

Figure 1. Study time series

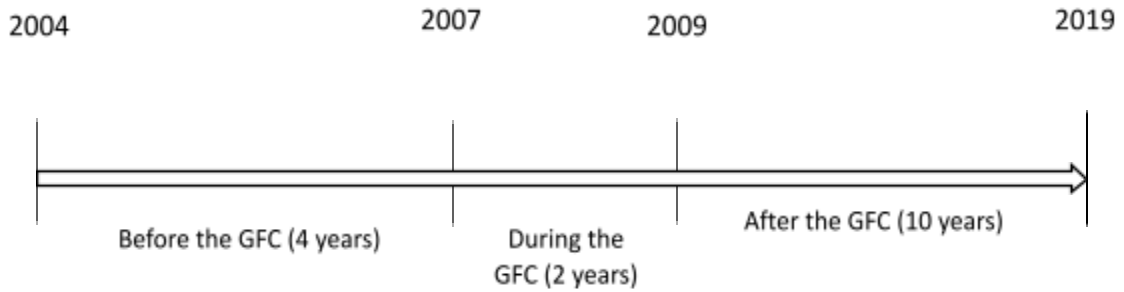
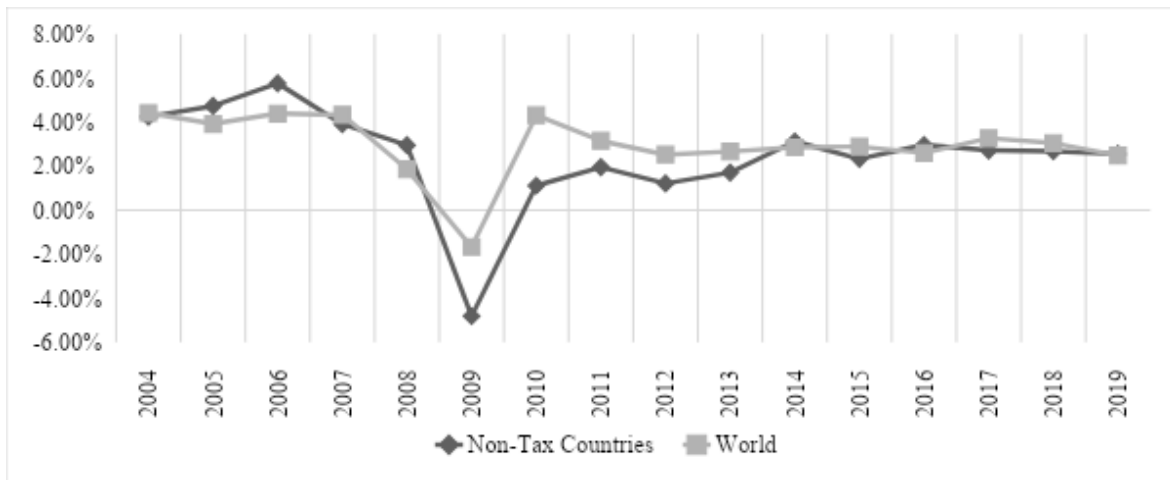
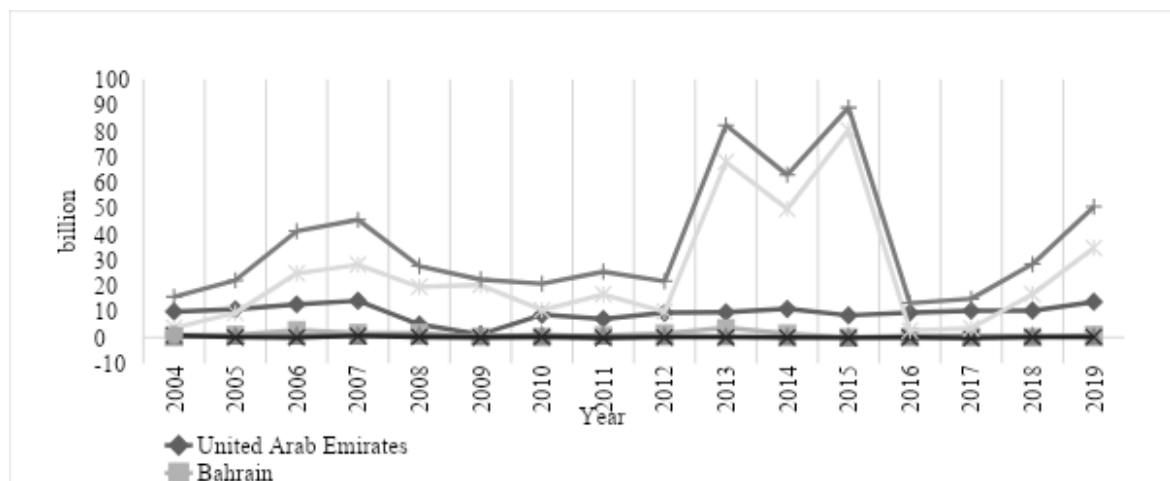


Figure 2. GDP growth



Data is obtained from World Bank website, and authors develop the graph.

Figure 3. Net Change in FDI



Data is obtained from World Bank website, and authors develop the graph.

Table 1. Variable definitions:

Variable Group	Model	Variable	Label in models	Description
Accrual-Based EM Modified Jones model 1995 with ROA	Kothari et al., (2005) - Model 1	Total Discretionary Accrual	DA	It is the income before extraordinary and discontinued operation less the cash from operation
		Assets	Assets	It is equal to the end of year total of assets
		Change in revenue	ΔREV	Current year revenue less revenue in the preceding year
		Change in account receivables	ΔAR	Current year account receivables less account receivables in the preceding year
		Property, plant, and equipment	GPPE	The total value of property, plant, and equipment reported in the balance sheet.
		Assets for the preceding year	Assets _(t-1)	The total of assets of the last year
		Profit	Profit	The current year net income
Real-Based EM DECHOW ET. AL. (1998) MODEL	Production cost - Model 2	Production cost	COGS	The sum of Cost of goods sold and change in the current year inventory
		Sales	Sales _{it}	The current year net sales
	Operating cash flow model - Model 3	Operating cash flow	CFO _{it}	Current year cash flow from operating activities
		Change of sales	$\Delta Sales_{it}$	Current year sales less sales in the preceding year
	Discretionary expenses - Model 4	Discretionary expenses	DisExp _{it}	Is the sum of research and development, Selling, General & Administrative, and advertisement expenses
FIRM LEVEL CONTROL VARIABLES	Profit margin	PM	Net income divided by the net sales	
	Return on assets	ROA	Net income divided by Assets	
	Return on equity	ROE	Net income divided by the total of equity	
	Firm size	F-size	The logarithm of gross assets	
	Financial leverage	F-LEV	Total of noncurrent debt (long term) over the equity	
	Firm growth	Firm-G	Net Income less (dividends + depreciation & Amortization) divided by (Equity + noncurrent liabilities)	
	Earnings per share	EPS	Net income divided by the average of outstanding shares	
	Dividends per share	DPS	Dividends divided by the number of shares	
COUNTRY LEVEL CONTROL VARIABLES	Economic growth in the country	GDP-G	Percent of growth in the GDP	
	Country governance	C-Governance	The average of country governance proxies (Control of Corruption, Government Effectiveness, Political Stability and Absence of	

Violence/Terrorism, Regulatory Quality, and Rule of law (Voice and Accountability).

*Note: the common variables between models identified only in one model.

Table 2. Data and models validity

Variables	Data validation techniques			
	Shapiro-Wilk		Collinearity	
	Statistic	p-value		VIF
DA Model	0.873***	0.000		
Positive_DA Model	0.543***	0.000		
Negative_DA Model	0.555***	0.000		
R_CFO	0.835***	0.000		
R_PROD	0.654***	0.000		
R_DISX	0.367***	0.000		
RM_PROXY	0.404***	0.000		
DPS	0.269***	0.000	0.725	1.379
EPS	0.387***	0.000	0.713	1.403
PM	0.084***	0.000	0.982	1.018
ROE	0.341***	0.000	0.755	1.325
ROA	0.136***	0.000	0.783	1.277
F-size	0.992***	0.000	0.888	1.126
F-Leverage	0.028***	0.000	0.816	1.225
Firm-G	0.302***	0.000	0.854	1.171
C-Governance	0.946***	0.000	0.868	1.152
GDP-G	0.937***	0.000	0.851	1.175
Model validity:	DA Model	Positive_DA Model	Negative_DA Model	
<i>Autocorrelation:</i>				
Durbin Watson	1.550	1.629	1.667	
<i>Heteroscedasticity:</i>				

Breusch-Pagan (p-value)	0.001	0.021	0.000
<i>Hausman Test:</i>			
Chi²	1.342	0.645	1.754
p-value	0.318	0.953	0.069

Notes: *, ** and *** denote significance at the 10%, 5% and 1% levels.

Table 3. Descriptive statistics:

Variable	Mean	Std. Dev.	Min	Max
DA	-0.008	0.120	-0.935	1.200
Positive_DA	0.033	0.072	0.000	1.200
ABSOLUTE_DA	0.075	0.094	0.000	1.200
Negative_DA	-0.042	0.081	-0.935	0.000
R_CFO	0.022	0.156	-1.831	1.317
R_PROD	-0.030	0.241	-3.062	2.134
R_DISX	-0.218	1.460	-29.823	9.945
RM_PROXY	-0.225	1.478	-29.620	9.371
DPS	0.439	1.486	0.000	9.844
EPS	0.788	5.173	-15.978	26.990
PM	0.218	4.099	-0.200	0.847
ROE	0.014	0.820	-5.432	3.338
ROA	0.017	0.220	-1.456	0.472
F-size	20.638	1.992	16.312	25.432
F-Leverage	0.567	1.082	-0.564	5.338
Firm-G	0.091	0.079	-0.018	0.525
C-Governance	2.285	3.156	-5.284	9.837
GDP-G	0.0732	0.359	-0.0231	0.1378

***1,608 Observations**

Where:

DA is the result of discretionary accrual EM presented in model 1.

Positive_DA: Is the portion of firms that used the discretionary accrual EM to overstate the income.

ABSOLUTE_DA: Is the absolute value of discretionary accrual EM presented in model 1.

Negative_DA: is the portion of firms that used the discretionary accrual EM to understate the income.

R_CFO: Is the results of real-based EM model 2 (cash flow from operation).

R_PROD: Is the results of real-based EM model 1 (production cost).

R_DISX: Is the results of real-based EM model 3 (Discretionary expenses).

RM_PROXY: Is equal to the sum of real-based EM, obtained from Model 2,3, and 4.

Before, During, and After: Represent the time series period concerning the Global Financial Crisis.

DPS: Is the dividends per share.

EPS: Is the earning per share.

PM: Is the profit margin.

ROE: Is the return equity.

ROA: Is the return on assets.

F-size: Is the firm size.

F-Leverage: Is the financial leverage.

Firm-G: Is the firm growth.

C-Governance: Is the Country governance.

GDP-G: Is the GDP growth

Table 4. Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. DA	1																	
2. Positive_DA	0.749***	1																
3. ABSOLUTE_DA	-0.177***	0.519***	1															
4. Nigative_DA	0.831***	0.254***	-0.695***	1														
5. R_CFO	-0.457***	-0.392***	0.00848	-0.339***	1													
6. R_PROD	0.0930***	0.0492	-0.0469	0.0945***	-0.162***	1												
7. R_DISX	0.0674*	0.0415	-0.0252	0.0635*	-0.306***	0.127***	1											
8. RM_PROXY	0.0389	0.0126	-0.0314	0.0462	-0.236***	0.264***	0.986***	1										
9. DPS	-0.00205	-0.0405	-0.0576*	0.0311	0.0608*	-0.0484	-0.0601*	-0.0615*	1									
10. EPS	0.00004	-0.0354	-0.0527*	0.0298	0.109***	-0.0683**	-0.0622*	-0.0623*	0.503***	1								
11. PM	-0.0384	0.0202	0.0796**	-0.0731**	0.0412	-0.00974	-0.0361	-0.0336	0.019	0.0271	1							
12. ROE	0.0567*	0.00906	-0.0597*	0.0752**	-0.0122	-0.0815**	0.0344	0.0208	0.0321	0.0813**	0.0158	1						
13. ROA	0.0279	0.0379	0.0203	0.00889	0.235***	0.0184	-0.442***	-0.415***	0.0321	0.0463	0.0128	-0.182***	1					
14. F-size	-0.00595	-0.0550*	-0.0740**	0.0375	0.0881***	-0.0870***	0.0213	0.0162	0.0540*	-0.106***	-0.0906***	0.0680**	0.187***	1				
15. F-Leverage	-0.00018	-0.0137	-0.0202	0.0113	0.00728	0.00556	0.00305	0.00455	0.00476	-0.0077	0.0046	0.399***	0.00714	0.0324	1			
16. F-Growth	-0.0335	0.0229	0.0773**	-0.0682**	0.121***	-0.0237	-0.467***	-0.457***	0.0355	0.032	0.0627*	0.0244	0.328***	-0.0789**	-0.002	1		
17. C-Governance	0.0530*	0.0172	-0.0429	0.0630*	-0.0432	0.0670*	0.0354	0.0414	-0.0677**	0.0228	0.0602*	0.0485	0.0548*	-0.0174	-0.04	-0.003	1	
18. GDP-G	-0.0568*	-0.008	0.0613*	-0.0762**	-0.0387	-0.0851**	-0.0101	-0.0265	0.0621*	-0.0249	-0.0583*	-0.120***	-0.0052	-0.0353	0.0596*	0.0316	-0.349***	1

t statistics in parentheses: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. Regression results of EM models in different period

Description	Before	During	After
ABSOLUTE DISCRETIONARY ACCRUAL EM (MODEL 1)	-0.004	0.017**	-0.005
POSITIVE DISCRETIONARY ACCRUAL EM (MODEL 1)	-0.001	-0.006	0.001
NEGATIVE DISCRETIONARY ACCRUAL EM (MODEL 1)	0.003	0.017**	0.005
ABNORMAL PRODUCTION COST (MODEL 2)	-0.011	-0.023	0.016
CASH FLOW FROM OPERATING (MODEL 3)	0.005	0.012	-0.008
DISCRETIONARY EXPENSES (MODEL 4)	0.183*	0.401***	-0.274***
REAL EARNING MANAGEMENT	0.176*	0.390***	-0.265***

STANDARD ERRORS ARE IN PARENTHESIS *** P<0.01, ** P<0.05, * P<0.1

Figure 4. Discretionary Accrual EM over time 2004 - 2019

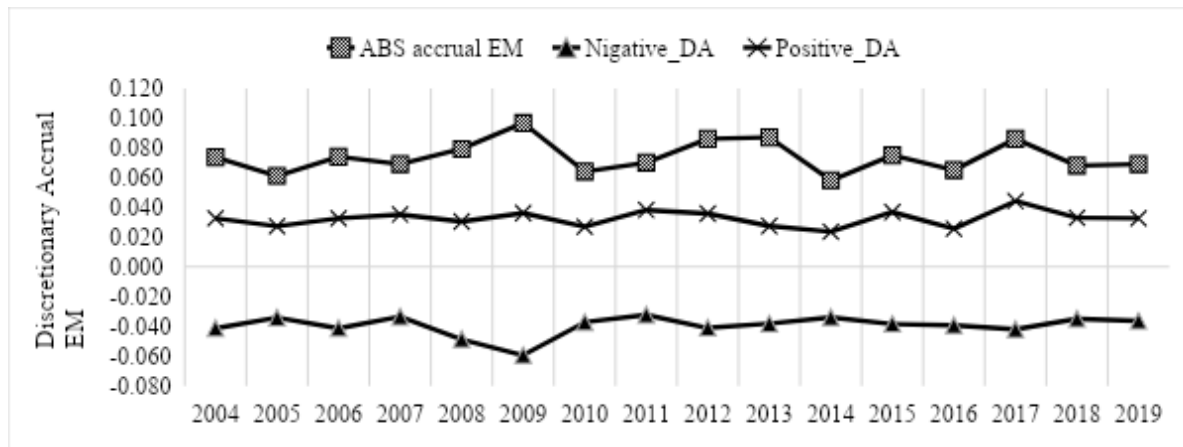


Figure 5. Real earning management over time 2004 - 2019



Table 6. Regression results of accrual-based EM activities determinants before, during and after GFC

Variable	Positive discretionary accrual EM			Absolute discretionary accrual EM			Negative discretionary accrual EM		
	Before	During	After	Before	During	After	Before	During	After
DPS	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	0.001	0.001	0.001
EPS	0	0	0	0	0	0	0	0	0
PM	0	0	0	0.000***	0.000***	0.000***	-0.000***	-0.000***	-0.000***
ROE	0.003	0.003	0.003	-0.004	-0.004	-0.004	0.006***	0.007***	0.006***
ROA	0.003**	0.003**	0.003**	0	0	0	0.003	0.003	0.003
F-size	-0.002**	-0.002**	-0.002**	-0.003**	-0.003**	-0.003**	0	0	0
F-Leverage	0	0	0	0	0	0	0	0	0
F-Growth	-0.001	-0.001	-0.001	0.037**	0.035**	0.036**	-0.038***	-0.036***	-0.036***
C-Governance	0	0	0	-0.001	0	-0.001	0.001	0	0.001
GDP-G	0	0	0	0.013*	0.014**	0.012*	-0.013*	-0.014**	-0.012*
_cons	0.084***	0.084***	0.084***	0.124***	0.117***	0.125***	-0.04	-0.033	-0.041*
R-squared	0.009	0.009	0.009	0.028	0.03	0.028	0.026	0.029	0.027

Table 7. Regression results of real based EM activities determinants before, during and after GFC

EM model	Cash flow from operating (model 3)			Abnormal production cost (model 2)			Discretionary expenses (model 4)			Real EM (Sum of model 2, 3, & 4)		
	Before	During	After	Before	During	After	Before	During	After	Before	During	After
Period												
DPS	0	0	0	0.001	0.001	0.001	-0.021	-0.017	-0.02	-0.02	-0.017	-0.02
EPS	0.002***	0.002** *	0.002***	-0.002**	-0.002**	-0.002**	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003
PM	0	0	0	0	0	0	0	0	0	0	0	0
ROE	0.001	0.001	0.001	-0.020** *	-0.020** *	-0.020** *	-0.044	-0.046	-0.048	-0.063*	-0.065*	-0.067*
ROA	0.024***	0.024** *	0.023***	0.006	0.006	0.006	-0.433** *	-0.434** *	-0.437** *	-0.403** *	-0.404** *	-0.407** *
F-size	0.005**	0.005**	0.005**	-0.012** *	-0.012** *	-0.012** *	0.050***	0.048***	0.052***	0.042**	0.041**	0.045**
F-Leverage	0	0	0	0.001*	0.001*	0.001*	0.002	0.002	0.002	0.003	0.003	0.003
F-Growth	0.043*	0.043*	0.042*	-0.043	-0.042	-0.041	-3.021** *	-3.038** *	-3.053** *	-3.020** *	-3.037** *	-3.052** *
C-Governance	-0.004** *	-0.003**	-0.004** *	0.004	0.002	0.003	0.02	0.047***	0.027**	0.02	0.046***	0.027**

GDP-G	-0.023**	-0.021*	-0.023**	-0.056** *	-0.061** *	-0.057** *	0.051	0.137	0.074	-0.028	0.055	-0.006
_cons	-0.05	-0.055	-0.048	0.262***	0.268***	0.253***	-1.090** *	-1.196** *	-0.947**	-0.881**	-0.984**	-0.743*
R-squared	0.079	0.08	0.08	0.035	0.035	0.035	0.321	0.326	0.326	0.298	0.302	0.302
STANDARD ERRORS ARE IN PARENTHESIS *** P<0.01, ** P<0.05, * P<0.1												

