors such as hours of schooling (Weede & Kämpf, 2002) or output-oriented proxies such as academic achievement in international student aptitude tests (Rindermann, 2008) do not seem to perform significantly better in proxying cognitive ability.

¹ Numerous additional studies show a positive relationship between IQ and economic development (cf., Lynn & Vanhanen, 2012 for a comprehensive review).

² Having said that there is even evidence that hiring by top audit firms is primarily based on grade point averages (Chia, 2005), which in turn are positively related to intelligence (Gracia & Jenkins, 2003).

³ The value for Pakistan is based on an earlier assessment by Lynn & Vanhanen (2006).

Table 1. Descriptive statistics

Variable	Obs.	Mean	S.D.	Min	.25	Med	.75	Max
AVGEM	31	16.02	7.75	2	7	18.30	21.6	28.30
IQ	31	96.39	7.90	72	92	99	100	108
log GDP/capita	31	9.77	0.96	7.42	9.82	10.23	10.35	10.55
Code Law	31	0.61	0.50					
Legor UK	31	0.39	0.50					
Legor French	31	0.29	0.46					
Legor German	31	0.19	0.40					
Legor Nordic	31	0.13	0.34					
OutInvRights	31	3.19	1.40	0	2	3	4	5
Enforce	31	21.71	9.24	6	15	19	27	40
Big4 market share	31	0.68	0.26	0.01	0.48	0.78	0.88	0.93
Disclosure	29	72.76	7.62	56	67	74	79	85
Secrecy	30	38.43	49.14	-59	-1	33.50	79	139

Notes: For binary variables only means and standard deviations are reported. Variable definitions are available in Appendix A.

Investor Protection. First attempts to find an association between investor protection and earnings quality relate to the notion of an insider-versus outsider-economies. Ball et al. (2000) link code law-based accounting standards to insider economies in which corporate insiders communicate primarily through private channels. This seems to dampen financial reporting's informativeness to outside shareholders as well as stakeholders. As such, Leuz et al. (2003) find that strong (outside) investor protection mitigates earnings management attempts. La Porta et al. (2008) propose a more refined approach to control for legal origins which lead to significant differences within code law countries with respect to, among other things, investor protection and accounting practices. On a related note, there is evidence that financial reporting quality is rather based on the implementation, and thus enforcement, of the legal regime than superficial proxies for legal origin (Filip et al., 2015).

Accounting Enforcement. Consequently, recent research has shown that controlling for investor protection alone might fall short in terms of considering the enforcement of accounting standards. It seems that some countries merely "adopt a label" (Daske et al., 2013). Accounting information thus is only reliable and enforceable if there is a high-quality public company auditors' working environment as well as efficient, independent accounting enforcement bodies (Brown et al., 2014). On a related note, international evidence points towards an incrementally higher reliability of accounting information which is certified by a brand name auditor, even after controlling for investor protection (Francis & Wang, 2008). In the following, I employ the combined audit and enforcement score for the year 2002 by Brown et al. (2014) and the average brand name (Big 4) auditor market share as reported by Francis & Wang (2008) and Hope et al. (2008). Additionally, building on a disclosure index by CIFAR (Center for International Financial Analysis and Research), La Porta et al. (1998) show that there is significant cross-country variation in the level of disclosure, with less detailed disclosure making earnings management harder to detect from the outside (Leuz et al., 2003).

Culture. A line of research determines national culture as an informal institution, complementing formal institutions and influencing everyday economic life (Duong et al., 2015). Hence, national culture might also represent a driver of financial disclosure (Gray, 1988). As such, Callen et al. (2011) find evidence of a significantly positive (negative) association of a national culture of uncertainty

(individualism) with earnings management. Interestingly, a cross-country study by Douppnik (2008) shows that national culture explains a far larger part of the variation in earnings management than investor protection regulation. Kanagaretnam et al. (2011) find that, in spite of being regulated quite extensively on the national and international level, cultural predispositions still result in significant differences in the earnings quality of banks. As a control whether my results are actually determined by a cultural disposition for secrecy instead of intelligence and sophistication, I employ the Secrecy score developed by Hope et al. (2008). It combines Hofstede's scores for uncertainty avoidance (UAI), power distance (PDI) and individualism (IND) as follows: Secrecy = PDI + UAI - IND. Building on work by Gray (1988), they argue that managers in high UAI countries are more likely to restrict information to avoid competition. A high power distance (PDI) society enables this behaviour as their stakeholders are more accepting of power differences and information asymmetries. To increase consistency, I employ the updated cultural scores by Tang & Koveos (2008) as inputs, as they show that Hofstede's cultural dimensions are only partly stable (i.e., masculinity and uncertainty avoidance) but partly influenced by changing economic conditions since their inception in 1980.⁴

Estimation Strategy. The econometric model has the following form:

$$AVGEM_i = \alpha_0 + \beta IQ_i + \gamma \ln GDP_i + \delta Secrecy_i + \sum Controls_i + \epsilon_i \quad (1)$$

Subscript i indicates country 1 through 31. Coefficient β on national average IQ is the main coefficient of interest in my subsequent analyses. With the exceptions of the secrecy score for Taiwan and the disclosure score for Indonesia and Taiwan, there are no missing values for additional variables. ϵ symbolizes the remaining error term. In line with Potrafke (2012), I estimate an ordinary least squares (OLS) model with robust standard errors. Besides, binary variables indicating the affiliation to a certain legal tradition, dependent and independent variables are transformed into ranks. First, I explore the link between earnings management, intelligence and institutions. Second, I add cultural variables to the analyses. Finally, there is a range of robustness checks to ensure that the results are not driven by ranking the dependent and independent variables, or spurious, attributable to omitted influential variables.

⁴ The original cultural dimensions can be found in Hofstede (1980).

4. RESULTS

4.1. Basic results

Univariate results presented in Table 2 reveal first insights. Intelligence (IQ) is positively associated with average national earnings management (AVGEM) but slightly insignificant (with a p-value of about 11%). Yet, the correlation between the natural logarithm of GDP per capita and intelligence is strong and highly significant, a finding which is in line with the relevant literature. Economic development is likely associated with a wide range of institutional factors, thus the incremental effect of intelligence on earnings management remains unsolved.

In accordance with prior literature, further significant determinants of earnings management are legal origin and outside investor rights (Leuz et al., 2003), a higher market share of brand name audit firms (Big4, Francis & Wang, 2008), as well as a cultural disposition to secrecy (Hope et al., 2008). The secrecy score is significantly negatively related

with IQ as well as GDP per capita, reinforcing popular notions of knowledge economies being based on the sharing of information and resulting network effects. Variance Inflation Factors (VIF) are well below critical levels and do not raise multicollinearity concerns. In accordance with prior literature, further significant determinants of earnings management are legal origin and outside investor rights (Leuz et al., 2003), a higher market share of brand name audit firms (Big4, Francis & Wang, 2008), as well as a cultural disposition to secrecy (Hope et al., 2008). The secrecy score is significantly negatively related with IQ as well as GDP per capita, reinforcing popular notions of knowledge economies being based on the sharing of information and resulting network effects. Variance Inflation Factors (VIF) is well below critical levels and do not raise multicollinearity concerns.

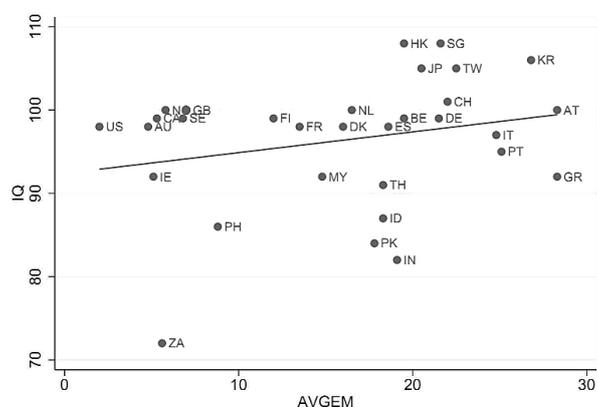
Figures 2 and 3 show that the national average earnings management measure (AVGEM) is positively associated with national IQs as well as a cultural disposition to secrecy.

Table 2. Pearson correlations of ranked variables

	AVGEM	IQ	log GDP capita	Code Law	LegOr UK	LegOr French	LegOr German	LegOr Nordic	OutInv Rights	Enforce	Big4 market share	Disclosure	Secrecy	VIF
AVGEM	1.0000													
IQ	0.2876	1.0000												2.28
log GDP/ capita	-0.2602	0.5667***	1.0000											4.79
Code Law	0.4592**	0.2420	0.0370	1.0000										2.39
LegOr UK	-0.4592**	-0.2420	-0.0370	-1.0000	1.0000									3.27
LegOr French	0.2424	-0.2837	-0.2384	0.5083**	-0.5083**	1.0000								2.69
LegOr German	0.5433**	0.5187**	0.0913	0.3893*	-0.3893*	-0.3133*	1.0000							3.49
LegOr Nordic	-0.3013*	0.1244	0.2690	0.3059*	-0.3059*	-0.2462	-0.1886	1.0000						1.65
OutInvRi ghts	-0.5250**	-0.0961	-0.0471	-0.7056**	0.7056**	-0.4509*	-0.3059*	-0.0541	1.0000					2.61
Enforce	-0.3183*	0.2859	0.6349**	-0.2005	0.2005	-0.2191	-0.1373	0.1672	0.0761	1.0000				1.95
Big4 market share	-0.3199*	0.3976*	0.5996**	-0.0666	0.0666	-0.1430	-0.1461	0.2690	0.1675	0.4596**	1.0000			1.89
Disclo- sure	-0.6518**	0.2277	0.4742**	-0.3144*	0.3144*	-0.4480**	-0.1967	0.3472*	0.3700*	0.3935**	0.4348**	1.0000		2.24
Secrecy	0.3943**	-0.5512**	-0.8436**	0.0550	-0.0550	0.4119**	-0.1757	-0.2833	-0.1568	-0.6219**	-0.5781**	-0.5819**	1.0000	4.91

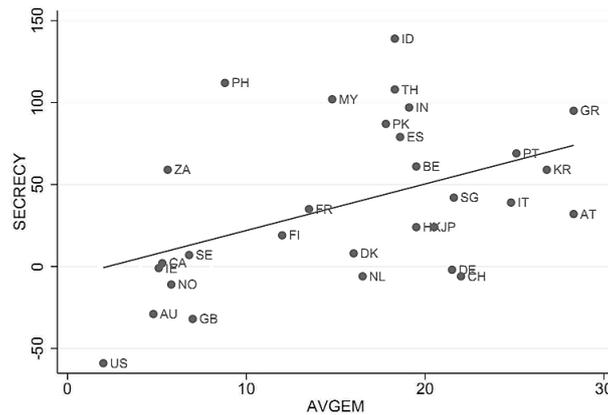
Notes: */**/** denotes significance at the 10/5/1%-level. Variable definitions are available in Appendix A.

Figure 2. AVGEM and IQ



Source: Leuz et al. (2003); Lynn and Meisenberg (2010).

Figure 3. AVGEM and Secrecy



Source: Leuz et al. (2003); Tang and Koveos (2008).

Table 3 exhibits the results of the first OLS rank regression of national average IQs on national average earnings management scores. Most importantly, across all models, IQ is significantly positively associated with earnings management. An increase in IQ of one rank is associated with an increase in earnings management between 29 and 62% of one rank. This confirms my hypothesis that earnings management requires sophistication. Greater economic development, in terms of GDP per capita, is significantly associated with less earnings management across all specifications. A reason for this might be that, on average, a wealthier population is more actively investing on the equity capital market, transforming the economy towards a more shareholder-oriented outsider paradigm. Moreover, this is also confirmed by increased outside investor rights (OutInvRights) which are at

least significant at the 5%-level. Their comparatively large impacts can be explained by their less fine ranking from 0 (lowest) to 5 (highest). Contrary to my prior predictions, controlling for improved independent enforcement of accounting standards (Enforce) or a larger proportion of Big4 audits does not significantly enhance the model. This might be attributable to the sample which consists almost exclusively of (highly) developed OECD countries which might not exhibit a great enough variation in terms of these two aspects. On the other hand, more disclosure seems to efficiently mitigate managers' ability to engage in earnings management. Substituting the Code Law insider-economy proxy for the finer legal origin proxies, with LegOr UK serving as the category of reference, does not yield incrementally significant results.

Table 3. Basic regression results

	(1)	(2a)	(2b)	(3a)	(3b)	(3c)	(4)
IQ	.2892 [*] [1.99]	.5287 ^{***} [4.05]	.5997 ^{***} [5.08]	.5969 ^{***} [5.07]	.6148 ^{***} [5.23]	.5897 ^{***} [4.63]	.5122 ^{***} [3.07]
log GDP/capita		-.5711 ^{***} [-5.17]	-.6214 ^{***} [-6.55]	-.5485 ^{***} [-3.66]	-.5273 ^{***} [-3.72]	-.3841 ^{***} [-3.15]	-.3067 [*] [-1.81]
Code Law		6.4817 ^{***} [2.43]	-.4681 [-0.15]	-1.0574 [-0.34]	-.2587 [-0.08]	-1.4462 [-0.46]	
OutInvRights			-3.3424 ^{***} [-3.71]	-3.4139 ^{***} [-3.70]	-3.0689 ^{**} [-2.74]	-2.3757 ^{**} [-2.30]	-2.0837 [*] [-1.97]
Enforce				-.1115 [-0.66]			-.0439 [-0.26]
Big4 market share					-.1684 [-0.88]		-.0522 [-0.34]
Disclosure						-.5307 ^{***} [-3.95]	-.4381 ^{***} [-3.09]
LegOr French							-.2885 [-0.07]
LegOr German							2.1703 [0.38]
LegOr Nordic							-3.4347 [-1.10]
Constant	11.3736 ^{***} [3.90]	12.7052 ^{***} [4.68]	27.3071 ^{***} [6.52]	28.5600 ^{***} [6.18]	27.2542 ^{***} [5.63]	29.0929 ^{***} [5.92]	27.6238 ^{***} [5.23]
Observations	31	31	31	31	31	29	29
R ²	0.08	0.46	0.59	0.59	0.60	0.72	0.75

Notes: Dependent variable: national average earnings management score AVGEM (Leuz et al., 2003). OLS rank regression with robust standard errors. Absolute value of t-statistics in brackets. */**/** denotes significance based on a two-sided test at the 10/5/1%-level. Variable definitions are available in Appendix A.

4.2. Results including controls for a cultural disposition towards secrecy

Table 4 exhibits the results of the second OLS rank regression of national IQs on national earnings management scores, controlling for legal institutions

as well as a secretive national culture (Models 5a through 6). As in line with the previous results, IQ still exhibits a consistent, highly significant positive association with earnings management. In line with Doupnik (2008), the addition of national culture results in a diminished association of institutional

factors. Hence, there might be the possibility that more secretive societies are generally and systematically associated with less strict enforcement of accounting standards and less disclosure. The cultural disposition to secrecy could, in the spirit of Gray (1988), have resulted in the formation of accounting systems and institutions which are tailored to preserving more pronounced information asymmetries. Therefore, I also apply two-stage least squares (2SLS, Models 7a through c) with Secrecy as the instrumented (i.e., endogenous) variable. The instruments in the first stage are

extended step-wise from including only variables with respect to the enforcement of accounting standards (Enforce, Big4 market share, Disclosure), to also including investor protection (OutInvRights), as well as the legal origin (LegOr French, LegOr German, LegOr Nordic). The results show that Secrecy, as well as IQ, are still highly significantly and positively associated with earnings management. A jump of one rank in Secrecy (IQ) results in an increase of up to 159% (72%) of one rank in earnings management.

Table 4. Regression results

	(5a)	(5b)	(5c)	(6)	(7a)	(7b)	(7c)
	OLS				2SLS		
IQ	.4628*** [3.63]	.4766*** [3.83]	.4808*** [3.96]	.4871*** [3.93]	.4304*** [2.79]	.4148** [2.50]	.7204*** [6.08]
log GDP/capita	-.1313 [-0.67]	-.1094 [-0.52]	-.0951 [-0.57]	-.0910 [-0.43]	.4914 [0.92]	.6511* [1.64]	.5738 [1.51]
OutInvRights	-1.7437* [-1.74]	-1.7770 [-1.49]	-1.6302 [-1.51]	-1.5874 [-1.41]	-.6735 [-0.37]	1 st stage	1 st stage
Enforce	.0394 [0.27]			.0140 [0.09]	1 st stage	1 st stage	1 st stage
Big4 market share		-.0388 [-0.20]		-.0269 [-0.17]	1 st stage	1 st stage	1 st stage
Disclosure			-.3710** [-2.57]	-.3690** [-2.42]	1 st stage	1 st stage	1 st stage
LegOr French	2.0601 [0.54]	1.9126 [0.49]	.1405 [0.04]	.2698 [0.07]	2.0751 [0.51]	2.8666 [0.74]	1 st stage
LegOr German	7.8320** [2.19]	7.1332** [2.08]	4.7051 [1.06]	4.6862 [1.02]	10.5573* [1.86]	12.2362*** [3.38]	1 st stage
LegOr Nordic	-3.1929 [-1.37]	-3.3363 [-1.23]	-2.5442 [-0.96]	-2.4268 [-0.92]	-1.0181 [-0.26]	.0636 [0.03]	1 st stage
Secrecy	.5088*** [2.88]	.4821** [2.59]	.3738* [1.75]	.3741* [1.84]	1.3145* [1.86]	1.5096*** [2.98]	1.5887*** [3.07]
Constant	6.1197 [0.92]	7.5100 [1.04]	14.2744 [1.63]	14.0904 [1.68]	-19.1798 [-0.77]	-27.3465** [-2.02]	-29.2260** [-2.10]
Observations	30	30	29	29	29	29	29
R ²	0.71	0.71	0.77	0.78	0.59	0.52	0.30

Notes: Dependent variable: national average earnings management score AVGEM (Leuz et al., 2003). Absolute value of *t*-statistics (*z*-values) based on robust standard errors in brackets. */**/** denotes significance based on a two-sided test at the 10/5/1%-level. In the 2SLS setup, Secrecy is the instrumented variable. Variable definitions are available in Appendix A.

5. ADDITIONAL TESTS

This study builds heavily on national IQ values compiled by Lynn & Meisenberg (2010). These country-level averages are subject to considerable critique, especially the results for African countries are drawn into question for being unrepresentative and potentially biased (Wicherts et al., 2010a; Wicherts et al., 2010b). To alleviate these concerns, I follow Wicherts et al. (2010a) and increase the minimum IQ value in my sample to 80. This does not affect the ranking of countries and, hence, the results remain unchanged. On a related note, Lynn & Meisenberg (2010) admit that there is an inherent quality differential in their data based on the available number of IQ studies and the cumulative number of test subjects per country. A re-run of Models 4 and 6 without observations with below median IQ quality indices exhibits a slight drop in the magnitude of the IQ variable to .35 (significant at a 10%-level) compared with 51 in Model 4, and to .41 (significant at the 5%-level) compared with .49 in Model 6 [untabulated].

An untabulated robustness check for unranked regression inputs exhibits that the results are not driven by ranking the independent variables. Insights provided in the previous sections remain qualitatively unchanged. Moreover, a heteroscedasticity-robust median regression (Machado & Santos Silva, 2013) shows that the results neither are influenced by the

dependent variables underlying distribution or influential observations [untabulated].

The notion that social desirability also forms managers' and stakeholders' stance on earnings management has been discussed in the literature for an extended period. Amongst others, Lo (2008) posits that, even in a world where capital market participants fully anticipate attempts to manage earnings, this might still present an equilibrium as it fulfils their expectations. Indicative of this, survey evidence of U.S. executives presents the meeting of expectations as crucially influential in the decision to manage earnings. In their opinion, it "build[s] credibility with capital markets" (p. 27) and "assures customers/suppliers that business is stable" (p. 47, Graham et al., 2005). Therefore, it seems plausible that social desirability bias is another cross-country determinant of earnings management not yet captured by a control for national culture (Niszczota, 2015). Untabulated correlations show that different psychological proxies for social desirability bias, so-called "Lie scores", are highly, significantly correlated with each other as well as secrecy but not with national intelligence.⁵ Results presented in Table 5 are qualitatively similar to

⁵ The Lie score based on Eysenck & Barrett (2013) (van Hemert et al., 2002) exhibits a correlation coefficient with Secrecy of .7258 (.6920), both significant at a 1%-level. The correlation of EB (vH) with national IQ is -0.1488 (.0246), respectively. Both correlations are highly insignificant with *p*-values of 0.5433 (0.9228).

Model 6 (Table 4), with the addition of Lie scores according to Eysenck & Barrett (2013) (EB) and van Hemert et al. (2002) (vH) as well as an aggregate Lie score (AGGLIE) (if both values are available for a country, the aggregate Lie score (AGGLIE) is set up as the average of the Lie scores of Eysenck & Barrett, 2013) and van Hemert et al. (2002). Otherwise, AGGLIE is based on the single available score. This increases the number of countries for which there is an available Lie score to 20). The association of IQ

with AVGEM remains largely stable, with the exception of Model (vH*), which suffers from a below textbook-level number of observations for valid OLS estimates. To avoid issues of collinearity, the secondary models (EB*, vH* and AGGLIE*) focus on the social desirability bias and discard cultural secrecy. Yet, I am still unable to fully confirm the findings by Niszczoła (2015) in a setting which controls for average national cognitive ability.

Table 5. Regression results

	(EB)	(EB*)	(vH)	(vH*)	(AGGLIE)	(AGGLIE*)
IQ	.6235*** [4.19]	.6598** [3.09]	.4877** [3.41]	.3553 [1.68]	.5205*** [4.77]	.4950** [3.18]
log GDP/capita	-.1349 [-0.57]	-.3241 [-1.18]	-.0485 [-0.30]	-.4099 [-1.89]	-.0890 [-0.44]	-.2635 [-1.70]
OutInvRights	-3.0556** [-2.60]	-2.4430* [-2.01]	-2.7434*** [-4.33]	-2.2565* [-2.31]	-2.6342** [-2.76]	-1.8938* [-2.14]
Enforce	.0457 [0.20]	.0459 [0.17]	.1346 [0.76]	-.0877 [-0.31]	.0244 [0.13]	.0015 [0.01]
Big4 market share	-.1896 [-0.91]	-.2384 [-1.16]	-.2280 [-1.19]	-.0427 [-0.15]	-.1585 [-1.11]	-.1683 [-1.26]
Disclosure	-.4938** [-3.46]	-.5897** [4.21]	-.1360 [-0.72]	-.1250 [-0.56]	-.4321** [-2.94]	-.4703*** [-3.58]
LegOr French	-3.0028 [-0.69]	-2.0504 [-0.46]	.3026 [0.09]	-1.5113 [-0.28]	-2.3958 [-0.67]	-.9465 [-0.30]
LegOr German	-4.1537 [-0.78]	-3.3012 [-0.50]	2.1264 [0.70]	2.8832 [0.52]	-1.3207 [-0.27]	.8317 [0.16]
LegOr Nordic	-3.7161 [-1.49]	-2.3829 [-0.76]	-5.5589* [-2.16]	-6.5372 [-1.75]	-5.0287** [-2.62]	-4.8052* [-2.05]
Secrecy	.4428 [1.29]		.6197** [3.49]		.4126 [1.37]	
LIE	.2344 [0.54]	.5564 [1.04]	.4026 [1.42]	.8234 [1.90]	.3203 [1.16]	.5875* [2.14]
Constant	21.6227* [1.95]	26.5741* [2.04]	10.2100 [1.98]	22.0073* [2.05]	18.9911* [2.02]	22.9096** [2.62]
Observations	18	18	17	17	20	20
R ²	0.94	0.92	0.97	0.92	0.95	0.93

Notes: Dependent variable: national average earnings management score AVGEM (Leuz et al., 2003). Absolute value of t-statistics based on robust standard errors in brackets. */**/** denotes significance based on a two-sided test at the 10/5/1%-level. LIE is based on the Social desirability bias score by either Eysenck & Barrett (2013, EB), van Hemert et al. (2002, vH) or an aggregate proxy (AGGLIE). Further variable definitions are available in Appendix A.

Duong et al. (2015) propose a different proxy for national culture. Their Rule Preference Index tries to capture the propensity of a population to set and follow more formal rules. Rule Preference is the rank of the sum of standardized uncertainty avoidance (UAI) and standardized individualism (IND). The intuition behind this metric is that, first, populations which dislike ambiguity and, second, societies based on a higher preference for individual rights prefer a more formal set of rules and regulations which guides individual decisions and protects individual rights. Their results suggest that rule preference and corporate governance are positively associated with the firm-level. Hence, I repeat the main analyses shown in Table 4 with the exception that cultural secrecy is replaced with rule preference (RULEPREF). Explicitly, I do not predict a sign. On the one hand, earnings management merely exploits leeway introduced by formal accounting rules. On the other hand, there is evidence that good corporate governance reduces earnings management at the firm-level (Garcia-Meca & Sanchez-Ballesta, 2009). Results presented in Table 6 are qualitatively unchanged with respect to national IQ, yet

ambiguous with respect to RULEPREF (the significant result for RULEPREF in Model 7c* is validated by untabulated tests for overidentification and endogeneity. These show that the two-stage model is invalid and thus OLS is preferable in this case). Another potential explanation for this finding might be that the formal institutions used as controls in this study capture good governance at the country-level, leaving little-unexplained variation for rule preference.

Attributable to plenty of critique the Hofstede measures of national culture received over the years (cf., Joannides et al., 2012 for a comprehensive review), I substitute SECRECY with Transparency International's perceived corruption measure. While Hofstede collected his main data in the 1950s, this provides a more timely account of corruption. On the downside, the perception of corruption is likely different across countries attributable to cultural values and beliefs (Geiger & van der Laan Smith, 2010). Nevertheless, an untabulated analysis exhibits qualitatively similar patterns with national IQ still being significantly positively associated with earnings management (at a 5 %-level).

Table 6. Regression results for rule preference (Duong et al., 2015)

	(5a*)	(5b*)	(5c*)	(6*)	(7a*)	(7b*)	(7c*)
	OLS				2SLS		
IQ	.5228*** [2.89]	.5398*** [3.02]	.5074*** [2.95]	.5425** [2.85]	.4961*** [3.21]	.3423** [2.09]	.6444*** [4.41]
log GDP/ capita	-.5741*** [-3.55]	-.5744*** [-3.86]	-.3955** [-2.43]	-.3565* [-1.80]	-.6128*** [-2.82]	-.2525 [-1.08]	-.8013*** [-5.86]
OutInvRights	-3.1112*** [-2.88]	-2.7892** [-2.44]	-2.2142* [-2.01]	-2.3505* [-1.84]	-2.8688*** [-2.97]	1 st stage	1 st stage
Enforce	-.1283 [-0.69]			-.0829 [-0.46]	1 st stage	1 st stage	1 st stage
Big4 market share		-.1150 [-0.64]		-.0699 [-0.46]	1 st stage	1 st stage	1 st stage
Disclosure			-.4363*** [-3.07]	-.4190*** [-3.04]	1 st stage	1 st stage	1 st stage
LegOr French	-3.0926 [-0.62]	-1.5456 [-0.36]	-1.4120 [-0.22]	-2.9242 [-0.39]	-.7328 [-0.09]	14.2609** [2.07]	1 st stage
LegOr German	.8240 [0.14]	1.8406 [0.36]	1.9245 [0.29]	-1.299 [-0.02]	3.1865 [0.50]	16.0537*** [3.22]	1 st stage
LegOr Nordic	-7.2329 [-1.95]	-6.1370* [-1.79]	-3.9329 [-1.11]	-4.7020 [-1.17]	-6.0245 [-1.60]	1.2385 [0.39]	1 st stage
RULEPREF	.2595 [1.19]	.2216 [1.06]	.0698 [0.27]	.1395 [0.50]	.1776 [0.44]	-.4061 [-1.05]	.4697** [2.45]
Constant	26.5460*** [5.09]	24.8333*** [5.40]	27.3049*** [5.48]	28.5647*** [4.64]	24.8395*** [6.84]	13.9240*** [5.11]	11.1795*** [3.93]
Observations	30	30	29	29	29	29	29
R ²	0.67	0.67	0.75	0.76	0.67	0.55	0.42

Notes: Dependent variable: national average earnings management score AVGEM (Leuz et al., 2003). Absolute value of *t*-statistics (*z*-values) based on robust standard errors in brackets. */**/** denotes significance based on a two-sided test at the 10/5/1%-level. In the 2SLS setup, RULEPREF is the instrumented variable. Variable definitions are available in Appendix A.

6. CONCLUSION

My results exhibit that intelligence and earnings management are significantly and positively associated. Financial reporting in general, and earnings management to an even larger extent, requires higher-order thinking skills (Springer & Borthick, 2007). The hypothesized association holds after controlling for well-known mitigating institutional factors such as the distinction between insider- and outsider-economies, outside investor protection laws, more stringent enforcement of accounting standards, increased audit quality, increased disclosure requirements as well as a cultural disposition towards secrecy.

The main results also prove robust to a series of additional analyses. Extant literature documents a significantly positive relationship of intelligence with institutional quality (Lynn & Vanhanen, 2012). While high-quality economic institutions generally reduce the level of earnings management, it seems impossible to deny the remaining positive effect of cognitive ability needed to manage earnings in the first place. Thus, this paper contributes to both the literature on economic effects of intelligence as well as the literature on institutional and cultural effects on financial reporting in a cross-country setting. Hence, it provides interesting and novel insights for standard-setters, investors and the general public.

Yet, there are some limitations. Attributable to the fact that the analyses are conducted on a country-level, the individual effect of intelligence on financial reporting behaviour cannot be measured. Actual cognitive processes behind accounting tasks are not directly observable (Hogarth, 1991). Even archival research based on individual audit partners (i.e., Kallunki et al., 2017) is unable to fill this void. Hence, this presents an apparent avenue for future behavioural research. Moreover, drawing general

conclusions for other jurisdictions from a rather narrow selection of countries might prove problematic for cultural reasons (Lo, 2008). For instance, economies in which accounting serves a contracting rather than a valuation role, earnings management might be less frowned upon, or even encouraged, as it reduces the need for frequent and costly covenant renegotiations.

As with most research about potential cultural influences on business decisions, this study relies heavily on Hofstede's cultural factors (Hofstede, 1980). Thus, it is prone to the same general points of critique. Yet, I tackle the most poignant criticism that the scores are outdated (e.g., Baskerville, 2003) by employing a validated version which takes into account that some cultural traits are more stable over time than others. As such, Tang & Koveos (2008) show that uncertainty avoidance (UAI) is rather stable whereas power distance (PDI) and individualism (IND), the other two factors determining cultural secrecy, are changing over time. More fundamentally, Baskerville (2003) also criticizes that the scoring approach inappropriately equates nations with cultures. The same potential problem might also arise with the use of an average value for national intelligence in situations where, for instance, business life is dominated by certain ethnicities which regularly are associated with other countries but the IQ scores proxy for the full population. Moreover, assuming, on average, meritocratic promotions to top management based on intelligence in combination with other personality traits (cf., Judge et al., 2004 for a comprehensive meta-study on the correlation of intelligence with leadership), average national IQ might not be a particularly fitting measure. Having said that, this general pattern is likely similar across countries and, thus, should not bias the presented results.

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APPENDIX

Appendix A. Variable definitions and sources

<i>Variable</i>	<i>Definition</i>	<i>Source</i>
AVGEM	Average earnings management score by country	Leuz et al. (2003)
IQ	Average national IQ value by country	Lynn & Vanhanen (2006), Lynn & Meisenberg (2010)
log GDP/capita	natural logarithm of GDP per capita in US-Dollars as of 2002	Penn World Table (7.1.)
Code Law	Binary variable equal to 1 if the respective country is rooted in the French, German or Nordic code law tradition	La Porta et al. (1998)
LegOr UK	Binary variable equal to 1 if the respective country is rooted in the Anglo-Saxon legal tradition	La Porta et al. (2008)
LegOr French	Binary variable equal to 1 if the respective country is rooted in the French legal tradition	La Porta et al. (2008)
LegOr German	Binary variable equal to 1 if the respective country is rooted in the German legal tradition	La Porta et al. (2008)
LegOr Nordic	Binary variable equal to 1 if the respective country is rooted in the Scandinavian legal tradition	La Porta et al. (2008)
OutInvRights	Anti-director rights index	La Porta et al. (1998)
Enforce	The combined score for public auditors working environment and independent enforcement body	Brown et al. (2014)
Big4 market share	The average market share of brand name (Big 4) audit firms in %	Francis & Wang (2008), Hope et al. (2008)
Disclosure	Disclosure score assembled by CIFAR	La Porta et al. (1998)
Secrecy	Proxy for a national culture of secrecy based on Hope et al. (2008)	Tang & Koveos (2008)

Appendix B. Full data set

<i>Country</i>	<i>AVGEM</i>	<i>IQ</i>	<i>GDP/capita</i>	<i>Code Law</i>	<i>LegOr UK</i>	<i>LegOr French</i>	<i>LegOr German</i>	<i>LegOr Nordic</i>	<i>OutInv Rights</i>	<i>Big4 market share</i>	<i>Enforce</i>	<i>Disclosure</i>	<i>Secrecy</i>
Austria	28.3	100	31646.85	1	0	0	1	0	2	0.511	17	62	32
Greece	28.3	92	20553.22	1	0	1	0	0	2	0.360	12	61	95
Korea (South)	26.8	106	19380.45	1	0	0	1	0	2	0.840	12	68	59
Portugal	25.1	95	18448.8	1	0	1	0	0	3	0.424	16	56	69
Italy	24.8	97	27013.46	1	0	1	0	0	1	0.932	34	66	39
Taiwan	22.5	105	22775.87	1	0	0	1	0	3	0.777	16	.	.
Switzerland	22	101	33106.24	1	0	0	1	0	2	0.775	34	80	-6
Singapore	21.6	108	32199.9	0	1	0	0	0	4	0.863	21	79	42
Germany	21.5	99	28793.64	1	0	0	1	0	1	0.492	18	67	-2
Japan	20.5	105	27641.78	1	0	0	1	0	4	0.770	16	71	24
Belgium	19.5	99	29758.17	1	0	1	0	0	0	0.621	24	68	61
Hong Kong	19.5	108	27468.78	0	1	0	0	0	5	0.872	24	73	24
India	19.1	82	1881.54	0	1	0	0	0	5	0.090	15	61	97
Spain	18.6	98	24735	1	0	1	0	0	4	0.923	19	72	79
Indonesia	18.3	87	2664.32	1	0	1	0	0	2	0.471	12	.	139
Thailand	18.3	91	5649.33	0	1	0	0	0	2	0.375	24	66	108
Pakistan	17.8	84	1672.56	0	1	0	0	0	5	0.010	15	73	87
Netherlands	16.5	100	32525.17	1	0	1	0	0	2	0.905	12	74	-6
Denmark	16	98	30053.77	1	0	0	0	1	2	0.885	27	75	8
Malaysia	14.8	92	8086.5	0	1	0	0	0	4	0.664	15	79	102
France	13.5	98	27829.07	1	0	1	0	0	3	0.480	34	78	35
Finland	12	99	28083.02	1	0	0	0	1	3	0.781	18	83	19
Philippines	8.8	86	2353.2	1	0	1	0	0	3	0.280	6	64	112
United Kingdom	7	100	29187.67	0	1	0	0	0	5	0.798	32	85	-32
Sweden	6.8	99	28862.91	1	0	0	0	1	3	0.842	22	83	7
Norway	5.8	100	38251.37	1	0	0	0	1	4	0.922	27	75	-11
South Africa	5.6	72	5572.94	0	1	0	0	0	5	0.860	11	79	59
Canada	5.3	99	30255.08	0	1	0	0	0	5	0.927	40	75	2
Ireland	5.1	92	35160.79	0	1	0	0	0	4	0.887	23	81	-1
Australia	4.8	98	31288.06	0	1	0	0	0	4	0.808	38	80	-29
United States	2	98	36796.23	0	1	0	0	0	5	0.880	39	76	-59

Notes: Variable definitions are available in Appendix A.