Lampiran A: Daftar saham LQ45

No	Saham LQ45
1	AALI (Astra Agro Lestari)
2	ADRO (Adaro Energi)
3	ANTM (Aneka Tambang)
4	ASII (Astra International)
5	BBCA (Bank Central Asia)
6	BBNI (Bank Negara Indonesia)
7	BBRI (Bank Rakyat Indonesia)
8	BDMN (Bank Danamon Indonesia)
9	BISI (Bisi International)
10	BLTA (Berlian Laju Tanker)
11	BMRI (Bank Mandiri)
12	BNBR (Bakrie & Brothers)
13	BRPT (Barito Pacific)
14	BTEL (Bakrie Telecom)
15	BUMI (Bumi Resources)
16	DEWA (Darma Henwa)
17	ELSA (Elnusa)
18	ELTY (Bakrieland Development)
19	ENRG (Energi Mega Persada)
20	GGRM (Gudang Garam)
21	HEXA (Hexindo Adiperkasa)
22	INCO (International Nickel Indonesia)
23	INDF (Indofood Sukses Makmur)
24	INDY (Indika Energi)
25	INKP (Indah Kiat Pulp & Paper)
26	INTP (Indocement Tunggal Perkasa)
27	ISAT (Indosat)
28	ITMG (Indo Tambangraya Megah)
29	JSMR (Jasa Marga)
30	KLBF (Kalbe Farma)
31	LPKR (Lippo Karawaci)
32	LSIP (London Sumatera)
33	MEDC (Medco Energi International)
34	MIRA (Mira International Resources)
35	PGAS (Perusahaan Gas Negara)
36	PTBA (Tambang Batubara Bukit Asam)
37	SGRO (Sampoerna Agro)
38	SMCB (Holchim Indonesia)
39	SMGR (Semen Gresik)
40	TINS (Timah)
41	TLKM (Telekomunikasi Indonesia)
42	TRUB (Truba Alam Manunggal Engineering)
43	UNTR (United Tractors)
44	UNVR (Unilever Indonesia).
45	UNSP (Bakrie Sumatra Plantations)

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AALI

Model Description

			Model Type
Model ID	AALI	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
AALI-Model_1	6	.998	345.319	2.231	167.867	21.509	3.264E3	16.702	18	.544	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
AALI-Model_1	AALI	Natural Log	Difference		1			
	Gold Price	Natural Log	Numerator	Lag 0	.127	.056	2.259	.024
				Lag 5	-.135	.056	-2.395	.017
			Difference		1			
	USD_IDR	Natural Log	Numerator	Lag 0	.302	.091	3.320	.001
			Delay		4			
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.308	.043	7.249	.000
			Delay		1			
			Difference		1			
			Denominator	Lag 2	.577	.078	7.383	.000
	STI	Natural Log	Numerator	Lag 0	.146	.053	2.773	.006
			Delay		6			
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	-.139	.053	-2.614	.009
			Delay		3			

			Difference		1			
	AALI	Natural Log	Numerator	Lag 0	.087	.021	4.223	.000
			Difference		1			

ADRO

Model Description

			Model Type
Model ID	ADRO	Model_1	ARIMA(0,1,17)

Model Statistics

Model	Number of Predictors	Model Fit statistics					Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAE	Statistics	DF	Sig.	
ADRO-Model_1	5	.994	34.888	2.432	25.233	161.474	18.441	17	.362	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
ADRO-Model_1	ADRO	No Transformation	Difference		1			
			MA	Lag 17	-.150	.055	-2.748	.006
	Gold_Price	No Transformation	Delay		6			
			Numerator	Lag 0	.261	.115	2.260	.024
				Lag 2	-.411	.116	-3.554	.000
			Difference		1			
	USD/UDR	No Transformation	Numerator	Lag 0	-.050	.016	-3.215	.001
			Delay		3			
			Difference		1			
	IHSG	No Transformation	Numerator	Lag 0	.391	.053	7.389	.000
				Lag 1	.547	.093	5.857	.000
				Lag 2	-.376	.061	-6.147	.000
			Difference		1			

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			Denominator	Lag 1	1.333	.136	9.789	.000
				Lag 2	-.555	.119	-4.681	.000
	STI	No Transformation	Numerator	Lag 0	-.121	.045	-2.682	.008
			Delay		1			
			Difference		1			
	ADRO	No Transformation	Numerator	Lag 0	-.121	.049	-2.491	.013
				Lag 2	.118	.049	2.429	.016
			Delay		2			
			Difference		1			

ANTM

Model Description

			Model Type
Model ID	ANTM	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
ANTM-Model_1	6	1.000	1.437E-10	4.888E-12	1.020E-10	5.423E-11	7.185E-10	37.552	18	.004	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
ANTM-Model_1	ANTM	No Transformation	Difference		1			
	Oil_Price	No Transformation	Delay		2			
			Numerator	Lag 0	-1.228E-11	2.330E-12	-5.270	.000
			Difference		1			
	Gold_Price	No Transformation	Numerator	Lag 0	-9.721E-13	4.034E-13	-2.410	.016

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			Delay	3			
			Difference	1			
	IHSG	No Transformation	Numerator Lag 0	1.527E-12	1.500E-13	10.184	.000
			Delay	1			
			Difference	1			
	STI	No Transformation	Numerator Lag 0	6.953E-13	1.322E-13	5.260	.000
			Difference	1			
	DJI	No Transformation	Numerator Lag 0	2.188E-13	3.269E-14	6.693	.000
			Difference	1			
	ANTM	No Transformation	Numerator Lag 0	1.000	5.939E-14	1.684E13	.000
			Difference	1			

ASII

Model Description

			Model Type
Model ID	ASII	Model_1	ARIMA(0,1,17)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
ASII-Model_1	4	.998	380.162	2.174	216.294	25.703	2.709E3	6.806	14	.942	0

ARIMA Model Parameters

				Estimate	SE	t	Sig.
ASII-Model_1	ASII	Natural Log	Difference	1			

		MA	Lag 1	.683	.073	9.312	.000
			Lag 4	.052	.020	2.622	.009
			Lag 16	.062	.021	2.950	.003
			Lag 17	-.097	.021	-4.610	.000
Gold_Price	Natural Log	Delay		1			
		Numerator	Lag 0	-.109	.039	-2.809	.005
		Difference		1			
IHSG	Natural Log	Numerator	Lag 0	.112	.038	2.932	.003
			Lag 1	-.130	.043	-3.020	.003
			Lag 2	.174	.038	4.585	.000
		Difference		1			
		Denominator	Lag 2	.776	.089	8.686	.000
STI	Natural Log	Numerator	Lag 0	.096	.035	2.731	.006
		Delay		5			
		Difference		1			
ASII	Natural Log	Numerator	Lag 0	.774	.075	10.346	.000
			Lag 1	.090	.023	3.825	.000
		Difference		1			

BBCA

Model Description

			Model Type
Model ID	BBCA	Model_1	ARIMA(0,1,13)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BBCA-Model_1	4	.997	61.570	1.653	41.051	11.333	311.472	8.312	15	.911	0

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ARIMA Model Parameters[a]

					Estimate	SE	t	Sig.
BBCA-Model_1	BBCA	Natural Log	Constant		.001	.001	2.110	.035
			Difference		1			
			MA	Lag 3	.079	.026	3.005	.003
				Lag 5	.089	.026	3.376	.001
				Lag 13	-.075	.026	-2.847	.004
	Gold_Price	Natural Log	Delay		7			
			Numerator	Lag 0	.181	.044	4.110	.000
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.091	.037	2.422	.016
				Lag 1	-.342	.038	-9.064	.000
			Difference		1			
			Denominator	Lag 1	-.187	.093	-2.002	.045
				Lag 2	.320	.096	3.322	.001
	STI	Natural Log	Numerator	Lag 0	-.114	.043	-2.625	.009
			Delay		2			
			Difference		1			
	BBCA	Natural Log	Numerator	Lag 0	-.045	.023	-2.006	.045
			Denominator	Lag 2	.734	.186	3.938	.000
			Delay		1			
			Difference		1			

BBNI

Model Description

			Model Type
Model ID	BBNI	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BBNI-Model_1	1	.992	39.514	1.891	25.336	24.754	274.814	24.844	18	.129	0

ARIMA Model Parameters[a]

					Estimate	SE	t	Sig.
BBNI-Model_1	BBNI	No Transformation	Difference		1			
	IHSG	No Transformation	Numerator	Lag 0	.116	.036	3.182	.001
				Lag 1	-.128	.026	-4.947	.000
				Lag 2	.094	.037	2.532	.011
			Difference		1			
			Denominator	Lag 2	.847	.040	21.162	.000

BBRI

Model Description

			Model Type
Model ID	BBRI	Model_1	ARIMA(1,1,2)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BBRI-Model_1	3	.996	127.649	2.147	88.484	12.833	596.025	16.904	15	.325	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
BBRI-Model_1	BBRI	Natural Log	Constant		.001	.000	2.391	.017
			AR	Lag 1	.896	.022	41.015	.000
			Difference		1			
			MA	Lag 1	.845	.033	25.944	.000
				Lag 2	.122	.027	4.520	.000
	Gold_Price	Natural Log	Delay		1			
			Numerator	Lag 0	-.146	.053	-2.723	.007
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.190	.040	4.725	.000
				Lag 1	-.412	.044	-9.277	.000
			Difference		1			
			Denominator	Lag 2	.440	.060	7.310	.000
	STI	Natural Log	Numerator	Lag 0	-.125	.052	-2.404	.016
				Lag 2	.211	.052	4.085	.000
			Denominator	Lag 2	-.672	.183	-3.682	.000
			Delay		2			
			Difference		1			

BDMN

Model Description

			Model Type
Model ID	BDMN	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BDMN-Model_1	4	.991	147.740	2.254	107.148	28.400	810.399	12.450	18	.823	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
BDMN-Model_1	BDMN	No Transformation	Difference		1			
	USD_IDR	No Transformation	Numerator	Lag 0	-.159	.057	-2.818	.005
			Difference		1			
	IHSG	No Transformation	Numerator	Lag 0	.412	.086	4.797	.000
			Difference		1			
			Denominator	Lag 1	.885	.032	27.900	.000
	STI	No Transformation	Numerator	Lag 0	-.320	.088	-3.621	.000
			Denominator	Lag 1	1.132	.160	7.063	.000
				Lag 2	-.572	.151	-3.802	.000
			Delay		1			
			Difference		1			
	BDMN	No Transformation	Numerator	Lag 0	-.088	.031	-2.832	.005
				Lag 5	.080	.031	2.596	.010
			Delay		1			
			Difference		1			

BISI

Model Description

			Model Type
Model ID	BISI	Model_1	ARIMA(1,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BISI-Model_1	4	.993	102.708	2.867	62.651	22.039	793.233	18.563	17	.354	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
BISI-Model_1	BISI	Natural Log	AR	Lag 1	.315	.071	4.437	.000
			Difference		1			
	Gold_Price	Natural Log	Numerator	Lag 0	.263	.100	2.622	.009
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.440	.080	5.518	.000
			Delay		1			
			Difference		1			
			Denominator	Lag 1	.721	.074	9.747	.000
	STI	Natural Log	Numerator	Lag 0	-.207	.071	-2.913	.004
			Denominator	Lag 2	.721	.133	5.402	.000
			Difference		1			
	BISI	Natural Log	Numerator	Lag 0	-.200	.071	-2.823	.005
			Difference		1			

BLTA

Model Description

			Model Type
Model ID	BLTA	Model_1	ARIMA(0,1,10)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BLTA-Model_1	4	.998	31.630	1.925	17.466	19.348	317.471	18.485	17	.359	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
BLTA-Model_1	BLTA	Natural Log	Difference		1			
			MA	Lag 10	.066	.022	2.951	.003
	Oil_Price	Natural Log	Delay		2			
			Numerator	Lag 0	.060	.025	2.354	.019
			Difference		1			
	Gold_Price	Natural Log	Numerator	Lag 0	-.168	.053	-3.135	.002
			Delay		2			
			Difference		1			
	USD/UDR	Natural Log	Numerator	Lag 0	-.226	.092	-2.451	.014
			Delay		1			
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.076	.029	2.588	.010
				Lag 1	-.207	.036	-5.809	.000
			Difference		1			
			Denominator	Lag 2	.748	.050	14.957	.000

BMRI

Model Description

			Model Type
Model ID	BMRI	Model_1	ARIMA(0,1,17)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BMRI-Model_1	4	.997	61.085	2.084	42.191	15.488	323.776	21.070	16	.176	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
BMRI-Model_1	BMRI	No Transformation	Difference		1			
			MA	Lag 6	.061	.025	2.458	.014
				Lag 17	.061	.025	2.433	.015
	Oil_Price	No Transformation	Delay		4			
			Numerator	Lag 0	1.735	.867	2.002	.045
			Difference		1			
	Gold_Price	No Transformation	Numerator	Lag 0	-.388	.154	-2.520	.012
			Delay		2			
			Difference		1			
	IHSG	No Transformation	Numerator	Lag 0	.404	.056	7.164	.000
				Lag 1	-.267	.044	-6.073	.000
				Lag 2	.321	.060	5.358	.000
			Difference		1			
			Denominator	Lag 2	.800	.043	18.767	.000
	STI	No Transformation	Numerator	Lag 0	-.141	.046	-3.082	.002
				Lag 1	.166	.046	3.603	.000

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			Delay	1			
			Difference	1			

BNBR

Model Description

			Model Type
Model ID	BNBR	Model_1	ARIMA(0,1,15)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BNBR-Model_1	1	.981	123.990	6.788	59.727	724.485	1.663E3	11.117	15	.744	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
BNBR-Model_1	BNBR	Natural Log	Difference		1			
			MA	Lag 1	.276	.020	13.770	.000
				Lag 14	.075	.021	3.585	.000
				Lag 15	.103	.021	4.898	.000
	STI	Natural Log	Delay		8			
			Numerator	Lag 0	-.409	.185	-2.212	.027
			Difference		1			

BRPT

Model Description

			Model Type
Model ID	BRPT	Model_1	ARIMA(1,1,1)

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Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BRPT-Model_1	4	.991	71.065	3.101	29.766	42.412	1.156E3	16.218	16	.438	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
BRPT-Model_1	BRPT	Natural Log	AR	Lag 1	.678	.195	3.479	.001
			Difference		1			
			MA	Lag 1	.627	.206	3.035	.002
	Oil_Price	Natural Log	Delay		6			
			Numerator	Lag 0	.128	.042	3.014	.003
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.296	.073	4.044	.000
				Lag 1	-.186	.060	-3.096	.002
				Lag 2	.223	.080	2.798	.005
			Difference		1			
			Denominator	Lag 2	.786	.093	8.458	.000
	STI	Natural Log	Numerator	Lag 0	.206	.087	2.358	.018
			Delay		7			
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	.217	.092	2.363	.018
				Lag 1	-.290	.092	-3.170	.002
			Delay		1			
			Difference		1			

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BTEL

Model Description

			Model Type
Model ID	BTEL	Model_1	ARIMA(2,1,1)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BTEL-Model_1	4	.994	8.659	2.439	5.256	23.372	81.802	19.678	15	.185	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
BTEL-Model_1	BTEL	Natural Log	AR	Lag 1	.637	.067	9.464	.000
				Lag 2	.329	.046	7.194	.000
			Difference		1			
			MA	Lag 1	.983	.032	30.523	.000
	USD_IDR	Natural Log	Delay		5			
			Numerator	Lag 0	.436	.152	2.876	.004
				Lag 1	.505	.152	3.317	.001
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.358	.061	5.901	.000
				Lag 8	-.418	.062	-6.704	.000
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	-.197	.076	-2.574	.010
			Difference		1			
	BTEL	Natural Log	Numerator	Lag 0	.328	.048	6.782	.000
				Lag 6	-.107	.031	-3.468	.001
			Difference		1			

BUMI

Model Description

			Model Type
Model ID	BUMI	Model_1	ARIMA(0,1,18)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
BUMI-Model_1	3	.997	107.485	2.959	49.884	43.375	1.028E3	18.086	16	.319	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
BUMI-Model_1	BUMI	Natural Log	Difference		1			
			MA	Lag 3	-.643	.068	-9.409	.000
				Lag 18	.085	.021	4.024	.000
	Oil_Price	Natural Log	Delay		1			
			Numerator	Lag 0	.074	.035	2.144	.032
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.167	.056	2.989	.003
			Difference		1			
	BUMI	Natural Log	Numerator	Lag 0	-.559	.073	-7.698	.000
				Lag 1	-.042	.011	-3.677	.000
				Lag 2	-.535	.070	-7.587	.000
			Delay		2			
			Difference		1			
			Denominator	Lag 2	.919	.025	36.658	.000

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DEWA

Model Description

			Model Type
Model ID	DEWA	Model_1	ARIMA(0,1,1)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
DEWA-Model_1	5	.993	16.141	3.673	9.467	32.331	116.658	21.111	17	.221	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
DEWA-Model_1	DEWA	Natural Log	Difference		1			
			MA	Lag 1	.440	.104	4.221	.000
	Oil_Price	Natural Log	Delay		8			
			Numerator	Lag 0	.131	.060	2.194	.029
			Difference		1			
	USD_IDR	Natural Log	Numerator	Lag 0	-.796	.256	-3.113	.002
			Delay		1			
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.646	.105	6.142	.000
				Lag 3	-.376	.127	-2.949	.003
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	-.239	.118	-2.031	.043
			Delay		6			
			Difference		1			
	DEWA	Natural Log	Numerator	Lag 0	.428	.098	4.390	.000
			Difference		1			

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ELSA

Model Description

			Model Type
Model ID	ELSA	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
ELSA-Model_1	2	.988	10.360	2.517	6.666	22.936	90.309	15.865	18	.602	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
ELSA-Model_1	ELSA	No Transformation	Difference		1			
	IHSG	No Transformation	Delay		2			
			Numerator	Lag 0	.045	.012	3.759	.000
				Lag 1	-.026	.012	-2.259	.024
			Difference		1			
			Denominator	Lag 2	.567	.130	4.355	.000
	ELSA	No Transformation	Numerator	Lag 0	-.090	.044	-2.025	.043
			Delay		5			
			Difference		1			

ELTY

Model Description

			Model Type
Model ID	ELTY	Model_1	ARIMA(0,1,0)

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
ELTY-Model_1	2	.993	12.314	4.022	7.272	99.085	99.915	26.719	18	.084	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
ELTY-Model_1	ELTY	Square Root	Difference		1			
	USD_IDR	Square Root	Delay		7			
			Numerator	Lag 0	-.060	.025	-2.407	.016
			Difference		1			
	IHSG	Square Root	Numerator	Lag 0	.142	.030	4.812	.000
			Difference		1			

ENRG

Model Description

			Model Type
Model ID	ENRG	Model_1	ARIMA(1,1,15)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
ENRG-Model_1	2	.994	24.714	2.423	14.266	46.706	253.778	15.606	14	.338	0

ARIMA Model Parameters[a]

					Estimate	SE	t	Sig.
ENRG-Model_1	ENRG	Square	AR	Lag 1	.657	.118	5.573	.000

			Difference		1			
			MA	Lag 1	.668	.116	5.742	.000
				Lag 3	-.075	.024	-3.146	.002
				Lag 15	-.068	.022	-3.023	.003
	USD_IDR	Square Root	Delay		3			
			Numerator	Lag 0	-.084	.032	-2.610	.009
			Difference		1			
	IHSG	Square Root	Numerator	Lag 0	.144	.036	3.959	.000
				Lag 8	-.077	.036	-2.108	.035
			Difference		1			

GGRM

Model Description

			Model Type
Model ID	GGRM	Model_1	ARIMA(0,1,2)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
GGRM-Model_1	4	.995	237.963	1.642	156.660	18.495	1.794E3	32.885	16	.008	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
GGRM-Model_1	GGRM	No Transformation	Difference		1			
			MA	Lag 1	-.081	.024	-3.416	.001
				Lag 2	.054	.024	2.272	.023
	Gold_Price	No Transformation	Delay		7			
			Numerator	Lag 0	1.397	.582	2.401	.016

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

			Difference	1			
	IHSG	No Transformation	Numerator Lag 0	1.069	.219	4.870	.000
			Lag 5	-.515	.219	-2.352	.019
			Difference	1			
	KLSE	No Transformation	Numerator Lag 0	.972	.441	2.207	.027
			Lag 1	1.588	.442	3.592	.000
			Delay	7			
			Difference	1			
	GGRM	No Transformation	Numerator Lag 0	.057	.023	2.447	.015
			Delay	8			
			Difference	1			

HEXA

Model Description

			Model Type
Model ID	HEXA	Model_1	ARIMA(0,1,9)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
HEXA-Model_1	6	.997	48.138	2.918	24.198	41.017	511.863	28.871	17	.036	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
HEXA-Model_1	HEXA	Natural Log	Difference		1			
			MA	Lag 9	.057	.023	2.477	.013
	Oil_Price	Natural Log	Numerator	Lag 0	.137	.040	3.406	.001
			Difference		1			
	USD_IDR	Natural	Numerator	Lag 0	-.327	.149	-2.195	.028

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.252	.057	4.400	.000
				Lag 1	-.411	.062	-6.621	.000
			Difference		1			
			Denominator	Lag 2	.600	.065	9.261	.000
	STI	Natural Log	Numerator	Lag 0	-.240	.082	-2.939	.003
				Lag 1	-.248	.081	-3.067	.002
			Delay		5			
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	-.230	.082	-2.808	.005
			Delay		6			
			Difference		1			
	HEXA	Natural Log	Numerator	Lag 0	-.234	.022	-10.565	.000
			Denominator	Lag 2	-.186	.090	-2.064	.039
			Difference		1			

INCO

Model Description

			Model Type
Model ID	INCO	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
INCO-Model_1	4	.991	227.050	2.431	56.289	83.275	7.634E3	11.143	18	.888	0

ARIMA Model Parameters

				Estimate	SE	t	Sig.
INCO-Model_1	INCO	Natural Log	Difference	1			

	Oil_Price	Natural Log	Delay		3			
			Numerator	Lag 0	-.119	.058	-2.054	.040
			Difference		1			
	Gold_Price	Natural Log	Numerator	Lag 0	-.245	.117	-2.095	.036
				Lag 5	-.320	.117	-2.745	.006
			Delay		2			
			Difference		1			
	USD_IDR	Natural Log	Numerator	Lag 0	-.669	.208	-3.218	.001
			Delay		5			
			Difference		1			
	STI	Natural Log	Numerator	Lag 0	.312	.114	2.735	.006
			Delay		2			
			Difference		1			

INDF

Model Description

			Model Type
Model ID	INDF	Model_1	ARIMA(1,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
INDF-Model_1	2	.997	40.676	2.087	24.922	18.036	370.114	22.623	17	.162	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
INDF-Model_1	INDF	Natural Log	AR	Lag 1	-.097	.021	-4.634	.000
			Difference		1			
	Gold_Price	Natural Log	Delay		8			

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

			Numerator	Lag 0	-.151	.050	-2.984	.003
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.152	.027	5.690	.000
			Delay		1			
			Difference		1			
			Denominator	Lag 2	.851	.032	26.612	.000

INDY

Model Description

			Model Type
Model ID	INDY	Model_1	ARIMA(0,1,2)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
INDY-Model_1	4	.985	72.513	2.674	52.199	18.692	326.375	16.400	17	.496	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
INDY-Model_1	INDY	No Transformation	Difference		1			
			MA	Lag 2	.206	.050	4.101	.000
	Gold_Price	No Transformation	Delay		1			
			Numerator	Lag 0	.547	.233	2.346	.019
				Lag 3	.485	.232	2.096	.037
			Difference		1			
	USD_IDR	No Transformation	Numerator	Lag 0	.071	.032	2.233	.026
			Delay		5			
			Difference		1			
	IHSG	No	Numerator	Lag 0	.573	.104	5.479	.000

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

				Lag 1	.880	.172	5.112	.000
				Lag 2	-.786	.119	-6.609	.000
			Difference		1			
			Denominator	Lag 1	1.095	.145	7.560	.000
				Lag 2	-.386	.127	-3.034	.003
	DJI	No Transformation	Numerator	Lag 0	.063	.020	3.177	.002
				Lag 1	-.073	.020	-3.623	.000
			Denominator	Lag 1	-.950	.034	-28.245	.000
			Delay		3			
			Difference		1			

INKP

Model Description

			Model Type
Model ID	INKP	Model_1	ARIMA(0,1,5)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
INKP-Model_1	7	.994	44.314	2.530	22.103	53.668	685.680	29.525	17	.030	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
INKP-Model_1	INKP	Natural Log	Difference		1			
			MA	Lag 5	-.052	.021	-2.469	.014
	Oil_Price	Natural Log	Delay		7			
			Numerator	Lag 0	-.111	.033	-3.334	.001
				Lag 1	-.081	.033	-2.412	.016
			Difference		1			

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

Gold_Price	Natural Log	Numerator	Lag 0	-.173	.073	-2.377	.018
		Delay		8			
		Difference		1			
USD_IDR	Natural Log	Numerator	Lag 0	.404	.115	3.519	.000
		Delay		4			
		Difference		1			
IHSG	Natural Log	Numerator	Lag 0	.309	.058	5.284	.000
			Lag 2	-.200	.058	-3.441	.001
		Delay		1			
		Difference		1			
KLSE	Natural Log	Numerator	Lag 0	.209	.078	2.665	.008
			Lag 1	-.209	.078	-2.675	.008
		Delay		7			
		Difference		1			
STI	Natural Log	Numerator	Lag 0	-.205	.068	-3.017	.003
			Lag 4	-.157	.068	-2.321	.020
		Delay		2			
		Difference		1			
DJI	Natural Log	Numerator	Lag 0	.167	.069	2.432	.015
			Lag 1	-.217	.089	-2.421	.016
			Lag 2	-.277	.073	-3.789	.000
		Difference		1			
		Denominator	Lag 1	-1.098	.114	-9.629	.000
			Lag 2	-.738	.110	-6.698	.000

INTP

Model Description

			Model Type
Model ID	INTP	Model_1	ARIMA(0,1,0)

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
INTP-Model_1	4	.998	135.238	2.141	78.956	19.206	907.765	11.266	18	.883	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
INTP-Model_1	INTP	Natural Log	Difference		1			
	Oil_Price	Natural Log	Numerator	Lag 0	.076	.024	3.117	.002
				Lag 5	-.061	.025	-2.490	.013
			Difference		1			
	Gold_Price	Natural Log	Numerator	Lag 0	-.113	.053	-2.134	.033
			Delay		7			
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.130	.036	3.557	.000
			Difference		1			
			Denominator	Lag 2	.717	.106	6.762	.000
	DJI	Natural Log	Numerator	Lag 0	-.116	.050	-2.320	.020
			Delay		5			
			Difference		1			

ISAT

Model Description

			Model Type
Model ID	ISAT	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number	Model Fit statistics	Ljung-Box Q(18)	Number

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
ISAT-Model_1	3	.982	149.966	1.827	100.720	25.542	1.168E3	14.948	18	.666	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
ISAT-Model_1	ISAT	No Transformation	Difference		1			
	IHSG	No Transformation	Delay		3			
			Numerator	Lag 0	.486	.122	3.972	.000
			Difference		1			
			Denominator	Lag 2	.699	.102	6.831	.000
	DJI	No Transformation	Numerator	Lag 0	.062	.030	2.050	.041
				Lag 5	-.067	.030	-2.209	.027
			Delay		2			
			Difference		1			
	ISAT	No Transformation	Numerator	Lag 0	-.111	.024	-4.693	.000
			Denominator	Lag 2	.630	.106	5.960	.000
			Delay		2			
			Difference		1			

ITMG

Model Description

			Model Type
Model ID	ITMG	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
ITMG-Model_1	2	.989	788.630	2.904	565.134	21.962	3.501E3	14.343	18	.706	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
ITMG-Model_1	ITMG	No Transformation	Difference		1			
	IHSG	No Transformation	Numerator	Lag 0	3.823	.906	4.219	.000
				Lag 1	-2.761	.758	-3.643	.000
				Lag 2	2.699	.991	2.725	.007
			Difference		1			
			Denominator	Lag 2	.744	.092	8.128	.000
	ITMG	No Transformation	Numerator	Lag 0	.115	.030	3.769	.000
			Denominator	Lag 1	-.167	.048	-3.459	.001
				Lag 2	-.850	.059	-14.431	.000
			Difference		1			

JSMR

Model Description

			Model Type
Model ID	JSMR	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
JSMR-Model_1	3	.993	30.893	1.693	21.845	13.490	158.636	13.695	18	.749	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
JSMR-Model_1	JSMR	No Transformation	Difference		1			
	USD_IDR	No Transformation	Delay		4			
			Numerator	Lag 0	.038	.014	2.732	.007
			Difference		1			
			Denominator	Lag 1	.556	.226	2.456	.014
	IHSG	No Transformation	Numerator	Lag 0	.079	.024	3.305	.001
				Lag 1	-.151	.028	-5.468	.000
			Denominator	Lag 2	.746	.055	13.569	.000
			Difference		1			
	JSMR	No Transformation	Numerator	Lag 0	-.119	.042	-2.849	.005
			Delay		2			
			Difference		1			

KLBF

Model Description

			Model Type
Model ID	KLBF	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
KLBF-Model_1	4	.996	23.347	1.810	15.037	34.065	310.299	19.092	18	.386	0

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

ARIMA Model Parameters

					Estimate	SE	t	Sig.
KLBF-Model_1	KLBF	No Transformation	Difference		1			
	IHSG	No Transformation	Delay		1			
			Numerator	Lag 0	.077	.017	4.654	.000
			Difference		1			
			Denominator	Lag 2	.809	.054	14.906	.000
	STI	No Transformation	Numerator	Lag 0	-.071	.018	-3.989	.000
			Delay		2			
			Difference		1			
	DJI	No Transformation	Numerator	Lag 0	.011	.005	2.348	.019
			Delay		5			
			Difference		1			
	KLBF	No Transformation	Numerator	Lag 0	.057	.025	2.253	.024
			Delay		4			
			Difference		1			

LPKR

Model Description

			Model Type
Model ID	LPKR	Model_1	ARIMA(3,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
LPKR-Model_1	4	.993	12.139	1.117	7.280	15.714	117.497	18.000	16	.324	0

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

ARIMA Model Parameters

					Estimate	SE	t	Sig.
LPKR-Model_1	LPKR	Natural Log	AR	Lag 1	.069	.034	2.010	.045
				Lag 3	.074	.034	2.167	.031
			Difference		1			
	Oil_Price	Natural Log	Delay		3			
			Numerator	Lag 0	.028	.010	2.687	.007
			Difference		1			
			Denominator	Lag 1	1.506	.157	9.569	.000
				Lag 2	-.659	.150	-4.383	.000
	Gold_Price	Natural Log	Numerator	Lag 0	-.120	.042	-2.889	.004
			Delay		4			
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.078	.034	2.260	.024
				Lag 5	-.091	.035	-2.643	.008
			Difference		1			
	STI	Natural Log	Numerator	Lag 0	.083	.036	2.293	.022
			Delay		7			
			Difference		1			

LSIP

Model Description

			Model Type
Model ID	LSIP	Model_1	ARIMA(0,1,7)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
LSIP-Model_1	5	.998	150.631	2.316	85.447	21.355	1.291E3	24.773	17	.100	0

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

ARIMA Model Parameters

					Estimate	SE	t	Sig.
LSIP-Model_1	LSIP	Natural Log	Difference		1			
			MA	Lag 7	.094	.024	3.999	.000
	Oil_Price	Natural Log	Numerator	Lag 0	.071	.030	2.343	.019
			Difference		1			
	Gold_Price	Natural Log	Numerator	Lag 0	.158	.063	2.507	.012
				Lag 1	-.365	.119	-3.059	.002
				Lag 2	-.217	.066	-3.308	.001
			Difference		1			
			Denominator	Lag 1	-1.839	.043	-42.377	.000
				Lag 2	-.928	.043	-21.819	.000
	IHSG	Natural Log	Numerator	Lag 0	.248	.049	5.066	.000
				Lag 1	-.386	.049	-7.908	.000
			Denominator	Lag 1	-.207	.081	-2.535	.011
				Lag 2	.567	.077	7.323	.000
			Difference		1			
	KLSE	Natural Log	Numerator	Lag 0	.169	.064	2.657	.008
			Denominator	Lag 2	.553	.241	2.293	.022
			Delay		5			
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	.136	.049	2.749	.006
			Denominator	Lag 1	.944	.106	8.878	.000
				Lag 2	-.763	.119	-6.422	.000
			Delay		1			
			Difference		1			

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

MEDC

Model Description

			Model Type
Model ID	MEDC	Model_1	ARIMA(0,1,15)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
MEDC-Model_1	6	.995	86.181	2.069	52.069	18.902	588.500	16.636	16	.409	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
MEDC-Model_1	MEDC	Natural Log	Difference		1			
			MA	Lag 11	.056	.021	2.649	.008
				Lag 15	.056	.021	2.664	.008
	Oil_Price	Natural Log	Numerator	Lag 0	.093	.024	3.866	.000
			Difference		1			
	USD_IDR	Natural Log	Numerator	Lag 0	-.214	.082	-2.618	.009
			Delay		3			
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.113	.038	2.961	.003
				Lag 1	-.270	.038	-7.099	.000
			Difference		1			
			Denominator	Lag 1	-.183	.073	-2.493	.013
				Lag 2	.612	.073	8.343	.000
	STI	Natural Log	Numerator	Lag 0	.163	.049	3.342	.001
			Delay		6			
			Difference		1			
	DJI	Natural	Numerator	Lag 0	.129	.049	2.620	.009

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

			Delay		1			
			Difference		1			
	MEDC	Natural Log	Numerator	Lag 0	-.053	.021	-2.543	.011
				Lag 6	.059	.021	2.877	.004
			Delay		1			
			Difference		1			

MIRA

Model Description

			Model Type
Model ID	MIRA	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
MIRA-Model_1	3	.989	18.548	2.056	11.739	19.333	114.062	11.934	18	.851	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
MIRA-Model_1	MIRA	No Transformation	Difference		1			
	IHSG	No Transformation	Numerator	Lag 0	.107	.027	4.024	.000
			Difference		1			
	STI	No Transformation	Numerator	Lag 0	-.078	.023	-3.434	.001
			Delay		3			
			Difference		1			
	MIRA	No Transformation	Numerator	Lag 0	.074	.027	2.710	.007
				Lag 1	-.106	.027	-3.903	.000

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

			Delay	2			
			Difference	1			
			Denominator Lag 1	-1.591	.042	-37.804	.000
			Lag 2	-.905	.042	-21.365	.000

PGAS

Model Description

			Model Type
Model ID	PGAS	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
PGAS-Model_1	6	.997	56.644	2.122	34.499	31.228	421.416	13.003	18	.791	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
PGAS-Model_1	PGAS	Natural Log	Difference		1			
	Oil_Price	Natural Log	Delay		7			
			Numerator	Lag 0	-.084	.030	-2.747	.006
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.194	.050	3.892	.000
				Lag 1	-.365	.052	-7.030	.000
			Difference		1			
			Denominator	Lag 2	.300	.101	2.965	.003
	KLSE	Natural Log	Numerator	Lag 0	.146	.065	2.241	.025
				Lag 1	-.186	.069	-2.716	.007
			Delay		5			

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

			Difference		1			
	STI	Natural Log	Numerator	Lag 0	-.191	.061	-3.150	.002
			Delay		4			
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	.182	.064	2.857	.004
				Lag 4	.189	.064	2.953	.003
			Delay		2			
			Difference		1			
	PGAS	Natural Log	Numerator	Lag 0	-.082	.025	-3.282	.001
				Lag 6	.064	.024	2.619	.009
			Delay		1			
			Difference		1			

PTBA

Model Description

			Model Type
Model ID	PTBA	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
PTBA-Model_1	6	.998	225.222	2.269	116.944	26.468	1.630E3	17.235	18	.507	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
PTBA-Model_1	PTBA	Natural Log	Difference		1			
	Oil_Price	Natural Log	Numerator	Lag 0	.108	.029	3.690	.000
			Difference		1			
	Gold_Price	Natural Log	Numerator	Lag 0	.156	.061	2.555	.011

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

			Difference		1			
	USD_IDR	Natural Log	Numerator	Lag 0	-.326	.109	-2.984	.003
			Delay		3			
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.371	.051	7.285	.000
				Lag 2	-.211	.051	-4.139	.000
			Delay		1			
			Difference		1			
	KLSE	Natural Log	Numerator	Lag 0	.130	.065	2.009	.045
			Delay		5			
			Difference		1			
	STI	Natural Log	Numerator	Lag 0	-.171	.060	-2.860	.004
				Lag 6	-.141	.060	-2.352	.019
			Delay		2			
			Difference		1			

SGRO

Model Description

			Model Type
Model ID	SGRO	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
SGRO-Model_1	2	.990	93.942	2.534	59.280	26.281	609.097	32.924	18	.017	0

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

ARIMA Model Parameters

					Estimate	SE	t	Sig.
SGRO-Model_1	SGRO	No Transformation	Difference		1			
	Oil_Price	No Transformation	Numerator	Lag 0	4.029	1.502	2.683	.007
			Difference		1			
	SGRO	No Transformation	Numerator	Lag 0	-.115	.036	-3.176	.002
			Delay		2			
			Difference		1			
			Denominator	Lag 1	-.692	.125	-5.542	.000

SMCB

Model Description

			Model Type
Model ID	SMCB	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics					Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	Statistics	DF	Sig.	
SMCB-Model_1	7	.996	25.689	2.259	15.791	19.447	7.925	18	.980	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
SMCB-Model_1	SMCB	Natural Log	Difference		1			
	Gold_Price	Natural Log	Delay		7			
			Numerator	Lag 0	.143	.060	2.392	.017
			Difference		1			
	USD_IDR	Natural Log	Numerator	Lag 0	-.292	.107	-2.734	.006
			Delay		5			

		Difference		1			
IHSG	Natural Log	Numerator	Lag 0	.255	.049	5.208	.000
			Lag 1	-.309	.048	-6.427	.000
			Lag 2	.150	.058	2.605	.009
		Difference		1			
		Denominator	Lag 2	.504	.102	4.931	.000
KLSE	Natural Log	Numerator	Lag 0	.219	.066	3.295	.001
		Delay		7			
		Difference		1			
STI	Natural Log	Numerator	Lag 0	-.196	.058	-3.354	.001
		Delay		2			
		Difference		1			
DJI	Natural Log	Numerator	Lag 0	.135	.062	2.183	.029
			Lag 1	-.174	.062	-2.808	.005
			Lag 2	-.308	.061	-5.013	.000
		Difference		1			
SMCB	Natural Log	Numerator	Lag 0	-.064	.023	-2.853	.004
		Delay		6			
		Difference		1			

SMGR

odel Description

			Model Type
Model ID	SMGR	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
SMGR-Model_1	3	.993	122.513	2.002	89.534	31.767	580.475	24.405	18	.142	0

ARIMA Model Parameters

				Estimate	SE	t	Sig.
SMGR-Model_1	SMGR	No Transformation	Difference	1			
	USD_IDR	No Transformation	Delay	3			
			Numerator Lag 0	-.199	.051	-3.882	.000
			Difference	1			
	IHSG	No Transformation	Numerator Lag 0	.514	.132	3.903	.000
			Difference	1			
	STI	No Transformation	Numerator Lag 0	.289	.113	2.551	.011
			Delay	6			
			Difference	1			

TINS

Model Description

			Model Type
Model ID	TINS	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
TINS-Model_1	6	.996	44.506	2.863	13.833	65.463	1.342E3	8.051	18	.978	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
TINS-Model_1	TINS	Natural Log	Constant		.003	.001	2.703	.007
			Difference		1			
	Gold_Price	Natural Log	Numerator	Lag 0	-.214	.101	-2.123	.034
			Difference		1			
	USD_IDR	Natural Log	Numerator	Lag 0	-.346	.158	-2.192	.028
				Lag 2	.732	.158	4.634	.000
			Delay		1			
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.302	.081	3.708	.000
				Lag 1	-.206	.081	-2.534	.011
			Difference		1			
	KLSE	Natural Log	Numerator	Lag 0	.260	.108	2.409	.016
			Delay		6			
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	.296	.094	3.146	.002
			Delay		2			
			Difference		1			
	TINS	Natural Log	Numerator	Lag 0	-.046	.021	-2.194	.028
				Lag 3	-.057	.021	-2.736	.006
			Difference		1			

TLKM

Model Description

			Model Type
Model ID	TLKM	Model_1	ARIMA(0,1,0)

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Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
TLKM-Model_1	2	.994	154.014	1.645	110.217	12.425	837.874	19.316	18	.373	0

TRUB

Model Description

			Model Type
Model ID	TRUB	Model_1	ARIMA(0,1,10)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
TRUB-Model_1	2	.998	20.904	2.668	12.165	39.020	138.984	11.333	15	.729	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
TRUB-Model_1	TRUB	Square Root	Difference		1			
			MA	Lag 1	-.094	.036	-2.631	.009
				Lag 2	-.103	.035	-2.904	.004
				Lag 10	-.117	.035	-3.311	.001
	Oil_Price	Square Root	Delay		3			
			Numerator	Lag 0	.381	.109	3.489	.001
			Difference		1			
			Denominator	Lag 2	.520	.192	2.715	.007
	TRUB	Square Root	Numerator	Lag 0	.147	.035	4.167	.000
			Delay		2			
			Difference		1			

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

UNSP

Model Description

			Model Type
Model ID	UNSP	Model_1	ARIMA(1,1,11)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
UNSP-Model_1	6	.995	42.278	2.744	24.495	38.527	349.508	25.294	16	.065	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
UNSP-Model_1	UNSP	Natural Log	AR	Lag 1	-.220	.051	-4.281	.000
			Difference		1			
			MA	Lag 11	.079	.028	2.805	.005
	Oil_Price	Natural Log	Numerator	Lag 0	.151	.041	3.714	.000
			Difference		1			
	USD_IDR	Natural Log	Numerator	Lag 0	-.517	.147	-3.520	.000
				Lag 3	.501	.148	3.376	.001
			Delay		3			
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.450	.065	6.883	.000
				Lag 8	-.310	.065	-4.777	.000
			Difference		1			
	STI	Natural Log	Numerator	Lag 0	-.206	.079	-2.623	.009
			Delay		3			
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	-.223	.086	-2.603	.009
			Difference		1			

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	UNSP	Natural Log	Numerator	Lag 0	.264	.049	5.443	.000
			Difference		1			

UNTR

Model Description

			Model Type
Model ID	UNTR	Model_1	ARIMA(0,1,1)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
UNTR-Model_1	5	.998	179.440	2.324	96.711	36.077	1.193E3	16.508	17	.488	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
UNTR-Model_1	UNTR	Natural Log	Difference		1			
			MA	Lag 1	.209	.098	2.138	.033
	Oil_Price	Natural Log	Numerator	Lag 0	.097	.026	3.702	.000
			Difference		1			
	IHSG	Natural Log	Numerator	Lag 0	.364	.044	8.234	.000
			Delay		1			
			Difference		1			
			Denominator	Lag 2	.465	.087	5.347	.000
	STI	Natural Log	Numerator	Lag 0	-.154	.053	-2.889	.004
			Delay		2			
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	.155	.055	2.833	.005
				Lag 1	.120	.056	2.124	.034
			Delay		7			

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			Difference		1			
	UNTR	Natural Log	Numerator	Lag 0	.225	.095	2.370	.018
			Difference		1			

UNVR

Model Description

			Model Type
Model ID	UNVR	Model_1	ARIMA(0,1,0)

Model Statistics

Model	Number of Predictors	Model Fit statistics						Ljung-Box Q(18)			Number of Outliers
		R-squared	RMSE	MAPE	MAE	MaxAPE	MaxAE	Statistics	DF	Sig.	
UNVR-Model_1	4	.997	125.459	1.425	79.208	18.199	1.092E3	23.095	18	.187	0

ARIMA Model Parameters

					Estimate	SE	t	Sig.
UNVR-Model_1	UNVR	Natural Log	Difference		1			
	Gold_Price	Natural Log	Delay		4			
			Numerator	Lag 0	.106	.039	2.731	.006
			Difference		1			
	KLSE	Natural Log	Numerator	Lag 0	.098	.039	2.539	.011
			Delay		3			
			Difference		1			
	DJI	Natural Log	Numerator	Lag 0	-.082	.027	-3.075	.002
			Delay		1			
			Difference		1			
			Denominator	Lag 1	.963	.060	16.173	.000
				Lag 2	-.847	.070	-12.103	.000

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	UNVR	Natural Log	Numerator	Lag 0	-.099	.022	-4.584	.000
			Denominator	Lag 1	.755	.083	9.095	.000
			Difference		1			

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

Lampiran C: Kode program matlab untuk ANN Backpropagation

```
%-----------------------------------------------------------------------
% ANN untuk 1 hidden layer
%-----------------------------------------------------------------------
% list of LQ45 stocks

tic % start time

list_of_LQ45 =
['AALI';'ADRO';'ANTM';'ASII';'BBCA';'BBNI';'BBRI';'BDMN';'BISI';'BLTA';'
BMRI';'BNBR';'BRPT';'BTEL';'BUMU';'DEWA';'ELSA';'ELTY';'ENRG';'GGRM';
'HEXA';'INCO';'INDF';'INDY';'INKP';'INTP';'ISAT';'ITMG';'JSMR';'KLBF';'L
PKR';'LSIP';'MEDC';'MIRA';'PGAS';'PTBA';'SGRO';'SMCB';'TLKM';'SMGR';
'TINS';'TRUB';'UNSP';'UNTR';'UNVR'];

[m,n] = size(list_of_LQ45);

COUNTER = 1;

% ================================================
% file output untuk catat hasil percobaan
% ================================================
% results.txt menghasilkan format sebagai berikut:
% saham = nama saham
% training = jenis training
% act_o = activation function di output layer
% act_h = activation function di hidden layer
% neu_hid = jumlah neuron di hidden layer
% rmse = root mean square error pada saat test performance
% format:
% saham training act_o act_h neu_hid rmse

% loop terluar (level 5)
% catat header
fid = fopen('results.txt', 'a');
str_header = 'no;saham;training;act_o;act_h;neu_hid;rmse';
count = fprintf(fid, '%s\n', str_header);

%lakukan untuk setiap saham LQ45
for ii=1:m

    %inisialisasi
    %filename = '';
    %message = '';
    jmlinp = 8; % jumlah input

    disp(['Processing ' list_of_LQ45(ii,:) ' ...'])
    filename = strcat('data/',list_of_LQ45(ii,:),'.xls');
    message = strcat('... Opening : ',filename);
    disp(message)

    A = xlsread(filename);  % baca file excel, dan masukkan ke matrix A

    [m,n] = size(A);        % ukuran input
    jmlout = n-jmlinp;
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

```
x = A(:,1:jmlinp);      % Input patterns
y = A(:,jmlinp+1:n);    % Output patterns

%transpose dulu biar bisa dipake oleh NN toolbox
p = x';
t = y';

%preprocessing
[ptrans,minp,maxp,tn,mint,maxt] = premnmx(p,t);

% bagi menjadi bagian training, dan validasi

itertest = 2:4:m;
iterval = 4:4:m;
iterindex = [1:4:m 3:4:m];
val.P = ptrans(:,iterval); val.T = tn(:,iterval);  %validation
test.P = ptrans(:,itertest); test.T = tn(:,itertest);
ptr = ptrans(:,iterindex); ttr = tn(:,iterindex);  %training

sim(net,perf)
[jumlah_baris, jumlah_kolom] = size(ptrans);

p_performance = ptrans(:,(jumlah_kolom-(50-1)):jumlah_kolom);
t_performance = t(:,(jumlah_kolom-(50-1)):jumlah_kolom);

%inisialisasi neural network
learning_rate = 0.05;
momentum_rate = 0.01;
maximum_iteration = 500;
performance_error = 0.0005;

str_level_5 = '';
str_level_5 = list_of_LQ45(ii,:);

%=================================================
% $% untuk 1 hidden layer dahulu
%=================================================
% loop level 4
for oo=1:15 %lakukan untuk 15 buah macam training

    switch oo
        case 1
            aaaaa = 'traingd';
        case 2
            aaaaa = 'traingdm';
        case 3
            aaaaa = 'traincgf';
        case 4
            aaaaa = 'traincgp';
        case 5
            aaaaa = 'traincgb';
        case 6
            aaaaa = 'trainscg';
        case 7
            aaaaa = 'trainbfg';
        case 8
            aaaaa = 'trainlm';
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

```
    case 9
        aaaaa = 'trainb';
    case 10
        aaaaa = 'trainbr';
    case 11
        aaaaa = 'traingda';
    case 12
        aaaaa = 'traingdx';
    case 13
        aaaaa = 'trainoss';
    case 14
        aaaaa = 'trainrp';
    case 15
        aaaaa = 'trains';
end

str_level_4 = '';
%inisialisasi
% jumlah activation function hidden layer adalah 3 buah
number_of_neuron_hidden_layer = oo;

% catat macam macam training
str_level_4 = strcat(str_level_5,';', aaaaa);

% loop level 3
%lakukan untuk 3 buah activation function di output layer
    for ll=1:3

          switch ll
            case 1
                aaaa = 'tansig';
            case 2
                aaaa = 'logsig';
            case 3
                aaaa = 'purelin';
    end

    str_level_3 = '';
    %inisialisasi

    % catat jenis activation function di output layer
    str_level_3 = strcat(str_level_4, ';', aaaa);

    % loop level 2
    %lakukan untuk 3 buah jenis activation function di hidden
    layer

    for kk=1:3
        str_level_2 = '';
        switch kk
            case 1
                aaa = 'tansig';
            case 2
                aaa = 'logsig';
            case 3
                aaa = 'purelin';
        end
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

```
% catat jenis activation function di hidden layer
str_level_2 = strcat(str_level_3, ';', aaa);

% loop level 1
 %lakukan mulai dari 3 neuron sampai dengan 30 neuron
 %untuk hidden layer; output layer selalu 1 neuoron
   for jj=3:30 %

     str_level_1 = '';
     number_of_neuron_hidden_layer = jj;

     % catat banyaknya neuron di hidden layer
     str_level_1 = strcat(str_level_2, ';',
      num2str(number_of_neuron_hidden_layer));

     % create neural network
     %net = newff(minmax(trainP),
      [number_of_neuron_hidden_layer jmlout], {aaa aaaa},
      aaaaa);
     net = newff(minmax(ptr),
      [number_of_neuron_hidden_layer jmlout], {aaa aaaa},
      aaaaa);

     % inisialisasi parameter neural network
     net.trainParam.show = 100;
     net.trainParam.lr = learning_rate;
     net.trainParam.lr_inc = 1.05;
     net.trainParam.mc = momentum_rate;
     net.trainParam.epochs = maximum_iteration;
     net.trainParam.goal = performance_error;

     % training neural network
     [net,tr] = train(net,ptr,ttr,[],[],val,test);

     % simulate neural network
     % old ==> an = sim(net,ptrans);
     an = sim(net,p_performance);

     % postprocessing
     a = postmnmx(an,mint,maxt);
     %a = mapminmax('reverse',an,ts);

     %cek performance
     d=[a-t_performance].^2;
     mse = mean(d);
     rmse = sqrt(mse);

     % catat forecat error (rmse) dan segala data
     fid = fopen('results.txt', 'a');
     str_level_0 = '';
     str_level_0 = strcat(num2str(COUNTER), ';',
      str_level_1, ';', num2str(rmse));
     count = fprintf(fid, '%s\t\n', str_level_0);
     COUNTER = COUNTER + 1;
     fclose(fid);
     %t_performance
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

```
                    %a
                    %output hasil ke matrix atau ke file (xls/txt)

                end % end loop untuk pertambahan jumlah neuron di hidden
                     layer

            end % end loop untuk 3 buah activation function di output
                     layer

        end % end loop untuk 3 buah activation function di output layer

    end % end loop untuk 15 macam training

    % ======================================
    % end section untuk 1 hidden layer dahulu
    %======================================

end
toc % end time

%-----------------------------------------------------------------------
% ANN untuk 2 hidden layer
%-----------------------------------------------------------------------

% list of LQ45 stocks

tic % start time

list_of_LQ45 =
['AALI';'ADRO';'ANTM';'ASII';'BBCA';'BBNI';'BBRI';'BDMN';'BISI';'BLTA';'
BMRI';'BNBR';'BRPT';'BTEL';'BUMU';'DEWA';'ELSA';'ELTY';'ENRG';'GGRM';
'HEXA';'INCO';'INDF';'INDY';'INKP';'INTP';'ISAT';'ITMG';'JSMR';'KLBF';'L
PKR';'LSIP';'MEDC';'MIRA';'PGAS';'PTBA';'SGRO';'SMCB';'TLKM';'SMGR';
'TINS';'TRUB';'UNSP';'UNTR';'UNVR'];

[m,n] = size(list_of_LQ45);

COUNTER = 1;

% ================================================
% file output untuk catat hasil percobaan
% ================================================
% results.txt menghasilkan format sebagai berikut:
% saham = nama saham
% training = jenis training
% act_o = activation function di output layer
% act_h = activation function di hidden layer
% neu_hid = jumlah neuron di hidden layer
% rmse = root mean square error pada saat test performance
% format:
% saham training act_o act_h neu_hid rmse

% loop terluar (level 5)
% catat header
fid = fopen('results.txt', 'a');
str_header = 'no;saham;training;act_o;act_h;neu_hid;rmse';
count = fprintf(fid, '%s\n', str_header);
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

```
%lakukan untuk setiap saham LQ45
for ii=1:m

    %inisialisasi
    %filename = '';
    %message = '';
    jmlinp = 8; %jumlah input

    disp(['Processing ' list_of_LQ45(ii,:) ' ...'])
    filename = strcat('data/',list_of_LQ45(ii,:),'.xls');
    message = strcat('... Opening : ',filename);
    disp(message)

    A = xlsread(filename);  % baca file excel, dan masukkan ke matrix A

    [m,n] = size(A);        % size of the input patterns
    jmlout = n-jmlinp;
    x = A(:,1:jmlinp);      % Input
    y = A(:,jmlinp+1:n);    % Output

    %transpose dulu biar bisa dipake oleh NN toolbox
    p = x';
    t = y';

    %preprocessing
    [ptrans,minp,maxp,tn,mint,maxt] = premnmx(p,t);

    % bagi menjadi training, dan validasi
    itertest = 2:4:m;
    iterval = 4:4:m;
    iterindex = [1:4:m 3:4:m];
    val.P = ptrans(:,iterval); val.T = tn(:,iterval); %validation array
    test.P = ptrans(:,itertest); test.T = tn(:,itertest);
    ptr = ptrans(:,iterindex); ttr = tn(:,iterindex); %training array

    [jumlah_baris, jumlah_kolom] = size(ptrans);

    p_performance = ptrans(:,(jumlah_kolom-(50-1)):jumlah_kolom);
    t_performance = t(:,(jumlah_kolom-(50-1)):jumlah_kolom);

    %inisialisasi neural network
    learning_rate = 0.05;
    momentum_rate = 0.01;
    maximum_iteration = 500;
    performance_error = 0.0005;

    str_level_5 = '';
    str_level_5 = list_of_LQ45(ii,:);

    %================================================
    % $% untuk 2 hidden layer
    %================================================
    % loop level 4
    for oo=1:15 %lakukan untuk 15 buah macam training

        switch oo
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

```
    case 1
        aaaaa = 'traingd';
    case 2
        aaaaa = 'traingdm';
    case 3
        aaaaa = 'traincgf';
    case 4
        aaaaa = 'traincgp';
    case 5
        aaaaa = 'traincgb';
    case 6
        aaaaa = 'trainscg';
    case 7
        aaaaa = 'trainbfg';
    case 8
        aaaaa = 'trainlm';
    case 9
        aaaaa = 'trainb';
    case 10
        aaaaa = 'trainbr';
    case 11
        aaaaa = 'traingda';
    case 12
        aaaaa = 'traingdx';
    case 13
        aaaaa = 'trainoss';
    case 14
        aaaaa = 'trainrp';
    case 15
        aaaaa = 'trains';
end

str_level_4 = '';
%inisialisasi
% jumlah activation function hidden layer adalah 3 buah
number_of_neuron_hidden_layer = oo;

% catat macam macam training
str_level_4 = strcat(str_level_5,';', aaaaa);

% loop level 3
for ll=1:3 %lakukan untuk 3 buah activation function di output
           layer
    switch ll
            case 1
                aaaa = 'tansig';
            case 2
                aaaa = 'logsig';
            case 3
                aaaa = 'purelin';
    end

    str_level_3 = '';
    %inisialisasi
    % jumlah activation function output layer adalah 3 buah

    % catat jenis activation function di output layer
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

```
str_level_3 = strcat(str_level_4, ';', aaaa);

% loop level 2
for kk=1:3 %lakukan untuk 3 buah jenis activation function
di hidden layer

    str_level_2 = '';
    switch kk
        case 1
            aaa = 'tansig';
        case 2
            aaa = 'logsig';
        case 3
            aaa = 'purelin';
    end

    % catat jenis activation function di hidden layer
    str_level_2 = strcat(str_level_3, ';', aaa);

    % loop level 1
    for jj=3:30 % lakukan mulai dari 3 neuron sampai dengan
     30 neuron untuk hidden layer; output layer selalu 1
     neuoron

       str_level_1 = '';
       number_of_neuron_hidden_layer = jj;

       % catat banyaknya neuron di hidden layer
       str_level_1 = strcat(str_level_2, ';',
        num2str(number_of_neuron_hidden_layer));

       % create neural network dengan 2 hidden layer
       net = newff(minmax(ptr),
       [number_of_neuron_hidden_layer
       number_of_neuron_hidden_layer jmlout], {aaa aaa
       aaaa}, aaaaa);

        % inisialisasi parameter neural network
        net.trainParam.show = 100;
        net.trainParam.lr = learning_rate;
        net.trainParam.lr_inc = 1.05;
        net.trainParam.mc = momentum_rate;
        net.trainParam.epochs = maximum_iteration;
        net.trainParam.goal = performance_error;

        % training neural network
        [net,tr] = train(net,ptr,ttr,[],[],val,test);

        % simulate neural network
        % old ==> an = sim(net,ptrans);
        an = sim(net,p_performance);

        % postprocessing
        a = postmnmx(an,mint,maxt);
        %a = mapminmax('reverse',an,ts);

        %cek performance dengan rmse
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

```
                    d=[a-t_performance].^2;
                    mse = mean(d);
                    rmse = sqrt(mse);

                    % catat forecat error (rmse) dan segala data
                    fid = fopen('results.txt', 'a');
                    str_level_0 = '';
                    str_level_0 = strcat(num2str(COUNTER), ';',
                     str_level_1, ';', num2str(rmse));
                    count = fprintf(fid, '%s\t\n', str_level_0);
                    COUNTER = COUNTER + 1;
                    fclose(fid);
                    %t_performance
                    %a
                    %output hasil ke matrix atau ke file (xls/txt)

                end % end loop untuk pertambahan jumlah neuron di hidden
                     layer

            end % end loop untuk 3 buah activation function di output
                    layer

        end % end loop untuk 3 buah activation function di output layer

    end % end loop untuk 15 macam training

    % ======================================
    % end section untuk 2 hidden layer
    %======================================

end
toc % end time

%-----------------------------------------------------------------------
% ANN untuk 2 hidden layer, arsitektur ANN terbaik
%-----------------------------------------------------------------------

% list of LQ45 stocks

tic % start time

list_of_LQ45 =
['AALI';'ADRO';'ANTM';'ASII';'BBCA';'BBNI';'BBRI';'BDMN';'BISI';'BLTA';'
BMRI';'BNBR';'BRPT';'BTEL';'BUMI';'DEWA';'ELSA';'ELTY';'ENRG';'GGRM';
'HEXA';'INCO';'INDF';'INDY';'INKP';'INTP';'ISAT';'ITMG';'JSMR';'KLBF';'L
PKR';'LSIP';'MEDC';'MIRA';'PGAS';'PTBA';'SGRO';'SMCB';'TLKM';'SMGR';
'TINS';'TRUB';'UNSP';'UNTR';'UNVR'];

[m,n] = size(list_of_LQ45);


%lakukan untuk setiap saham LQ45
for ii=1:m

    %inisialisasi
    jmlinp = 8; %jumlah input
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

```
disp(['Processing ' list_of_LQ45(ii,:) ' ...'])
filename = strcat('data/',list_of_LQ45(ii,:),'.xls');
message = strcat('... Opening : ',filename);
disp(message)

A = xlsread(filename);  % baca file excel, dan masukkan ke matrix A

[m,n] = size(A);        % ukuran input
jmlout = n-jmlinp;
x = A(:,1:jmlinp);      % Input
y = A(:,jmlinp+1:n);    % Output

%transpose dulu biar bisa dipake oleh NN toolbox
p = x';
t = y';

%preprocessing
[ptrans,minp,maxp,tn,mint,maxt] = premnmx(p,t);

itertest = 2:4:m;
iterval = 4:4:m;
iterindex = [1:4:m 3:4:m];
val.P = ptrans(:,iterval); val.T = tn(:,iterval);      %validation
test.P = ptrans(:,itertest); test.T = tn(:,itertest);
ptr = ptrans(:,iterindex); ttr = tn(:,iterindex);      %training

[jumlah_baris, jumlah_kolom] = size(ptrans);

p_performance = ptrans(:,(jumlah_kolom-(50-1)):jumlah_kolom);
t_performance = t(:,(jumlah_kolom-(50-1)):jumlah_kolom);

%inisialisasi neural network
learning_rate = 0.05;
momentum_rate = 0.01;
maximum_iteration = 500;
performance_error = 0.0005;

%==================================================================
% $% untuk 2 hidden layer
%==================================================================

    aaaaa = 'trainbr';  %training
    aaaa = 'tansig';    %act_o
    aaa = 'tansig';     %act_h
    number_of_neuron_hidden_layer = 11; %neu_hid

    disp(aaaaa);

    % create neural network dengan 2 hidden layer
    net = newff(minmax(ptr), [number_of_neuron_hidden_layer
     number_of_neuron_hidden_layer jmlout], {aaa aaa aaaa}, aaaaa);

    % inisialisasi parameter neural network
    net.trainParam.show = 100;
    net.trainParam.lr = learning_rate;
    net.trainParam.lr_inc = 1.05;
    net.trainParam.mc = momentum_rate;
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

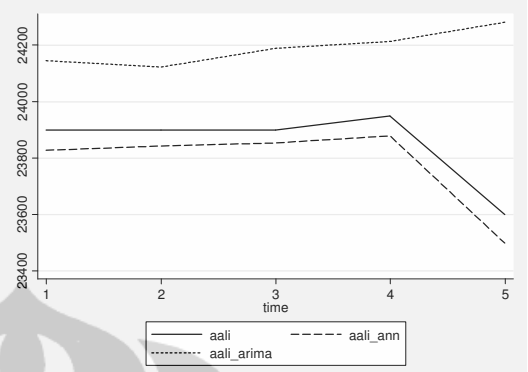
```
        net.trainParam.epochs = maximum_iteration;
        net.trainParam.goal = performance_error;

        % training neural network
        [net,tr] = train(net,ptr,ttr,[],[],val,test);

        % simulate neural network
        an = sim(net,p_performance);

        % postprocessing
        a = postmnmx(an,mint,maxt);

        %cek performance dengan rmse
        d=[a-t_performance].^2;
        mse = mean(d);
        rmse = sqrt(mse) % display RMSE to screen

        actual_stock_price = t_performance';
        predicted_stock_price = a';

        %tulis ke excel hasilnya
        xls_results = [actual_stock_price predicted_stock_price];
        filename_output = strcat('forecast/',list_of_LQ45(ii,:),'-
       forecast','.xls');
        xlswrite(filename_output,xls_results);

end % end loop untuk semua saham LQ45

    % ======================================
    % end section untuk 2 hidden layer
    %======================================

toc % end time
```


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

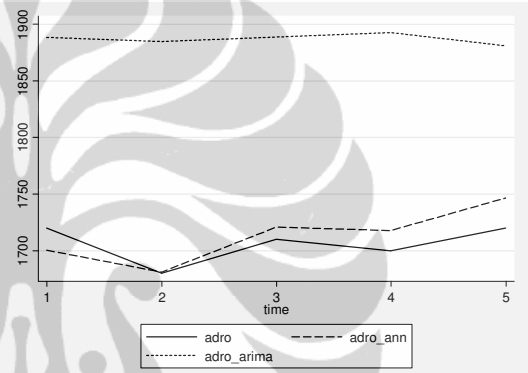
Lampiran D: Detail perbandingan harga dan diagram forecast

Perbandingan Harga Saham			
time	aali	aali_ann	aali_arima
1	23,900.00	23827.711	24,145.50
2	23,900.00	23843.141	24,122.97
3	23,900.00	23853.846	24,189.38
4	23,950.00	23879.159	24,213.72
5	23,600.00	23499.079	24,281.66

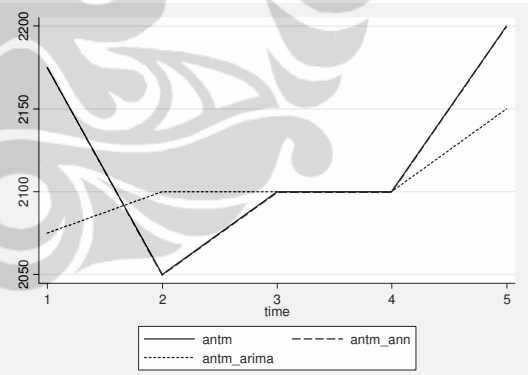
Diagram Harga Saham



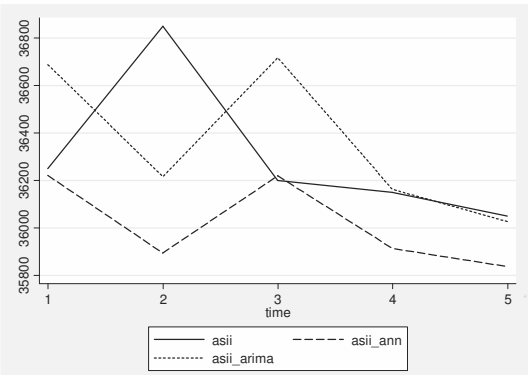
time	adro	adro_ann	adro_arima
1	1720	1700.478438	1888.575
2	1680	1681.057659	1884.9304
3	1710	1720.823384	1888.9339
4	1700	1717.797733	1892.871
5	1720	1746.590333	1881.113



time	antm	antm_ann	antm_arima
1	2175	2174.896876	2075
2	2050	2049.558749	2100
3	2100	2099.562341	2100
4	2100	2099.527895	2100
5	2200	2199.74938	2150

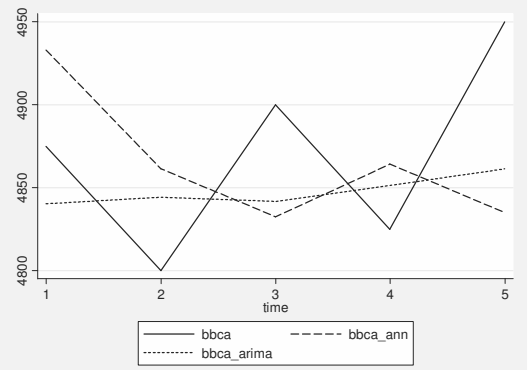


time	asii	asii_ann	asii_arima
1	36250	36221.729	36688.92
2	36850	35894.907	36216.42
3	36200	36220.116	36717.92
4	36150	35913.938	36163.32
5	36050	35837.731	36027.49

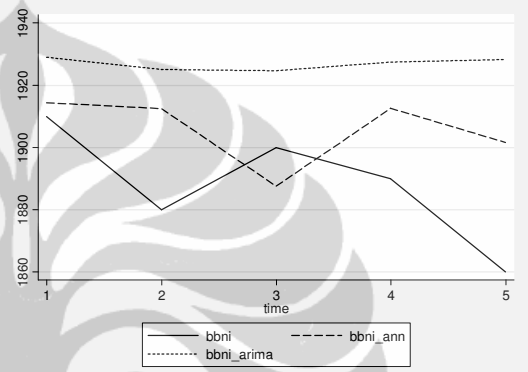


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

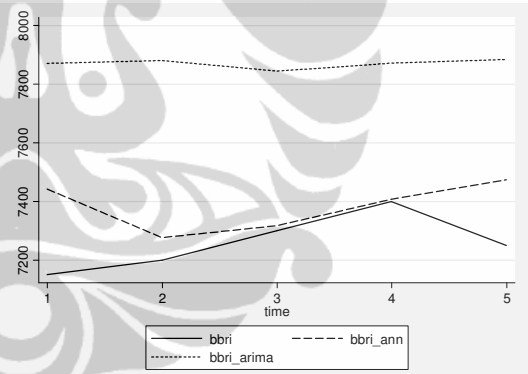
time	bbca	bbca_ann	bbca_arima
1	4875	4933.141609	4840.3504
2	4800	4861.520683	4844.3109
3	4900	4832.50996	4841.7901
4	4825	4864.262301	4851.3592
5	4950	4835.168705	4861.4326



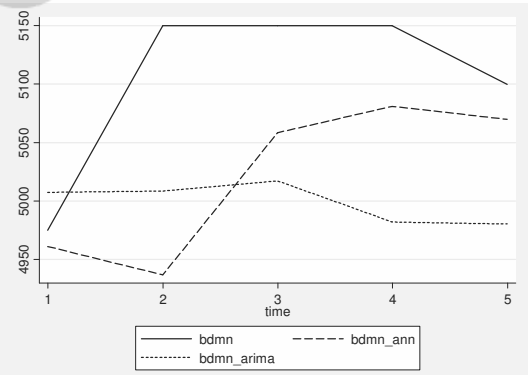
time	bbni	bbni_ann	bbni_arima
1	1910	1914.4349	1929.0361
2	1880	1912.5291	1925.1165
3	1900	1887.6114	1924.707
4	1890	1912.6179	1927.4886
5	1860	1901.6733	1928.3246



time	bbri	bbri_ann	bbri_arima
1	7150	7442.093049	7871.4701
2	7200	7276.517367	7881.2945
3	7300	7317.438337	7845.1259
4	7400	7407.553494	7872.3855
5	7250	7474.4445	7884.8858

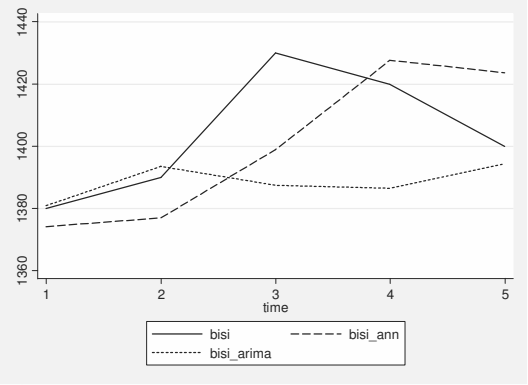


time	bdmn	bdmn_ann	bdmn_arima
1	4975	4961.08266	5007.406
2	5150	4936.767845	5008.5187
3	5150	5058.459971	5017.2523
4	5150	5081.048548	4982.0423
5	5100	5069.92794	4980.3528

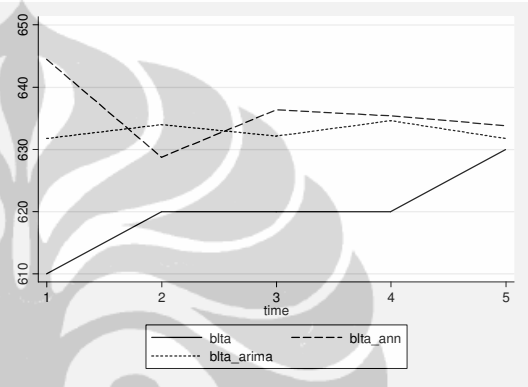


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

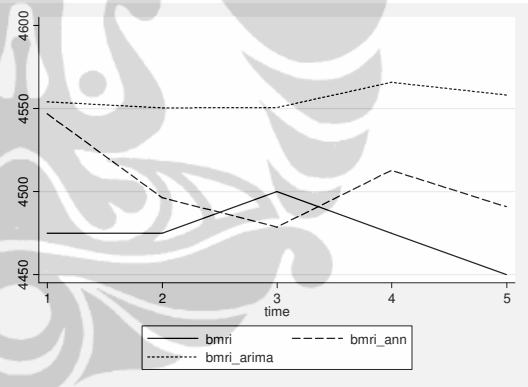
time	bisi	bisi_ann	bisi_arima
1	1380	1374.173551	1380.9278
2	1390	1376.973473	1393.548
3	1430	1398.922417	1387.4708
4	1420	1427.701659	1386.5156
5	1400	1423.679378	1394.3676



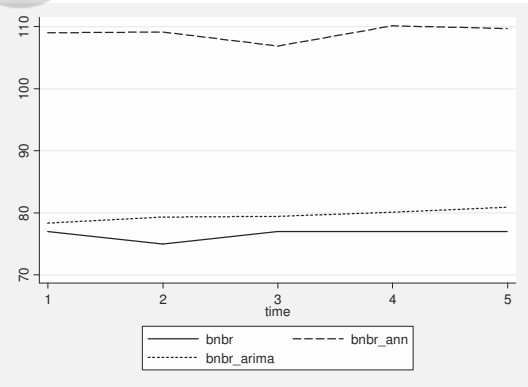
time	blta	blta_ann	blta_arima
1	610	644.49636	631.7795
2	620	628.77046	634.0021
3	620	636.38515	632.1551
4	620	635.41057	634.6377
5	630	633.84491	631.7717



time	bmri	bmri_ann	bmri_arima
1	4475	4546.881178	4554.1147
2	4475	4496.442156	4550.4814
3	4500	4478.713831	4550.7152
4	4475	4512.865036	4565.8714
5	4450	4490.924948	4558.2409

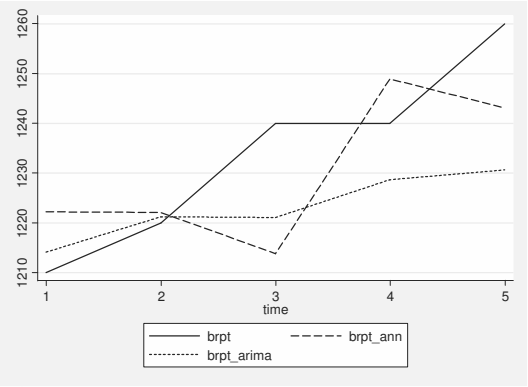


time	bnbr	bnbr_ann	bnbr_arima
1	77	109.01471	78.35056
2	75	109.15024	79.32384
3	77	106.88174	79.44048
4	77	110.14584	80.10564
5	77	109.70734	80.90753

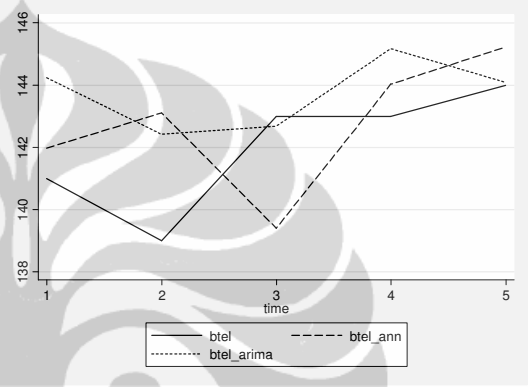


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

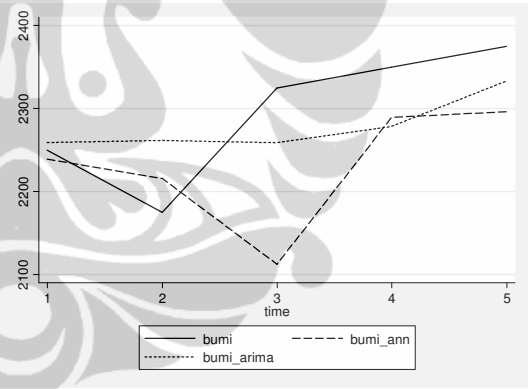
time	brpt	brpt_ann	brpt_arima
1	1210	1222.237809	1214.1312
2	1220	1222.113797	1221.2438
3	1240	1213.835881	1221.0954
4	1240	1248.950443	1228.6959
5	1260	1243.14951	1230.6698



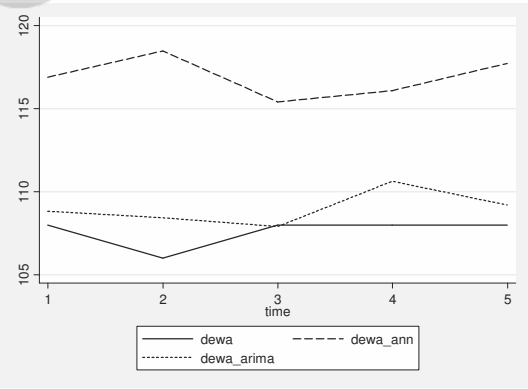
time	btel	btel_ann	btel_arima
1	141	141.9793083	144.2395
2	139	143.1099132	142.4232
3	143	139.405389	142.6848
4	143	144.0328833	145.1781
5	144	145.2284512	144.0955



time	bumi	bumi_ann	bumi_arima
1	2250	2239.226195	2259.186
2	2175	2215.895494	2261.7081
3	2325	2112.544175	2258.9308
4	2350	2289.440193	2278.6526
5	2375	2296.315795	2333.1952

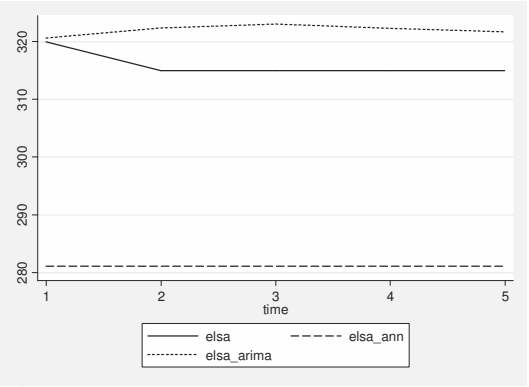


time	dewa	dewa_ann	dewa_arm
1	108	116.9022439	108.8322
2	106	118.4860826	108.4394
3	108	115.4148812	107.9109
4	108	116.091897	110.6384
5	108	117.7307005	109.2079

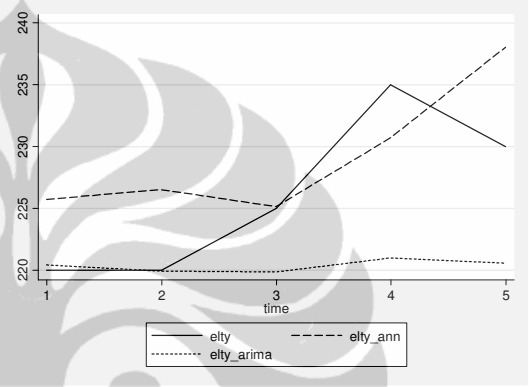


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

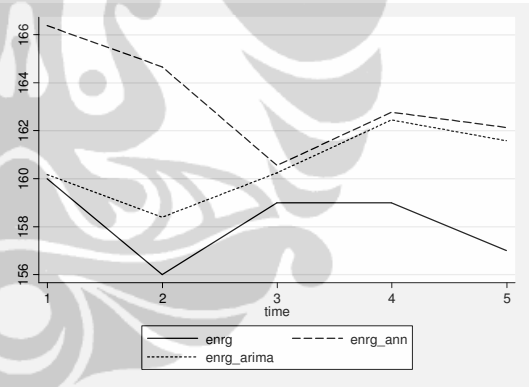
time	elsa	elsa_ann	elsa_arima
1	320	281.10458	320.6437
2	315	281.10458	322.3838
3	315	281.10458	323.0651
4	315	281.10458	322.3182
5	315	281.10458	321.713



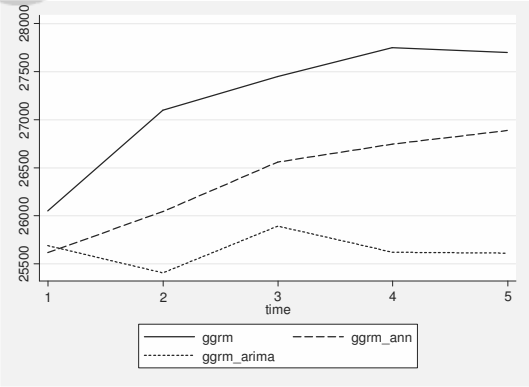
time	elty	elty_ann	elty_arima
1	220	225.7333253	220.4197
2	220	226.5124046	219.9193
3	225	225.1434113	219.8534
4	235	230.7255249	220.9848
5	230	238.0422318	220.5633



time	enrg	enrg_ann	enrg_arima
1	160	166.3853599	160.1738
2	156	164.6704175	158.3977
3	159	160.5560454	160.2464
4	159	162.7775869	162.4533
5	157	162.1415948	161.5869

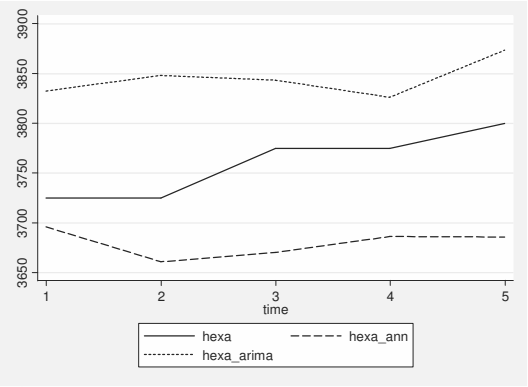


time	ggrm	ggrm_ann	ggrm_arima
1	26050	25617.02194	25690.01543
2	27100	26043.89497	25405.82523
3	27450	26559.84144	25892.80468
4	27750	26746.43036	25620.88391
5	27700	26887.95516	25611.60331

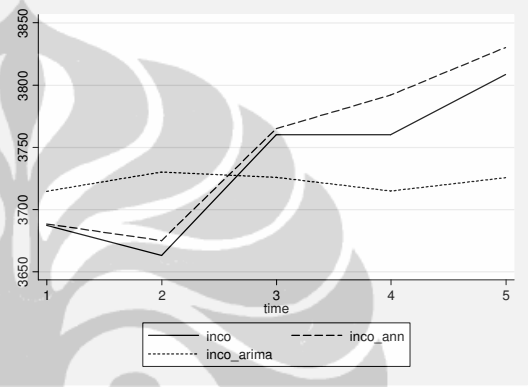


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

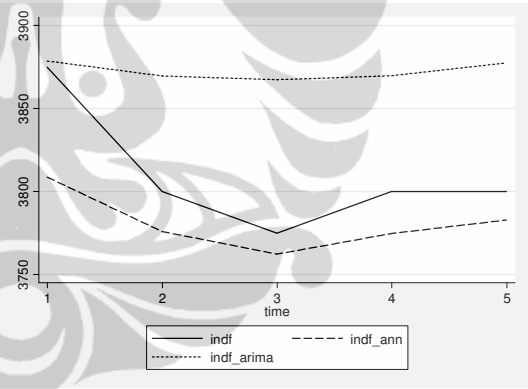
time	hexa	hexa_ann	hexa_arima
1	3725	3696.077909	3832.6705
2	3725	3660.964076	3848.3294
3	3775	3670.361232	3843.5904
4	3775	3686.384607	3826.342
5	3800	3685.86353	3873.6497



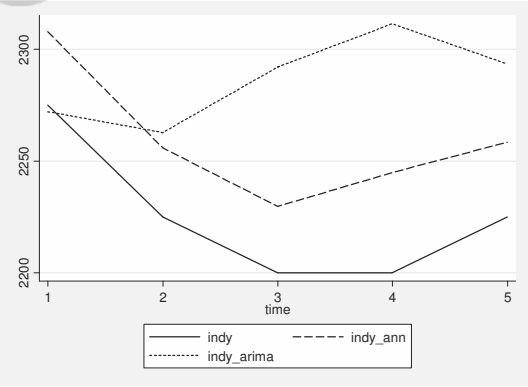
time	inco	inco_ann	inco_arima
1	3687.39	3688.478543	3714.8173
2	3663.13	3675.14246	3730.2448
3	3760.17	3765.196479	3725.9491
4	3760.17	3792.105904	3715.009
5	3808.68	3830.323138	3725.7282



time	indf	indf_ann	indf_arima
1	3875	3808.714128	3878.6881
2	3800	3775.951089	3869.6858
3	3775	3762.403696	3867.4521
4	3800	3774.777601	3869.8349
5	3800	3782.899021	3877.5413

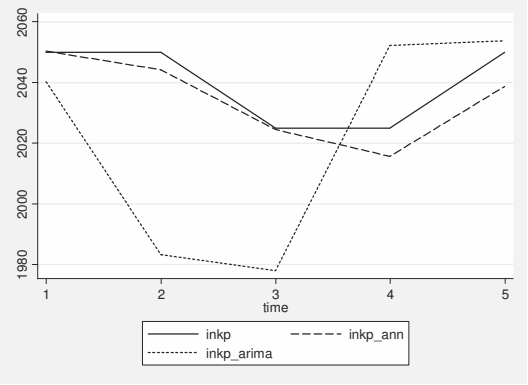


time	indy	indy_ann	indy_arima
1	2275	2307.836242	2272.088733
2	2225	2255.918015	2262.757982
3	2200	2229.771233	2292.080972
4	2200	2244.873927	2311.427824
5	2225	2258.430939	2293.451076

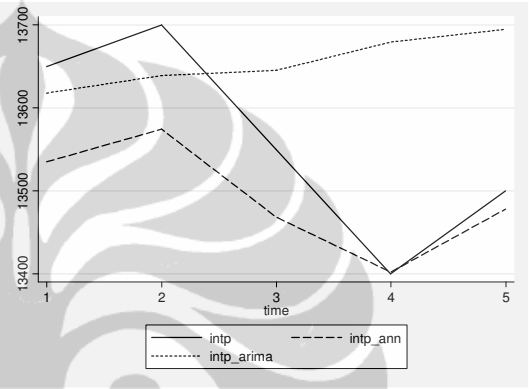


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

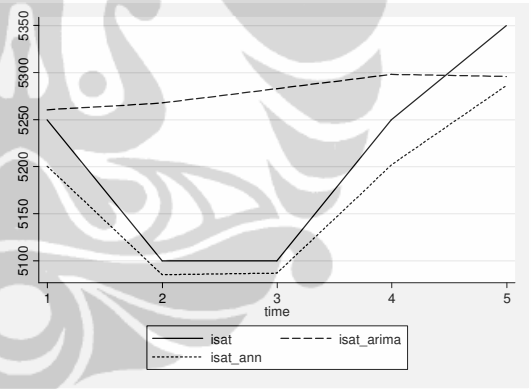
time	inkp	inkp_ann	inkp_arima
1	2050	2050.396123	2040.275
2	2050	2044.246753	1983.3017
3	2025	2024.531263	1978.0106
4	2025	2015.703983	2052.2616
5	2050	2038.762911	2053.8179



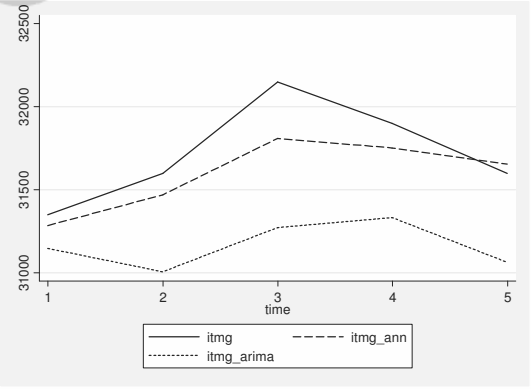
time	intp	intp_ann	intp_arima
1	13650	13535.20402	13618.0824
2	13700	13574.51345	13639.1721
3	13550	13468.47391	13645.5004
4	13400	13402.14353	13679.5536
5	13500	13478.00779	13694.9019



time	isat	isat_ann	isat_arima
1	5250	5200.5005	5260.5609
2	5100	5085.094946	5267.7661
3	5100	5086.77803	5283.0871
4	5250	5201.981575	5298.245
5	5350	5286.210275	5296.0484

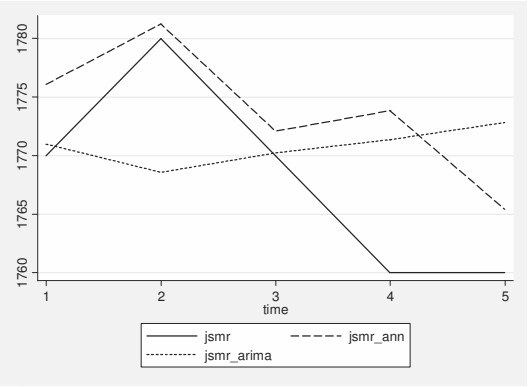


time	itmg	itmg_ann	itmg_arima
1	31350	31284.90853	31147.4527
2	31600	31470.37552	31006.60659
3	32150	31809.69763	31273.13152
4	31900	31752.29621	31333.07152
5	31600	31654.19753	31063.98143

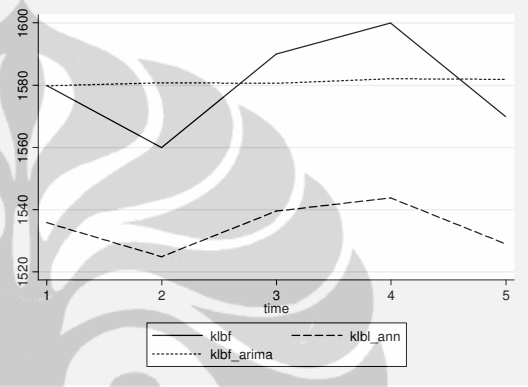


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

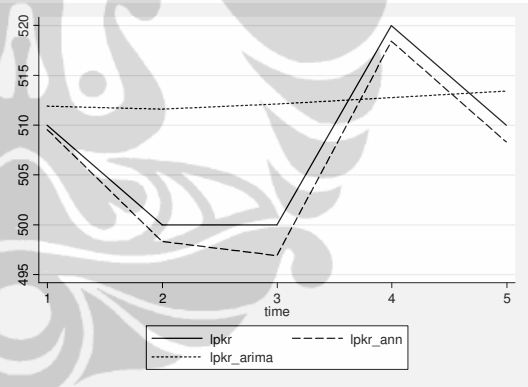
time	jsmr	jsmr_ann	jsmr_arima
1	1770	1776.095001	1770.9914
2	1780	1781.255208	1768.5807
3	1770	1772.0973	1770.2393
4	1760	1773.849427	1771.3661
5	1760	1765.425837	1772.8282



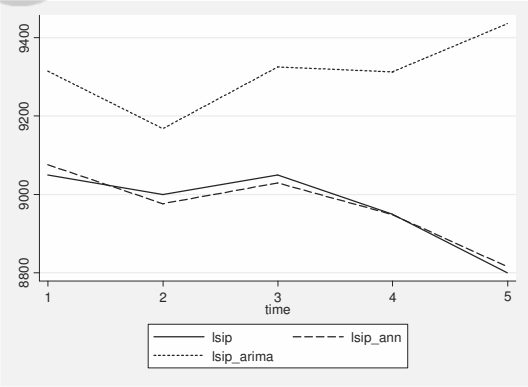
time	klbf	klbl_ann	klbf_arima
1	1580	1535.857931	1579.8383
2	1560	1524.907775	1580.8126
3	1590	1539.55526	1580.6494
4	1600	1543.800388	1582.1208
5	1570	1529.06176	1581.9087



time	lpkr	lpkr_ann	lpkr_arima
1	510	509.5617548	511.9195
2	500	498.331821	511.6215
3	500	496.9137787	512.1372
4	520	518.4474765	512.7787
5	510	508.3344292	513.436

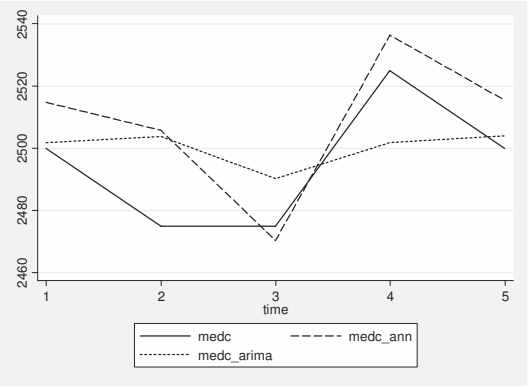


time	lsip	lsip_ann	lsip_arima
1	9050	9075.999806	9314.6908
2	9000	8976.547976	9168.1136
3	9050	9029.406614	9325.3873
4	8950	8948.822697	9312.7844
5	8800	8816.019293	9435.7016

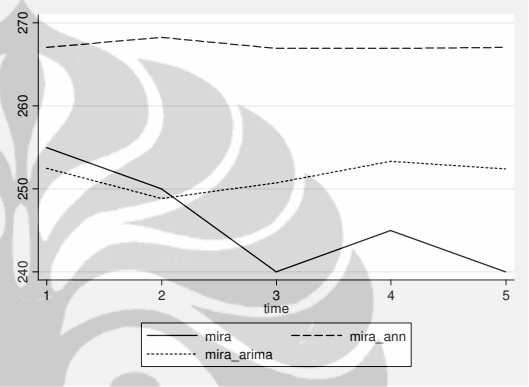


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

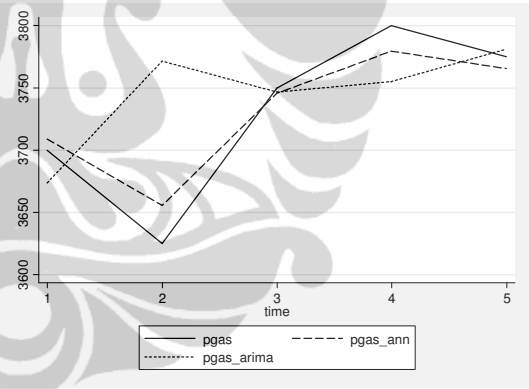
time	medc	medc_ann	medc_arima
1	2500	2514.813797	2501.819077
2	2475	2505.822654	2503.809109
3	2475	2470.36016	2490.256307
4	2525	2536.430467	2501.86132
5	2500	2515.494086	2504.042111



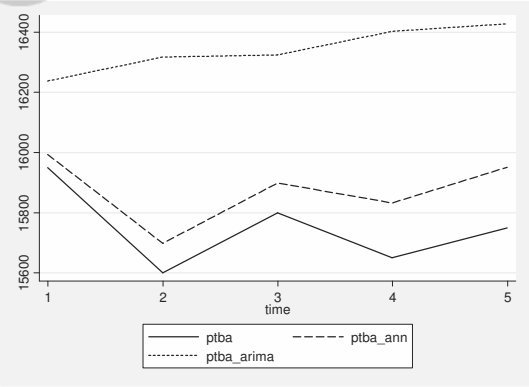
time	mira	mira_ann	mira_arima
1	255	267.0849535	252.496
2	250	268.2727002	248.8578
3	240	266.9581249	250.7391
4	245	266.9454912	253.3389
5	240	267.0756709	252.4222



time	pgas	pgas_ann	pgas_arima
1	3700	3708.85742	3673.7933
2	3625	3655.617244	3771.58
3	3750	3745.787868	3746.7391
4	3800	3779.620201	3755.1397
5	3775	3765.574423	3781.1914

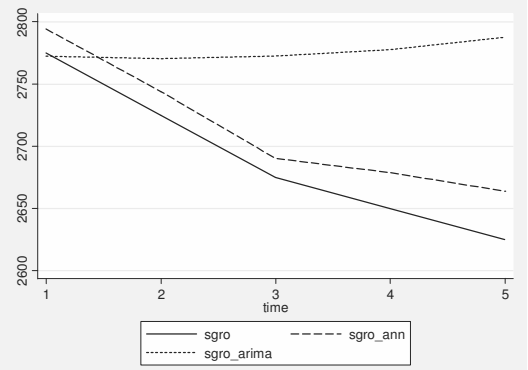


time	ptba	ptba_ann	ptba_arima
1	15950	15993.34166	16238.0544
2	15600	15698.24494	16317.6702
3	15800	15898.86489	16324.7145
4	15650	15832.48007	16403.1695
5	15750	15951.18704	16428.1868

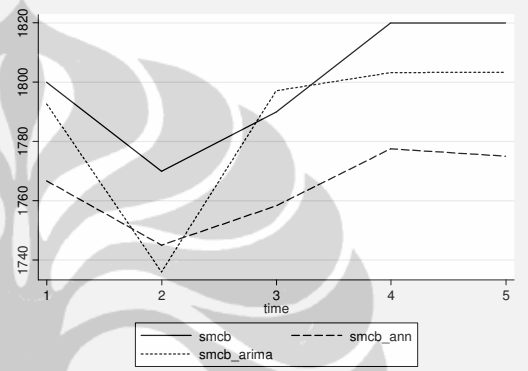


Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

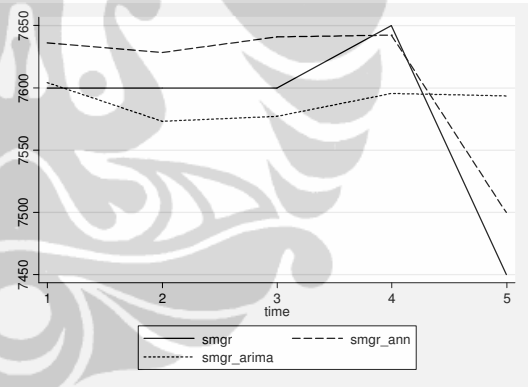
time	sgro	sgro_ann	sgro_arima
1	2775	2794.387129	2772.5031
2	2725	2744.091638	2770.5458
3	2675	2690.32673	2772.6537
4	2650	2678.863085	2777.7944
5	2625	2663.986361	2787.7198



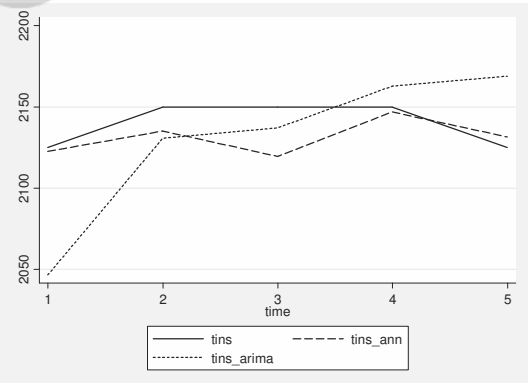
time	smcb	smcb_ann	smcb_arima
1	1800	1766.772396	1792.6641
2	1770	1745.069378	1736.0226
3	1790	1758.34795	1797.1776
4	1820	1777.562178	1803.3015
5	1820	1775.103843	1803.4238



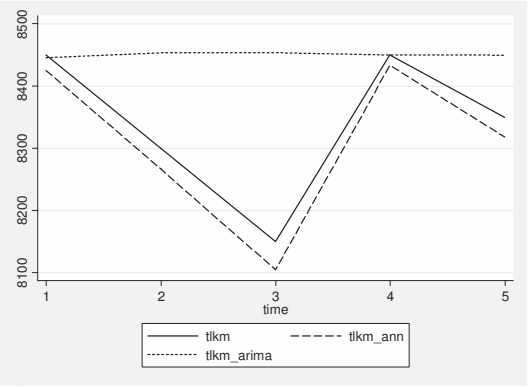
time	smgr	smgr_ann	smgr_arima
1	7600	7636.228827	7604.2787
2	7600	7628.512192	7573.2158
3	7600	7640.98485	7577.1959
4	7650	7642.415992	7595.5713
5	7450	7499.96654	7593.5703



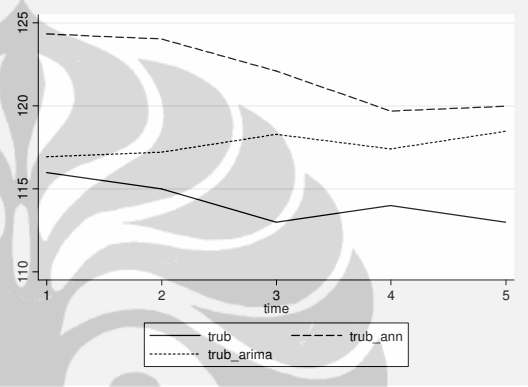
time	tins	tins_ann	tins_arima
1	2125	2122.67897	2046.6618
2	2150	2135.210222	2130.7847
3	2150	2119.606249	2137.145
4	2150	2146.944637	2162.8109
5	2125	2131.583689	2168.9882



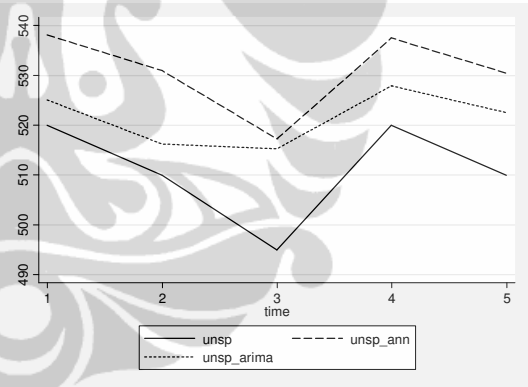
time	tlkm	tlkm_ann	tlkm_arima
1	8450	8425.089627	8445.824
2	8300	8266.775045	8453.6111
3	8150	8104.750936	8453.8659
4	8450	8433.764372	8450.1864
5	8350	8318.300649	8449.9528



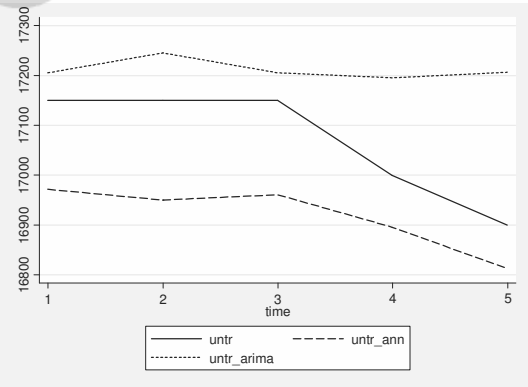
time	trub	trub_ann	trub_arima
1	116	124.3461143	116.944
2	115	124.0435656	117.2201
3	113	122.1132301	118.2956
4	114	119.6981813	117.4154
5	113	119.9918408	118.4769



time	unsp	unsp_ann	unsp_arima
1	520	538.1467112	525.10139
2	510	530.985653	516.25326
3	495	517.2846049	515.28903
4	520	537.5557597	527.92625
5	510	530.4742212	522.56233

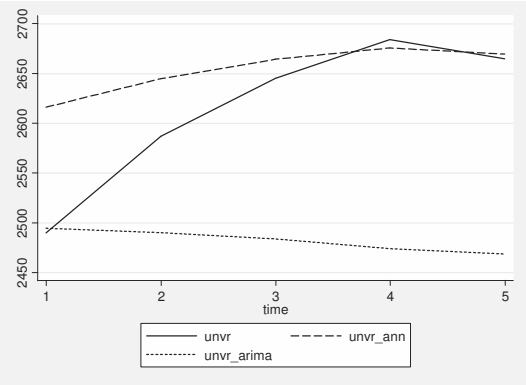


time	untr	untr_ann	untr_arima
1	17150	16971.76076	17205.5607
2	17150	16950.26748	17245.5236
3	17150	16960.79727	17205.6491
4	17000	16895.74531	17195.6001
5	16900	16812.88087	17206.6908



Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

time	unvr	unvr_ann	unvr_arima
1	2490	2616.371014	2494.6987
2	2587	2645.113353	2490.2557
3	2646	2664.566428	2483.9461
4	2684	2675.955929	2474.1594
5	2665	2669.706245	2468.763



Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

Lampiran E: Hasil Uji Diebold-Mariano Saham LQ45

no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
1.	AALI	. dmariano aali aali_ann aali_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : aali Competing forecasts: aali_ann versus aali_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ aali_ann 5158 aali_arima 145586 Difference -140428 By this criterion, aali_ann is the better forecast H0: difference is not significant S(1) = -2.756 p-value = 0.0059
2.	ADRO	. dmariano adro adro_ann adro_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : adro Competing forecasts: adro_ann versus adro_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ adro_ann 304.6 adro_arima 33118 Difference -32813 By this criterion, adro_ann is the better forecast H0: difference is not significant S(1) = -26.9 p-value = 0.0000
3.	ANTM	. dmariano antm antm_ann antm_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : antm Competing forecasts: antm_ann versus antm_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ antm_ann .1365

no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		antm_arima 3000 Difference -3000 By this criterion, antm_ann is the better forecast H0: difference is not significant S(1) = -2.551 p-value = 0.0108
4.	ASII	. dmariano asii asii_ann asii_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : asii Competing forecasts: asii_ann versus asii_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ asii_ann 202838 asii_arima 172599 Difference 30239 By this criterion, asii_arima is the better forecast H0: difference is not significant S(1) = .7627 p-value = 0.4457
5.	BBCA	. dmariano bbca bbca_ann bbca_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : bbca Competing forecasts: bbca_ann versus bbca_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ bbca_ann 5290 bbca_arima 3018 Difference 2271 By this criterion, bbca_arima is the better forecast H0: difference is not significant S(1) = 5.577 p-value = 0.0000
6.	BBNI	. dmariano bbni bbni_ann bbni_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : bbni Competing forecasts: bbni_ann versus bbni_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		Series MSE bbni_ann 695.9 bbni_arima 1816 Difference -1120 By this criterion, bbni_ann is the better forecast H0: difference is not significant S(1) = -3.605 p-value = 0.0003
7.	BBRI	. dmariano bbri bbri_ann bbri_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : bbri Competing forecasts: bbri_ann versus bbri_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE bbri_ann 28382 bbri_arima 381614 Difference -353232 By this criterion, bbri_ann is the better forecast H0: difference is not significant S(1) = -12.62 p-value = 0.0000
8.	BDMN	. dmariano bdmn bdmn_ann bdmn_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : bdmn Competing forecasts: bdmn_ann versus bdmn_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE bdmn_ann 11940 bdmn_arima 16243 Difference -4303 By this criterion, bdmn_ann is the better forecast H0: difference is not significant S(1) = -.8341 p-value = 0.4042
9.	BISI	. dmariano bisi bisi_ann bisi_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : bisi

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		Competing forecasts: bisi_ann versus bisi_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ bisi_ann 357.9 bisi_arima 595 Difference -237.1 By this criterion, bisi_ann is the better forecast H0: difference is not significant S(1) = -1.954 p-value = 0.0507
10.	BLTA	. dmariano blta blta_ann blta_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : blta Competing forecasts: blta_ann versus blta_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ blta_ann 357.5 blta_arima 207.1 Difference 150.4 By this criterion, blta_arima is the better forecast H0: difference is not significant S(1) = 1.848 p-value = 0.0646
11.	BMRI	. dmariano bmri bmri_ann bmri_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : bmri Competing forecasts: bmri_ann versus bmri_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ bmri_ann 1838 bmri_arima 6900 Difference -5063 By this criterion, bmri_ann is the better forecast H0: difference is not significant S(1) = -4.376 p-value = 0.0000

Pendekatan artificial..., Arief Purnama L.K., FE UI, 2010.

no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
12.	BNBR	. dmariano bnbr bnbr_ann bnbr_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : bnbr Competing forecasts: bnbr_ann versus bnbr_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ bnbr_ann 1051 bnbr_arima 10.28 Difference 1040 By this criterion, bnbr_arima is the better forecast H0: difference is not significant S(1) = 80.22 p-value = 0.0000
13.	BRPT	. dmariano brpt brpt_ann brpt_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : brpt Competing forecasts: brpt_ann versus brpt_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ brpt_ann 240.6 brpt_arima 272.8 Difference -32.24 By this criterion, brpt_ann is the better forecast H0: difference is not significant S(1) = -.3395 p-value = 0.7342
14.	BTEL	. dmariano btel btel_ann btel_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : btel Competing forecasts: btel_ann versus btel_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ btel_ann 6.67 btel_arima 5.413 Difference 1.256

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		By this criterion, btel_arima is the better forecast H0: difference is not significant S(1) = .7983 p-value = 0.4247
15.	BUMI	. dmariano bumi bumi_ann bumi_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : bumi Competing forecasts: bumi_ann versus bumi_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ bumi_ann 11357 bumi_arima 3761 Difference 7596 By this criterion, bumi_arima is the better forecast H0: difference is not significant S(1) = 2.567 p-value = 0.0102
16.	DEWA	. dmariano dewa dewa_ann dewa_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : dewa Competing forecasts: dewa_ann versus dewa_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ dewa_ann 90.06 dewa_arima 3.014 Difference 87.05 By this criterion, dewa_arima is the better forecast H0: difference is not significant S(1) = 12.61 p-value = 0.0000
17.	ELSA	. dmariano elsa elsa_ann elsa_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : elsa Competing forecasts: elsa_ann versus elsa_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ elsa_ann 1222

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		elsa_arima 43.72 Difference 1178 By this criterion, elsa_arima is the better forecast H0: difference is not significant S(1) = 22.54 p-value = 0.0000
18.	ELTY	. dmariano elty elty_ann elty_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : elty Competing forecasts: elty_ann versus elty_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ elty_ann 31.65 elty_arima 62.43 Difference -30.78 By this criterion, elty_ann is the better forecast H0: difference is not significant S(1) = -1.291 p-value = 0.1966
19.	ENRG	. dmariano enrg enrg_ann enrg_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : enrg Competing forecasts: enrg_ann versus enrg_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ enrg_ann 31.82 enrg_arima 8.059 Difference 23.76 By this criterion, enrg_arima is the better forecast H0: difference is not significant S(1) = 2.627 p-value = 0.0086
20.	GGRM	. dmariano ggrm ggrm_ann ggrm_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : ggrm Competing forecasts: ggrm_ann versus ggrm_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel :

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		bartlett Series MSE _____ ggrm_ann 752356 ggrm_arima 2863842 Difference -2111486 By this criterion, ggrm_ann is the better forecast H0: difference is not significant S(1) = -3.843 p-value = 0.0001
21.	HEXA	. dmariano hexa hexa_ann hexa_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : hexa Competing forecasts: hexa_ann versus hexa_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ hexa_ann 7353 hexa_arima 7914 Difference -560.4 By this criterion, hexa_ann is the better forecast H0: difference is not significant S(1) = -.1721 p-value = 0.8634
22.	INCO	. dmariano inco inco_ann inco_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : inco Competing forecasts: inco_ann versus inco_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ inco_ann 331.8 inco_arima 3070 Difference -2738 By this criterion, inco_ann is the better forecast H0: difference is not significant S(1) = -5.124 p-value = 0.0000
23.	INDF	. dmariano indf indf_ann indf_arima, crit(MSE) kernel(bartlett)

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		Diebold-Mariano forecast comparison test for actual : indf Competing forecasts: indf_ann versus indf_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ indf_ann 1212 indf_arima 4861 Difference -3649 By this criterion, indf_ann is the better forecast H0: difference is not significant S(1) = -2.765 p-value = 0.0057
24.	INDY	. dmariano indy indy_ann indy_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : indy Competing forecasts: indy_ann versus indy_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ indy_ann 1210 indy_arima 5403 Difference -4193 By this criterion, indy_ann is the better forecast H0: difference is not significant S(1) = -3.069 p-value = 0.0022
25.	INKP	. dmariano inkp inkp_ann inkp_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : inkp Competing forecasts: inkp_ann versus inkp_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ inkp_ann 49.23 inkp_arima 1502 Difference -1453 By this criterion, inkp_ann is the better forecast H0: difference is not significant S(1) = -3.567 p-value = 0.0004

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
26.	INTP	. dmariano intp intp_ann intp_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : intp Competing forecasts: intp_ann versus intp_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ intp_ann 7212 intp_arima 25995 Difference -18783 By this criterion, intp_ann is the better forecast H0: difference is not significant S(1) = -1.536 p-value = 0.1246
27.	ISAT	. dmariano isat isat_ann isat_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : isat Competing forecasts: isat_ann versus isat_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ isat_ann 1844 isat_arima 13403 Difference -11559 By this criterion, isat_ann is the better forecast H0: difference is not significant S(1) = -3.249 p-value = 0.0012
28.	ITMG	. dmariano itmg itmg_ann itmg_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : itmg Competing forecasts: itmg_ann versus itmg_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ itmg_ann 32320 itmg_arima 354153

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		Difference -321833 By this criterion, itmg_ann is the better forecast H0: difference is not significant S(1) = -6.969 p-value = 0.0000
29.	JSMR	. dmariano jsmr jsmr_ann jsmr_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : jsmr Competing forecasts: jsmr_ann versus jsmr_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ jsmr_ann 52.87 jsmr_arima 85.04 Difference -32.16 By this criterion, jsmr_ann is the better forecast H0: difference is not significant S(1) = -2.193 p-value = 0.0283
30.	KLBF	. dmariano klbf klbl_ann klbf_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : klbf Competing forecasts: klbl_ann versus klbf_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ klbl_ann 2112 klbf_arima 196.4 Difference 1915 By this criterion, klbf_arima is the better forecast H0: difference is not significant S(1) = 13.05 p-value = 0.0000
31.	LPKR	. dmariano lpkr lpkr_ann lpkr_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : lpkr Competing forecasts: lpkr_ann versus lpkr_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		lpkr_ann 3.537 lpkr_arima 70 Difference -66.46 By this criterion, lpkr_ann is the better forecast H0: difference is not significant S(1) = -5.093 p-value = 0.0000
32.	LSIP	. dmariano lsip lsip_ann lsip_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : lsip Competing forecasts: lsip_ann versus lsip_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ lsip_ann 381.6 lsip_arima 141978 Difference -141597 By this criterion, lsip_ann is the better forecast H0: difference is not significant S(1) = -2.954 p-value = 0.0031
33.	MEDC	. dmariano medc medc_ann medc_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : medc Competing forecasts: medc_ann versus medc_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ medc_ann 312.3 medc_arima 323.6 Difference -11.21 By this criterion, medc_ann is the better forecast H0: difference is not significant S(1) = -.1901 p-value = 0.8492
34.	MIRA	. dmariano mira mira_ann mira_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : mira Competing forecasts: mira_ann versus mira_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		Series MSE _____ mira_ann 484.3 mira_arima 69.35 Difference 414.9 By this criterion, mira_arima is the better forecast H0: difference is not significant S(1) = 7.098 p-value = 0.0000
35.	PGAS	. dmariano pgas pgas_ann pgas_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : pgas Competing forecasts: pgas_ann versus pgas_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ pgas_ann 307.6 pgas_arima 4847 Difference -4539 By this criterion, pgas_ann is the better forecast H0: difference is not significant S(1) = -2.542 p-value = 0.0110
36.	PTBA	. dmariano ptba ptba_ann ptba_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : ptba Competing forecasts: ptba_ann versus ptba_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ ptba_ann 19016 ptba_arima 380111 Difference -361095 By this criterion, ptba_ann is the better forecast H0: difference is not significant S(1) = -7.977 p-value = 0.0000
37.	SGRO	. dmariano sgro sgro_ann sgro_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : sgro Competing forecasts: sgro_ann versus sgro_arima

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE sgro_ann 665.7 sgro_arima 10885 Difference -10220 By this criterion, sgro_ann is the better forecast H0: difference is not significant S(1) = -2.675 p-value = 0.0075
38.	SMCB	. dmariano smcb smcb_ann smcb_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : smcb Competing forecasts: smcb_ann versus smcb_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE smcb_ann 1309 smcb_arima 362.7 Difference 946.1 By this criterion, smcb_arima is the better forecast H0: difference is not significant S(1) = 3.901 p-value = 0.0001
39.	SMGR	. dmariano smgr smgr_arima smgr_ann, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : smgr Competing forecasts: smgr_arima versus smgr_ann Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE smgr_arima 4966 smgr_ann 1272 Difference 3694 By this criterion, smgr_ann is the better forecast H0: difference is not significant S(1) = 1.437 p-value = 0.1508
40.	TINS	. dmariano tins tins_ann tins_arima, crit(MSE) kernel(bartlett)

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		Diebold-Mariano forecast comparison test for actual : tins Competing forecasts: tins_ann versus tins_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE tins_ann 240.1 tins_arima 1754 Difference -1514 By this criterion, tins_ann is the better forecast H0: difference is not significant S(1) = -2.282 p-value = 0.0225
41.	TLKM	. dmariano tlkm tlkm_ann tlkm_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : tlkm Competing forecasts: tlkm_ann versus tlkm_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE tlkm_ann 1008 tlkm_arima 25188 Difference -24180 By this criterion, tlkm_ann is the better forecast H0: difference is not significant S(1) = -3.751 p-value = 0.0002
42.	TRUB	. dmariano trub trub_ann trub_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : trub Competing forecasts: trub_ann versus trub_var Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE trub_ann 63.17 trub_var 15.1 Difference 48.07 By this criterion, trub_arima is the better forecast H0: difference is not significant S(1) = 5.006 p-value = 0.0000
43.	UNSP	. dmariano unsp unsp_ann unsp_arima, crit(MSE)

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		kernel(bartlett) Diebold-Mariano forecast comparison test for actual : unsp Competing forecasts: unsp_ann versus unsp_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ unsp_ann 398.7 unsp_arima 139.5 Difference 259.3 By this criterion, unsp_arima is the better forecast H0: difference is not significant S(1) = 11.72 p-value = 0.0000
44.	UNTR	. dmariano untr untr_ann untr_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : untr Competing forecasts: untr_ann versus untr_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ untr_ann 25184 untr_arima 29525 Difference -4342 By this criterion, untr_ann is the better forecast H0: difference is not significant S(1) = -.2451 p-value = 0.8064
45.	UNVR	. dmariano unvr unvr_ann unvr_arima, crit(MSE) kernel(bartlett) Diebold-Mariano forecast comparison test for actual : unvr Competing forecasts: unvr_ann versus unvr_arima Criterion: MSE over 5 observations Maxlag = 5 chosen by Schwert criterion Kernel : bartlett Series MSE _____ unvr_ann 3961 unvr_arima 23649 Difference -19687 By this criterion, unvr_ann is the better forecast H0: difference is not significant

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no	Saham	Hasil Diebold Mariano Test (forecast accuracy)
		S(1) = -2.215 p-value = 0.0268

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