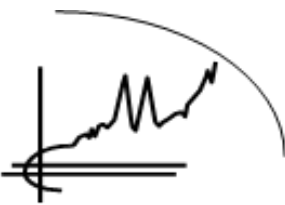# *Only blunt Tools left?*

How IFRS 9 affects the Earnings and Capital Management of European Banks

by

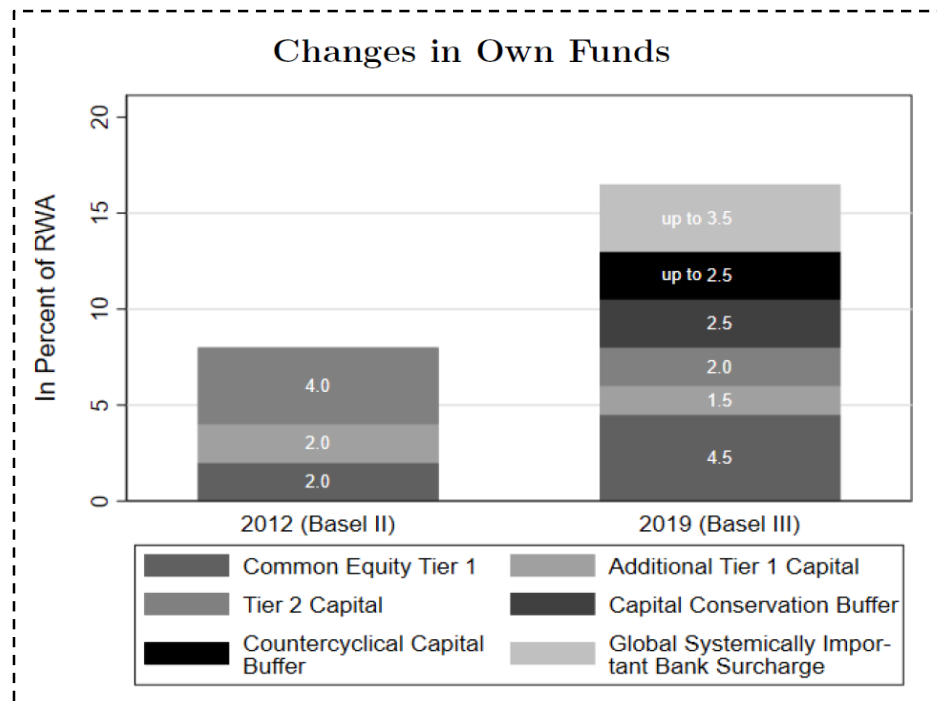Arndt-Gerrit Kund & Florian Neitzert

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AGENDA

1. Introduction

2. Research Question and Hypotheses

3. Empirical Approach

4. Results

5. Robustness

6. Conclusions

1. Introduction

Regulatory reconditioning of the financial crisis 2007:

Changes in Own Funds

➤ **Increased regulatory capital minimum requirements and stricter banking supervision**
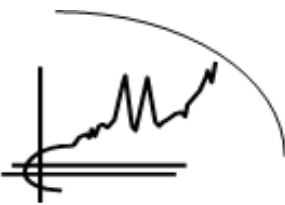
2. Research Question and Hypotheses

➤ **Stronger incentives for Earnings and Capital Management**

- Loan Loss Provisions (LLPs) are a formidable instrument for these purposes
- Discretionary leeway of LLPs is dependent on the impairment model

➤ **IFRS 9 has limited the managerial leeway in applying Earnings and Capital Management**

- Expected Credit Loss (ECL) model of IFRS 9 replaced the Incurred Credit Loss (ICL) model under IAS 39

	ICL (IAS 39)	ECL (IFRS 9)
Loss Recognition	incurred losses	expected losses
Impairment Definition	non-exlusive and non-binding trigger events	three stages
Impairment Quantification	managerial discretion	impairment matrix or standardized valuation model

2. Research Question and Hypotheses

Hypotheses:

➤ **H1:** Do European banks use Earnings Management in the stress test?

➤ **H2:** Has IFRS 9 decreased Earnings Management in the European bank stress test?

➤ **H3:** Do European banks use Capital Management in the stress test?

3. Empirical Approach

Sample:

- EBA bank stress test data

- 43 banks from 15 European countries

- Period 2014-2020

- Predestined for our analysis:

  - IAS & IFRS data

  - Macroeconomic baseline and adverse scenario

  - No Covid bias

  - Homogeneous incentive structure

Methodology:

- Fixed effects model

included
not included

4. Results

H1: Do European banks use Earnings Management in the stress test?

	Baseline Scenario	Adverse Scenario
LLR (%)	-0.0009	-0.0257
	(0.9431)	(0.4669)
ΔNPL (%)	0.0198***	0.0091*
	(0.0008)	(0.0320)
GDP (%)	-0.0005	-0.0000
	(0.1067)	(0.2713)
Intercept	0.0038***	0.0074***
	(0.0000)	(0.0000)
Cluster	Bank	Bank
N	215	215
R^2_w	0.1476	0.1395

4. Results

H2: Has IFRS 9 decreased Earnings Management in the European bank stress test?

	Baseline Scenario				Adverse Scenario			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
IFRS $(\in \{0;1\})$	-0.0009*	0.0012*	0.0016*	0.0014*	-0.0003	0.0033**	0.0038**	0.0038***
	(0.0177)	(0.0188)	(0.0110)	(0.0163)	(0.6308)	(0.0046)	(0.0024)	(0.0007)
LLR (%) × IAS		-0.0212*	-0.0250**	-0.0261**		-0.0411	-0.0359	-0.0261
		(0.0474)	(0.0052)	(0.0063)		(0.0604)	(0.1045)	(0.2299)
LLR (%) × IFRS		-0.0236	-0.0231	-0.0105		-0.1506***	-0.1453***	-0.0979**
		(0.1614)	(0.1069)	(0.4755)		(0.0000)	(0.0000)	(0.0014)
ΔNPL (%) × IAS		0.1534	0.1775*	0.1985*		0.0433	0.0482	0.0458
		(0.0509)	(0.0275)	(0.0232)		(0.3956)	(0.3945)	(0.3565)
ΔNPL (%) × IFRS		0.0116	0.0107	0.0042		-0.0109	-0.0158	-0.0097
		(0.0893)	(0.1608)	(0.5727)		(0.2041)	(0.0701)	(0.0995)
ROA (%)			-0.0009	-0.0006			0.0010	-0.0007
			(0.5401)	(0.6678)			(0.1585)	(0.3359)
Size (ln)			0.0018	0.0024			0.0034	0.0026
			(0.2104)	(0.1408)			(0.2559)	(0.3463)
GDP (%)				-0.0001				-0.0001*
				(0.6128)				(0.0425)
UNEMP (%)				0.0003*				0.0006*
				(0.0371)				(0.0258)
CPI (%)				0.0018*				0.0000
				(0.0307)				(0.9430)
HPI (%)				0.0001				0.0002*
				(0.2589)				(0.0227)
Intercept	0.0035***	0.0019**	-0.0187	-0.0308	0.0071***	0.0073***	-0.0322	-0.0288
	(0.0000)	(0.0027)	(0.2708)	(0.1282)	(0.0000)	(0.0000)	(0.3501)	(0.3751)
Cluster	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank
N	301	215	215	215	301	215	215	215
R_w^2	0.0562	0.2517	0.2733	0.3812	0.0016	0.2605	0.2740	0.3535

4. Results

H3: Do European banks use Capital Management in the stress test?

	Baseline Scenario				Adverse Scenario			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
IFRS ($\in \{0; 1\}$)	0.0000	0.0002	0.0001	-0.0001	0.0020	0.0014	0.0014	0.0016
	(0.9963)	(0.6782)	(0.8942)	(0.6680)	(0.3070)	(0.4664)	(0.4577)	(0.2649)
LLR (%) × IAS	0.0023	0.0014	0.0021	0.0023	-0.0253	-0.0246	-0.0228	-0.0321
	(0.8403)	(0.9035)	(0.8560)	(0.8620)	(0.2672)	(0.2155)	(0.2738)	(0.1969)
LLR (%) × IFRS	-0.0160	-0.0175	-0.0158	-0.0201	-0.1075**	-0.0972**	-0.1030**	-0.1067**
	(0.3149)	(0.2674)	(0.3163)	(0.2228)	(0.0067)	(0.0053)	(0.0074)	(0.0013)
ΔNPL (%) × IAS	0.0198***	0.0206***	0.0214***	0.0191**	0.0027	0.0045	0.0050	0.0036
	(0.0004)	(0.0002)	(0.0002)	(0.0023)	(0.8353)	(0.6721)	(0.6754)	(0.8304)
ΔNPL (%) × IFRS	-0.0013	-0.0013	-0.0008	-0.0020	0.0132	0.0171	0.0110	0.0078
	(0.8549)	(0.8566)	(0.9078)	(0.7812)	(0.3611)	(0.2578)	(0.4510)	(0.6194)
DI_{CET1} × IAS	0.0231*				0.0653			
	(0.0129)				(0.0556)			
DI_{CET1} × IFRS	0.0188*				0.0474			
	(0.0178)				(0.0591)			
DI_{T1} × IAS		0.0200**				0.0969**		
		(0.0069)				(0.0031)		
DI_{T1} × IFRS		0.0148*				0.0748***		
		(0.0166)				(0.0005)		
DI_{EQT} × IAS			0.0179**				0.0739**	
			(0.0070)				(0.0072)	
DI_{EQT} × IFRS			0.0134*				0.0524**	
			(0.0163)				(0.0038)	
DI_{LR} × IAS				0.0081				0.0117
				(0.1571)				(0.3357)
DI_{LR} × IFRS				0.0198				-0.0134
				(0.2645)				(0.7174)
Intercept	-0.0329	-0.0294	-0.0300	-0.0115	-0.0397	-0.0501	-0.0534	-0.0013
	(0.1106)	(0.1124)	(0.1205)	(0.3812)	(0.2350)	(0.1347)	(0.1346)	(0.9599)
Bank Controls	✓	✓	✓	✓	✓	✓	✓	✓
Macro Controls	✓	✓	✓	✓	✓	✓	✓	✓
Cluster	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank
N	215	215	215	215	215	215	215	215
R^2_w	0.3311	0.3320	0.3369	0.3124	0.3282	0.3835	0.3625	0.3033

5. Robustness

Alternative Models (Baseline Scenario)

	Baseline Scenario				
	Collins et al. (1995)	Beatty et al. (1995)	Liu and Ryan (1995)	Bushman and Williams (2012)	Kund and Neitzert (2020)
LLR_{t-1}	-0.0161	-0.0170			-0.0009
	(0.2270)	(0.1174)			(0.9431)
NPA_{t-1}	0.0164*	0.0156**			
	(0.0180)	(0.0036)			
ΔNPA_{t+1}				-0.0000	
				(0.0851)	
ΔNPA_t	-0.0000		0.0000	-0.0000	
	(0.7794)		(0.4644)	(0.0836)	
ΔNPA_{t-1}				-0.0000	-0.0198***
				(0.1226)	(0.0008)
ΔNPA_{t-2}				-0.0000*	
				(0.0342)	
$Size_{t-1}$				-0.0001	
				(0.9410)	
ΔGDP_t				-0.0005*	-0.0005
				(0.0131)	(0.1067)
Intercept	0.0015***	0.0015***	0.0028***	0.0041	0.0038***
	(0.0002)	(0.0002)	(0.0000)	(0.7876)	(0.0000)
N	215	215	258	129	215
R_w^2	0.1987	0.1981	0.0010	0.1191	0.1476

5. Robustness

Alternative Models (Adverse Scenario)

| | Adverse Scenario | | | | |
	Collins et al. (1995)	Beatty et al. (1995)	Liu and Ryan (1995)	Bushman and Williams (2012)	Kund and Neitzert (2020)
LLR_{t-1}	-0.0104	-0.0051			-0.0257
	(0.6418)	(0.7915)			(0.4669)
NPA_{t-1}	0.0290*	0.0332**			
	(0.0222)	(0.0034)			
ΔNPA_{t+1}				-0.0000	
				(0.1367)	
ΔNPA_t	-0.0000		-0.0000***	-0.0000	
	(0.2274)		(0.0002)	(0.1041)	
ΔNPA_{t-1}				-0.0000	0.0091*
				(0.1739)	(0.0320)
ΔNPA_{t-2}				-0.0000	
				(0.1873)	
$Size_{t-1}$				-0.0062**	
				(0.0047)	
ΔGDP_t				-0.0000	-0.0000
				(0.2069)	(0.2713)
Intercept	0.0042***	0.0042***	0.0066***	0.0759**	0.0074***
	(0.0000)	(0.0000)	(0.0000)	(0.0032)	(0.0000)
N	215	215	258	129	215
R_w^2	0.1742	0.1679	0.0194	0.1866	0.1395

5. Robustness

Loan Diversification

	Baseline Scenario		Adverse Scenario	
	Heterogeneous	Homogeneous	Heterogeneous	Homogeneous
IFRS ($\in \{0; 1\}$)	-0.0002	-0.0006	-0.0001	0.0000
	(0.4768)	(0.3778)	(0.9007)	(0.9810)
LLR (%) $\times$ IAS	-0.0336*	-0.0277	-0.0713**	-0.1227*
	(0.0231)	(0.2837)	(0.0038)	(0.0109)
LLR (%) $\times$ IFRS	-0.0348*	0.0441	-0.0868***	-0.2035
	(0.0443)	(0.0906)	(0.0002)	(0.0561)
ΔNPL (%) $\times$ IAS	0.0251	0.0050	0.0099	-0.0068
	(0.2553)	(0.7934)	(0.7296)	(0.5393)
ΔNPL (%) $\times$ IFRS	0.0103	0.0044	0.0063	0.0278
	(0.1050)	(0.3430)	(0.6227)	(0.2973)
ROA (%)	-0.0018	-0.0013	-0.0007	-0.0007
	(0.1138)	(0.2888)	(0.4648)	(0.7145)
Size (ln)	0.0010	-0.0003	-0.0007	-0.0049
	(0.5410)	(0.8528)	(0.6968)	(0.4604)
GDP (%)	-0.0001	0.0003	-0.0001***	-0.0001
	(0.7598)	(0.4701)	(0.0001)	(0.1934)
UNEMP (%)	-0.0001	0.0008	-0.0000	0.0003
	(0.1646)	(0.0638)	(0.8838)	(0.4821)
CPI (%)	0.0003	0.0024*	-0.0001	0.0009
	(0.3911)	(0.0291)	(0.8129)	(0.2443)
HPI (%)	0.0001	0.0001	0.0002	-0.0000
	(0.0987)	(0.4143)	(0.0607)	(0.9662)
Intercept	-0.0075	-0.0038	0.0170	-0.0469
	(0.6867)	(0.8319)	(0.3980)	(0.5327)
Cluster	Bank	Bank	Bank	Bank
N	012	102	102	102
R^2_w	0.5137	0.4205	0.5296	0.5032

5. Robustness

OSII Capital Buffer

|	Baseline Scenario		Adverse Scenario	
	P1	P1 + P2	P1	P1 + P2
IFRS ($\in \{0;1\}$)	0.0000	-0.0001	0.0020	0.0015
	(0.9663)	(0.8042)	(0.3070)	(0.3676)
LLR (%) × IAS	0.0023	0.0025	-0.0253	-0.0252
	(0.8403)	(0.8313)	(0.2672)	(0.2796)
LLR (%) × IFRS	-0.0160	-0.0149	-0.1075**	-0.1042**
	(0.3149)	(0.3562)	(0.0067)	(0.0079)
ΔNPL (%) × IAS	0.0198***	0.0197***	0.0027	0.0023
	(0.0004)	(0.0004)	(0.8353)	(0.8577)
ΔNPL (%) × IFRS	-0.0013	-0.0016	0.0132	0.0131
	(0.8549)	(0.8172)	(0.3611)	(0.3681)
ROA (%)	-0.0005	-0.0005	-0.0020	-0.0020
	(0.7472)	(0.7463)	(0.0593)	(0.0519)
Size (ln)	0.0026	0.0026	0.0035	0.0031
	(0.1135)	(0.1110)	(0.2063)	(0.2258)
GDP (%)	-0.0002	-0.0002	-0.0001*	-0.0001*
	(0.2509)	(0.2116)	(0.0347)	(0.0344)
UNEMP (%)	0.0002	0.0002	0.0004	0.0004
	(0.2522)	(0.2596)	(0.1969)	(0.2016)
CPI (%)	0.0017*	0.0017*	0.0000	0.0000
	(0.0356)	(0.0359)	(0.9048)	(0.9193)
HPI (%)	-0.0001	-0.0001	0.0002	0.0002
	(0.3968)	(0.4159)	(0.0836)	(0.0809)
DI_{CET1} × IAS	0.0231*	0.0224*	0.0653	0.0592
	(0.0129)	(0.0120)	(0.0556)	(0.0580)
DI_{CET1} × IFRS	0.0188*	0.0188*	0.0474	0.0456
	(0.0178)	(0.0162)	(0.0591)	(0.0662)
Intercept	-0.0329	-0.0321	-0.0397	-0.0346
	(0.1106)	(0.1098)	(0.2350)	(0.2639)
Cluster	Bank	Bank	Bank	Bank
N	215	215	215	215
R_w^2	0.3311	0.3296	0.3282	0.3224

6. Conclusions

> **Main results:**
> - H1: European Banks use Earnings Management in the EBA/ECB stress test
> - H2: IFRS 9 increases the average impairments per loan
> - H3: Evidence for Capital Management – especially risk-sensitive capital requirements
> - Results are robust to several checks
>
> **Implications:**
> - IFRS 9 is more objective than its predecessor
> - Meeting regulatory capital requirements for banks becomes even more challenging
>
> **Future research aspects:**
> - Reinstate our finding with actual data
> - Comparing the results of the IFRS 9 introduction with the CECL model in the U.S.
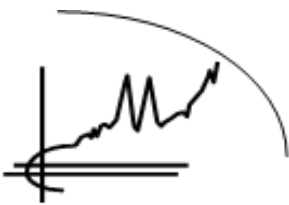
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Appendix

Used variables

Variable	Description	Source
T1	Percentage of Tier 1 Capital	Item 993442[1], Item 1690848[2], Item 183766[3]
EQT	Percentage of Total Equity	Item 993401[1], Item 1690801[2], Item 183701[3]
Size	Logarithm of Total Assets	Own Computation: $Size = ln\left(\frac{T1\ Capital}{Leverage\ Ratio}\right)$
NI	Net Income	Item 993014[1], Item 1690715[2], Item 183615[3]
ROA	Return on Assets	Own Computation: $ROA = \frac{Net\ Income}{Total\ Assets}$
IMP	Amortized Impairments	Item 993007[1], Item 1690710[2], Item 183610[3]
LR	Leverage Ratio	Item 1690858[2], Item 183112[3]
IFRS	Dummy that equals one if IFRS 9 is applicable	Own Computation: 1 if Year $\geq$ 2018
LLR	Percentage of Loan Loss Reserves	$LLR_{it} = \frac{Default\ Stock}{Total\ Loans}$
PORTDIV	Portfolio Diversification	$PORTDIV_{it} = 1 - \left\lvert\frac{homogen - heterogen}{homogen + heterogen}\right\rvert$
DI_{CET1}	Distance to minimum CET1 requirements	$DI_{CET1} = CET1_{i,t} - CET1_{minimum}$
DI_{T1}	Distance to minimum Tier 1 requirements	$DI_{T1} = T1_{i,t} - T1_{minimum}$
DI_{EQT}	Distance to minimum Equity requirements	$DI_{EQT} = EQT_{i,t} - EQT_{minimum}$
DI_{LR}	Distance to minimum Leverage Ratio	$DI_{LR} = LR_{i,t} - LR_{minimum}$
CPI	Consumer Price Inflation	ESRB[4]
GDP	Gross Domestic Product	ESRB[4]
HPI	Housing Price Inflation	ESRB[4]
UNEMP	Unemployment Rate	ESRB[4]

Appendix

Correlation Matrix

	LLP	IFRS	LLR	ΔNPL	ROA	Size	GDP	UNEMP	CPI	HPI	PORTDIV	DI_{CET1}	DI_{T1}	DI_{EQT}	DI_{LR}
LLP	1.0000														
IFRS	-0.0533	1.0000													
LLR	0.7697	-0.0380	1.0000												
ΔNPL	-0.0407	-0.0548	0.1069	1.0000											
ROA	0.2233	0.1048	0.1183	-0.0642	1.0000										
Size	-0.1665	0.0160	-0.2281	0.0244	-0.0357	1.0000									
GDP	0.1605	-0.0160	0.1895	-0.1732	0.1972	-0.2719	1.0000								
UNEMP	0.3485	-0.2908	0.3474	-0.0420	0.1348	0.1784	-0.1157	1.0000							
CPI	0.0144	0.3173	-0.0839	0.0302	0.3051	-0.1149	0.0425	-0.5176	1.0000						
HPI	0.0821	0.0243	0.1073	-0.1531	0.1153	-0.2379	0.5603	-0.2076	0.1883	1.0000					
PORTDIV	0.1227	0.0766	0.0637	-0.1332	0.4248	0.1540	0.1194	0.1921	0.0733	-0.1690	1.0000				
DI_{CET1}	-0.3047	0.2812	-0.3032	0.0066	0.0683	-0.3763	0.1213	-0.3573	0.2446	0.1609	-0.1117	1.0000			
DI_{T1}	-0.3467	0.2515	-0.3500	0.0140	0.0879	-0.3080	0.0887	-0.3431	0.2633	0.1346	-0.0992	0.9784	1.0000		
DI_{EQT}	-0.3578	0.3315	-0.3743	-0.0247	0.0704	-0.2707	0.0682	-0.4264	0.3084	0.1528	-0.1060	0.9566	0.9652	1.0000	
DI_{LR}	0.1851	0.0078	0.1630	-0.0134	0.1148	-0.4156	0.1373	-0.0497	0.0310	0.1658	0.0099	0.4341	0.3600	0.3624	1.0000

Appendix

Descriptive statistics

| | Baseline Scenario | | | | | | |
	Min	$Q_{0.25}$	Mean	Median	$Q_{0.75}$	Max	σ
LLP	0.0001	0.0012	0.0030	0.0021	0.0037	0.0218	0.0029
IFRS	0.0000	0.0000	0.4286	0.0000	1.0000	1.0000	0.4957
LLR	0.0001	0.0083	0.0270	0.0156	0.0351	0.1967	0.0310
ΔNPL	-0.1488	-0.0101	-0.0056	0.0030	0.0078	0.0383	0.0264
ROA	-0.4470	0.1464	0.2987	0.2747	0.4351	1.1238	0.2372
Size	10.4411	12.0036	12.7744	12.5413	13.6462	14.7581	1.0472
GDP	0.2000	1.6000	1.9844	1.8000	2.4000	4.5000	0.6789
UNEMP	2.9000	5.0000	7.6671	6.7000	9.6000	25.7000	4.1190
CPI	0.3000	1.2000	1.5449	1.5000	1.8000	2.9000	0.4504
HPI	-4.3000	2.2000	3.5724	3.8000	4.9000	12.6000	2.6134
PORTDIV	0.0000	0.4665	0.6015	0.6719	0.7925	0.9982	0.2770
DI_{CET1}	0.0383	0.0772	0.1110	0.0987	0.1263	0.3619	0.0526
DI_{T1}	0.0376	0.0691	0.1044	0.0921	0.1198	0.3469	0.0548
DI_{EQT}	0.0366	0.0745	0.1125	0.1004	0.1360	0.3628	0.0566
DI_{LR}	-0.0331	-0.0060	0.0101	0.0020	0.0129	0.3237	0.0380

| | Adverse Scenario | | | | | | |
	Min	$Q_{0.25}$	Mean	Median	$Q_{0.75}$	Max	σ
LLP	0.0003	0.0031	0.0067	0.0051	0.0086	0.0371	0.0055
IFRS	0.0000	0.0000	0.4286	0.0000	1.0000	1.0000	0.4957
LLR	0.0002	0.0118	0.0347	0.0231	0.0442	0.2430	0.0357
ΔNPL	-0.2110	-0.0161	-0.0036	0.0060	0.0128	0.1026	0.0356
ROA	-2.5804	-0.2742	-0.1495	-0.0856	0.0423	0.4941	0.3372
Size	10.4411	12.0036	12.7744	12.5413	13.6462	14.7581	1.0472
GDP	-31.0000	-1.7000	-1.4821	-1.1000	-0.4000	1.9000	3.6463
UNEMP	3.8000	6.5000	9.4322	8.8000	10.9000	26.8000	3.9935
CPI	-3.9000	-0.1000	0.2907	0.4000	1.0000	2.7000	1.0555
HPI	-31.1000	-10.1000	-7.0508	-6.0000	-3.0000	10.0000	6.1882
PORTDIV	0.0000	0.4665	0.6012	0.6692	0.7925	0.9982	0.2771
DI_{CET1}	0.0115	0.0464	0.0755	0.0624	0.0910	0.3213	0.0483
DI_{T1}	0.0092	0.0378	0.0672	0.0515	0.0815	0.3063	0.0500
DI_{EQT}	-0.0039	0.0442	0.0747	0.0641	0.0927	0.3188	0.0505
DI_{LR}	-0.0340	-0.0133	0.0010	-0.0062	0.0023	0.3237	0.0374
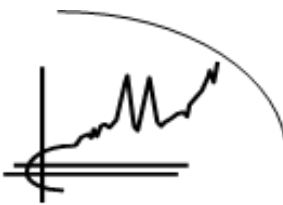
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