

24th XBRL International Conference

"Transparency: with Available, Reliable, Comparable and Re-usable Data"

March 20-22, 2012 Abu Dhabi, UAE

Acedemic Track; "Capital Market Implications of XBRL Adoption", S. Nurwahyu Harahap, March 22, 2012



- 1. Studies of XBRL from the accounting discipline is very limited
- 2. In its comment on SEC's XBRL Voluntary Filing Program, American Accounting Association (AAA) urged the academic community to conduct studies on this program, including capital market implications of the XBRL voluntary filings (Debreceny et al., 2005).

- 3. Debreceny and Gray (2001)
 - a. proposed 2 research agendas:
 - identification of characteristics of the voluntary adopters of XBRL
 - identification of impact of voluntarily XBRL adoption
 - b. Suggested employment of theories and research approaches of the voluntary disclosure literature

4. In its release, SEC expresses its belief that financial information in XBRL format enables more efficient and effective retrieval, research, and analysis of financial information. It will lead to more analyst coverage and higher investor interest in registrants' securities. Overall, these will result in increase liquidity in the market and lower the cost of capital (SEC, 2007). Need empirical support

5. Studies on quality of disclosure mainly focus on the content of disclosure, not the format. There is no evidence that higher disclosure quality in terms of more accessibility has the same capital market effects as the increase in disclosure content.

RESEARCH QUESTION

- What are the capital market implications of voluntary and mandatory XBRL adoption?
 - Information asymmetry
 - Number of Analyst Following
 Cost of Capital
 - Cost of Capital

LITERATURE REVIEW

XBRL adoption in US

- February 3, 2005: SEC established a voluntary program for registrants to file supplemental financial information using XBRL through EDGAR
- Up to Dec 31, 2008: 25 firms and investment funds participated in the program.
- Dec 18, 2008: SEC mandated XBRL for all filings on a phased-in schedule beginning 2009.

LITERATURE REVIEW

- Tan and Shon (2009) : volunteers of SEC's XBRL Filing Program experienced an increase in analyst following and a decrease in information asymmetry subsequent to their XBRL filing for the first time.
- Yoon et al. (2011) : found a significant negative association between XBRL adoption and information asymmetry in Korean Stock Market .
- Extension:
 - impact of XBRL adoption on cost of capital
 - Impact of mandatory adoption

LITERATURE REVIEW

- voluntary disclosure generally associates with reduced information asymmetry, increased following by financial analysts, and reduction in the cost of capital (Healy and Palepu, 2001)
- Mandatory disclosure results in
 - (i) more information production by analyst that leads to reduction in information asymmetry (Bushee et al., 2004; Gintschel and Markov, 2004; Chiyachantana et al., 2004),
 - (ii) positive abnormal returns for large firms Chhaochharia and Grinstein, 2007; Wu and Zimmerman, 2009).

THEORY



Hypothesis

- H1: XBRL adopters experience decrease in information asymmetry after the XBRL adoption
- H2: XBRL adopters experience increase in numbers of analysts following after the XBRL adoption
- H3: Lower information asymmetry due to XBRL adoption decreases cost of capital
- H4: Higher analyst following due to XBRL adoption decreases cost of capital
- H5: XBRL adopters experience decrease in cost of equity capital after the XBRL adoption

RESEARCH FRAMEWORK



 $\begin{array}{l} & \text{Regression model (H1), voluntary adoption:} \\ & \Delta \text{ASYMMETRY}_t = \beta_0 + \beta_1 \text{ DISC} + \beta_2 \text{ XBLR}_t + \beta_3 \Delta \text{SIZE}_t \\ & + \beta_4 \Delta \text{E}_\text{VOL}_t + \beta_5 \Delta \text{RE}_\text{CORR}_t + \beta_6 \Delta \text{E}_\text{SURP}_t \end{array}$

where,

- ASYMMETRY = Information asymmetry, measured as:
 - DISPERSION: standard deviation of inter analyst EPS forecast, deflated by closing stock price in t-1
 - ACCURACY: difference between forecast and actual EPS, deflated by closing stock price deflated by closing stock price in t-1
- $\Delta ASYMMETRY_t = ASYMMETRY_t ASYMMETRY_{t-1}$ as in Botosan and Harris (2000) that investigate the impact of changes in frequency of segment dislocure
- XBRL = 1 for firms participating in SEC's voluntary XBRL program, 0 otherwise

 $\begin{array}{l} \mbox{Regression model (H1) cont:} \\ \Delta ASYMMETRY_t = \beta_0 + \beta_1 \mbox{ DISC} + \beta_2 \mbox{ XBLR}_t + \beta_3 \mbox{ } \Delta SIZE_t \\ + \mbox{ } \beta_4 \mbox{ } \Delta E_VOL_t + \mbox{ } \beta_5 \mbox{ } \Delta RE_CORR_t + \mbox{ } \beta_6 \mbox{ } \Delta E_- \mbox{ } SURP_t \end{array} \tag{1}$

DISC, SIZE, E_VOL, RE_CORR and E_SURP serve as control variables as in Lang and Lundholm (1996)

where,

- DISC = S&P ranking, 1 for high-ranked firms, 0 otherwise
- SIZE = Ln of Total Assets

- E_VOL = standard dev of ROE over previous 5 years
- RE_CORR = correlation between annual stock returns and ROE over last 5 years
- E_SURP = absolute value of difference between EPS in year t and t-1, deflated by closing stock price in t-1

Regression model (H2), voluntary adoption: $\Delta NAF_{t} = \beta_{0} + \beta_{1} DISC + \beta_{2} XBLR_{t} + \beta_{3} CG + \beta_{4} \Delta SIZE_{t}$ + $\beta_5 \Delta E_VOL_t$ + $\beta_6 \Delta RE_CORR_t$ (2)

where,

- NAF = number of analysts following the firms
- CG = Corporate Governance score

an additional control variable as in Lang et al. (2003) that find analysts are less likely to follow firms with potential incentives to withhold or manipulate information

All other variables are as previously defined

Regression model (H3 and H4), voluntary adoption: $\Delta \text{ CoE}_{t} = \beta_{0} + \beta_{1} \text{ E}_{\Delta}\text{ASYMMETRY}_{t} + \beta_{2} \text{ E}_{\Delta}\text{NAF}_{t}$ $+ \beta_{3} \text{ DISC} + \beta_{4} \Delta \text{Size}_{t}$ (3)

where,

- CoE = Cost of Equity Capital, measured as Beta
- E_ Δ ASYMMETRY = fitted value of Δ ASYMMETRY obtained from eq (1)
- $E_{\Delta}NAF = fitted$ value of ΔNAF obtained from eq (2)
- DISC and SIZE serve as control variables as in Botosan (1997).

Regression model (H5), voluntary adoption: $\Delta \text{ CoE}_{t} = \beta_{0} + \beta_{1} \Delta \text{ASYMMETRY}_{t} + \beta_{2} \Delta \text{NAF}_{t}$ $+ \beta_{3} \text{ DISC} + \beta_{4} \text{ XBLR}_{t} + \beta_{5} \Delta \text{SIZE}_{t}$

Similar to Model (3) except that XBLR enters the equation as independent variable to test its direct impact to CoE, while Δ ASYMMETRY and Δ NAF as control variables

(4)

Regression model to (H1-H5), mandatory adoption:

$$\begin{split} &\Delta ASYMMETRY_{t} = \beta_{0} + \beta_{1} XBLR_{adopt} + \beta_{2} \Delta SIZE_{t} \\ &+ \beta_{3} \Delta E_{V}OL_{t} + \beta_{4} \Delta RE_{C}ORR_{t} + \beta_{5} \Delta E_{L} SURP_{t} \end{split}$$
(5)

 $\Delta NAF_{t} = \beta_{0} + \beta_{1} XBLR_{adopt} + \beta_{2} \Delta SIZE_{t} + \beta_{3} \Delta E_{VOL_{t}}$ $+ \beta_{4} \Delta RE_{CORR_{t}}$ (6)

$$\begin{split} &\Delta CoE_{t} = \beta_{0} + \beta_{1} \ \Delta ASYMMETRY_{t} + \beta_{2} \ \Delta NAF_{t} + \beta_{3} \ DISC \\ &+ \beta_{4} \ XBLR_{adopt} + \ \beta_{4} \ \Delta SIZE_{t} \end{split} \tag{7}$$

Similar to Model 1–4 except the definition of XBLR variable as all companies in the sample are mandated to adopt XBRL, XBLR_{adopt} = 1 in the year of adoption (2009), 0 for 2007&2008

RESEARCH METHOD: Source of Data

- SEC's website: to identify participants of XBRL program <u>http://viewerprototype1.com/viewer</u>)
- Institutional Shareholder Services (ISS): CG score data, 2003 – 2005 (available at <u>www.robinson.gsu.edu/accountancy/gov_scor</u> <u>e.html</u>
- S&P: Transparency and Disclosure Ranking 2002 (available at <u>http://www2.standardandpoors.com</u> /portal/site/sp/en/ap/page.article/2,1,1,0,10 34657119268.html?vregion=ap&vlang=en)

RESEARCH METHOD: Source of Data (cont)

- OSIRIS: financial data
- I/B/E/S: analysts following, analyst forecast data, and actual EPS
- Value Line: stock price, returns and beta data (available at www.damodaran.com)

RESEARCH METHOD: Sample Selection

	Total	Sub	Sample
Data Requirement	samples	XBRL	Non XBRL
S&P original data	460	61	399
Bank and insurance	(48)	(7)	(41)
Delisted	(77)	-	(77)
No CG data	(42)	(5)	(37)
No analyst data	(11)	-	(11)
No beta data	(8)	-	(8)
Incomplete financial data	(20)	(2)	(18)
Usable sample firms	254	47	207
Firm years (2005-2008): voluntary model	1016	188	828
Firm years (2007-2009): mandatory model	762	141	621

Impacts on Information Asymmetry: *Correlation Analysis*

Variables	ΔDISP _t	ΔACC _t	DISC	XBRL	$\Delta SIZE_t$	ΔE_VOL_t	ΔRE_CORR_t	$\Delta SURP_t$
ΔDISP _t	1	.610**	046	.042	168**	.231**	.178**	.004
ΔACC _t		1	029	.042	161**	.192**	.218**	.006
DISC			1	.050	020	036	043	057*
XBRL				1	009	029	.105**	.015
$\Delta SIZE_t$					1	196**	121**	.016
ΔE_VOL_t						1	.063*	.007
ΔRE_CORR_t							1	.003
ΔSURP _t								1
*** significant	*** significant at the 0.01 level (1-tailed).							

** significant at the 0.05 level (1-tailed).

Impacts on Information Asymmetry : *regression analysis*

Model (1): $\Delta DISP_t = \beta_0 + \beta_1 DISC + \beta_2 XBLR_t + \beta_3 \Delta SIZE_t + \beta_4 \Delta E_VOL_t + \beta_5 \Delta RE CORR_t + \beta_6 \Delta SURP_t$

Variables	Predicted Sign	Coeficient	t-value			
DISC	-	-0.000801 **	-1.2977			
XBLR _t	-	0.001203	1.0199			
$\Delta SIZE_{t}$	-	-0.007607 ***	-2.3194			
ΔE_VOL_t	+	0.353580 ***	2.8218			
$\Delta RE CORR_{t}$	-	0.067819 ***	3.0615			
$\Delta SURP_t$	+	0.000668	0.1054			
Constant		0.002197 **	1.9630			
R2	0.0942					
Adj. R2	0.0888					
F	17.4804	***				
Durbin-Watson	2.1837					
*** significant at the 0.01 level (1-tailed).						
enificant at the 0.05 level (1-tailed).						
* significanted of 10 level (1-tailed).						

Impacts of voluntary adoption on Information Asymmetry : *discussion*

- XBRL does not have significant correlation with both measures of information asymmetry: ΔDISP and ΔACC
- \blacktriangleright XBRL does not significant relationship to $\Delta DISP$
- Additional test using ∆ ACC arrives in consistent result (H1 is not supported)
- Contrary to Tan and Shon (2009) that used bid-ask spread as measure of information asymmetry

Impacts of voluntary adoption on Information Asymmetry : *discussion*

- possible explanations:
 - XBRL filings contain multiple errors (Bartley et al., 2009)
 - users, analysts in particular, are not aware of XBRL's potential to improve the quality of financial information (CFA Institute, 2008)
 - measures based on analysts forecast misstate the degree of information asymmetry (Clarke and Shastri, 2000)

Impacts on NAF: correlation analysis

Variables	ΔNAF _t	DISC	XBRL	CG	$\Delta SIZE_t$	ΔE_VOL_t	ΔRE_CORR_t
ΔNAFt	1	.037	023	005	.091**	051	051
DISC		1	.050	010	020	036	043
XBRL			1	.110**	009	029	.105**
CG				1	.022	018	026
ΔSIZEt					1	196**	121**
ΔE_VOLt						1	.063*
∆RE_CORRt							
*** significant at the 0.01 level (1-tailed).							

Impacts on NAF : regression analysis

Model (2) : $\Delta NAF_t = \beta 0 + \beta 1 DISC + \beta 2 XBLR + \beta 3 CG + \beta 4 \Delta SIZE_t + \beta 5 \Delta E_VOL_t + \beta 6 \Delta RE_CORR_t$

Variablas	Predicted	Cooficient	t-value			
variables	Sign	Coencient				
DISC	+	0.2280 **	1.7205			
XBRL	+	-0.2162	-0.5620			
CG	+	-0.0040	-0.2000			
Δ SIZE _t	+	1.5475 ***	2.6654			
ΔE_VOL_t	_	-15.6655	-0.8849			
$\Delta RE CORR_{t}$	+	-4.4807	-0.9962			
Constant		-0.2839	-0.4308			
R2	0.0127					
Adj. R2	0.0069					
F	2.1685	**				
Durbin-Watson	2.3828					
*** significant at the 0.01	level (1-tailed).					
** signifies that the 0.05 level (1-tailed).						
* significant at the o.	<u>-1 (1</u> -tailed).					

Impacts of Voluntary Adoption on NAF: *discussion*

- DISC : quality of disclosure is a factor that attract analyst attention (Lang & Lundholm, 1996; Francis et al., 1998; Healy et al., 1999)
- further increase in quality of disclosure by providing financial info in XBRL format does not increase NAF
- analysts have not used XBRL to support their analyses, therefore they do no put special interest to firms adopting XBRL
- Contrary to Tan and Shon (2009) that use absolute NAF as dependent variable instead of change

- Separation between early and late adopters
 - $\Delta ASYMMETRY_{t} = \beta_{0} + \beta_{1} DISC + \beta_{2} \frac{\text{XBLR}_{early}}{\text{XBLR}_{t}} + \beta_{3} \frac{\text{XBLR}_{late}}{\text{XBLR}_{t}} + \beta_{5} \Delta E_{VOL_{t}} + \beta_{6} \Delta RE CORR_{t} + \beta_{7} \Delta SURP_{t}$

consistent with the results of the original model: XBRL voluntary adoption does not reduce information asymmetry or increase NAF

Impact in adoption year only

 $\begin{array}{l} \Delta ASYMMETRY_{t}=\beta_{0}+\beta_{1}\,DISC\,+\,\beta_{2}\,\frac{\mathsf{XBLR}_{year}}{\mathsf{AE}_{t}}+\,\beta_{3}\,\Delta SIZE\\ _{t}+\,\beta_{4}\,\Delta E_{t}VOL_{t}+\,\beta_{5}\,\Delta RE\,CORR\,_{t}+\,\beta_{6}\,\Delta\,SURP\,_{t} \end{array}$

consistent with the results of the original model (2) and (3): XBRL voluntary adoption does not reduce information asymmetry or increase NAF

Addition of moderating variables

$$\begin{split} & \Delta ASYMMETRY_{t} = \beta_{0} + \beta_{1} \text{ DISC} + \beta_{2} \text{ XBLR}_{t} + \beta_{3} \Delta SIZE_{t} \\ & + \beta_{4} \Delta E_{V}OL_{t} + \beta_{5} \Delta RE \text{ CORR}_{t} + \beta_{6} \Delta \text{ SURP}_{t} + \beta_{6} \Delta \\ & \text{SURP}_{t} + \beta_{7} \text{ ASYMMETRY}_{t} + \beta_{8} \text{ XBRL}_{t} \text{ *ASYMMETRY}_{t} \end{split}$$

$$\begin{split} &\Delta NAF_t = \beta_0 + \beta_1 \, DISC + \beta_2 \, XBLR_t + \beta_3 \, CG + \beta_4 \, \Delta SIZE \\ &_t + \beta_5 \Delta E_VOL_t + \beta_6 \, \Delta RE_CORR_t + \beta_7 \, NAF_t + \beta_8 \\ &XBRL_t * NAF_t \end{split}$$

results: XBRL voluntary adoption does not reduce information asymmetry

Model (2a)

* significant at the 0.10 level (1-tailed).

	Predicted					
Variables	Sign	Coeficient	t-value			
DISC	+	0.24531 **	1.9894			
XBRL	+	0.97821	1.1426			
CG	+	-0.00465	-0.2592			
Δ SIZE _t	+	1.45827 ***	2.1845			
ΔE_VOL_t	-	-16.94197	-0.9843			
ΔRE_CORR_t	+	-4.45746	-0.9803			
NAF _t	-	0.01666	0.4512			
XBRL _t *NAF _t	- 🤇	-0.05485 *	-1.4373			
Constant		-0.59854	-0.7863			
R2	0.0127					
Adj. R2	0.0069					
F	2.1685	**				
Durbin-Watson	2.3828					
*** significant at the 0.01 level (1-tailed).						
** significant at the 0.05 1	** significant at the 0.05 level (1-tailed).					

impact of XBRL adoption on ΔNAF is moderated by the level of NAF. Adopters with relatively high NAF experience smaller NAF increase, implying that the impact of XBRL adoption to NAF applies only to adopters with relatively low NAF.

Impacts on Cost of Equity Capital: *correlation analysis*

Variables	ΔCOEt	ΔDISPt	ΔACCt	ΔNAFt	DISC	XBRL	ΔSIZEt
ΔCOEt	1	003	.014	.036	.030	075**	031
ΔDISPt		1	.610**	059*	046	.042	168**
ΔACCt			1	016	029	.042	161**
ΔNAFt				1	.037	023	.091**
DISC					1	.050	020
XBRL						1	-0.009
ΔSIZEt							1
*** significant a	*** significant at the 0.01 level (1-tailed).						

** significant at the 0.05 level (1-tailed).

Impacts on Cost of Equity Capital: *Regression Analysis*

Model (4) : $\triangle COE_t = \beta_0 + \beta_1 \triangle ASYMMETRY_t + \beta_2 \triangle NAF_t + \beta_3 DISC + \beta_4 XBLR_t + \beta_5 \triangle SIZE_t$

Variables	Predicted Sign	Coeficient	t-value
ΔDISP _t	+	-0.0286	-0.0417
ΔNAF _t	-	0.0018 *	1.3117
DISC	-	0.0098 *	1.4560
XBRL _t	-	-0.0390	-2.4377
$\Delta SIZE_t$	-	-0.0335	-1.0173
Constant		-0.0229 *	-1.4459
R2	0.0090		
Adj. R2	0.0041		
F	1.8418	*	
Durbin-Watson	2.1159		
*** significant at the 0.01	level (1-tailed).		

** significant at the 0.05 level (1-tailed).

* significant at the 0.10 level (1-tailed).

Impacts of Voluntary Adoption on CoE: *discussion*

 Voluntary participation may be perceived as firms' willingness to improve the quality of disclosure so that inventors' confidence on these firms increase. Investors may reduce their risk premiums on the stock, thus lowering the firms' cost of capital (Li & Pinsker, 2005).

SUMMARY OF REGRESSION ANALYSIS

Hypothe- ses	Impact	Expected sign	Voluntary	Mandatory
H12	Information Asymmetry	_	Х	V
H13	Number of Analysts Following	+	X V *	V
H16	Cost of Equity	-	V	Х*

V = Accepted , X = Rejected, V* = applies to adopters with previous low NAF,
 X* = significant, sign +

Impacts of Mandatory Adoption: *discussion*

- When XBRL becomes mandatory, it associates to lower information asymmetry and higher NAF, implying that analysts postpone using XBRL until it is mandatory, when more firms file their financial information in XBRL format.
- Contrary to voluntary adoption that associates to lower CoE, mandatory adoption associates to higher CoE, which may represent markets' perception on the higher risk of XBRL mandatory adoption.

CONCLUSION

- Impacts of XBRL voluntary adoption
 - No support for hypotheses that XBRL adoption results in lower information asymmetry and higher number of analyst following.
 - Increase in NAF applies only to firms with previous low NAF
 - support for direct impact on reduction of cost of capital.

Impacts of XBRL mandatory adoption

 mandatory adoption associates to reduction of information asymmetry, increased analysts following, and increased cost of capital.

IMPLICATION

Academic

- contributes to limited number of XBRL research, particularly in accounting discipline
- providing evidences on the impacts of XBRL adoption
- integrates previous studies on disclosure and studies in the use of technology for financial reporting.

IMPLICATION

Regulator

- promote the fact that voluntary adopters enjoy decrease in cost of capital.
- offer incentives for voluntary adoptions. As many firms participate in voluntary program, XBRL adoption impact on analysts following takes place.

IMPLICATION

Regulator

- Once XBRL becomes mandatory, cost of capital increase, implying market's perception that XBRL adoption associates to higher risk.
- regulators may start with voluntary program and conduct careful evaluation before mandating XBRL adoption. XBRL adoption in two phases may minimize the negative impact such as higher info asymmetry.

LIMITATION

- Due to constraint in data availability, measurement of CG and DISC variables is based on out dated data, with the assumption that these data remain constant until 2008.
- Constraint in availability of longitudinal data
- does not differentiate the extent of disclosure prepared in XBRL format. Extent of XBRL adoption may have different impact



s.nurwahyu@ui.ac.id