

# Usefulness of Accounting Estimates: A Tale of Two Countries (China and India)

**Thanyaluk Vichitsarawong**  
Chulalongkorn University  
**Li Li Eng**

Missouri University of Science and Technology

# Motivation

- ▶ China and India are among two of the emerging economies of BRIC (Brazil, Russia, India and China).
  - Largest economy
  - Largest populations
  - High growth emerging market
- ▶ China and India have committed to the adoption of IFRS.
  - IFRS–convergent accounting standards became mandatory for listed firms in China in 2007.
  - India intended to converge with IFRS beginning 2011, but the transition date is to be announced.

# Literature Review



## ▶ Research on accounting in China and India

- Frequency and magnitude of earnings management have gone up during the post-2000 period (Wang et al. 2008).
- Non-state-owned enterprises have higher earnings management (lower quality) than state-owned enterprises in China (Chen et al. 2011).
- Chinese family firms have lower earnings quality than non family firms (Ding et al. 2011).
- Board quality is important for reducing earnings management but board independence has no significant relation with discretionary accruals in India (Sarker et al. 2008).

# Literature Review

- ▶ **The impact of IFRS adoption on accounting quality**
  - Firms applying IFRS have less earnings management, more timely loss recognition and more value relevant of accounting amounts (Barth et al. 2008, 2012).
  - Earnings quality increases for mandatory IFRS adoption when a country's investor protection regime provides stronger protection (Houque et al. 2011).
  - In contrast, mandatory adoption of IFRS leads to decreased accounting quality e.g. increases in income smoothing and aggressive reporting of accruals, and a significant decrease in timeliness of loss recognition (Ahmed et al. 2013).

# Literature Review

- ▶ **Other effects of IFRS adoption**
  - Market liquidity increases, firms' cost of capital decreases and equity valuation increases around the introduction of IFRS (Daske et al., 2008).
  - The information content of earnings announcements (abnormal return volatility and abnormal trading volume) increases in countries following mandatory IFRS adoption (Landsman et al., 2012).
  - Analysts' absolute forecast errors and forecast dispersion decrease for mandatory IFRS adopters (Byard et al., 2011)
- ▶ The effects of IFRS adoption depend on the strength of legal enforcement in the adopting countries.

# Objective & Hypothesis



- ▶ This study examines the quality of earnings and cash flows as reported by Chinese firms during the period 2001–2013 and Indian firms during the period 2008–2013.
- ▶ H1: Accounting estimates perform better in predicting future earnings (cash flows) in the post-IFRS convergence period than pre-IFRS convergence period.

# Sample and Data

- ▶ Datastream Database
- ▶ Sample firms are actively listed on the main stock exchanges in India or China.
- ▶ Period of study
  - **India:** pre-IFRS (2007–2009) and post-IFRS (2011–2013)
    - Since April 2010, listed firms in India have an option to file their consolidated F/S under either Indian GAAP or IFRS (with reconciliations). The IFRS converged Indian Accounting Standards have been issued but the effective date of these standards has not been announced.
  - **China:** pre-IFRS (2001–2006) and post-IFRS (2008–2013)
    - Chinese listed firms have been required to follow IFRS–convergent new accounting standards since January 1, 2007.

# Sample and Data

**Table 1 Sample**

**Panel A: Sample Selection**

	<b>India</b>	<b>China</b>
	<b>Firm-year obs.</b>	<b>Firm-year obs.</b>
Sample period	Pre (2007-2009) Post (2011-2013)	Pre (2001-2006) Post (2008-2013)
Initial sample	28,161	27,636
Less: Missing data	14,548	11,297
Less: Financial service, real estate, and insurance	546	1,174
Less: Firms not available in all years	5,267	6,381
Final sample	7,800	8,784
Final sample (No. of firms)	1,300	732



# Methodology

## ▶ Prediction models for $EARN_{t+1}$ and $CFO_{t+1}$

$$EARN_{t+1} = \beta_0 + \beta_1 EARN_t + \varepsilon_t \quad (1)$$

$$EARN_{t+1} = \beta_0 + \beta_1 CFO_t + \varepsilon_t \quad (2)$$

$$EARN_{t+1} = \beta_0 + \beta_1 CFO_t + \beta_2 ACCRUALS_t + \varepsilon_t \quad (3)$$

$$EARN_{t+1} = \beta_0 + \beta_1 CFO_t + \beta_2 \Delta AR_t + \beta_3 \Delta INV_t + \beta_4 \Delta AP_t + \beta_5 DP_t + \beta_6 OTHER_t + \varepsilon_t \quad (4)$$

Where:

*EARN* = earnings before extraordinary items;

*CFO* = net cash flow from operations;

*ACCRUALS* = *EARN* – *CFO*;

$\Delta AR$  = change in accounts receivable;

$\Delta INV$  = change in inventory;

$\Delta AP$  = change in accounts payable;

*DP* = depreciation and amortization expenses;

*OTHER* = other accruals defined as  $EARN - (CFO + \Delta AR + \Delta INV - \Delta AP - DP)$ .

All variables are scaled by beginning total assets. We run regression of these models to obtain sample estimates.

# Methodology

## ▶ Out-of-sample prediction of earnings (cash flows)

Example of the prediction of earnings for year 2008 using Model 1.

1. Estimate the following regression for each country:

$$EARN_{2007} = b_0 + b_1 EARN_{2006} + e_t$$

2. Use the country specific estimated coefficients ( $b_0$  and  $b_1$ ) to predict earnings,  $Est(EARN)$ , for each firm in the country:

$$Est(EARN_{2008}) = Est(b_0) + Est(b_1) * EARN_{2007}$$

3. Determine prediction error (PE) for each firm in a given country:

$$PE_{2008} = EARN_{2008} - Est(EARN_{2008})$$

We repeat the procedure for every firm and sample year.

# Methodology

- ▶ **Out-of-sample prediction performance metrics**
  - MPE = mean prediction error;
  - MAPE = mean absolute prediction error;
  - RMSE = root mean square prediction error;
  - ALPHA = the intercept from the Mincer–Zarnowitz (1969) regressions of actual values on predicted values;
  - BETA = the slope coefficient from the Mincer–Zarnowitz regressions of actual values on predicted values;
  - $R^2$  = the adjusted  $R^2$  from the Mincer–Zarnowitz regressions of actual values on predicted values;
  - Theil's U = Theil's U statistic, defined as the square root of  $\frac{\Sigma(\text{actual}-\text{predicted})^2}{\Sigma(\text{actual})^2}$

# Methodology

- ▶ **Out-of-sample prediction performance metrics** (following Lev et al., 2010 and Li and Sougiannis, 2014)
  - **MPE** and **ALPHA** measure prediction bias.
  - **MPAE**, **RMSE** and **Theil's U** measure prediction accuracy.
  - **BETA** measures the correlation between actual and predicted values.
  - **R2** measures how well predicted values are related to actual values.

# Results: Out-of-Sample Prediction, Forecast of $Earn_{t+1}$

## ▶ Table 4, Panel A: India

Prediction bias                      Prediction accuracy

Panel A: India

Model	MPE	MAPE	RMSE	ALPHA	BETA	ADJ $R^2$	Theil's U
<i>India (Pre 2010)</i>							
1	-0.0329	0.0570	0.0749	-0.0418	1.1177	0.4205	0.7637
2	-0.0392	0.0726	0.0897	-0.0794	1.4886	0.1687	0.9193
3	-0.0335	0.0571	0.0752	-0.0373	1.0491	0.4161	0.7666
4	-0.0366	0.0619	0.0782	-0.0499	1.1659	0.3683	0.8075
<i>India (Post 2010)</i>							
1	0.0016	0.0403	0.0621	0.0020	0.9847	0.5201	0.6614
2	-0.0148	0.0564	0.0810	-0.0232	1.1965	0.1824	0.8794
3	-0.0012	0.0402	0.0613	-0.0039	1.0891	0.5325	0.6549
4	-0.0038	0.0429	0.0641	-0.0094	1.1749	0.4891	0.6902

Pre-Post	MPE	MAPE	RMSE	ALPHA	BETA	ADJ $R^2$	Theil's U
1	-0.0345 ***	0.0167 ***	0.0128 ***	-0.0439 ***	0.1330 ***	-0.0996 ***	0.1023 ***
2	-0.0244 ***	0.0162 ***	0.0086 ***	-0.0562 ***	0.2922 ***	-0.0137 ***	0.0399 ***
3	-0.0323 ***	0.0169 ***	0.0139 ***	-0.0335 ***	-0.0399 ***	-0.1164 ***	0.1117 ***
4	-0.0329 ***	0.0190 ***	0.0141 ***	-0.0405 ***	-0.0090 ***	-0.1208 ***	0.1173 ***

# Results: Out-of-Sample Prediction, Forecast of $Earn_{t+1}$

## ▶ Table 4, Panel B: China

Prediction bias                      Prediction accuracy

Panel B: China

Model	MPE	MAPE	RMSE	ALPHA	BETA	ADJ R <sup>2</sup>	Theil's U
<i>China (Pre 2007)</i>							
1	0.0049	0.0364	0.0583	0.0029	0.9374	0.2540	0.8700
2	0.0002	0.0396	0.0626	-0.0023	1.0845	0.1450	0.8951
3	0.0040	0.0361	0.0575	0.0028	0.9509	0.2750	0.8500
4	0.0024	0.0372	0.0582	0.0021	0.9219	0.2584	0.8546
<i>China (Post 2007)</i>							
1	0.0018	0.0490	0.0995	0.0222	0.4759	0.0524	0.9053
2	0.0042	0.0514	0.1005	0.0104	0.8523	0.0296	0.9070
3	0.0026	0.0484	0.0995	0.0185	0.5933	0.0539	0.8986
4	0.0035	0.0508	0.1002	0.0250	0.4556	0.0391	0.9171
<i>Pre-Post</i>							
1	0.0032	-0.0126 ***	-0.0413 ***	-0.0193 ***	0.4615 ***	0.2015 ***	-0.0353 ***
2	-0.0040 *	-0.0118 ***	-0.0379 ***	-0.0127 ***	0.2322 ***	0.1154 ***	-0.0118 ***
3	0.0014	-0.0123 ***	-0.0421 ***	-0.0157 ***	0.3576 ***	0.2211 ***	-0.0486 ***
4	-0.0010	-0.0136 ***	-0.0420 ***	-0.0229 ***	0.4663 ***	0.2193 ***	-0.0625 ***

# Overall Results

- ▶ Results of the prediction of cash flows are consistent with the findings in Table 4.
- ▶ After **India** converged to IFRS in 2010, the out-of-sample forecasts derived from the four models are **less biased, more accurate, and more efficient**.
- ▶ The out-of-sample forecasts in **China** are **more biased, less accurate, and less efficient** after the IFRS convergence in 2007.

# Portfolio Analysis



- We rank firms based on the predicted values of earnings (cash flows) and form five portfolios.
- We computed market-adjusted returns from holding a zero-investment hedge portfolio; going long (investing) in the top portfolio and shorting (selling) the bottom portfolio over 90, 180, 270, and 365 days after the fiscal year end.
- The abnormal returns on zero investment portfolios indicate the returns to investors of using earnings (CFO) as predictors of future earnings (CFO).



# Results: Portfolio Analysis Based on Ranking of Future Earnings Predictions

## ► Table 6, Panel A: India

### Panel A: India

Model 1	Pre-2010 (1)	Post-2010 (2)	Difference (2) – (1)	p-value	(2-tailed)
90 days from fiscal year end	<b>0.0581</b>	0.0169	-0.041	0.070	*
180 days from fiscal year end	<b>0.0551</b>	-0.0014	-0.057	0.058	*
270 days from fiscal year end	0.0202	0.0224	0.002	1.040	
365 days from fiscal year end	0.0662	<b>0.0962</b>	0.030	1.470	
Model 2	Pre-2010 (1)	Post-2010 (2)	Difference (2) – (1)	p-value	(2-tailed)
90 days from fiscal year end	<b>-0.0465</b>	<b>0.0588</b>	0.105	0.000	***
180 days from fiscal year end	<b>-0.0563</b>	<b>0.0713</b>	0.128	0.000	***
270 days from fiscal year end	-0.0312	<b>0.1105</b>	0.142	0.000	***
365 days from fiscal year end	-0.0086	<b>0.1607</b>	0.169	0.000	***
Model 3	Pre-2010 (1)	Post-2010 (2)	Difference (2) – (1)	p-value	(2-tailed)
90 days from fiscal year end	0.0179	<b>0.0279</b>	0.010	1.346	
180 days from fiscal year end	0.0000	0.0246	0.025	1.598	
270 days from fiscal year end	-0.0231	<b>0.0507</b>	0.074	0.078	*
365 days from fiscal year end	0.0236	<b>0.1352</b>	0.112	0.018	**
Model 4	Pre-2010 (1)	Post-2010 (2)	Difference (2) – (1)	p-value	(2-tailed)
90 days from fiscal year end	<b>0.0414</b>	0.0262	-0.015	0.504	
180 days from fiscal year end	0.0177	0.0228	0.005	0.864	
270 days from fiscal year end	-0.0133	<b>0.0626</b>	0.076	0.072	*
365 days from fiscal year end	0.0294	<b>0.1363</b>	0.107	0.026	**

# Results: Portfolio Analysis Based on Ranking of Future Earnings Predictions

## ► Table 6, Panel B: China

### Panel B: China

Model 1	Pre-2007 (1)	Post-2007 (2)	Difference (2) – (1)	p-value	(2-tailed)
90 days from fiscal year end	<b>-0.0526</b>	<b>-0.0788</b>	-0.026	0.190	
180 days from fiscal year end	-0.0285	<b>-0.0993</b>	-0.071	0.004	***
270 days from fiscal year end	-0.0464	<b>-0.1235</b>	-0.077	0.006	***
365 days from fiscal year end	-0.0009	<b>-0.0841</b>	-0.083	0.014	**
Model 2	Pre-2007 (1)	Post-2007 (2)	Difference (2) – (1)	p-value	(2-tailed)
90 days from fiscal year end	<b>-0.0314</b>	<b>-0.0614</b>	-0.030	0.146	
180 days from fiscal year end	0.0060	<b>-0.0750</b>	-0.081	0.002	***
270 days from fiscal year end	-0.0144	<b>-0.0789</b>	-0.065	0.026	**
365 days from fiscal year end	0.0331	<b>-0.0633</b>	-0.096	0.002	***
Model 3	Pre-2007 (1)	Post-2007 (2)	Difference (2) – (1)	p-value	(2-tailed)
90 days from fiscal year end	<b>-0.0479</b>	<b>-0.0793</b>	-0.031	0.132	
180 days from fiscal year end	-0.0123	<b>-0.1029</b>	-0.091	0.000	***
270 days from fiscal year end	-0.0261	<b>-0.1120</b>	-0.086	0.004	***
365 days from fiscal year end	0.0197	<b>-0.0747</b>	-0.094	0.006	***
Model 4	Pre-2007 (1)	Post-2007 (2)	Difference (2) – (1)	p-value	(2-tailed)
90 days from fiscal year end	<b>-0.0368</b>	<b>-0.0729</b>	-0.036	0.070	*
180 days from fiscal year end	-0.0032	<b>-0.0897</b>	-0.087	0.000	***
270 days from fiscal year end	-0.0256	<b>-0.0828</b>	-0.057	0.044	**
365 days from fiscal year end	0.0195	<b>-0.0406</b>	-0.060	0.074	*

# Overall Results

- ▶ Accounting estimates in **India** in the post-IFRS period are **better predictors** of future earnings and cash flows than accounting estimates in the pre-IFRS period.
- ▶ There is **no evidence** that accounting estimates in **China** are improving in predicting future earnings and cash flows in the post-IFRS period.

# Implication

- ▶ The difference in results may be attributed to **accounting systems** and **legal enforcement**.
- ▶ China's accounting system is from Socialist legal origin (**civil law**) while India's is from English legal origin (**common law**).
- ▶ Common law countries have the strongest legal protection of investors compared to civil law countries (La Porta et al., 1998).
- ▶ Other studies find higher accounting quality in countries with strong legal enforcement (Ball et al., 2003, Burgstahler et al., 2006).
- ▶ Our findings provide a preliminary understanding of the usefulness of accounting estimates for firms in China and India.

▶ Thank you