Bank soundness: A PLS-SEM approach

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Abstract

During the Global Financial Crisis (GFC) of 2007-09, even banks in industrial economies with long established markets suffered significantly. This highlights the weakness in the banking system and the importance of a sound banking sector. This article illustrates the drivers of bank soundness for G7 countries during the period 2003-2013. In creating a parsimonious model, the study assembles 18 manifest variables of 6 constructs as the cause of bank soundness. The structural equation model comprises of six latent exogenous constructs [Capital (C), Asset (A), Management (M), Earnings (E), Liquidity (L) and Sensitivity(S)] which explains the observed consequences of bank soundness in these countries. Results indicate that 43.8% of the variation in banks' soundness is explained by CAMELS. The model's predictive relevance (Q^2) with regard to endogenous construct stands at a strong category of 0.425. The results imply that banks placed high importance on off balance sheet and capital activities thus taking on higher risk. Surprisingly, these banks were operating at low levels of capital and liquidity resembling banks that failed during the Great Depression. The weakness in capital and liquidity measures calls for robust policy measures to create convergence with soundness.

Keywords

Bank soundness; G7; CAMELS; Financial Crisis

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Introduction

The recent GFC resulted in large bank failures in the G7 countries (Canada, France, Germany, Italy, Japan, UK and US) with the exception of Canada, which led to deep recessions. This highlights the chronic weakness in the existing banking sector and the importance of a robust banking system. A sound banking system has to be efficient in the key role it plays to influence the economy positively.

This article assesses the soundness of banks in G7 countries, to better understand the workings of these banks as providers of payment services and hubs for economic and financial activities especially during the crisis period. The motivation to study the G7 banks lies on several reasons. G7 countries are among the top 10 biggest economies, 5 of the countries hold the top 10 financial hub position in the world and G7 countries play a key role in global monetary affairs and trade. As a result, these countries hold a significant position in influencing the world economy at large.

In assessing the soundness of banks, seven clusters of financial indicators and credit rating models were considered, namely, Financial Soundness Indicator (FSI), Basel Core Principles (BCP), CAMELS, Moody, Fitch, Standard and Poor (S&P) and Bank Financial Strength Rating (BFSR). The study puts together 60 bank-level variables from these indicators and applied stock returns as the proxy for bank soundness. Partial least square structural equation modeling was applied to assess the banks.

The study offers two main contributions. First, the assessment of G7 banks as key players in global trade and monetary affairs during the GFC. Second contribution is to apply seven sets of bank soundness and credit rating indicators in the assessment.

Literature review

Bank soundness is a concept that signifies the ability of a bank to survive an adversity in the economy (Lindgren et al.1996). Financial ratios play a key role in assessing bank soundness as early signs of impairment could be easily detected by the changes in the internal condition of the banks (Sinkey 1979; Hanc 1998). Several measures have been suggested for bank soundness such as earnings (Gasbarro et. al. 2002); capital (Schaeck and Čihák 2007); internal governance (Lindgren et al.1996) and credit ratings (Podviezko and Ginevičius 2010; Demirgüç-Kunt and Detragiache 2011). A sound bank is also viewed as a bank that is solvent and remains solvent. The future solvency of a bank depends on its efficiency and thus its profitability. Therefore, solvency is a measure of the positive net worth of a bank.

As banks go through different phases, it's impossible to precisely classify banks as "sound" or "unsound" at a given point of time. This is because banks could be performing well at the moment but show signs of probable problems in the future. As theory is unable to provide a clear answer on what constitutes a sound bank, the study looks to bank specific sets of indicators for solutions.

In literature as reported by Bernanke (2007) the Fed examines the safety and soundness of banks in US through CAMELS rating. CAMELS ratings proved to be effective in reflecting bank soundness (Meyer and Piffer 1970; Korobow and Stuhr 1975; Korobow et al. 1976; 1977; Pettway and Sinkey 1980 and Bovenzi et al. 1987). Basel Core Principles (BCP) on the other hand, represents the global standard for best practices in supervision and regulation. Demirgüç-Kunt and Detragiache (2011) noted that better compliance with BCP does not necessarily lead to improved bank soundness. Models such as Financial Soundness Indicators (FSI) 'core' series, monitors the soundness of the banks as Authorised Deposit-taking Institutions (ADI) (Costa Navajas and Thegeya 2013).

Demirgüç-Kunt et al. (2008) state that rating measures bank soundness accurately as credit rating system takes into account both quantitative and qualitative information on banks as well as the environment a bank operate. Moody denotes that BFSR (Bank Financial Strength Rating) measures the intrinsic soundness and safety of a bank. While Moody, Fitch and Standard & Poor (S&P) measures the ability of banks to meet their depositors and creditors obligations as they fall due.

The study assembles seven sets of bank and credit rating indicators [Basel Core Principles (BCP), Financial Soundness Indicators (FSI), CAMELS, Moody, Fitch, S&P and Bank Financial Strength Rating BFSR] to provide a meaningful insight on the indicators that contribute to bank soundness. Although several studies have assessed bank soundness in the past, only a few covered the two key areas of developed economies and soundness indicators [Gaganis et al. 2006; Demirgüç-Kunt et al. 2008; Demirgüç-Kunt and Detragiache 2011].

The core hypotheses tested through PLS-SEM is as follows:

H1: Capital makes a significant contribution to bank soundness

The quality and level of a bank's capital determines the survival of a bank. Bank capital acts as the last resort against losses to uninsured depositors, creditors and the Federal Deposit insurance corporation (FDIC). Therefore, insufficient capital during adversity could bring banks down.

H2: Asset makes a significant contribution to bank soundness

Banks that extends loans to credit worthy customers with sound collateral levels indicates low non-performing loans (NPL) and less exposure to excessive risk levels. Therefore, if banks have accumulated high NPL, bad debts and do not have quality collateral to back its loans then there is a lesser chance of survival.

H3: Management makes a significant contribution to bank soundness

The efficiency of the management structure lies in the ability of bank officers and managers to make decisions that contributes to bank soundness.

H4: Earning makes a significant contribution to bank soundness

Earnings is viewed as the first line of defense against adversity and loan defaults. Therefore, steady streams of earnings from solid operating base is vital for the survival of the banks.

H5: Liquidity makes a significant contribution to bank soundness

Banks' funding sources and liquid assets determines the ability of the bank to meet unforeseen deposit outflows. Banks that are unable to meet its daily liquidity needs could result in bank runs, thus an insolvent bank.

H6: Sensitivity makes a significant contribution to bank soundness

Market forces play a key role in bank stability. Banks are exposed to various market risks (interest rate risk, foreign exchange risk, price risk). Sensitivity ratio assesses the effect of changes in market risk on the earnings and capital of a bank.

Banks are also sensitive to growth. Bank size (large or small) plays a key role in bank soundness (Bell 1997; Hooks 1995; Ohlson 1980; Gunsel 2005; Nurazi and Evans 2005). The bigger a bank grows in size, the more stable and financially sound a bank is in comparison to smaller banks. This was evident during the GFC (Košak et al. 2015). As banks increase in size, they have better access to additional financing, risk diversification and dealing with liquidity problems thus have longer survival time and less likely to fail.

Data collection

The sample consists of 1,135 listed banks in G7 countries. Listed banks provide homogeneity in the comparison of banks within the economies. Banks chosen were under the Global Industry Classification Standard of banks (code 401010) in Osiris. Data was collected for the period 2003-2013 sourced from Osiris and Bankscope databases. The data was converted and averaged in US dollars.

The study collected 60 independent variables (in reference to Table A1, A2) and categorized them under CAMELS. In reference to Fama and French (1992) stock return explains microeconomic variables (firm sensitivity, earnings price ratio, leverage ratio and book to market equity) and futuristic thus able to measure bank's expected soundness.

Summary statistics (Table A3) highlights substantial skewness and kurtosis outside the range of ±2.58 across the variables, thus failing to meet parametric assumptions. According to Cheng (2008), King and Wen (2011) and Rasli et al. (2013) archive-based financial accounting empirical studies often report non-normal datasets.

Methodology

The study applies a second-generation multivariate technique of PLS-SEM for several reasons. PLS-SEM Hair et al. (2017) integrates both econometric and psychometric analysis in its estimation (Fornell and Larcke, 1981). Therefore, it is the best measure for latent variables in empirical studies.

Although bank specific variables of CAMELS are observable through ratio analysis, these variables contain latent factors that are not directly observable. One example is the variables under the earnings cluster "return on average assets" and "return on average equity". Both of these variables are highly correlated among themselves but have small correlations with Capital, Asset, Management, Liquidity and Sensitivity variables. This suggests the presence of latent variable "profitability" or "earning" in Capital, Asset, Management and Liquidity variables, which is responsible for the observed correlations. In this respect, PLS-SEM works to understand the relationship among the variables by understanding the constructs that underlie them and how the latent factors drive the variation in the data.

Besides, PLS-SEM supports models with formative measurements, works with non-normal distributed datasets, and most importantly, estimates cause-effect relationships amongst latent accounting variables.

Henseler et al. (2009) notes that the partial least square path model comprises of inner and outer models, which sets out the linear equation. The inner model highlights the relationship amongst the latent constructs.

The inner model is constructed as follows:

$$\xi = B\xi + \zeta \quad \text{Eq. (1)}$$

where ξ stands for the vector of latent variables, B is the matrix of coefficients and ζ is the inner model residuals. The predictor specification reduces the inner model in Eq. (1) to:

$$(\xi|\xi) = B\xi \quad \text{Eq. (2)}$$

The outer model predicts the relationship amongst the latent constructs and indicators. The outer model comprises of reflective and formative measurement models.

The reflective mode shows causal relationship from latent variable to manifest variables generated as a linear function of latent variables and residual ε:

$$X_\chi = \lambda_\chi \xi + \varepsilon_\chi \quad \text{Eq. (3)}$$

where λ stands for the loading coefficients. The predictor specification reduces the outer model in Eq. (3) to:

$$(X_\chi|\xi) = \lambda_\chi \xi \quad \text{Eq. (4)}$$

The formative shows causal relationship from manifest variables to latent variables. The linear relationship is as follows:

$$\xi = \Pi_\chi X_\chi + \varepsilon_\chi \quad \text{Eq. (5)}$$

The predictor specification reduces Eq. (5) to:

$$(\xi|X_\chi) = \Pi_\chi X_\chi \quad \text{Eq. (6)}$$

PLS-SEM algorithm comprises of two stages. The first stage estimates the latent constructs' scores in four steps. The outer approximations of latent construct scores are estimated first. Then proxies for structural model relationships are established. Inner approximation of latent constructs scores is then considered while estimating the proxies for coefficients in the measurement models. The second stage calculates the final estimates of the outer weights and loadings and path coefficients (Lohmöller 1989).

Construct measures

The model was initially designed with six exogenous constructs (CAMELS) of 60 manifest variables. In creating a parsimonious model, the manifest variables were reduced to 16 [3 capital(C), 4 assets (A), 2 management (M), 3 earnings (E), 3 liquidity (L), 1 sensitivity (S)]. In reference to Figure F1, path models visually show the relationships between the six hypotheses and manifest variables (Hair et al. 2011; Hair et al. 2017). The inner model (structural model) displays the relationships between constructs. While the outer model (measurement model) displays the relationship between the constructs and the manifest variables.

Findings

Measurement mode

Theoretical conceptualization supports the framework that CAMELS constructs are appropriate measures of stock returns, thus the proxy for bank soundness. The 16 manifest variables form the six CAMELS exogenous constructs. These constructs are modelled as formative measures for the endogenous construct of stock return (Figure F2).

Formative measurement models

The study follows Hair et al. (2017) in assessing the formative measures. Formative measures are expected to be free of errors (Diamantopoulos 2006; Edwards and Bagozzi 2000). The study presents a comprehensive set of formative indicators (Table A2) to show that the formative indicators encapsulate all the facets of the construct. Past literature shows strong support on content validity for the six dimensions of CAMELS as formative measures that forms bank soundness.

The bootstrapping procedure was conducted to generate outer weights, outer loadings and path coefficients results. The bootstrapping procedure was run with a bootstrap sample of 10, 000 with "no sign change" option for the most conservative results.

In assessing the significance and the relevance of the formative indicators, the study examines the outer weights. Table A4 assembles the relative contribution of each manifest variables (in weights) thus, its significance in forming the constructs. The results show that some manifest variables have a low or even insignificant outer weights. Although the outer weight is insignificant, the outer loading is above 0.5. This indicates that the manifest variables have an absolute contribution to the constructs and is to be retained.

In assessing the formative measurements models for collinearity issues, the variance inflation factor (VIF) is noted (Table A4). The results show that all VIFs are below the threshold level of 5. Therefore, the presence of collinearity issues in manifest variables is not of a concern.

Structural model

The study managed to create a parsimonious model with a R^2 value of 43.8%. This indicates that 43.8%. of the variance in the stock returns is explained by CAMELS constructs. Hair et al. (2011) and Henseler et al. (2009) evaluates this result as moderate. The model's predictive relevance (Q^2) with regard to endogenous construct stands at a large category of 0.425 (see Hair et al. 2017).

Analysis

Effects of Capital on Stock returns

Capital construct failed to establish a significant relationship with stock returns (p=.987). Capital has no predictive relevance as f Square stands at 0.001 and is the

least important construct with a weak path coefficient of -0.001. Thus, rejecting hypothesis 1. The negative sign indicates insufficient capital levels, despite adhering to Basel Core Principles. This validates Demirguc-Kunt et. al. (2008) point that mere adherence to Basel Core Principles does not guarantees a sound bank.

Effects of Asset on Stock returns

The findings highlight that asset has established a strong significance with a p value of 0.000. It has an average predictive relevance (f square 0.150) and is of an average importance with a path coefficient of -0.679. Thus, supporting hypothesis 2. The path coefficient highlights a negative relationship. This suggests that these countries had low levels of assets.

Effects of Management on Stock returns

Management construct shows a significant p-value of 0.002 at 99% confidence level. Thus, establishing a relationship between the constructs and supporting hypothesis 3. However, management has no predictive relevance (f square 0.007) and a weak but positive path coefficient of 0.147. This suggest that management is the least important construct. On contrary, Lindgreen et al. (1996) views internal governance (management) as the most important construct for a sound bank.

Effects of Earnings on Stock returns

The results suggest that there is no significant relationship between earnings and stock returns (p-value = 0.715). A weak predictive relevance is evident with an f square that stands at 0.001. The path coefficient displays a value of 0.032 suggesting that earnings have a weak but positive relationship with stock returns.

Effects of Liquidity on Stock returns

Liquidity construct highlights a weak path coefficient of -0.138 and no predictive relevance (f squares=0.017) but a strong significance (p=0.007). Therefore,

supporting hypothesis 5. However, the path coefficient shows an adverse relationship suggesting that banks had insufficient liquidity buffer. Low liquidity levels result in dangerous bank runs. Ratnovski and Huang (2009) on the other hand, noted that banks in UK and US were relatively liquid.

Effects of Sensitivity on Stock returns

Large banks have strong significance (p=0.000), strong path coefficient of 1.150 and the largest predictive relevance (f square = 0.297) on stock returns. Thus, supporting hypothesis 6. The results suggest that large banks have larger stock returns. This finding is in line with Demirguc-Kunt et al. (2008) that big banks are well diversified and more stable, and thus are more sound. However, Gaganis et al. (2006) states that size of a bank does not determine bank soundness in developed countries. While Ho and Saunders (1980) suggested that large banks that has access to discount windows, had depositors who were partially insured were more susceptible of catastrophe than smaller banks.

In summary, the results (Table A5) strongly suggest that banks that were big in size were more sound. Asset, management and liquidity ratios played a significant role in determining bank soundness. However, banks were least focused on core business areas of taking deposits and giving out loans. Higher priority was placed on off-balance sheet activities and capital market investment thus taking on excessive risks. This explains the weak management, liquidity, capital and earnings ratios. Surprisingly, banks were also operating with insufficient capital and liquidity ratios which resembles the causes of bank failures (illiquidity, bad assets, overbanking and mismanagement) during the Great Depression (Tussing 1967).

Banks engage in financing long-term assets, fund short-term debts and carry out excessive amounts of maturity transformations. Aggressive withdrawal of funds during adversity could cause bank runs. Although Basel III established Net Stable Funding Ratio (NFSR) and Liquidity Coverage Ratio (LCR) with the intention to improve liquidity levels, the results from this study proves otherwise.

Despite the fact that capital is a strong determinant of bank status, capital showed no significance in bank soundness. As banks grow in size, capital needs to increase

proportionately to cushion against market shocks. Basel III was formed with the understanding that higher bank capital results in financial stability. Conversely, Ratnovski and Huang (2009) and Währungsfonds (2009) found that banks with high capital levels in advanced economies exhausted capital to adversity during the GFC. Therefore, there is no conclusive answer whether increased capital levels helps during crisis periods.

Conclusion

In conclusion, the study represents and contributes to the notion that banks in G7 countries place significance on size as the most important and capital as the least important determinant of bank soundness. Banks in these countries were more focused on off balance sheet transactions and capital market investments which led to high risk levels. Despite adhering to Basel requirements, bank failures in these countries during the GFC was a result of low capital and liquidity levels. Many other factors could make capital and liquidity insufficient resulting in a crisis. Policy makers should further examine the existing capital framework and devise new policy measures that will create convergence with soundness.

Appendix

Table A1. List of independent variables

category	code	variable	category	code	variables	category	code	variables
Asset	aa	allowance for loan loss to gross loan		ci	equity to asset	Earnings	eo	net interest income to asset growth rate
	ab	common equity to net loan	Management	ma	business per employee to total shareholder return		ep	non-interest income to non-interest expense
	ac	equity to net loan			loan growth rate		eq	operating income to total asset
	ad	gross non-performing loan to advances		mb	Management expense to average asset		er	pre-tax income to average asset
	ae	non-performing loan to gross loan		mc	profit per employee to total shareholder return		es	pre-tax income to revenue
	af	Provision for loan loss to net advances		md	total loan to total deposit		et	Net profit to average asset
	ag	loan loss provision to average asset	Earnings	ea	cost to income		eu	Net profit on average equity
	ah	loan loss provision to net interest income		eb	dividend payment to net income		ev	tax to earning before tax
	ai	Provision for loan loss to total loan		ec	earnings per share to average equity		ew	interest expense to total expenses
	aj	non-performing loan to net advances		ed	interest income to interest expense	Liquidity	la	customer deposit to total asset
	ak	non-performing loan to total equity		ee	interest income to total income		lb	liquid asset to customer and short term funding
	al	total loan to total asset		ef	non-interest expense to average asset		lc	liquid asset to deposit and non-deposit fund
Capital	ca	capital adequacy ratio 1		eg	non-interest expense to gross income		ld	liquid asset to short term liabilities
	cb	capital adequacy ratio 2		eh	non-interest expense to total expense		le	liquid asset to total asset
	cc	common equity to total asset		ei	non-interest expense to total customer deposit		lf	liquid asset to total deposit
	cd	debt to equity		ej	net interest margin to gross income		lg	net loan to total asset
	ce	retained earnings to total equity		ek	net interest margin		lh	non-performing loan to total asset
	cf	net income and total equity to deposit and short term funding		el	net interest revenue to average asset		li	total loan to customer deposit
	cg	net income and total equity to total asset		em	non-interest income to total income	Sensitivity	sa	log of total asset
	ch	regulatory tier 1 capital to risk weighted asset		en	net income to average asset		se	market price per ordinary equity to earning per share

Table A2. List of variables with references

No	Code	Variables	References
	Dependent variable	*Stock return*	Fama and French (1992)
	Independent variable		
		Asset	
1	aa	Allowance for loan loss to gross loan	Dang (2011)
2	ab	Common equity to net loan	Poon et al.(1999)
3	ac	Equity to net loan	Poon et al.(1999)
4	ad	Gross non-performing loan to advances	Kumar et al. (2012)
5	ae	Nonperforming loans to gross loans	International Monetary Fund Staff (2008)
6	af	Provision for loan loss to net advances	Kumar et al. (2012)
7	ag	Loan loss provision to average asset	Poon et al.(1999)
8	ah	Loan loss provision to net interest income	Loannidis et al.(2010)
9	ai	Provision for loan loss to total loans	Kumar et al. (2012)
10	aj	Non-performing loan to net advances	Kumar et al. (2012)
11	ak	Non-performing loan to total equity	Dang (2011)
12	al	Total loan to total asset	Kumar et al. (2012)
		Capital	
13	ca	Capital adequacy ratio(1)	Dang (2011)
14	cb	Capital adequacy ratio(2)	Kumar et al. (2012)
15	cc	Common equity to total asset	Poon et al.(1999)
16	cd	Debt to equity	N.S. Toor, (2009)
17	ce	Retained earnings to total equity	Sarker (2006)
18	cf	Net income and total equity to deposit and short term funding	Canbas et al.(2005)
19	cg	Net income and total equity to total asset	Canbas et al.(2005)
20	ch	Regulatory Tier 1 capital to risk weighted assets	International Monetary Fund Staff (2008)
21	ci	Total equity to total asset	Loannidis et al.(2010)
		Management	
22	ma	Business per employee to total shareholder return	Kumar et al. (2012)
23		Loan growth rate	Dang (2011)
24	mb	Management expense to average asset	Kumar et al. (2012)
25	mc	Profit per employee to total shareholder return	Kumar et al. (2012)
26	md	Total loan to total deposit	Kumar et al. (2012)
		Earnings	
27	ea	Cost to income	Dang (2011)

28	eb	Dividend payment to net income	Poon et al.(1999)
29	ec	Earning per share to average equity	N.S. Toor (2009)
30	ed	Interest income to interest expense	Canbas et al.(2005)
31	ee	Interest income to total income	N.S. Toor (2009)
32	ef	Non-interest expenditure to average asset	Loannidis et al.(2010)
33	eg	Non-interest expense to gross income	International Monetary Fund Staff (2008)
34	eh	Non interest expenses to total expense	International Monetary Fund Staff (2008)
35	ei	Non interest expense/ Total Deposit	Poon et al.(1999)
36	ej	Interest margin to gross income	International Monetary Fund Staff (2008)
37	ek	Net interest margin	Poon et al.(1999)
38	el	Net interest revenue to average asset	Dang (2011)
39	em	Non-interest income to total income	N.S. Toor (2009)
40	en	Net income to average asset	Poon et al.(1999)
41	eo	Net interest income to asset growth rate	Dang (2011)
42	ep	Non-interest income to non-interest expense	International Monetary Fund Staff (2008)
43	eq	Operating profit to total asset	Gasbarro et al.(2002)
44	er	Pre-tax income to average asset	Poon et al.(1999)
45	es	Pre-tax income to revenue	Poon et al.(1999)
46	et	Net profit to average asset	Kumar et al. (2012)
47	eu	Net profit on average equity	Demirgüç-Kunt et al.(2008)
48	ev	Tax to earning before tax	Poon et al.(1999)
49	ew	Interest expense to total expenses	Canbas et al.(2005)
		Liquidity	
50	la	Customer deposits to total assets	Dang (2011)
51	lb	Liquid asset to customer and short term funding	Loannidis et al.(2010)
52	lc	Liquid asset to deposit and non deposit fund	Canbas et al.(2005)
53	ld	Liquid asset to short term liabilities	International Monetary Fund Staff (2008)
54	le	Liquid asset to total asset	Poon et al.(1999)
55	lf	Liquid assets to total deposit	Kumar et al. (2012)
56	lg	Net loan to total asset	Demirgüç-Kunt et al.(2008)
57	lh	Non performing loan to total asset	Gasbarro et al.(2002)
58	li	Total loan to customer deposit	Dang (2011)
		Sensitivity	
59	sa	Log of total asset	Košak et al.(2015)
60	se	Market price per ordinary equity to earning per share	Nurazi, R., & Evans, M. (2005)

Table A3. Summary statistics

	No.	Missing	Mean	Median	Min	Max	Standard Deviation	Excess Kurtosis	Skewness
bank code	1	0	568	568	1	1,135.00	327.646	-1.2	0
country	2	0	6.653	7	1	7	1.08	12.252	-3.558
aa	3	0	0.005	0.004	-0.034	0.044	0.005	6.789	1.084
ab	4	0	0.468	0.078	-0.01	391.624	11.623	1,132.19	33.628
ac	5	0	1.746	1.818	-2.959	5.607	0.913	0.777	-0.04
ad	6	0	0.022	0.017	-0.032	0.329	0.024	29.6	3.385
ae	7	0	0.546	0.476	0	2.16	0.437	0.436	0.915
af	8	0	-271.263	4.368	-46,770.83	16.36	2,277.55	224.483	-13.8
ag	9	0	0.004	0.002	-0.015	0.804	0.024	1,093.91	32.775
ah	10	0	1.229	1.346	-82.364	4.331	2.718	789.426	-25.822
ai	11	0	0.005	0.004	-0.032	0.329	0.011	732.236	24.324
aj	12	0	0.017	0.012	0	0.2	0.019	11.675	2.407
ak	13	0	-4.779	0.051	-5,464.99	1.286	162.147	1,134.94	-33.688
al	14	0	0.447	0.475	0	0.899	0.218	-1.194	-0.21
sp	15	0	1.698	0.639	-0.944	12.539	2.261	2.576	1.576
ca	16	0	-5,353.14	2.362	-3,395,496.41	18.469	112,745.59	759.94	-26.731
cb	17	0	-56.921	2.545	-40,088.36	18.485	1,236.74	970.117	-30.261
cc	18	0	0.054	0.039	-0.004	1.572	0.075	162.659	9.656
cd	19	0	0.948	1.571	-238.073	3.809	8.385	622.557	-23.437
ce	20	0	-31,283.43	3.019	-10,931,475.66	16.585	396,921.78	535.916	-21.497
cf	21	0	-2,858.10	6.733	-2,920,521.90	18.79	86,838.79	1,124.74	-33.47
cg	22	0	-47.057	6.831	-8,737.47	18.79	515.555	152.561	-11.831
ch	23	0	0.028	0.02	-21.726	0.701	0.65	1,106.27	-33.044
ci	24	0	0.051	0.063	-21.696	0.912	0.649	1,115.77	-33.256

ma	25	0	5.225	5.533	-16.853	12.227	2.919	1.455	-0.562
mb	26	0	7.127	4.076	-13.95	123.12	11.964	27.745	4.374
mc	27	0	0.002	0.018	-21.713	0.308	0.645	1,133.11	-33.647
md	28	0	13.712	11.031	-207.799	425.136	32.436	30.538	2.284
me	29	0	0.592	0.599	-21.066	29.021	1.282	362.538	9.946
ea	30	0	2.893	3.218	0	4.909	1.331	-1.275	-0.411
eb	31	0	-0.26	0.863	-105.758	4.981	7.501	72.882	-7.544
ec	32	0	-0.742	0.007	-232.336	4.231	10.639	346.851	-17.836
ed	33	0	0.628	0.638	-21.617	3.116	0.912	312.066	-12.319
ee	34	0	-0.794	0.411	-491.562	2.893	15.703	844.2	-27.517
ef	35	0	0.778	0.762	-21.188	3.108	0.795	514.299	-18.549
eg	36	0	0.373	0.387	-21.524	2.414	0.687	909.082	-28.5
eh	37	0	0.435	0.443	-21.475	1	0.696	866.626	-27.519
ei	38	0	0.011	0.024	-21.708	2.744	0.651	1,091.89	-32.651
ej	39	0	-0.019	0	-21.726	0.004	0.645	1,135.00	-33.69
ek	40	0	0.793	0.764	-20.989	1.886	0.778	541.884	-19.346
el	41	0	0.733	0.717	-21.012	1.778	0.76	591.024	-20.647
em	42	0	-0.145	0.22	-149.256	1.682	5.055	676.582	-24.037
en	43	0	-0.018	0.003	-21.722	0.021	0.645	1,132.31	-33.631
eo	44	0	-90,708.91	-497.266	-12,251,161.60	14.135	672,672.78	211.093	-13.427
ep	45	0	0.188	0.171	-21.651	0.83	0.67	998.997	-30.6
eq	46	0	-0.015	0.004	-21.719	0.032	0.645	1,134.60	-33.681
er	47	0	0.096	0.137	-21.529	0.519	0.771	572.872	-22.028
es	48	0	-0.072	0.13	-59.849	0.892	2.17	542.106	-21.524
et	49	0	-1.183	0.144	-987.96	0.946	29.877	1,051.34	-32
eu	50	0	0.018	0.141	-21.251	0.839	0.939	316.717	-15.464
ev	51	0	-1.551	0.537	-80.799	3.165	6.266	35.161	-4.578
ew	52	0	0.198	0.191	-21.432	0.929	0.661	1,014.08	-30.949

la	53	0	0.502	0.539	-21.357	0.941	0.7	837.769	-26.842
lb	54	0	0.121	0.092	0	1.522	0.121	30.188	4.165
lc	55	0	1.222	1.142	-21.039	4.044	1.029	192.081	-8.63
ld	56	0	1.265	1.179	-20.874	4.443	1.057	168.947	-7.699
le	57	0	0.628	0.712	-21.185	1	0.719	746.323	-24.638
lf	58	0	0.185	0.124	0	3.796	0.249	54.62	5.736
lg	59	0	2.271	2.267	-21.726	4.43	1.693	33.697	-2.497
lh	60	0	-0.007	0.008	-21.724	0.168	0.645	1,134.04	-33.668
li	61	0	0.457	0.455	-21.622	3.735	0.725	759.893	-24.734
sa	62	0	4.291	4.503	0	9.296	2.067	-0.927	-0.058
se	63	0	3.161	0.065	-2,375.495	630.914	81.690	640.643	-21.619

Table A4. Results for bank soundness constructs and manifest variables

Bank Soundness Constructs	Bank soundness manifest variables	Outer Weights	Outer Loadings	Path Coefficients	t Values	p Values	f Square	VIF
Test criterion			>0.5		2.583(1% level) 1.963(5% level) 1.646(10% level)	< 0.1(10% level) <0.05(5% level) <0.01(1% level)	Small 0.02 Medium 0.15 Large 0.35	<5
Asset	aa	0.068	0.570	-0.679	9.653	0.000	0.150	1.460
	ac	0.429	0.854					1.900
	ae	0.312	0.780					1.898
	al	0.386	0.912					2.645
Capital	ca	0.580	0.697	-0.001	0.016	0.987	0.000	1.227
	cd	-0.681	-0.687					1.000
	cf	0.255	0.504					1.227
Earnings	ea	0.556	0.765	0.032	0.365	0.715	0.001	1.349
	ed	0.499	0.876					1.895
	eu	0.263	0.525					1.555
Liquidity	lb	0.434	0.852	-0.138	2.714	0.007	0.017	1.999
	lf	0.402	0.800					1.896
	lg	0.455	0.678					1.107
Management	ma	0.639	0.795	0.147	3.126	0.002	0.018	1.066
	md	0.626	0.786					1.066
Sensitivity	sa	1.000	1.000	1.150	10.284	0.000	0.297	1.000
Stock return	sr	1.000	1.000					1.000

Table A5. Results summary

	Path Coefficients	p Values	f Square
Asset -> Stock returns	▼✚	★	✚
Capital -> Stock returns	●▼	●	●
Earnings -> Stock returns	●	●	●
Liquidity -> Stock returns	●▼	★	●
Management -> Stock returns	●	★	●
Sensitivity -> Stock returns	★	★	★

Note:
●= Weak
▼= Negative
✚ =Moderate
★= Exceptional

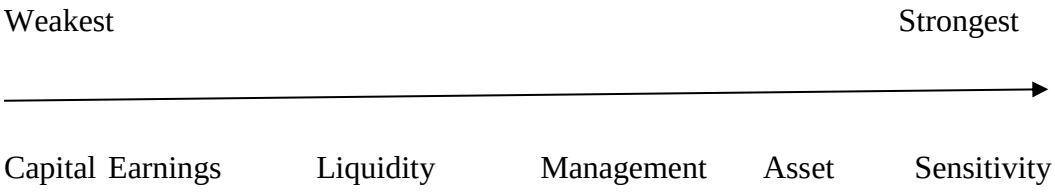


Table A6. Summary of correlations

	bank code	country	aa	ab	ac	ad	ae	af	ag	ah	ai	aj	ak	al	sp	ca	cb	cc	cd	ce	cf	cg	ch	ci	ma	mb	mc	md	me	ea	eb	ec	ed	ee	ef	eg	eh	ei	ej	ek	el	em	en	eo	ep	eq	er	es	et	eu	ev	ew	la	lb	lc	ld	le	lf	lg	lh	li	sa	se
bank code	1																																																																
country	0.386	1																																																																		
aa	0.072	0.14	1																																																																
ab	0.046	0.005	0.127	1																																																															
ac	-0.186	-0.106	0.356	0.032	1																																																														
ad	-0.056	-0.065	0.62	0.053	0.337	1																																																												
ae	-0.2	-0.142	0.53	0.027	0.435	0.807	1																																																											
af	0.165	0.11	0.027	0.004	-0.074	-0.018	-0.067	1																																																										
ag	0.043	0.027	0.183	0.013	0.072	0.076	0.046	0.008	1																																																									
ah	-0.006	-0.021	0.134	0.011	0.108	0.169	0.185	0.106	0.039	1																																																							
ai	0.007	0.07	0.39	0.047	0.248	0.637	0.208	0.016	0.076	0.098	1																																																				
aj	-0.075	-0.122	0.559	0.04	0.283	0.897	0.9	-0.032	0.052	0.158	0.23	1																																																				
ak	-0.025	-0.01	-0.028	0.001	0.02	-0.068	-0.039	-0.004	-0.003	-0.01	-0.011	-0.079	1																																																	
al	-0.111	-0.014	0.476	0.001	0.687	0.472	0.638	-0.02	0.113	0.224	0.187	0.489	-0.018	1																																															
sp	-0.499	-0.145	0.06	-0.023	0.378	0.087	0.275	-0.091	-0.014	0.048	0.013	0.102	0.019	0.34	1																																															
ca	0.076	0.079	-0.024	0.002	-0.006	-0.061	-0.084	0.006	-0.002	-0.026	-0.012	-0.071	-0.001	-0.026	-0.07	1																																														
cb	0.012	-0.016	-0.081	0.002	0.165	-0.117	-0.096	0.008	-0.012	0.01	-0.038	-0.126	-0.001	-0.055	-0.013	-0.002	1																																												
cc	0.069	0.021	0.075	0.076	0.363	0.135	0.127	0.01	-0.007	0	0.153	0.083	0.012	0.222	0.023	0.029	0.017	1																																												
cd	-0.113	-0.027	-0.046	0.001	0.139	0.009	0.064	0.008	-0.008	0.019	-0.022	0.024	0.002	0.074	0.082	-0.01	0.064	0.039	1																																											
ce	0.112	0.158	-0.081	0.002	0	-0.139	-0.119	0.062	-0.008	-0.04	-0.067	-0.137	-0.002	-0.02	-0.017	-0.003	0.008	0.007	0.022	1																																										
cf	0.05	0.026	-0.002	0.001	-0.004	-0.018	-0.042	0.011	0	-0.013	-0.001	-0.023	-0.001	-0.027	-0.031	0.43	0.013	0.024	0.001	0.017	1																																									
cg	-0.152	-0.035	-0.18	0.004	0.129	-0.125	-0.075	-0.013	-0.021	-0.017	-0.081	-0.111	-0.003	-0.007	0.03	-0.003	0.162	0.025	0.08	-0.004	0.002	1																																									
ch	-0.038	-0.007	0.004	0.029	0.085	0.029	0.036	-0.008	-0.002	0.007	0.019	0.026	0.004	0.023	0.012	-0.003	0.004	0.048	0.846	-0.006	0	0.005	1																																									
ci	-0.042	-0.008	-0.021	0.009	0.072	0.012	0.022	-0.002	-0.002	0.001	0.002	0.014	0.003	0.016	0.018	0.001	0.001	0.046	0.846	0	0.002	0.004	0.994	1																																								
ma	-0.206	-0.11	0.365	0.02	0.758	0.414	0.562	-0.123	0.019	0.14	0.202	0.406	0.014	0.768	0.392	-0.048	-0.038	0.263	0.282	-0.039	-0.045	-0.017	0.274	0.25	1																																							
mb	0.169	0.061	0.152	0.021	0.311	0.045	0.011	0.043	0.042	0.097	0.069	0.018	0.021	0.23	-0.105	-0.012	0.044	0.246	0.055	0	0.021	0.026	0.1	0.073	0.282	1																																							
mc	-0.047	-0.008	-0.023	0.003	0.037	0.011	0.023	-0.003	-0.004	0.001	-0.004	0.016	0.002	0.003	0.016	-0.001	-0.003	0.02	0.847	-0.002	0	-0.002	0.995	0.996	0.237	0.049	1																																						
md	-0.399	-0.203	-0.234	-0.12	0.284	-0.276	-0.035	-0.15	-0.059	-0.023	-0.321	-0.164	0.038	0.138	0.384	-0.034	0.087	-0.023	0.087	0.115	-0.051	0.183	-0.008	0.004	0.25	-0.158	-0.002	1																																					
me	-0.064	-0.111	-0.03	0.022	0.227	0.075	0.133	-0.022	0.01	-0.427	-0.015	0.104	0.002	0.187	0.111	-0.013	-0.009	0.277	0.44	-0.023	-0.006	0.001	0.506	0.532	0.315	0.161	0.51	0.041	1																																				
ea	-0.138	-0.071	0.475	0.051	0.834	0.514	0.672	-0.071	0.095	0.187	0.245	0.508	-0.005	0.907	0.381	-0.025	-0.048	0.303	0.1	-0.037	-0.027	-0.011	0.065	0.048	0.834	0.279	0.029	0.141	0.245	1																																			
eb	-0.047	-0.046	-0.133	0.001	0.015	-0.073	-0.045	-0.004	-0.018	0.057	-0.065	-0.055	-0.005	-0.016	0.024	-0.012	0.037	0.009	0.074	0.009	-0.007	0.027	0.082	0.08	0.039	0.021	0.079	0.117	-0.004	-0.003	1																																		
ec	0.025	-0.019	-0.145	0	-0.022	-0.105	-0.08	-0.006	-0.018	-0.022	-0.065	-0.095	-0.001	-0.025	0.032	-0.002	0.03	-0.003	0.084	0.02	-0.001	0.026	0.057	0.06	-0.073	0.012	0.058	0.05	0.022	-0.055	0.025	1																																	
ed	-0.366	-0.132	0.091	-0.001	0.343	0.261	0.443	-0.068	0.006	0.092	0.046	0.303	0	0.381	0.342	-0.051	0.006	0.079	0.671	-0.01	-0.06	0.047	0.734	0.732	0.49	0.05	0.727	0.163	0.439	0.424	0.085	0.051	1																																	
ee	0.008	-0.026	-0.068	0.001	-0.014	-0.034	-0.028	-0.001	-0.008	0.007	-0.028	-0.027	-0.001	-0.028	0.012	0.007	-0.001	0.012	0.029	-0.003	-0.003	-0.004	0.036	0.037	-0.013	0.002	0.037	0.041	0.012	-0.024	0.094	0.008	0.029	1																																	
ef	0.011	0.083	0.291	0.032	0.416	0.257	0.251	0.019	0.061	0.071	0.197	0.211	-0.004	0.413	0.086	0.011	-0.04	0.217	0.718	0.006	0.012	-0.025	0.846	0.841	0.54	0.246	0.832	-0.067	0.572	0.465	0.029	0.017	0.685	0.002	1																																	
eg	-0.107	-0.018	0.075	0.013	0.262	0.164	0.206	-0.023	0.002	0.053	0.115	0.142	0.01	0.229	0.137	-0.008	-0.007	0.106	0.83	0.006	-0.012	0.005	0.957	0.952	0.448	0.12	0.951	0.018	0.526	0.286	0.078	0.055	0.831	0.033	0.906	1																																	
eh	-0.122	-0.011	0.094	0.012	0.294	0.16	0.241	-0.026	0.004	0.063	0.064	0.166	0.009	0.271	0.16	-0.007	-0.013	0.117	0.824	-0.001	-0.016	0.004	0.946	0.942	0.483	0.13	0.94	0.052	0.541	0.326	0.081	0.044	0.853	0.029	0.908	0.987	1																																	
ei	-0.056	-0.025	-0.02	0.003	0.042	0.016	0.025	-0.004	-0.004	-0.052	0.005	0.018	0.003	0.009	0.018	-0.001	-0.002	0.021	0.84	-0.003	0	-0.002	0.986	0.987	0.242	0.048	0.991	0.007	0.527	0.034	0.075	0.057	0.722	0.037	0.825	0.943	0.93	1																																
ej	-0.048	-0.01	-0.03	0.001	0.023	0.002	0.016	-0.004	-0.005	-0.001	-0.014	0.01	0.002	-0.01	0.013	-0.001	-0.001	0.01	0.847	-0.002	-0.001	-0.002	0.994	0.996	0.225	0.041	1	0.002	0.502	0.015	0.08	0.058	0.725	0.038	0.821	0.946	0.935	0.99	1																															
ek	-0.003	0.136	0.251	0.01	0.429	0.188	0.232	0.018	0.053	0.108	0.113	0.172	-0.004	0.438	0.127	0.021	-0.027	0.171	0.738	0.029	0.019	0	0.854	0.848	0.558	0.195	0.84	0.058	0.495	0.459	0.065	0.037	0.708	0.012	0.963	0.906	0.918	0.829	0.832	1																															
el	-0.004	0.126	0.234	0.006	0.407	0.172	0.219	0.01	0.05	0.102	0.097	0.162	-0.003	0.416	0.119	0.02	-0.023	0.16	0.753	0.028	0.016	0.001	0.87	0.865	0.545	0.187	0.858	0.063	0.499	0.435	0.068	0.038	0.713	0.014	0.961	0.915	0.926	0.846	0.85	0.999	1																													
em	0.006	-0.033	-0.078	0.004	-0.005	-0.039	-0.032	-0.003	-0.009	0.007	-0.033	-0.031	-0.001	-0.024	0.003	0.029	-0.003	0.014	0.104	-0.003	-0.004	-0.004	0.124	0.124	0.016	0.012	0.124	0.042	0.056	-0.014	0.146	0.012	0.091	0.974	0.074	0.119	0.112	0.124	0.125	0.087	0.092	1																											
en	-0.053	-0.01	-0.036	0	0.024	-0.002	0.016	-0.004	-0.035	-0.002	-0.019	0.009	0.002	-0.01	0.018	-0.001	0	0.009	0.847	-0.002	-0.001	0	0.992	0.995	0.227	0.036	0.999	0.009	0.501	0.014	0.081	0.06	0.725	0.038	0.819	0.946	0.935	0.99	0.999	0.832	0.85	0.126	1																										
eo	0.206	0.153	-0.095	0.004	-0.074	-0.104	-0.141	0.058	-0.002	-0.063	-0.043	-0.107	-0.004	-0.031	-0.186	0.324	-0.007	0.022	-0.024	0.111	0.531	-0.015	-0.007	-0.001	-0.104	0.026	-0.033	-0.128	-0.022	-0.087	-0.01	-0.003	-0.11	-0.007	0.01	-0.03	-0.029	-0.005	-0.004	0.022	0.022	-0.003	-0.005	1																								
ep	-0.17	-0.091	0.014	-0.005	0.15	0.056	0.095	-0.034	-0.004	0.025	0.023	0.058	0.008	0.111	0.151	-0.019	0.003	0.033	0.839	-0.021	-0.014	0.008	0.965	0.968	0.346	0.026	0.97	0.097	0.524	0.143	0.082	0.058	0.766	0.035	0.856	0.956	0.949	0.964	0.969	0.858	0.872	0.117	0.969	-0.066	1																								
eq	-0.053	-0.01	-0.033	0	0.026	-0.002	0.015	-0.004	-0.006	-0.001	-0.018	0.008	0.002	-0.007	0.018	-0.001	0	0.009	0.847	-0.002	-0.001	0	0.993	0.996	0.227	0.037	0.999	0.01	0.502	0.016	0.062	0.06	0.726	0.039	0.821	0.946	0.936	0.99	1	0.833	0.852	0.126	0.999	-0.004	0.97	1																							
er	-0.077	-0.038	-0.079	-0.003	0.054	-0.008	0.036	-0.01	-0.025	0.007	-0.03	0.007	0.002	0.039	0.088	0.004	-0.003	0.008	0.715	-0.005	0.002	-0.006	0.822	0.827	0.232	-0.065	0.832	0.088	0.42	0.056	0.065	0.071	0.647	0.031	0.676	0.801	0.795	0.825	0.833	0.702	0.717	0.106	0.834	-0.016	0.827	0.834	1																							
es	-0.147	-0.049	-0.188	-0.046	0	-0.093	0.007	-0.017	-0.833	-0.023	-0.151	-0.031	0.004	-0.032	0.11	-0.008	0.028	-0.022	0.277	0.005	-0.009	0.045	0.284	0.295	0.104	-0.105	0.296	0.194	0.15	-0.03	0.044	0.05	0.254	0.02	0.189	0.283	0.292	0.296	0.303	0.23	0.238	0.046	0.335	-0.026	0.321	0.306	0.3	1																							
et	-0.008	-0.013	-0.065	-0.017	-0.026	-0.033	-0.02	-0.004	-0.008	-0.014	-0.037	-0.021	-0.001	-0.03	0.031	-0.002	-0.002	-0.028	0.033	0	-0.001	-0.003	0.019	0.02	-0.026	-0.012	0.019	0.025	0.003	-0.038	0.008	0.014	0.008	0.002	-0.018	0.007	0.004	0.019	0.02	-0.011	-0.009	-0.001	0.02	-0.006	0.017	0.021	0.018	0.014	1																							
eu	-0.233	-0.073	-0.238	-0.1	0.044	-0.211	-0.056	-0.023	-0.039	-0.016	-0.244	-0.126	0.016	0.008	0.18	-0.009	0.049	-0.065	0.61	0.02	-0.001	0.086	0.65	0.659	0.172	-0.216	0.667	0.36	0.304	-0.01	0.104	0.113	0.537	0.056	0.466	0.627	0.627	0.662	0.673	0.562	0.577	0.125	0.678	-0.03	0.688	0.681	0.62	0.349	0.035	1																							
ev	-0.306	-0.057	-0.51	-0.08	0.098	-0.423	-0.254	0.013	-0.068	-0.044	-0.271	-0.378	0.038	-0.093	0.199	0.021	0.18	-0.028	0.278	0.128	0.079	0.3	0.079	0.087	-0.013	-0.128	0.084	0.517	0.019	-0.107	0.081	0.231	0.122	0.057	-0.051	0.073	0.072	0.085	0.088	0.043	0.051	0.059	0.095	0.001	0.131	0.095	0.138	0.202	0.031	0.427	1																							
ew	-0.071	-0.061	0.036	-0.001	0.128	0.068	0.098	-0.024	-0.003	0.017	0.008	0.082	0.001	0.109	0.067	-0.011	-0.007	0.034	0.833	-0.035	-0.001	-0.01	0.971	0.971	0.348	0.056	0.973	0.057	0.519	0.134	0.073	0.041	0.723	0.034	0.842	0.941	0.926	0.968	0.972	0.858	0.874	0.121	0.972	-0.028	0.964	0.973	0.816	0.307	0.018	0.671	0.075	1																						
la	-0.063	0.045	0.14	0.003	0.298	0.169	0.25	-0.002	0.029	0.093	0.06	0.179	0.002	0.318	0.134	-0.004	-0.018	0.096	0.818	0.017	-0.013	-0.004	0.937	0.932	0.487	0.116	0.931	0.056	0.503	0.354	0.077	0.036	0.824	0.025	0.915	0.975	0.982	0.919	0.927	0.94	0.948	0.109	0.927	-0.002	0.931	0.928	0.792	0.274	0.007	0.63	0.057	0.934	1																						
lb	-0.241	-0.392	0.141	0.069	0.461	0.276	0.299	-0.192	0.005	-0.063	0.179	0.246	-0.007	0.298	0.278	-0.093	0.002	0.291	0.006	-0.237	-0.014	0.017	0.021	0.012	0.443	0.228	-0.011	0.119	0.423	0.443	-0.01	-0.046	0.11	0.009	0.18	0.083	0.087	0.003	-0.022	0.118	0.11	0.011	-0.022	-0.198	0.084	-0.022	-0.019	-0.036	0.002	-0.058	-0.051	0.088	0.025	1																					
lc	-0.162	-0.249	0.279	0.054	0.55	0.385	0.437	-0.11	0.03	0.088	0.185	0.355	-0.01	0.455	0.193	-0.062	-0.043	0.218	0.595	-0.09	-0.036	0.007	0.686	0.662	0.659	0.249	0.651	0.062	0.477	0.596	0.053	0.003	0.73	0.016	0.784	0.776	0.789	0.65	0.643	0.761	0.758	0.081	0.642	-0.163	0.711	0.643	0.552	0.179	-0.012	0.395	-0.037	0.698	0.773	0.394	1																				
ld	-0.17	-0.287	0.261	0.052	0.554	0.373	0.455	-0.127	0.011	0.045	0.18	0.368	0.005	0.45	0.212	-0.067	-0.042	0.228	0.577	-0.112	-0.036	0.006	0.665	0.642	0.672	0.249	0.631	0.088	0.49	0.6	0.045	-0.002	0.718	0.017	0.766	0.761	0.774	0.633	0.622	0.736	0.733	0.08	0.622	-0.183	0.7	0.622	0.538	0.192	-0.012	0.362	-0.037	0.686	0.746	0.463	0.977	1																				
le	-0.128	-0.061	0.144	0.01	0.377	0.213	0.306	-0.044	0.006	0.097	0.079	0.224	0.007	0.371	0.201	-0.02	-0.019	0.135	0.804	-0.025	-0.016	-0.005	0.916	0.91	0.586	0.143	0.906	0.098	0.54	0.423	0.079	0.027	0.836	0.026	0.913	0.97	0.979	0.899	0.901	0.93	0.937	0.108	0.901	-0.03	0.934	0.902	0.776	0.291	0.004	0.617	0.057	0.932	0.977	0.186	0.825	0.817	1																				
lf	-0.33	-0.569	0.091	0.029	0.311	0.19	0.22	-0.223	-0.003	-0.03	0.092	0.187	0.004	0.244	0.258	-0.067	0.006	0.078	0.012	-0.236	-0.019	0.014	0.017	0.007	0.356	0.055	0	0.218	0.125	0.309	0.023	-0.018	0.134	0.013	0.058	0.052	0.052	0.068	-0.003	0.032	0.033	0.019	-0.002	-0.171	0.116	-0.002	0.019	0.011	-0.003	0.038	-0.005	0.108	-0.016	0.687	0.311	0.368	0.153	1																			
lg	-0.177	-0.061	0.335	0.015	0.583	0.341	0.46	-0.079	0.061	0.136	0.161	0.339	0.041	0.617	0.292	-0.044	-0.046	0.194	0.418	-0.052	-0.035	-0.034	0.461	0.44	0.726	0.227	0.429	0.116	0.358	0.656	0.033	0.007	0.563	0.038	0.631	0.577	0.595	0.425	0.421	0.646	0.638	0.074	0.421	-0.101	0.499	0.422	0.367	0.11	-0.026	0.297	-0.008	0.499	0.612	0.311	0.689	0.658	0.657	0.219	1																			
lh	-0.049	-0.011	-0.02	0.002	0.028	0.02	0.034	-0.004	-0.004	0.003	-0.01	0.03	0	0.001	0.015	-0.003	-0.004	0.011	0.847	-0.005	-0.001	-0.004	0.994	0.996	0.232	0.041	0.999	-0.002	0.503	0.024	0.079	0.057	0.731	0.038	0.825	0.949	0.938	0.99	1	0.835	0.853	0.125	0.999	-0.005	0.969	1	0.832	0.302	0.02	0.67	0.081	0.973	0.93	-0.018	0.649	0.629	0.905	0	0.427	1																		
li	-0.117	-0.092	0.089	0.004	0.256	0.12	0.195	-0.035	0.016	0.088	0.034	0.132	0.012	0.272	0.137	-0.001	-0.004	0.07	0.788	-0.02	-0.017	-0.004	0.909	0.909	0.454	0.08	0.908	0.086	0.528	0.3	0.086	0.056	0.794	0.025	0.855	0.93	0.931	0.921	0.905	0.871	0.881	0.108	0.904	-0.032	0.921	0.905	0.77	0.277	0.006	0.634	0.069	0.921	0.929	0.093	0.75	0.73	0.933	0.21	0.57	0.907	1																		
sa	-0.414	-0.252	0.409	0.002	0.781	0.494	0.7	-0.165	0.068	0.17	0.2	0.509	0.004	0.817	0.575	-0.088	-0.036	0.206	0.1	-0.115	-0.066	0.004	0.046	0.037	0.808	0.128	0.02	0.311	0.214	0.907	0.009	-0.074	0.493	-0.009	0.339	0.258	0.3	0.027	0.01	0.35	0.332	-0.004	0.011	-0.232	0.174	0.012	0.077	0.028	-0.025	0.073	-0.006	0.134	0.302	0.52	0.582	0.596	0.398	0.447	0.645	0.019	0.281	1																		
se	-0.101	-0.027	-0.001	-0.001	0.031	0.037	0.067	-0.02	-0.002	0.017	-0.002	0.048	0.002	0.024	0.107	-0.019	0.003	0	0.008	-0.042	-0.005	0.006	0.003	0.002	0.023	-0.037	0	0.026	0.006	0.039	-0.018	0.005	0.065	0.002	-0.01	0.019	0.018	0.001	0.001	-0.007	-0.007	0.003	0.001	-0.015	0.008	0.001	0.002	0.008	0.001	0.012	0.019	0.003	0.013	0.03	0.027	0.028	0.018	0.027	0	0.002	0.017	0.064	1																		

Figure F1. Structural model/Inner model and the Measurement model/Outer model

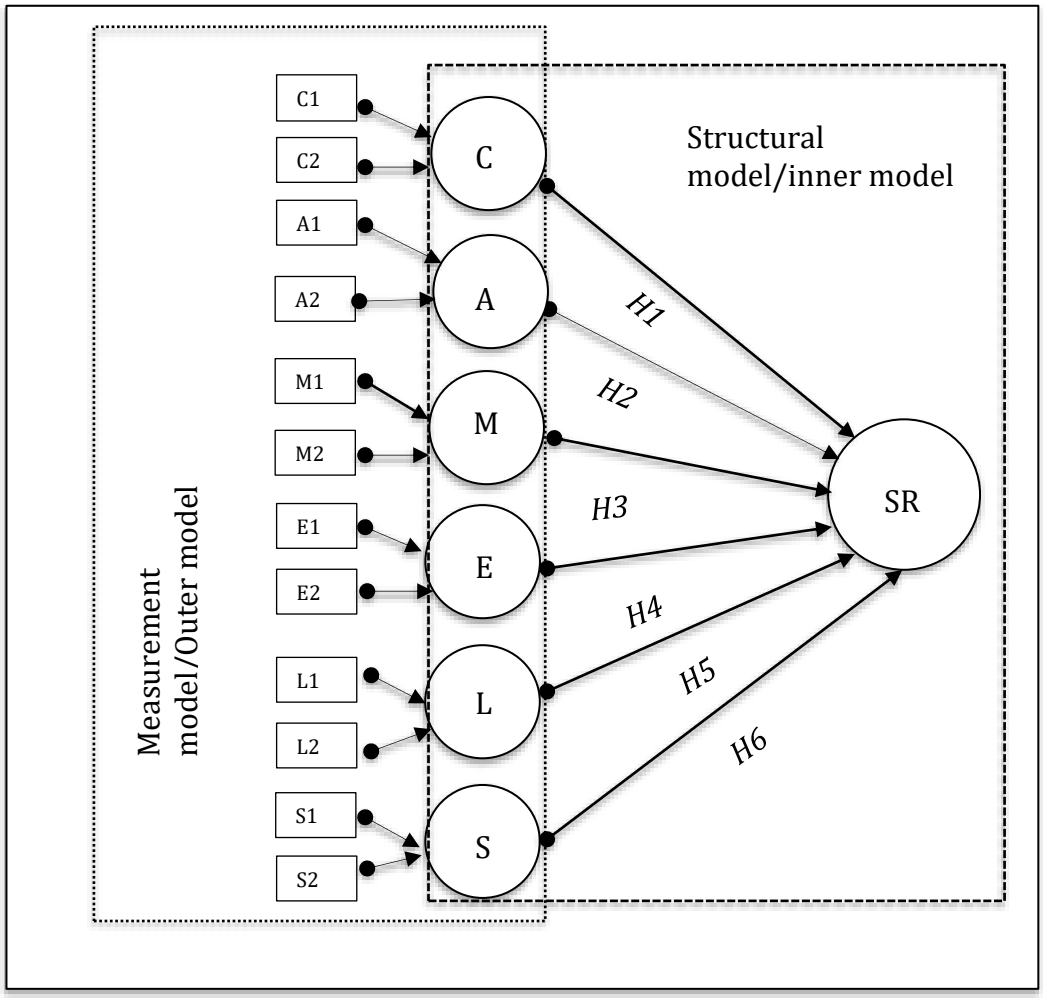
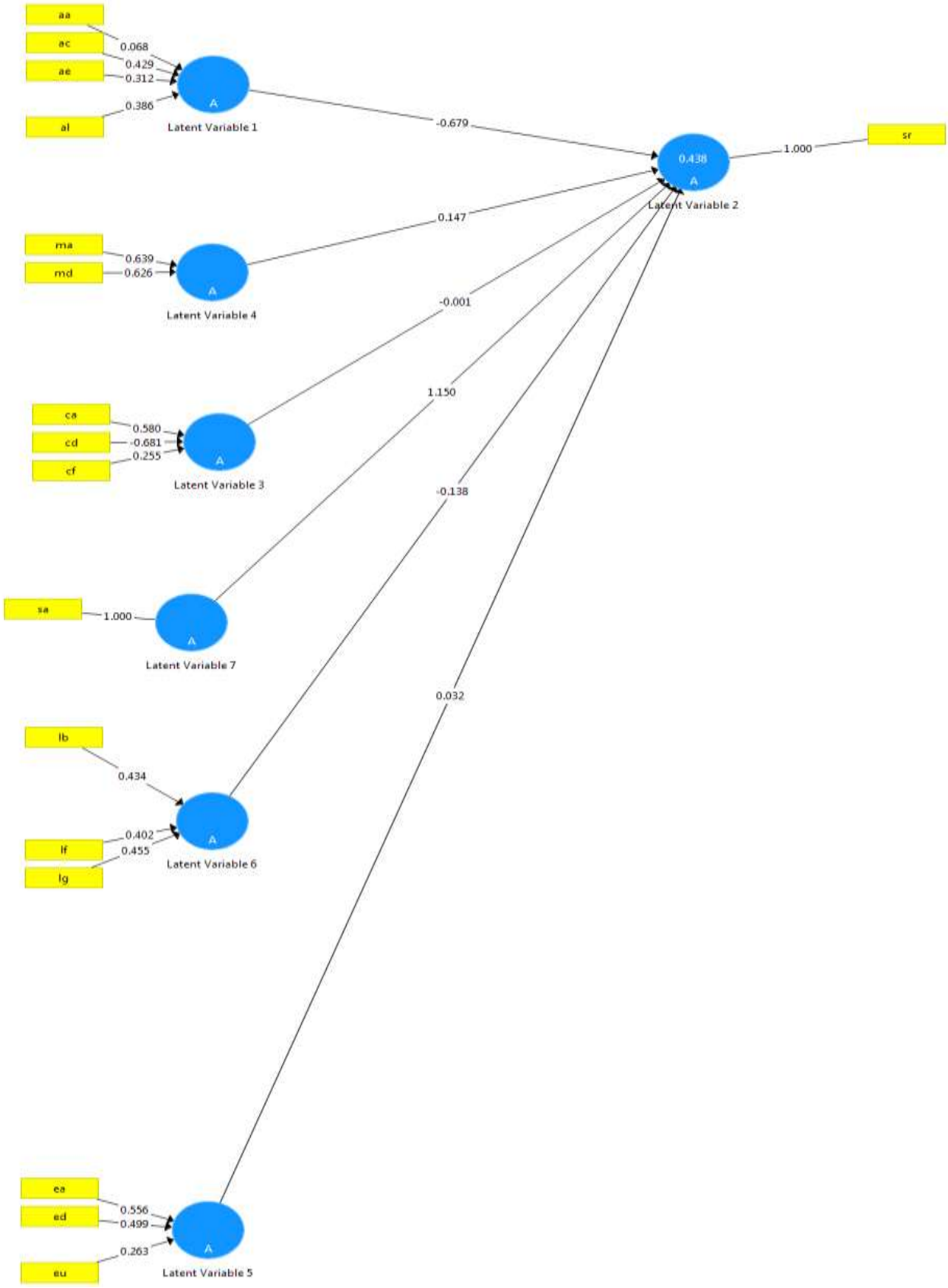


Figure F2. PLS-SEM results


aa
ac
ae
al
0.068
0.429
0.312
0.386
A
Latent Variable 1
-0.679
0.438
A
Latent Variable 2
1.000
sr
0.147
ma
md
0.639
0.626
A
Latent Variable 4
-0.001
1.150
ca
cd
cf
0.580
-0.681
0.255
A
Latent Variable 3
-0.138
sa
1.000
A
Latent Variable 7
0.032
lb
0.434
lf
lg
0.402
0.455
A
Latent Variable 6
ea
ed
eu
0.556
0.499
0.263
A
Latent Variable 5

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