

# Appendices



# Appendix A

## The First Appendix

This appendix gives more detailed information regarding different experiment configurations.

### A.1 Dataset Configuration

In this section, more information about the datasets can be found. Selecting different time intervals will make the size of the training, validation, and test set vary. For example, a 30-day long set can be split into 30 entries of one-day intervals, 60 entries of 12-hour intervals, 90 entries of 6-hour intervals, 180 entries of 3-hour intervals, 270 entries of 2-hour intervals, 540 entries of 1-hour intervals, 1080 entries of 30-minute intervals and 3240 entries of 10-minute intervals. The number of entries in a set is inversely proportional to the length of the time interval. Similarly different sets have different sizes as discussed in Section 2.4. Notice that only the size of the training set is affected by the fold number, the validation set size is always 15 days long and the test set size is always month-long. The fluctuations in test size are because different months have different lengths.

An increase in the window size will decrease the training set size. This is due to time lagging features. If the window size equals 10, the first 10 rows cannot be used since their 10 previous values are not available and are therefore dropped. An increase in the size of the window will account for a decrease in the training set size. For example, a training set with a window size of 10 that has 374 items will have 359 items when the window size is set to 25. This is 15 items less which is the difference between the two window sizes. Only the first part of the set is affected by the size of the window since the removal is only done at the head of the dataset. In Table A.8, there is no entry for the first fold with a window size of 100. This is not possible since the size of the first set is not large enough to time lag the features with a window size of 100.

$w$	Fold NR.	Training Set Size	Validation Set Size	Test Set Size
2	1	14399	2160	4464
2	2	18863	2160	4464
2	3	23327	2160	4320
2	4	27647	2160	4895
5	1	14396	2160	4464
5	2	18860	2160	4464
5	3	23324	2160	4320
5	4	27644	2160	4895
10	1	14391	2160	4464
10	2	18855	2160	4464
10	3	23319	2160	4320
10	4	27639	2160	4895
25	1	14376	2160	4464
25	2	18840	2160	4464
25	3	23304	2160	4320
25	4	27624	2160	4895
50	1	14351	2160	4464
50	2	18815	2160	4464
50	3	23279	2160	4320
50	4	27599	2160	4895
100	1	14301	2160	4464
100	2	18765	2160	4464
100	3	23229	2160	4320
100	4	27549	2160	4895

Table A.1: The size for the training, validation, and test for a time interval of 10 minutes for varying window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	Training Set Size	Validation Set Size	Test Set Size
2	1	4799	720	1488
2	2	6287	720	1488
2	3	7775	720	1440
2	4	9215	720	1631
5	1	4796	720	1488
5	2	6284	720	1488
5	3	7772	720	1440
5	4	9212	720	1631
10	1	4791	720	1488
10	2	6279	720	1488
10	3	7767	720	1440
10	4	9207	720	1631
25	1	4776	720	1488
25	2	6264	720	1488
25	3	7752	720	1440
25	4	9192	720	1631
50	1	4751	720	1488
50	2	6239	720	1488
50	3	7727	720	1440
50	4	9167	720	1631
100	1	4701	720	1488
100	2	6189	720	1488
100	3	7677	720	1440
100	4	9117	720	1631

Table A.2: The size for the training, validation, and test for a time interval of 30 minutes for varying window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	Training Set Size	Validation Set Size	Test Set Size
2	1	2399	360	744
2	2	3143	360	744
2	3	3887	360	720
2	4	4607	360	815
5	1	2396	360	744
5	2	3140	360	744
5	3	3884	360	720
5	4	4604	360	815
10	1	2391	360	744
10	2	3135	360	744
10	3	3879	360	720
10	4	4599	360	815
25	1	2376	360	744
25	2	3120	360	744
25	3	3864	360	720
25	4	4584	360	815
50	1	2351	360	744
50	2	3095	360	744
50	3	3839	360	720
50	4	4559	360	815
100	1	2301	360	744
100	2	3045	360	744
100	3	3789	360	720
100	4	4509	360	815

Table A.3: The size for the training, validation, and test for a time interval of 1 hour for varying window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	Training Set Size	Validation Set Size	Test Set Size
2	1	1199	180	372
2	2	1571	180	372
2	3	1943	180	360
2	4	2303	180	407
5	1	1196	180	372
5	2	1568	180	372
5	3	1940	180	360
5	4	2300	180	407
10	1	1191	180	372
10	2	1563	180	372
10	3	1935	180	360
10	4	2295	180	407
25	1	1176	180	372
25	2	1548	180	372
25	3	1920	180	360
25	4	2280	180	407
50	1	1151	180	372
50	2	1523	180	372
50	3	1895	180	360
50	4	2255	180	407
100	1	1101	180	372
100	2	1473	180	372
100	3	1845	180	360
100	4	2205	180	407

Table A.4: The size for the training, validation, and test for a time interval of 2 hours for varying window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	Training Set Size	Validation Set Size	Test Set Size
2	1	799	120	248
2	2	1047	120	248
2	3	1295	120	240
2	4	1535	120	271
5	1	796	120	248
5	2	1044	120	248
5	3	1292	120	240
5	4	1532	120	271
10	1	791	120	248
10	2	1039	120	248
10	3	1287	120	240
10	4	1527	120	271
25	1	776	120	248
25	2	1024	120	248
25	3	1272	120	240
25	4	1512	120	271
50	1	751	120	248
50	2	999	120	248
50	3	1247	120	240
50	4	1487	120	271
100	1	701	120	248
100	2	949	120	248
100	3	1197	120	240
100	4	1437	120	271

Table A.5: The size for the training, validation, and test for a time interval of 3 hours for varying window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	Training Set Size	Validation Set Size	Test Set Size
2	1	399	60	124
2	2	523	60	124
2	3	647	60	120
2	4	767	60	135
5	1	396	60	124
5	2	520	60	124
5	3	644	60	120
5	4	764	60	135
10	1	391	60	124
10	2	515	60	124
10	3	639	60	120
10	4	759	60	135
25	1	376	60	124
25	2	500	60	124
25	3	624	60	120
25	4	744	60	135
50	1	351	60	124
50	2	475	60	124
50	3	599	60	120
50	4	719	60	135
100	1	301	60	124
100	2	425	60	124
100	3	549	60	120
100	4	669	60	135

Table A.6: The size for the training, validation, and test for a time interval of 6 hours for varying window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	Training Set Size	Validation Set Size	Test Set Size
2	1	199	30	62
2	2	261	30	62
2	3	323	30	60
2	4	383	30	67
5	1	196	30	62
5	2	258	30	62
5	3	320	30	60
5	4	380	30	67
10	1	191	30	62
10	2	253	30	62
10	3	315	30	60
10	4	375	30	67
25	1	176	30	62
25	2	238	30	62
25	3	300	30	60
25	4	360	30	67
50	1	151	30	62
50	2	213	30	62
50	3	275	30	60
50	4	335	30	67
100	1	101	30	62
100	2	163	30	62
100	3	225	30	60
100	4	285	30	67

Table A.7: The size for the training, validation, and test for a time interval of 12 hours for varying window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	Training Set Size	Validation Set Size	Test Set Size
2	1	99	15	31
2	2	130	15	31
2	3	161	15	30
2	4	191	15	33
5	1	96	15	31
5	2	127	15	31
5	3	158	15	30
5	4	188	15	33
10	1	91	15	31
10	2	122	15	31
10	3	153	15	30
10	4	183	15	33
25	1	76	15	31
25	2	107	15	31
25	3	138	15	30
25	4	168	15	33
50	1	51	15	31
50	2	82	15	31
50	3	113	15	30
50	4	143	15	33
100	1	1	15	31
100	2	32	15	31
100	3	63	15	30
100	4	93	15	33

Table A.8: The size for the training, validation, and test for a time interval of 24 hours for varying window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



## Appendix B

# The Second Appendix

In this appendix, extensive results of the experiments are found.

### B.1 Baseline Models Results

#### B.1.1 The Non-Time Differenced Baseline Model $Base_c$

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	91.54	13413.04	115.81	0.9746	68
2	2	158.49	29489.8	171.73	0.819	127
2	3	62.06	4751.73	68.93	0.9513	75
2	4	39.41	1895.07	43.53	0.8577	93
5	1	179.84	55078.42	234.69	0.8958	77
5	2	132.08	19698.36	140.35	0.8791	88
5	3	91.78	11349.08	106.53	0.8836	67
5	4	17.37	465.99	21.59	0.965	69
10	1	146.07	35526.71	188.49	0.9328	69
10	2	125.65	19530.85	139.75	0.8801	76
10	3	71.26	6074.32	77.94	0.9377	74
10	4	35.09	1524.72	39.05	0.8855	72
25	1	136.08	25896.88	160.93	0.951	82
25	2	130.93	20801.72	144.23	0.8723	74
25	3	78.01	10439.18	102.17	0.893	68
25	4	42.42	2077.63	45.58	0.844	92
50	1	198.78	46015.14	214.51	0.913	67
50	2	122.23	19222.5	138.65	0.882	70
50	3	81.58	15728.94	125.42	0.8387	83
50	4	20.88	736.6	27.14	0.9447	74
100	1	244.1	77904.22	279.11	0.8527	81
100	2	157.56	32118.49	179.22	0.8028	102
100	3	94.61	15095.81	122.87	0.8452	80
100	4	39.4	2496.63	49.97	0.8125	87

Table B.1: Result metrics for the  $Base_c$  model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	84.08	10865.35	104.24	0.9795	82
2	2	29.1	2125.12	46.1	0.9869	66
2	3	25.71	1321.83	36.36	0.9864	83
2	4	14.96	545.59	23.36	0.9589	74
5	1	57.2	4981.88	70.58	0.9906	79
5	2	28.48	1853.35	43.05	0.9886	67
5	3	31.86	1731.58	41.61	0.9822	72
5	4	12.01	447.49	21.15	0.9663	90
10	1	46.39	4636.73	68.09	0.9912	85
10	2	32.49	2279.06	47.74	0.986	74
10	3	21.72	1266.12	35.58	0.987	66
10	4	9.1	392.72	19.82	0.9704	95
25	1	64.19	7680.73	87.64	0.9855	71
25	2	46.96	3942.57	62.79	0.9757	75
25	3	23.04	1441.08	37.96	0.9852	84
25	4	11.21	445.37	21.1	0.9665	69
50	1	65.37	7576.01	87.04	0.9857	76
50	2	48.15	4352.86	65.98	0.9732	79
50	3	20.25	1337.17	36.57	0.9863	96
50	4	14.69	543.71	23.32	0.9591	68
100	1	66.35	6898.35	83.06	0.987	89
100	2	67.77	7108.23	84.31	0.9562	88
100	3	29.4	2103.43	45.86	0.9784	83
100	4	18.48	803.57	28.35	0.9395	102

Table B.2: Result metrics for the  $Base_c$  model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	81.34	9838.26	99.19	0.9814	73
2	2	32.03	2374.72	48.73	0.9853	74
2	3	22.34	1355.6	36.82	0.986	77
2	4	14.76	655.62	25.61	0.9504	67
5	1	52.14	5367.7	73.26	0.9898	70
5	2	40.38	3084.77	55.54	0.9809	73
5	3	25.26	1704.77	41.29	0.9824	84
5	4	32.83	1618.76	40.23	0.8776	69
10	1	86.16	12590.36	112.21	0.9762	84
10	2	52.06	4401.5	66.34	0.9727	86
10	3	24.04	1672.13	40.89	0.9828	95
10	4	11.03	587.99	24.25	0.9555	96
25	1	46.51	4442.98	66.66	0.9916	80
25	2	54.46	4685.4	68.45	0.9709	69
25	3	25.42	1822.47	42.69	0.9812	66
25	4	12.86	610.55	24.71	0.9538	72
50	1	54.65	5382.87	73.37	0.9898	73
50	2	74.61	7544.35	86.86	0.9532	77
50	3	28.04	2145.05	46.31	0.9779	89
50	4	12.2	630.7	25.11	0.9523	67
100	1	172.18	92623.14	304.34	0.8248	78
100	2	66.11	6658.1	81.6	0.9587	70
100	3	43.27	4178.49	64.64	0.9569	67
100	4	14.04	791.32	28.13	0.9402	92

Table B.3: Result metrics for the  $Base_c$  model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	84.79	13202.78	114.9	0.975	66
2	2	43.84	4459.62	66.78	0.9721	70
2	3	30.53	2379.4	48.78	0.9752	94
2	4	14.1	610.75	24.71	0.9535	77
5	1	85.89	13419.64	115.84	0.9746	66
5	2	49.37	5419.88	73.62	0.9661	69
5	3	32.97	2619.63	51.18	0.9727	114
5	4	15.9	767.87	27.71	0.9415	82
10	1	69.05	8608.31	92.78	0.9837	69
10	2	48.89	5245.34	72.42	0.9672	71
10	3	32.78	2615.96	51.15	0.9727	96
10	4	13.72	685.22	26.18	0.9478	78
25	1	55.62	6217.6	78.85	0.9882	72
25	2	51.66	5452.63	73.84	0.9659	87
25	3	34.02	2819.99	53.1	0.9706	71
25	4	14.13	699.17	26.44	0.9467	66
50	1	95.04	15478.75	124.41	0.9707	70
50	2	61.84	7205.98	84.89	0.9549	68
50	3	35.52	2980.7	54.6	0.9689	86
50	4	14.45	712.99	26.7	0.9457	115
100	1	609.47	1385375.2	1177.02	-1.6243	69
100	2	64.24	8239.3	90.77	0.9485	69
100	3	51.76	4533.33	67.33	0.9527	88
100	4	19.45	1066.81	32.66	0.9187	94

Table B.4: Result metrics for the  $Base_c$  model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	87.88	13910.35	117.94	0.9734	77
2	2	57.21	6981.03	83.55	0.9562	77
2	3	36.76	3302.32	57.47	0.966	91
2	4	16.24	920.04	30.33	0.9297	80
5	1	71.49	9619.44	98.08	0.9816	68
5	2	56.49	6941.44	83.32	0.9564	66
5	3	38.46	3952.27	62.87	0.9593	72
5	4	17.25	995.59	31.55	0.924	94
10	1	74.31	10059.55	100.3	0.9808	66
10	2	58.43	7261.14	85.21	0.9544	81
10	3	37.35	3753.89	61.27	0.9613	74
10	4	15.65	956.43	30.93	0.927	96
25	1	73.56	10070.6	100.35	0.9808	80
25	2	60.61	7675.03	87.61	0.9518	76
25	3	39.84	4126.25	64.24	0.9575	68
25	4	16.67	1009.17	31.77	0.9229	74
50	1	109.46	19352.91	139.11	0.963	100
50	2	63.52	7697.02	87.73	0.9517	73
50	3	50.93	4952.3	70.37	0.949	76
50	4	29.26	1573.36	39.67	0.8798	70
100	1	592.8	1038493.4	1019.06	-0.9835	66
100	2	76.81	10100.17	100.5	0.9366	73
100	3	49.18	5369.05	73.27	0.9447	82
100	4	23.38	1452.37	38.11	0.8891	87

Table B.5: Result metrics for the  $Base_c$  model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	114.54	21188.99	145.56	0.9597	79
2	2	79.58	12905.98	113.6	0.9177	71
2	3	51.13	6702.37	81.87	0.9291	91
2	4	23.52	1720.64	41.48	0.8665	78
5	1	110.9	20772.46	144.13	0.9605	77
5	2	83.75	13409.02	115.8	0.9145	66
5	3	52.01	6431.77	80.2	0.9319	72
5	4	23.06	1783.08	42.23	0.8616	67
10	1	87.03	14051.29	118.54	0.9733	79
10	2	83.18	13538.9	116.36	0.9137	69
10	3	53.52	6862.29	82.84	0.9274	73
10	4	21.99	1691.42	41.13	0.8687	86
25	1	113.53	19640.53	140.14	0.9626	66
25	2	87.46	14245.01	119.35	0.9092	68
25	3	57.14	7260.31	85.21	0.9231	74
25	4	22.79	1785.03	42.25	0.8615	74
50	1	157.66	33553.1	183.18	0.9361	84
50	2	99.31	16077.28	126.8	0.8975	82
50	3	63.12	8212.67	90.62	0.9131	92
50	4	31.42	2189.03	46.79	0.8301	72
100	1	316.71	123172.63	350.96	0.7655	76
100	2	103.94	18497.54	136.01	0.8821	73
100	3	84.68	14048.64	118.53	0.8513	75
100	4	38.84	3146.19	56.09	0.7558	77

Table B.6: Result metrics for the  $Base_c$  model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	138.86	34788.8	186.52	0.9339	66
2	2	104.94	18896.26	137.46	0.875	86
2	3	79.55	12426.86	111.48	0.8577	73
2	4	30.34	3061.56	55.33	0.7695	68
5	1	129.29	30606.44	174.95	0.9419	90
5	2	105.95	19304.87	138.94	0.8723	68
5	3	74.25	12660.96	112.52	0.855	81
5	4	32.16	3160.85	56.22	0.762	82
10	1	129.43	29125.24	170.66	0.9447	68
10	2	116.68	25315.05	159.11	0.8325	68
10	3	75.89	12570.44	112.12	0.856	102
10	4	32.94	3280.62	57.28	0.753	96
25	1	152.66	33833.48	183.94	0.9357	66
25	2	136.51	29414.25	171.51	0.8054	68
25	3	82.66	14623.81	120.93	0.8325	74
25	4	39.08	3673.49	60.61	0.7234	98
50	1	297.16	119482.11	345.66	0.7731	75
50	2	142.21	32758.55	180.99	0.7833	81
50	3	88.35	14814.64	121.72	0.8303	66
50	4	45.53	4231.54	65.05	0.6814	71
100	1	714.17	992493.6	996.24	-0.8852	93
100	2	328.73	146196.3	382.36	0.0328	66
100	3	159.71	42784.2	206.84	0.51	91
100	4	76.19	8896.59	94.32	0.3301	66

Table B.7: Result metrics for the  $Base_c$  model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	192.35	60397.34	245.76	0.8813	66
2	2	139.29	31954.42	178.76	0.7728	72
2	3	105.32	26286.03	162.13	0.6822	66
2	4	48.13	6999.32	83.66	0.507	69
5	1	199.76	62911.78	250.82	0.8764	77
5	2	184.71	56649.94	238.01	0.5972	73
5	3	113.37	29835.13	172.73	0.6393	70
5	4	59.25	8621.09	92.85	0.3927	69
10	1	200.15	60572.29	246.11	0.881	72
10	2	323.6	153939.56	392.35	-0.0945	89
10	3	106.53	28690.6	169.38	0.6531	67
10	4	58.41	8667.09	93.1	0.3895	78
25	1	258.1	98811.79	314.34	0.8058	67
25	2	318.26	155104.94	393.83	-0.1028	77
25	3	119.07	31455.09	177.36	0.6197	84
25	4	62.58	8014.93	89.53	0.4354	88
50	1	204.15	84380.69	290.48	0.8342	75
50	2	347.53	177061.95	420.79	-0.2589	82
50	3	194.36	49400.46	222.26	0.4027	86
50	4	67.35	7989.15	89.38	0.4372	82
100	1	751.86	963423.1	981.54	-0.8934	65
100	2	506.06	344774.9	587.18	-1.4513	69
100	3	189.03	81809.64	286.02	0.0109	114
100	4	120.49	21979.2	148.25	-0.5483	71

Table B.8: Result metrics for the  $Base_c$  model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.1.2 The Time Differenced Baseline Model  $Base_{td}$** 

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	10.48	297.81	17.26	-0.0004	202
2	2	11.83	363.38	19.06	-0.0018	164
2	3	8.45	215.21	14.67	-0.0018	100
2	4	4.6	91.92	9.59	-0.0043	102
5	1	10.48	297.75	17.26	-0.0002	318
5	2	11.83	363.36	19.06	-0.0017	195
5	3	8.45	214.97	14.66	-0.0007	192
5	4	4.58	91.74	9.58	-0.0023	66
10	1	10.48	297.8	17.26	-0.0003	236
10	2	11.83	363.53	19.07	-0.0022	152
10	3	8.45	215.05	14.66	-0.0011	93
10	4	4.56	91.59	9.57	-0.0007	98
25	1	10.48	297.71	17.25	-0.0	370
25	2	11.84	363.71	19.07	-0.0027	158
25	3	8.45	215.02	14.66	-0.001	191
25	4	4.58	91.77	9.58	-0.0027	73
50	1	10.51	298.25	17.27	-0.0019	76
50	2	11.83	363.19	19.06	-0.0012	247
50	3	8.45	215.07	14.67	-0.0012	171
50	4	4.58	91.78	9.58	-0.0027	140
100	1	10.49	298.05	17.26	-0.0012	110
100	2	11.98	368.98	19.21	-0.0172	119
100	3	8.45	214.92	14.66	-0.0005	74
100	4	4.55	91.55	9.57	-0.0002	66

Table B.9: Result metrics for the  $Base_{td}$  model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	17.52	908.18	30.14	-0.0034	86
2	2	19.83	1010.88	31.79	-0.0009	66
2	3	14.78	742.97	27.26	-0.0065	69
2	4	7.4	263.41	16.23	-0.0005	66
5	1	17.48	906.45	30.11	-0.0015	78
5	2	19.84	1010.92	31.79	-0.001	78
5	3	14.82	744.17	27.28	-0.0081	69
5	4	7.48	264.27	16.26	-0.0037	93
10	1	17.48	906.43	30.11	-0.0015	86
10	2	19.84	1011.36	31.8	-0.0014	67
10	3	14.84	744.8	27.29	-0.009	68
10	4	7.51	264.64	16.27	-0.0051	68
25	1	17.5	907.4	30.12	-0.0026	71
25	2	19.84	1011.14	31.8	-0.0012	75
25	3	14.8	743.6	27.27	-0.0074	77
25	4	7.53	264.88	16.28	-0.006	70
50	1	17.47	906.07	30.1	-0.0011	83
50	2	19.83	1010.84	31.79	-0.0009	85
50	3	14.85	745.2	27.3	-0.0095	74
50	4	7.58	265.59	16.3	-0.0087	78
100	1	17.49	906.97	30.12	-0.0021	72
100	2	19.84	1011.41	31.8	-0.0015	86
100	3	15.05	751.32	27.41	-0.0178	83
100	4	7.42	263.65	16.24	-0.0014	81

Table B.10: Result metrics for the  $Base_{td}$  model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	25.08	1820.51	42.67	-0.006	79
2	2	28.63	2064.21	45.43	-0.0001	74
2	3	20.08	1176.15	34.3	-0.0058	85
2	4	9.87	466.43	21.6	-0.0	76
5	1	25.05	1818.4	42.64	-0.0048	98
5	2	28.63	2064.15	45.43	-0.0001	67
5	3	20.05	1173.76	34.26	-0.0037	69
5	4	9.87	466.42	21.6	-0.0	66
10	1	25.09	1821.1	42.67	-0.0063	76
10	2	28.66	2064.83	45.44	-0.0004	110
10	3	20.04	1172.98	34.25	-0.0031	68
10	4	9.88	466.49	21.6	-0.0002	83
25	1	25.07	1820.19	42.66	-0.0058	78
25	2	28.6	2064.12	45.43	-0.0001	96
25	3	20.09	1176.85	34.31	-0.0064	67
25	4	9.87	466.43	21.6	-0.0	89
50	1	25.08	1820.83	42.67	-0.0061	95
50	2	28.62	2064.06	45.43	-0.0001	72
50	3	20.05	1174.38	34.27	-0.0042	73
50	4	9.88	466.47	21.6	-0.0001	86
100	1	25.17	1826.91	42.74	-0.0095	88
100	2	28.6	2064.06	45.43	-0.0001	69
100	3	20.04	1173.14	34.25	-0.0032	68
100	4	9.87	466.43	21.6	-0.0	71

Table B.11: Result metrics for the  $Base_{td}$  model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	36.06	3739.47	61.15	-0.0069	103
2	2	42.15	4291.0	65.51	-0.0001	68
2	3	29.38	2162.65	46.5	-0.0001	75
2	4	12.84	559.72	23.66	-0.0	71
5	1	36.08	3741.04	61.16	-0.0073	70
5	2	42.12	4290.77	65.5	-0.0	79
5	3	29.38	2162.51	46.5	-0.0	67
5	4	12.84	559.81	23.66	-0.0002	82
10	1	36.07	3740.07	61.16	-0.007	84
10	2	42.15	4290.97	65.51	-0.0	93
10	3	29.38	2162.62	46.5	-0.0001	82
10	4	12.84	559.72	23.66	-0.0	88
25	1	36.08	3740.66	61.16	-0.0072	104
25	2	42.15	4290.93	65.51	-0.0	68
25	3	29.38	2162.51	46.5	-0.0	68
25	4	12.84	559.77	23.66	-0.0001	67
50	1	36.06	3739.09	61.15	-0.0068	111
50	2	42.16	4291.1	65.51	-0.0001	93
50	3	29.37	2162.78	46.51	-0.0002	80
50	4	12.84	559.82	23.66	-0.0002	69
100	1	35.99	3733.3	61.1	-0.0052	153
100	2	42.12	4290.79	65.5	-0.0	70
100	3	29.38	2162.55	46.5	-0.0001	67
100	4	12.84	559.74	23.66	-0.0	68

Table B.12: Result metrics for the  $Base_{td}$  model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	45.24	6168.97	78.54	-0.0114	171
2	2	53.53	6324.21	79.52	-0.0002	68
2	3	34.73	3209.49	56.65	-0.0001	83
2	4	14.87	871.24	29.52	-0.0005	95
5	1	45.25	6170.4	78.55	-0.0116	154
5	2	53.54	6324.4	79.53	-0.0002	68
5	3	34.68	3209.31	56.65	-0.0	67
5	4	14.88	871.41	29.52	-0.0007	66
10	1	45.1	6151.36	78.43	-0.0085	101
10	2	53.45	6323.2	79.52	-0.0	88
10	3	34.64	3209.35	56.65	-0.0	84
10	4	14.85	870.93	29.51	-0.0002	79
25	1	45.11	6153.25	78.44	-0.0088	78
25	2	53.44	6323.18	79.52	-0.0	71
25	3	34.64	3209.35	56.65	-0.0	98
25	4	14.85	870.89	29.51	-0.0001	96
50	1	45.1	6151.0	78.43	-0.0084	68
50	2	54.9	6546.26	80.91	-0.0353	69
50	3	35.55	3363.67	58.0	-0.0481	78
50	4	16.12	928.26	30.47	-0.066	96
100	1	45.0	6138.78	78.35	-0.0064	106
100	2	53.47	6323.27	79.52	-0.0	77
100	3	34.68	3209.3	56.65	-0.0	95
100	4	14.86	871.04	29.51	-0.0003	89

Table B.13: Result metrics for the  $Base_{td}$  model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	69.37	12272.36	110.78	-0.0245	72
2	2	80.88	13360.94	115.59	-0.0021	69
2	3	52.41	6384.9	79.91	-0.0135	73
2	4	22.04	1698.91	41.22	-0.0137	77
5	1	68.7	12165.44	110.3	-0.0156	78
5	2	77.86	12590.38	112.21	0.0557	66
5	3	51.83	6373.55	79.83	-0.0117	77
5	4	21.29	1757.66	41.92	-0.0488	81
10	1	69.25	12253.44	110.7	-0.0229	68
10	2	81.78	13334.69	115.48	-0.0001	68
10	3	51.68	6300.02	79.37	-0.0001	83
10	4	21.65	1676.89	40.95	-0.0006	75
25	1	68.74	12173.98	110.34	-0.0163	66
25	2	81.9	13337.03	115.49	-0.0003	69
25	3	51.84	6299.67	79.37	-0.0	74
25	4	21.82	1679.68	40.98	-0.0023	102
50	1	68.11	11509.1	107.28	0.0392	76
50	2	93.57	15270.37	123.57	-0.1453	70
50	3	56.53	6863.85	82.85	-0.0896	93
50	4	29.57	2148.57	46.35	-0.282	79
100	1	68.18	12026.67	109.67	-0.004	66
100	2	86.54	13240.45	115.07	0.0069	67
100	3	57.89	7093.31	84.22	-0.126	69
100	4	24.03	1876.04	43.31	-0.1194	75

Table B.14: Result metrics for the  $Base_{td}$  model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	102.46	26871.23	163.92	-0.0548	90
2	2	110.99	20225.3	142.22	-0.009	70
2	3	83.21	13843.32	117.66	-0.0596	84
2	4	32.52	3607.76	60.06	-0.099	72
5	1	98.77	25727.67	160.4	-0.0099	81
5	2	110.04	20492.06	143.15	-0.0223	87
5	3	81.79	13840.9	117.65	-0.0595	67
5	4	31.12	3502.14	59.18	-0.0668	82
10	1	98.56	24830.14	157.58	0.0254	73
10	2	111.35	20769.46	144.12	-0.0361	90
10	3	86.0	16376.44	127.97	-0.2535	77
10	4	31.09	3483.86	59.02	-0.0612	69
25	1	102.68	26061.45	161.44	-0.023	68
25	2	111.22	20074.14	141.68	-0.0014	66
25	3	79.04	13144.55	114.65	-0.0061	70
25	4	30.34	3288.33	57.34	-0.0017	67
50	1	120.25	26808.36	163.73	-0.0523	70
50	2	158.57	39895.33	199.74	-0.9903	68
50	3	84.77	15610.98	124.94	-0.1949	92
50	4	47.39	5156.68	71.81	-0.5708	68
100	1	132.01	32582.26	180.51	-0.2789	72
100	2	123.21	23886.89	154.55	-0.1917	69
100	3	95.02	18579.78	136.31	-0.4222	75
100	4	54.45	5499.27	74.16	-0.6751	70

Table B.15: Result metrics for the  $Base_{td}$  model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	173.4	60388.17	245.74	-0.0791	66
2	2	140.42	31798.51	178.32	0.0819	70
2	3	113.34	29558.42	171.93	-0.0453	76
2	4	53.39	8185.43	90.47	-0.0726	80
5	1	172.83	59283.15	243.48	-0.0593	78
5	2	151.8	35055.22	187.23	-0.0121	79
5	3	113.44	30524.7	174.71	-0.0795	72
5	4	53.95	8075.82	89.87	-0.0582	75
10	1	168.16	57633.84	240.07	-0.0299	73
10	2	151.46	36657.7	191.46	-0.0584	80
10	3	110.09	29614.43	172.09	-0.0473	66
10	4	52.36	8150.23	90.28	-0.0679	85
25	1	172.65	57964.59	240.76	-0.0358	76
25	2	148.51	35292.96	187.86	-0.019	66
25	3	134.95	37006.58	192.37	-0.3087	66
25	4	67.11	9582.03	97.89	-0.2556	66
50	1	208.63	92629.76	304.35	-0.6552	70
50	2	193.67	61641.78	248.28	-0.7797	118
50	3	176.53	63172.98	251.34	-1.2341	71
50	4	108.07	17979.54	134.09	-1.3559	68
100	1	184.68	59211.48	243.33	-0.0581	66
100	2	165.65	50589.25	224.92	-0.4606	67
100	3	122.94	31764.79	178.23	-0.1233	70
100	4	104.24	21634.76	147.09	-1.8348	72

Table B.16: Result metrics for the  $Base_{td}$  model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

## B.2 Sentiment Models Results

### B.2.1 The Non-Time Differenced Sentiment Model $Sent_c$

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	131.24	23914.5	154.64	0.9548	67
2	2	192.92	43684.7	209.01	0.7318	71
2	3	131.87	19546.51	139.81	0.7996	71
2	4	31.99	1262.29	35.53	0.9052	75
5	1	179.31	47434.5	217.79	0.9103	68
5	2	208.74	52573.5	229.29	0.6773	68
5	3	97.5	13154.64	114.69	0.8651	104
5	4	19.46	610.92	24.72	0.9541	76
10	1	189.2	53032.64	230.29	0.8997	66
10	2	168.63	34956.94	186.97	0.7854	70
10	3	150.04	29806.98	172.65	0.6944	92
10	4	61.27	5058.14	71.12	0.6201	67
25	1	168.89	42795.82	206.87	0.9191	113
25	2	99.53	17320.28	131.61	0.8937	86
25	3	89.04	19255.4	138.76	0.8026	68
25	4	49.47	3191.77	56.5	0.7603	69
50	1	166.32	44339.42	210.57	0.9162	124
50	2	153.14	28538.36	168.93	0.8248	81
50	3	150.79	42698.94	206.64	0.5622	68
50	4	59.57	4874.48	69.82	0.6339	68
100	1	146.53	27734.24	166.54	0.9476	106
100	2	215.03	64671.78	254.31	0.603	72
100	3	97.75	20084.79	141.72	0.7941	82
100	4	102.37	12586.55	112.19	0.0547	81

Table B.17: Result metrics for the  $Sent_c$  model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	73.72	8609.45	92.79	0.9837	76
2	2	42.73	2827.43	53.17	0.9826	82
2	3	24.3	1200.52	34.65	0.9877	81
2	4	8.92	319.65	17.88	0.9759	68
5	1	62.68	9551.31	97.73	0.9819	75
5	2	37.55	2802.8	52.94	0.9827	93
5	3	30.39	2267.64	47.62	0.9767	84
5	4	21.97	846.93	29.1	0.9362	71
10	1	92.58	17717.42	133.11	0.9665	97
10	2	42.76	3726.2	61.04	0.977	83
10	3	41.38	2811.23	53.02	0.9711	90
10	4	13.44	599.4	24.48	0.9549	79
25	1	82.73	9862.65	99.31	0.9813	71
25	2	62.88	6170.58	78.55	0.962	78
25	3	45.81	4115.14	64.15	0.9578	68
25	4	45.43	2708.05	52.04	0.7961	79
50	1	102.39	14269.83	119.46	0.973	76
50	2	64.04	6647.26	81.53	0.959	68
50	3	46.89	4015.4	63.37	0.9588	78
50	4	37.65	2320.4	48.17	0.8253	77
100	1	114.24	19182.12	138.5	0.9637	96
100	2	87.19	10952.35	104.65	0.9325	68
100	3	64.1	6560.76	81.0	0.9326	79
100	4	33.87	1995.0	44.67	0.8498	67

Table B.18: Result metrics for the  $Sent_c$  model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	40.03	3417.32	58.46	0.9935	67
2	2	46.33	3614.34	60.12	0.9776	81
2	3	26.81	1641.09	40.51	0.9831	87
2	4	32.91	1546.94	39.33	0.883	70
5	1	56.01	5309.89	72.87	0.99	107
5	2	38.91	3168.67	56.29	0.9803	75
5	3	27.02	1858.82	43.11	0.9808	93
5	4	48.72	3079.45	55.49	0.7672	72
10	1	67.34	7471.97	86.44	0.9859	96
10	2	56.56	5270.35	72.6	0.9673	71
10	3	42.15	3685.41	60.71	0.962	66
10	4	42.39	2540.53	50.4	0.8079	74
25	1	66.18	7990.43	89.39	0.9849	67
25	2	94.07	12083.83	109.93	0.925	73
25	3	40.56	3346.8	57.85	0.9655	80
25	4	23.46	1264.74	35.56	0.9044	74
50	1	121.89	20983.47	144.86	0.9603	74
50	2	124.59	22627.5	150.42	0.8595	75
50	3	59.07	5839.9	76.42	0.9398	72
50	4	41.91	3048.12	55.21	0.7695	82
100	1	112.19	21196.67	145.59	0.9599	73
100	2	135.02	25390.84	159.35	0.8424	81
100	3	54.83	5153.17	71.79	0.9469	89
100	4	42.29	3041.04	55.15	0.7701	80

Table B.19: Result metrics for the  $Sent_c$  model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	87.64	14013.02	118.38	0.9735	97
2	2	46.08	4635.02	68.08	0.971	70
2	3	33.86	2689.56	51.86	0.972	82
2	4	15.72	715.06	26.74	0.9455	97
5	1	103.92	19560.36	139.86	0.9629	80
5	2	51.23	5481.35	74.04	0.9657	76
5	3	38.66	3182.32	56.41	0.9668	71
5	4	16.94	809.56	28.45	0.9383	70
10	1	100.75	18949.43	137.66	0.9641	85
10	2	60.55	6820.74	82.59	0.9573	84
10	3	37.72	3075.96	55.46	0.9679	88
10	4	20.93	1005.58	31.71	0.9234	77
25	1	91.11	13597.58	116.61	0.9742	129
25	2	64.03	7591.94	87.13	0.9525	75
25	3	48.8	4582.41	67.69	0.9522	76
25	4	26.87	1520.1	38.99	0.8842	86
50	1	146.44	34689.27	186.25	0.9343	80
50	2	90.42	13161.52	114.72	0.9177	73
50	3	54.68	5940.82	77.08	0.9381	75
50	4	34.74	2423.67	49.23	0.8154	66
100	1	139.48	28460.14	168.7	0.9461	76
100	2	100.04	16623.64	128.93	0.896	111
100	3	62.63	7018.17	83.77	0.9268	78
100	4	40.19	2882.17	53.69	0.7805	68

Table B.20: Result metrics for the  $Sent_c$  model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	100.09	17233.48	131.28	0.9671	73
2	2	55.87	6854.91	82.79	0.957	68
2	3	39.29	3509.92	59.24	0.9638	66
2	4	19.11	1124.92	33.54	0.9141	72
5	1	81.59	12125.87	110.12	0.9768	75
5	2	60.36	7586.82	87.1	0.9524	69
5	3	41.2	3817.46	61.79	0.9606	79
5	4	20.71	1287.62	35.88	0.9017	77
10	1	77.77	11051.25	105.12	0.9789	73
10	2	64.62	8326.68	91.25	0.9477	101
10	3	45.15	4354.7	65.99	0.9551	66
10	4	24.84	1505.16	38.8	0.885	85
25	1	81.28	11953.67	109.33	0.9772	85
25	2	75.3	10351.21	101.74	0.935	92
25	3	51.14	5118.05	71.54	0.9472	75
25	4	28.55	1884.1	43.41	0.8561	98
50	1	137.43	27328.05	165.31	0.9478	78
50	2	93.31	15085.73	122.82	0.9053	93
50	3	65.85	9035.86	95.06	0.9069	78
50	4	33.97	2403.5	49.03	0.8164	94
100	1	243.03	76435.2	276.47	0.854	76
100	2	107.77	19871.32	140.97	0.8753	81
100	3	80.46	11487.86	107.18	0.8816	79
100	4	42.84	3412.93	58.42	0.7393	67

Table B.21: Result metrics for the  $Sent_c$  model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	124.84	25080.76	158.37	0.9523	97
2	2	82.04	14088.84	118.7	0.9102	85
2	3	57.0	6901.16	83.07	0.9269	74
2	4	25.29	1970.96	44.4	0.847	68
5	1	91.07	14913.02	122.12	0.9716	73
5	2	82.01	13664.43	116.89	0.9129	66
5	3	56.74	6949.58	83.36	0.9264	66
5	4	26.19	1998.01	44.7	0.8449	68
10	1	106.7	18633.54	136.5	0.9645	121
10	2	87.06	14327.0	119.7	0.9087	76
10	3	68.42	9032.94	95.04	0.9044	96
10	4	33.53	2444.5	49.44	0.8103	96
25	1	136.91	29426.74	171.54	0.944	78
25	2	116.91	23275.63	152.56	0.8517	67
25	3	81.16	12358.12	111.17	0.8692	66
25	4	41.23	3217.2	56.72	0.7503	70
50	1	228.16	68498.3	261.72	0.8696	80
50	2	141.53	34637.41	186.11	0.7793	81
50	3	119.82	22641.71	150.47	0.7603	68
50	4	54.23	5082.79	71.29	0.6055	70
100	1	294.44	131985.1	363.3	0.7488	71
100	2	178.73	45856.34	214.14	0.7078	84
100	3	123.08	35791.24	189.19	0.6211	73
100	4	58.32	5923.99	76.97	0.5402	76

Table B.22: Result metrics for the  $Sent_c$  model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	141.89	35469.86	188.33	0.9326	66
2	2	108.27	19677.67	140.28	0.8698	78
2	3	82.09	13736.27	117.2	0.8427	73
2	4	40.88	3877.5	62.27	0.708	73
5	1	126.47	29701.27	172.34	0.9436	86
5	2	124.15	24975.67	158.04	0.8348	71
5	3	87.33	15118.33	122.96	0.8269	80
5	4	44.98	4625.46	68.01	0.6517	81
10	1	148.09	36301.45	190.53	0.931	71
10	2	158.7	38227.75	195.52	0.7471	90
10	3	112.99	23314.68	152.69	0.733	79
10	4	60.9	7365.4	85.82	0.4454	72
25	1	178.82	50908.58	225.63	0.9033	87
25	2	210.2	69949.69	264.48	0.5372	67
25	3	143.01	38724.07	196.78	0.5565	74
25	4	69.34	8293.91	91.07	0.3755	85
50	1	406.21	203511.0	451.12	0.6134	73
50	2	145.06	34130.68	184.74	0.7742	73
50	3	160.07	43276.42	208.03	0.5044	82
50	4	96.54	16201.33	127.28	-0.22	72
100	1	270.67	103069.82	321.04	0.8042	68
100	2	149.68	36342.58	190.64	0.7596	69
100	3	225.64	89444.52	299.07	-0.0243	69
100	4	111.85	21221.02	145.67	-0.598	87

Table B.23: Result metrics for the  $Sent_c$  model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	201.22	62120.88	249.24	0.8779	66
2	2	148.87	34895.28	186.8	0.7519	91
2	3	108.75	27638.8	166.25	0.6658	68
2	4	56.64	7166.42	84.65	0.4952	67
5	1	200.65	63840.7	252.67	0.8745	66
5	2	251.44	94682.23	307.7	0.3268	66
5	3	133.47	36960.24	192.25	0.5531	81
5	4	126.53	25314.93	159.11	-0.7832	78
10	1	236.33	86333.03	293.82	0.8303	69
10	2	291.65	138998.4	372.82	0.0117	83
10	3	180.78	53517.04	231.34	0.353	78
10	4	177.08	42695.92	206.63	-2.0076	77
25	1	473.41	335150.47	578.92	0.3413	80
25	2	393.43	263088.84	512.92	-0.8705	104
25	3	169.26	52043.56	228.13	0.3708	67
25	4	186.85	66210.33	257.31	-3.664	68
50	1	247.73	102242.85	319.75	0.7991	66
50	2	278.06	127373.02	356.89	0.0944	70
50	3	244.68	102714.65	320.49	-0.2418	84
50	4	170.04	38969.19	197.41	-1.7451	68
100	1	752.32	964449.94	982.06	-0.8954	65
100	2	352.35	187079.4	432.53	-0.3301	78
100	3	200.1	76329.74	276.28	0.0772	69
100	4	123.24	30143.78	173.62	-1.1234	67

Table B.24: Result metrics for the  $Sent_c$  model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.2.2 The Time Differenced Sentiment Model  $Sent_{td}$** 

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	10.48	297.89	17.26	-0.0006	152
2	2	11.83	363.36	19.06	-0.0017	138
2	3	8.45	214.98	14.66	-0.0008	173
2	4	4.56	91.61	9.57	-0.0009	106
5	1	10.48	297.82	17.26	-0.0004	290
5	2	11.83	363.36	19.06	-0.0017	164
5	3	8.45	215.16	14.67	-0.0016	133
5	4	4.7	92.9	9.64	-0.0149	79
10	1	10.48	297.85	17.26	-0.0005	262
10	2	11.84	363.57	19.07	-0.0023	170
10	3	8.45	214.98	14.66	-0.0008	165
10	4	4.55	91.56	9.57	-0.0004	67
25	1	10.48	297.79	17.26	-0.0003	205
25	2	11.83	363.23	19.06	-0.0013	227
25	3	8.45	214.99	14.66	-0.0008	86
25	4	4.58	91.76	9.58	-0.0025	84
50	1	10.48	297.8	17.26	-0.0003	151
50	2	11.83	363.23	19.06	-0.0013	99
50	3	8.45	215.01	14.66	-0.0009	213
50	4	4.56	91.62	9.57	-0.001	78
100	1	10.48	297.77	17.26	-0.0002	149
100	2	11.83	363.11	19.06	-0.001	183
100	3	8.45	214.98	14.66	-0.0008	102
100	4	4.59	91.84	9.58	-0.0034	73

Table B.25: Result metrics for the  $Sent_{td}$  model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	17.48	906.27	30.1	-0.0013	67
2	2	19.83	1010.89	31.79	-0.001	81
2	3	14.77	742.62	27.25	-0.006	78
2	4	7.4	263.42	16.23	-0.0005	72
5	1	17.47	906.0	30.1	-0.001	67
5	2	19.84	1010.97	31.8	-0.001	71
5	3	14.86	745.6	27.31	-0.0101	78
5	4	7.48	264.26	16.26	-0.0037	67
10	1	17.48	906.46	30.11	-0.0015	79
10	2	19.84	1011.28	31.8	-0.0013	77
10	3	14.82	744.26	27.28	-0.0083	99
10	4	7.49	264.42	16.26	-0.0043	94
25	1	17.51	907.84	30.13	-0.0031	80
25	2	19.84	1010.95	31.8	-0.001	78
25	3	14.75	742.19	27.24	-0.0055	72
25	4	7.51	264.68	16.27	-0.0053	70
50	1	17.47	906.06	30.1	-0.0011	96
50	2	19.83	1010.74	31.79	-0.0008	74
50	3	14.85	745.06	27.3	-0.0094	79
50	4	7.61	265.99	16.31	-0.0102	72
100	1	17.47	906.09	30.1	-0.0011	89
100	2	19.84	1010.37	31.79	-0.0004	69
100	3	14.82	744.37	27.28	-0.0084	88
100	4	7.5	264.54	16.26	-0.0048	69

Table B.26: Result metrics for the  $Sent_{td}$  model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	25.12	1823.51	42.7	-0.0076	78
2	2	28.62	2063.99	45.43	-0.0	75
2	3	20.11	1178.11	34.32	-0.0074	68
2	4	9.87	466.44	21.6	-0.0	69
5	1	25.1	1822.31	42.69	-0.007	68
5	2	28.61	2063.96	45.43	-0.0	89
5	3	20.06	1174.94	34.28	-0.0047	74
5	4	9.87	466.44	21.6	-0.0	76
10	1	25.06	1819.25	42.65	-0.0053	80
10	2	28.67	2065.0	45.44	-0.0005	78
10	3	20.02	1170.49	34.21	-0.0009	73
10	4	9.87	466.46	21.6	-0.0001	85
25	1	25.06	1819.62	42.66	-0.0055	83
25	2	28.63	2064.18	45.43	-0.0001	71
25	3	20.05	1173.81	34.26	-0.0038	69
25	4	9.87	466.43	21.6	-0.0	124
50	1	25.07	1820.31	42.67	-0.0059	88
50	2	28.6	2064.01	45.43	-0.0	72
50	3	20.06	1174.97	34.28	-0.0048	69
50	4	9.88	466.49	21.6	-0.0001	79
100	1	25.05	1818.23	42.64	-0.0047	96
100	2	28.63	2064.24	45.43	-0.0001	72
100	3	20.05	1174.48	34.27	-0.0043	86
100	4	9.87	466.43	21.6	-0.0	67

Table B.27: Result metrics for the  $Sent_{td}$  model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	36.07	3739.57	61.15	-0.0069	123
2	2	42.16	4291.12	65.51	-0.0001	88
2	3	29.38	2162.5	46.5	-0.0	78
2	4	12.84	559.72	23.66	-0.0	66
5	1	36.08	3741.15	61.16	-0.0073	67
5	2	42.15	4290.96	65.51	-0.0	106
5	3	29.38	2162.53	46.5	-0.0001	87
5	4	12.84	559.79	23.66	-0.0001	69
10	1	36.07	3740.17	61.16	-0.0071	107
10	2	42.15	4291.02	65.51	-0.0001	84
10	3	29.38	2162.54	46.5	-0.0001	80
10	4	12.84	559.72	23.66	-0.0	77
25	1	36.08	3740.72	61.16	-0.0072	103
25	2	42.15	4290.93	65.51	-0.0	66
25	3	29.38	2162.5	46.5	-0.0	120
25	4	12.84	559.74	23.66	-0.0	67
50	1	36.06	3738.79	61.15	-0.0067	120
50	2	42.15	4290.95	65.51	-0.0	114
50	3	29.38	2162.67	46.5	-0.0001	92
50	4	12.84	559.81	23.66	-0.0002	73
100	1	35.99	3733.59	61.1	-0.0053	126
100	2	42.11	4290.76	65.5	0.0	75
100	3	29.38	2162.58	46.5	-0.0001	86
100	4	12.84	559.75	23.66	-0.0001	69

Table B.28: Result metrics for the  $Sent_{td}$  model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	45.24	6168.64	78.54	-0.0113	118
2	2	53.55	6324.53	79.53	-0.0002	80
2	3	34.72	3209.44	56.65	-0.0	99
2	4	14.88	871.35	29.52	-0.0007	93
5	1	45.25	6170.22	78.55	-0.0116	156
5	2	53.53	6324.24	79.53	-0.0002	105
5	3	34.7	3209.35	56.65	-0.0	92
5	4	14.87	871.34	29.52	-0.0006	67
10	1	45.1	6151.26	78.43	-0.0085	71
10	2	53.45	6323.19	79.52	-0.0	66
10	3	34.64	3209.36	56.65	-0.0	108
10	4	14.85	870.94	29.51	-0.0002	78
25	1	45.11	6153.11	78.44	-0.0088	79
25	2	53.44	6323.2	79.52	-0.0	71
25	3	34.64	3209.34	56.65	-0.0	75
25	4	14.85	870.92	29.51	-0.0002	73
50	1	45.07	6147.28	78.4	-0.0078	67
50	2	59.83	7170.91	84.68	-0.1341	101
50	3	36.34	3565.04	59.71	-0.1108	117
50	4	17.95	1215.61	34.87	-0.396	105
100	1	45.0	6138.74	78.35	-0.0064	97
100	2	53.48	6323.4	79.52	-0.0	66
100	3	34.69	3209.31	56.65	-0.0	75
100	4	14.85	870.99	29.51	-0.0002	69

Table B.29: Result metrics for the  $Sent_{td}$  model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	69.46	12005.83	109.57	-0.0022	67
2	2	82.05	13862.14	117.74	-0.0397	101
2	3	52.61	6344.17	79.65	-0.0071	69
2	4	24.22	1917.21	43.79	-0.144	69
5	1	70.28	12336.94	111.07	-0.0299	66
5	2	79.85	13258.04	115.14	0.0056	98
5	3	52.73	6481.79	80.51	-0.0289	70
5	4	26.51	2078.66	45.59	-0.2403	80
10	1	69.24	12252.42	110.69	-0.0228	66
10	2	85.4	14395.73	119.98	-0.0797	85
10	3	51.97	6780.37	82.34	-0.0763	79
10	4	25.0	1960.79	44.28	-0.17	69
25	1	68.71	12167.12	110.3	-0.0157	70
25	2	81.91	13337.06	115.49	-0.0003	71
25	3	51.84	6299.66	79.37	-0.0	85
25	4	21.82	1679.68	40.98	-0.0023	90
50	1	68.7	12327.53	111.03	-0.0291	66
50	2	97.54	16770.24	129.5	-0.2578	87
50	3	84.66	12894.52	113.55	-1.0469	68
50	4	66.77	7524.96	86.75	-3.4901	71
100	1	68.18	12029.1	109.68	-0.0042	66
100	2	81.02	13342.63	115.51	-0.0007	81
100	3	51.09	6310.76	79.44	-0.0018	90
100	4	21.43	1676.45	40.94	-0.0003	67

Table B.30: Result metrics for the  $Sent_{td}$  model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	106.0	26895.74	164.0	-0.0557	69
2	2	110.45	20553.88	143.37	-0.0254	80
2	3	86.9	15034.25	122.61	-0.1508	67
2	4	42.02	4553.5	67.48	-0.387	70
5	1	103.89	26439.38	162.6	-0.0378	67
5	2	117.57	24167.34	155.46	-0.2056	72
5	3	90.09	16363.66	127.92	-0.2526	69
5	4	50.16	6024.04	77.61	-0.835	92
10	1	102.38	26319.74	162.23	-0.0331	66
10	2	115.54	24640.22	156.97	-0.2292	96
10	3	112.63	21719.74	147.38	-0.6625	68
10	4	65.62	8610.97	92.8	-1.623	74
25	1	102.68	26061.47	161.44	-0.023	67
25	2	111.22	20074.24	141.68	-0.0015	74
25	3	79.04	13144.73	114.65	-0.0062	68
25	4	30.34	3288.32	57.34	-0.0017	94
50	1	110.04	27809.46	166.76	-0.0916	76
50	2	159.31	43019.72	207.41	-1.1461	74
50	3	145.31	35705.4	188.96	-1.7331	101
50	4	85.51	12368.98	111.22	-2.7677	68
100	1	109.59	27944.02	167.16	-0.0969	66
100	2	112.73	20250.8	142.31	-0.0103	80
100	3	145.35	35988.48	189.71	-1.7547	92
100	4	74.22	8464.85	92.0	-1.5785	68

Table B.31: Result metrics for the  $Sent_{td}$  model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	168.51	62008.98	249.02	-0.108	89
2	2	147.41	33101.53	181.94	0.0443	68
2	3	130.37	39924.5	199.81	-0.4119	81
2	4	84.58	13008.87	114.06	-0.7046	75
5	1	174.01	58152.38	241.15	-0.0391	66
5	2	170.95	45347.65	212.95	-0.3093	76
5	3	130.25	38710.56	196.75	-0.369	66
5	4	103.55	16809.79	129.65	-1.2026	73
10	1	183.78	63903.96	252.79	-0.1419	74
10	2	172.94	48948.4	221.24	-0.4132	73
10	3	110.36	31386.31	177.16	-0.11	68
10	4	92.62	17202.17	131.16	-1.254	77
25	1	172.52	57619.96	240.04	-0.0296	66
25	2	249.69	107843.02	328.39	-2.1136	85
25	3	222.03	84029.88	289.88	-1.9717	69
25	4	117.17	21086.86	145.21	-1.7631	67
50	1	178.2	63465.86	251.92	-0.1341	78
50	2	188.22	58901.04	242.7	-0.7006	78
50	3	205.15	74876.25	273.64	-1.648	84
50	4	103.38	19459.6	139.5	-1.5498	66
100	1	185.19	59336.98	243.59	-0.0603	74
100	2	149.1	36779.89	191.78	-0.0619	74
100	3	124.6	33191.78	182.19	-0.1738	94
100	4	116.64	22710.18	150.7	-1.9758	77

Table B.32: Result metrics for the  $Sent_{td}$  trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.2.3 The Non-Time Differenced Compound Sentiment Model**  
*Comp<sub>c</sub>*

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	92.29	11676.92	108.06	0.9779	70
2	2	169.17	33401.53	182.76	0.795	70
2	3	87.57	9280.31	96.33	0.9049	84
2	4	36.43	1519.12	38.98	0.8859	80
5	1	165.53	38199.78	195.45	0.9278	70
5	2	123.51	18507.43	136.04	0.8864	71
5	3	112.9	15466.57	124.36	0.8414	100
5	4	51.56	3113.87	55.8	0.7661	80
10	1	207.59	61355.0	247.7	0.884	74
10	2	103.18	13311.46	115.38	0.9183	95
10	3	111.39	16279.11	127.59	0.8331	104
10	4	66.95	5530.88	74.37	0.5846	81
25	1	230.51	79663.7	282.25	0.8494	66
25	2	84.26	12325.87	111.02	0.9243	72
25	3	112.75	22114.64	148.71	0.7733	80
25	4	69.53	5199.34	72.11	0.6095	86
50	1	232.56	85936.2	293.15	0.8375	69
50	2	137.97	23512.26	153.34	0.8557	76
50	3	97.75	16562.92	128.7	0.8302	70
50	4	58.12	4280.1	65.42	0.6786	68
100	1	260.67	98828.16	314.37	0.8131	105
100	2	108.37	18868.88	137.36	0.8842	73
100	3	116.37	22373.55	149.58	0.7706	104
100	4	84.81	8261.75	90.89	0.3795	79

Table B.33: Result metrics for the *Comp<sub>c</sub>* model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	67.07	8168.29	90.38	0.9846	76
2	2	29.66	1692.65	41.14	0.9896	81
2	3	25.18	1306.03	36.14	0.9866	75
2	4	12.52	426.99	20.66	0.9678	93
5	1	58.46	5004.22	70.74	0.9905	80
5	2	30.65	2027.59	45.03	0.9875	66
5	3	19.5	1138.42	33.74	0.9883	85
5	4	12.17	461.35	21.48	0.9653	80
10	1	74.43	10484.88	102.4	0.9802	89
10	2	31.78	2127.99	46.13	0.9869	83
10	3	29.62	1773.43	42.11	0.9818	83
10	4	10.04	414.93	20.37	0.9688	70
25	1	53.9	5538.51	74.42	0.9895	66
25	2	52.96	4722.69	68.72	0.9709	74
25	3	34.86	2425.18	49.25	0.9751	71
25	4	17.12	748.06	27.35	0.9437	88
50	1	71.57	8519.39	92.3	0.9839	71
50	2	51.05	4550.58	67.46	0.9719	68
50	3	35.47	2648.98	51.47	0.9728	67
50	4	20.87	978.91	31.29	0.9263	80
100	1	168.43	42196.64	205.42	0.9202	82
100	2	69.93	7878.82	88.76	0.9514	93
100	3	80.33	9880.58	99.4	0.8986	82
100	4	17.62	802.62	28.33	0.9396	66

Table B.34: Result metrics for the  $Comp_c$  model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	49.59	4818.01	69.41	0.9909	79
2	2	55.07	4473.93	66.89	0.9722	79
2	3	24.81	1524.78	39.05	0.9843	69
2	4	35.75	1698.99	41.22	0.8715	71
5	1	67.85	7317.21	85.54	0.9862	71
5	2	54.8	4594.26	67.78	0.9715	70
5	3	23.82	1602.19	40.03	0.9835	87
5	4	14.08	659.13	25.67	0.9502	77
10	1	60.52	6624.46	81.39	0.9875	85
10	2	53.11	4569.9	67.6	0.9716	84
10	3	27.22	1841.2	42.91	0.981	83
10	4	65.7	4897.51	69.98	0.6297	70
25	1	88.35	12481.06	111.72	0.9764	68
25	2	46.99	4502.41	67.1	0.9721	66
25	3	30.55	2318.86	48.15	0.9761	69
25	4	18.3	861.63	29.35	0.9349	73
50	1	79.46	9732.7	98.65	0.9816	76
50	2	79.64	9094.14	95.36	0.9435	82
50	3	70.75	7380.46	85.91	0.9239	69
50	4	39.46	2199.94	46.9	0.8337	69
100	1	124.85	23595.73	153.61	0.9554	67
100	2	127.85	22624.57	150.41	0.8596	82
100	3	80.85	9107.76	95.43	0.9061	68
100	4	29.2	1531.84	39.14	0.8842	67

Table B.35: Result metrics for the  $Comp_c$  model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	81.22	12235.15	110.61	0.9768	75
2	2	46.2	4626.36	68.02	0.9711	94
2	3	32.77	2558.78	50.58	0.9733	80
2	4	14.39	645.36	25.4	0.9508	75
5	1	93.53	15989.12	126.45	0.9697	72
5	2	50.19	5215.67	72.22	0.9674	71
5	3	33.13	2723.35	52.19	0.9716	67
5	4	15.76	750.33	27.39	0.9429	101
10	1	94.66	16064.07	126.74	0.9696	68
10	2	55.21	6024.11	77.62	0.9623	79
10	3	35.18	2793.02	52.85	0.9709	73
10	4	19.98	946.51	30.77	0.9279	74
25	1	89.38	13034.92	114.17	0.9753	68
25	2	62.69	7162.26	84.63	0.9552	66
25	3	42.34	4009.63	63.32	0.9582	74
25	4	24.3	1261.03	35.51	0.904	67
50	1	128.92	26835.84	163.82	0.9492	76
50	2	67.58	8479.32	92.08	0.947	77
50	3	43.85	4556.63	67.5	0.9525	80
50	4	33.22	2061.32	45.4	0.843	79
100	1	119.09	22731.44	150.77	0.9569	77
100	2	77.62	11573.04	107.58	0.9276	67
100	3	47.88	4736.84	68.82	0.9506	67
100	4	33.59	2102.55	45.85	0.8399	78

Table B.36: Result metrics for the  $Comp_c$  model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	72.78	9524.7	97.59	0.9818	69
2	2	54.95	6727.96	82.02	0.9578	72
2	3	41.22	3806.28	61.7	0.9608	82
2	4	17.21	1027.17	32.05	0.9216	83
5	1	80.92	11823.11	108.73	0.9774	69
5	2	59.19	7349.28	85.73	0.9539	75
5	3	41.44	4225.8	65.01	0.9564	78
5	4	21.34	1239.74	35.21	0.9053	85
10	1	85.42	12648.58	112.47	0.9758	73
10	2	61.8	7774.31	88.17	0.9512	78
10	3	43.29	4313.96	65.68	0.9555	74
10	4	20.9	1213.52	34.84	0.9073	70
25	1	89.16	12628.0	112.37	0.9759	78
25	2	67.35	8936.92	94.54	0.9439	72
25	3	43.33	4511.46	67.17	0.9535	68
25	4	24.88	1498.44	38.71	0.8856	71
50	1	125.34	23249.06	152.48	0.9556	72
50	2	76.43	11763.8	108.46	0.9262	80
50	3	51.78	6622.94	81.38	0.9317	79
50	4	28.93	1858.45	43.11	0.8581	86
100	1	165.33	37368.63	193.31	0.9286	81
100	2	85.14	13606.86	116.65	0.9146	76
100	3	55.1	7349.77	85.73	0.9242	73
100	4	25.29	1635.61	40.44	0.8751	70

Table B.37: Result metrics for the  $Comp_c$  model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	101.47	17111.57	130.81	0.9674	66
2	2	81.85	13183.23	114.82	0.916	72
2	3	54.19	6956.95	83.41	0.9264	69
2	4	23.39	1827.14	42.75	0.8582	74
5	1	103.24	17824.5	133.51	0.9661	70
5	2	84.99	14034.6	118.47	0.9106	83
5	3	54.97	6694.61	81.82	0.9291	69
5	4	23.11	1788.61	42.29	0.8612	66
10	1	98.46	15687.09	125.25	0.9701	97
10	2	85.94	14345.58	119.77	0.9086	92
10	3	58.75	7603.85	87.2	0.9195	84
10	4	26.8	1960.33	44.28	0.8479	67
25	1	121.66	22337.63	149.46	0.9575	74
25	2	97.03	16788.25	129.57	0.893	71
25	3	63.18	8905.32	94.37	0.9057	74
25	4	28.57	2236.18	47.29	0.8264	69
50	1	146.51	31480.2	177.43	0.9401	86
50	2	102.93	19181.92	138.5	0.8778	70
50	3	70.61	10369.77	101.83	0.8902	81
50	4	34.71	2761.03	52.55	0.7857	66
100	1	200.79	54033.84	232.45	0.8971	82
100	2	138.53	34577.79	185.95	0.7796	72
100	3	83.22	17988.38	134.12	0.8096	71
100	4	38.79	3250.41	57.01	0.7477	79

Table B.38: Result metrics for the  $Comp_c$  model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	133.42	31496.37	177.47	0.9402	74
2	2	108.95	19921.54	141.14	0.8682	70
2	3	76.15	12360.49	111.18	0.8584	92
2	4	34.59	3389.47	58.22	0.7448	92
5	1	127.02	30484.01	174.6	0.9421	107
5	2	109.82	20319.01	142.54	0.8656	76
5	3	75.63	12858.89	113.4	0.8527	71
5	4	36.43	3722.0	61.01	0.7197	73
10	1	144.05	32742.89	180.95	0.9378	68
10	2	120.94	25197.66	158.74	0.8333	80
10	3	93.85	16925.03	130.1	0.8062	69
10	4	39.61	4480.24	66.93	0.6626	73
25	1	232.71	70854.35	266.18	0.8654	105
25	2	140.35	29944.64	173.05	0.8019	74
25	3	99.51	17874.66	133.7	0.7953	66
25	4	50.26	5393.11	73.44	0.5939	101
50	1	297.21	111579.54	334.04	0.7881	78
50	2	132.3	26181.4	161.81	0.8268	71
50	3	117.16	29047.88	170.43	0.6673	78
50	4	60.36	7277.97	85.31	0.452	94
100	1	245.08	88472.99	297.44	0.832	110
100	2	186.88	54436.8	233.32	0.6399	66
100	3	160.03	45000.09	212.13	0.4847	74
100	4	194.75	51062.26	225.97	-2.8451	72

Table B.39: Result metrics for the  $Comp_c$  model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	182.06	57513.91	239.82	0.887	66
2	2	126.5	29774.07	172.55	0.7883	89
2	3	111.9	28544.57	168.95	0.6549	74
2	4	49.36	7898.68	88.87	0.4436	74
5	1	181.44	60234.14	245.43	0.8816	66
5	2	275.8	113131.48	336.35	0.1957	73
5	3	121.04	30509.07	174.67	0.6311	66
5	4	88.74	14742.83	121.42	-0.0385	67
10	1	210.66	66568.12	258.01	0.8692	67
10	2	505.09	345149.25	587.49	-1.454	66
10	3	138.92	38815.73	197.02	0.5307	70
10	4	105.04	19168.58	138.45	-0.3503	81
25	1	406.25	215453.36	464.17	0.5766	115
25	2	576.39	454365.38	674.07	-2.2305	92
25	3	179.71	55136.64	234.81	0.3334	73
25	4	146.66	39841.53	199.6	-1.8065	70
50	1	308.8	162910.0	403.62	0.6798	66
50	2	246.86	99017.9	314.67	0.296	70
50	3	186.03	62060.82	249.12	0.2497	66
50	4	100.08	18581.72	136.31	-0.3089	69
100	1	752.17	964178.5	981.93	-0.8949	65
100	2	454.8	267787.38	517.48	-0.9039	66
100	3	179.04	51488.65	226.91	0.3775	86
100	4	99.64	17421.49	131.99	-0.2272	67

Table B.40: Result metrics for the  $Comp_c$  model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.2.4 The Time Differenced Compound Sentiment Model  $Comp_{td}$** 

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	10.48	297.81	17.26	-0.0004	331
2	2	11.83	363.38	19.06	-0.0018	271
2	3	8.45	215.11	14.67	-0.0014	232
2	4	4.58	91.8	9.58	-0.003	114
5	1	10.48	297.84	17.26	-0.0005	271
5	2	11.83	363.14	19.06	-0.0011	280
5	3	8.45	215.01	14.66	-0.0009	142
5	4	4.56	91.65	9.57	-0.0013	67
10	1	10.48	297.76	17.26	-0.0002	130
10	2	11.83	363.09	19.05	-0.001	240
10	3	8.45	215.0	14.66	-0.0008	88
10	4	4.55	91.55	9.57	-0.0002	70
25	1	10.48	297.84	17.26	-0.0005	323
25	2	11.84	363.78	19.07	-0.0029	156
25	3	8.46	215.24	14.67	-0.002	69
25	4	4.66	92.46	9.62	-0.0102	132
50	1	10.48	297.79	17.26	-0.0003	233
50	2	11.83	363.22	19.06	-0.0013	132
50	3	8.46	215.23	14.67	-0.0019	127
50	4	4.6	91.94	9.59	-0.0045	112
100	1	10.48	297.8	17.26	-0.0004	375
100	2	11.84	363.69	19.07	-0.0026	242
100	3	8.46	215.23	14.67	-0.0019	95
100	4	4.65	92.35	9.61	-0.009	214

Table B.41: Result metrics for the  $Comp_{td}$  model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	17.52	908.03	30.13	-0.0033	89
2	2	19.84	1010.97	31.8	-0.001	81
2	3	14.76	742.44	27.25	-0.0058	73
2	4	7.36	263.34	16.23	-0.0002	70
5	1	17.51	907.72	30.13	-0.0029	72
5	2	19.83	1010.65	31.79	-0.0007	75
5	3	14.79	743.43	27.27	-0.0071	79
5	4	7.37	263.3	16.23	-0.0	81
10	1	17.51	907.57	30.13	-0.0028	71
10	2	19.83	1010.72	31.79	-0.0008	90
10	3	14.83	744.7	27.29	-0.0089	74
10	4	7.38	263.3	16.23	-0.0	69
25	1	17.51	907.83	30.13	-0.0031	67
25	2	19.83	1010.8	31.79	-0.0009	86
25	3	14.86	745.43	27.3	-0.0098	76
25	4	7.38	263.3	16.23	-0.0	96
50	1	17.51	907.53	30.13	-0.0027	89
50	2	19.84	1010.36	31.79	-0.0004	67
50	3	14.85	745.22	27.3	-0.0096	68
50	4	7.4	263.43	16.23	-0.0005	69
100	1	17.52	907.98	30.13	-0.0032	70
100	2	19.84	1010.31	31.79	-0.0004	66
100	3	14.79	743.17	27.26	-0.0068	121
100	4	7.37	263.3	16.23	-0.0	94

Table B.42: Result metrics for the  $Comp_{td}$  model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	25.05	1818.24	42.64	-0.0047	74
2	2	28.65	2064.58	45.44	-0.0003	88
2	3	20.04	1173.29	34.25	-0.0033	82
2	4	9.87	466.43	21.6	-0.0	66
5	1	25.01	1815.3	42.61	-0.0031	71
5	2	28.66	2064.77	45.44	-0.0004	68
5	3	20.06	1174.6	34.27	-0.0044	80
5	4	9.87	466.43	21.6	-0.0	74
10	1	25.1	1821.88	42.68	-0.0067	75
10	2	28.69	2065.86	45.45	-0.0009	86
10	3	20.06	1175.36	34.28	-0.0051	86
10	4	9.87	466.48	21.6	-0.0001	78
25	1	25.08	1820.91	42.67	-0.0062	95
25	2	28.63	2064.21	45.43	-0.0001	66
25	3	20.06	1175.15	34.28	-0.0049	90
25	4	9.88	466.49	21.6	-0.0002	77
50	1	25.09	1821.23	42.68	-0.0064	88
50	2	28.66	2064.79	45.44	-0.0004	68
50	3	20.03	1172.23	34.24	-0.0024	66
50	4	9.87	466.43	21.6	-0.0	68
100	1	25.13	1824.08	42.71	-0.0079	70
100	2	28.67	2065.13	45.44	-0.0006	68
100	3	20.04	1172.93	34.25	-0.003	68
100	4	9.87	466.44	21.6	-0.0	75

Table B.43: Result metrics for the the *Comp<sub>td</sub>* model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	36.06	3739.47	61.15	-0.0069	99
2	2	42.16	4291.15	65.51	-0.0001	69
2	3	29.38	2162.44	46.5	-0.0	70
2	4	12.84	559.72	23.66	-0.0	86
5	1	36.09	3741.18	61.17	-0.0073	69
5	2	42.18	4291.32	65.51	-0.0001	89
5	3	29.45	2176.77	46.66	-0.0066	66
5	4	12.85	560.07	23.67	-0.0006	67
10	1	36.08	3740.48	61.16	-0.0071	121
10	2	42.16	4291.04	65.51	-0.0001	80
10	3	29.38	2162.5	46.5	-0.0	82
10	4	12.84	559.72	23.66	-0.0	73
25	1	36.08	3740.72	61.16	-0.0072	118
25	2	42.14	4290.91	65.51	-0.0	94
25	3	29.38	2162.47	46.5	-0.0	80
25	4	12.84	559.73	23.66	-0.0	67
50	1	36.05	3738.43	61.14	-0.0066	77
50	2	42.17	4291.2	65.51	-0.0001	97
50	3	29.38	2162.62	46.5	-0.0001	103
50	4	12.84	559.94	23.66	-0.0004	75
100	1	35.99	3733.48	61.1	-0.0053	111
100	2	42.12	4290.78	65.5	-0.0	81
100	3	29.37	2164.63	46.53	-0.001	68
100	4	12.84	559.72	23.66	-0.0	71

Table B.44: Result metrics for the  $Comp_{td}$  model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	45.24	6169.24	78.54	-0.0114	95
2	2	53.54	6324.5	79.53	-0.0002	69
2	3	34.73	3209.48	56.65	-0.0001	89
2	4	14.88	871.43	29.52	-0.0007	87
5	1	45.25	6170.67	78.55	-0.0117	139
5	2	53.53	6324.22	79.52	-0.0002	74
5	3	34.7	3209.35	56.65	-0.0	68
5	4	14.88	871.39	29.52	-0.0007	66
10	1	45.1	6151.43	78.43	-0.0085	100
10	2	53.45	6323.19	79.52	-0.0	70
10	3	34.64	3209.36	56.65	-0.0	94
10	4	14.85	870.95	29.51	-0.0002	79
25	1	45.12	6153.7	78.45	-0.0089	132
25	2	53.43	6323.21	79.52	-0.0	85
25	3	34.65	3209.33	56.65	-0.0	111
25	4	14.85	870.93	29.51	-0.0002	76
50	1	45.11	6152.98	78.44	-0.0088	127
50	2	53.51	6323.86	79.52	-0.0001	86
50	3	34.7	3209.34	56.65	-0.0	73
50	4	14.86	871.06	29.51	-0.0003	97
100	1	45.0	6138.71	78.35	-0.0064	79
100	2	53.48	6323.42	79.52	-0.0	67
100	3	34.69	3209.31	56.65	-0.0	83
100	4	14.85	870.98	29.51	-0.0002	66

Table B.45: Result metrics for the  $Comp_{td}$  model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	69.85	12397.19	111.34	-0.0349	71
2	2	82.12	13649.85	116.83	-0.0238	78
2	3	53.05	6471.64	80.45	-0.0273	78
2	4	23.23	1767.75	42.04	-0.0548	66
5	1	68.8	12185.98	110.39	-0.0173	79
5	2	79.04	12849.32	113.35	0.0363	74
5	3	52.68	6476.31	80.48	-0.028	131
5	4	23.31	1848.73	43.0	-0.1031	84
10	1	69.25	12252.97	110.69	-0.0229	69
10	2	81.78	13334.69	115.48	-0.0001	68
10	3	51.68	6300.02	79.37	-0.0001	72
10	4	21.65	1676.91	40.95	-0.0006	69
25	1	68.69	12162.79	110.29	-0.0154	77
25	2	81.9	13337.01	115.49	-0.0003	75
25	3	51.84	6299.66	79.37	-0.0	72
25	4	21.82	1679.68	40.98	-0.0023	77
50	1	68.47	12119.13	110.09	-0.0117	66
50	2	81.69	13333.57	115.47	-0.0001	66
50	3	51.92	6299.84	79.37	-0.0	66
50	4	21.7	1677.54	40.96	-0.001	87
100	1	68.18	12030.49	109.68	-0.0043	66
100	2	81.02	13342.68	115.51	-0.0007	169
100	3	51.08	6310.9	79.44	-0.0018	86
100	4	21.43	1676.45	40.94	-0.0003	87

Table B.46: Result metrics for the  $Comp_{td}$  model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	104.75	27113.3	164.66	-0.0643	117
2	2	107.86	19374.55	139.19	0.0335	79
2	3	84.99	14153.12	118.97	-0.0834	81
2	4	36.79	3740.57	61.16	-0.1394	66
5	1	104.3	28091.3	167.6	-0.1026	92
5	2	107.87	19736.86	140.49	0.0154	75
5	3	83.68	13998.2	118.31	-0.0715	72
5	4	34.51	3514.22	59.28	-0.0705	90
10	1	102.71	26218.91	161.92	-0.0292	69
10	2	112.18	21581.66	146.91	-0.0767	66
10	3	87.41	14721.55	121.33	-0.1269	66
10	4	37.38	4121.89	64.2	-0.2556	169
25	1	102.68	26061.78	161.44	-0.023	80
25	2	111.2	20073.06	141.68	-0.0014	70
25	3	85.24	14668.75	121.11	-0.1228	66
25	4	40.95	4033.44	63.51	-0.2286	68
50	1	102.26	25818.4	160.68	-0.0134	69
50	2	109.41	20112.09	141.82	-0.0033	66
50	3	79.21	13127.12	114.57	-0.0048	79
50	4	29.7	3284.41	57.31	-0.0005	70
100	1	108.31	27632.92	166.23	-0.0847	77
100	2	112.19	20364.18	142.7	-0.0159	83
100	3	109.54	23653.22	153.8	-0.8105	75
100	4	80.08	10834.03	104.09	-2.3001	75

Table B.47: Result metrics for the  $Compt_d$  model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	171.6	60175.91	245.31	-0.0753	68
2	2	134.53	30922.24	175.85	0.1072	70
2	3	134.35	33700.27	183.58	-0.1918	67
2	4	73.17	10657.6	103.24	-0.3965	66
5	1	178.58	61971.74	248.94	-0.1074	79
5	2	136.26	32660.06	180.72	0.057	67
5	3	124.65	32471.91	180.2	-0.1484	66
5	4	73.41	11878.57	108.99	-0.5565	71
10	1	172.96	59270.26	243.45	-0.0591	68
10	2	142.89	33311.52	182.51	0.0382	66
10	3	117.94	31168.2	176.55	-0.1023	66
10	4	88.06	15346.81	123.88	-1.0109	71
25	1	175.66	67307.29	259.44	-0.2027	165
25	2	168.01	50536.2	224.8	-0.4591	84
25	3	150.75	54313.88	233.05	-0.9208	66
25	4	138.68	31120.48	176.41	-3.0778	76
50	1	183.6	66452.22	257.78	-0.1874	76
50	2	194.09	63128.86	251.25	-0.8227	96
50	3	190.78	68950.12	262.58	-1.4384	83
50	4	82.94	12172.82	110.33	-0.595	70
100	1	184.61	59250.99	243.42	-0.0588	77
100	2	149.32	35346.16	188.01	-0.0205	66
100	3	113.59	31333.08	177.01	-0.1081	67
100	4	98.13	17528.85	132.4	-1.2968	68

Table B.48: Result metrics for the  $Comp_{td}$  model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

### B.3 Volume Models Results

#### B.3.1 The Non-Time Differenced Original Tweet Volume Model *VolumeOrg<sub>c</sub>*

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	75.91	8772.55	93.66	0.9834	86
2	2	182.98	38319.1	195.75	0.7648	73
2	3	119.08	16269.71	127.55	0.8332	67
2	4	35.27	1694.68	41.17	0.8727	79
5	1	125.89	25404.27	159.39	0.952	73
5	2	141.18	23245.96	152.47	0.8573	74
5	3	83.51	9132.99	95.57	0.9064	79
5	4	26.43	1018.25	31.91	0.9235	99
10	1	146.06	29418.07	171.52	0.9444	74
10	2	81.23	8963.18	94.67	0.945	87
10	3	77.48	9120.07	95.5	0.9065	71
10	4	36.16	1593.83	39.92	0.8803	67
25	1	147.65	30811.05	175.53	0.9417	69
25	2	92.82	11107.29	105.39	0.9318	79
25	3	60.03	5563.24	74.59	0.943	71
25	4	36.03	1893.63	43.52	0.8578	68
50	1	121.46	26456.98	162.66	0.95	66
50	2	82.01	13007.87	114.05	0.9202	74
50	3	68.32	10278.28	101.38	0.8946	66
50	4	47.26	3641.82	60.35	0.7265	71
100	1	157.54	38873.92	197.16	0.9265	66
100	2	131.84	27009.2	164.34	0.8342	67
100	3	68.53	11707.63	108.2	0.88	77
100	4	50.88	3629.32	60.24	0.7274	87

Table B.49: Result metrics for the *VolumeOrg<sub>c</sub>* model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	57.45	5853.16	76.51	0.9889	74
2	2	28.59	1680.29	40.99	0.9896	76
2	3	27.32	1679.58	40.98	0.9828	82
2	4	13.25	449.94	21.21	0.9661	77
5	1	49.82	4174.47	64.61	0.9921	90
5	2	34.32	2352.93	48.51	0.9855	71
5	3	27.99	1575.2	39.69	0.9838	90
5	4	12.63	533.37	23.09	0.9598	80
10	1	59.63	6015.96	77.56	0.9886	78
10	2	33.75	2312.36	48.09	0.9857	83
10	3	27.44	1693.51	41.15	0.9826	71
10	4	12.24	706.67	26.58	0.9468	101
25	1	71.38	8699.71	93.27	0.9835	68
25	2	43.4	3358.84	57.96	0.9793	68
25	3	29.19	1955.92	44.23	0.9799	70
25	4	13.42	879.09	29.65	0.9338	84
50	1	73.04	10736.95	103.62	0.9797	78
50	2	38.13	3034.66	55.09	0.9813	71
50	3	30.29	2279.93	47.75	0.9766	91
50	4	15.12	866.05	29.43	0.9348	71
100	1	72.44	8843.32	94.04	0.9833	69
100	2	83.06	10388.72	101.93	0.936	67
100	3	45.32	3493.51	59.11	0.9641	68
100	4	43.81	4729.3	68.77	0.6439	87

Table B.50: Result metrics for the *VolumeOrg<sub>c</sub>* model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	62.6	7401.92	86.03	0.986	70
2	2	68.09	6141.46	78.37	0.9619	66
2	3	24.03	1471.64	38.36	0.9848	68
2	4	15.45	668.07	25.85	0.9495	75
5	1	47.77	4266.14	65.32	0.9919	70
5	2	40.45	3253.85	57.04	0.9798	76
5	3	23.64	1603.29	40.04	0.9835	76
5	4	21.74	1276.16	35.72	0.9035	66
10	1	66.39	7219.99	84.97	0.9863	107
10	2	50.11	4433.17	66.58	0.9725	67
10	3	24.72	1755.83	41.9	0.9819	66
10	4	17.72	1796.86	42.39	0.8641	85
25	1	51.09	4987.27	70.62	0.9906	87
25	2	45.07	3782.26	61.5	0.9765	101
25	3	28.67	1902.72	43.62	0.9804	79
25	4	25.0	3443.49	58.68	0.7397	91
50	1	62.1	7237.85	85.08	0.9863	76
50	2	46.79	4369.98	66.11	0.9729	75
50	3	28.38	2069.36	45.49	0.9787	86
50	4	41.64	7894.93	88.85	0.4031	73
100	1	247.73	203394.69	450.99	0.6153	66
100	2	82.22	9570.24	97.83	0.9406	69
100	3	38.91	3560.89	59.67	0.9633	92
100	4	78.07	41624.98	204.02	-2.1471	78

Table B.51: Result metrics for the *VolumeOrg<sub>c</sub>* model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	83.34	13269.15	115.19	0.9749	68
2	2	54.39	5755.93	75.87	0.964	74
2	3	32.62	2627.37	51.26	0.9726	71
2	4	16.9	2298.22	47.94	0.825	103
5	1	79.76	11544.8	107.45	0.9781	81
5	2	48.81	5122.96	71.57	0.968	66
5	3	32.14	2655.13	51.53	0.9723	76
5	4	22.97	3564.47	59.7	0.7285	77
10	1	87.5	13752.02	117.27	0.9739	82
10	2	49.32	5236.07	72.36	0.9673	90
10	3	32.47	2667.63	51.65	0.9722	67
10	4	28.04	7078.93	84.14	0.4608	111
25	1	57.54	6459.67	80.37	0.9878	79
25	2	48.27	5249.97	72.46	0.9672	66
25	3	38.11	3294.45	57.4	0.9657	68
25	4	54.21	31938.97	178.71	-1.4326	81
50	1	118.75	22661.82	150.54	0.9571	67
50	2	55.09	5989.26	77.39	0.9625	70
50	3	39.6	3594.69	59.96	0.9625	67
50	4	76.31	25844.1	160.76	-0.9684	104
100	1	192.29	88090.89	296.8	0.8331	71
100	2	70.74	8621.2	92.85	0.9461	84
100	3	49.59	4797.72	69.27	0.95	71
100	4	133.99	55198.85	234.94	-3.2041	78

Table B.52: Result metrics for the *VolumeOrg<sub>c</sub>* model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	88.35	13804.69	117.49	0.9736	80
2	2	57.95	7408.99	86.08	0.9535	88
2	3	40.46	4064.97	63.76	0.9581	68
2	4	23.78	3177.3	56.37	0.7573	69
5	1	79.5	11499.24	107.23	0.978	77
5	2	58.66	7114.34	84.35	0.9554	91
5	3	38.23	3638.98	60.32	0.9625	83
5	4	22.91	1911.16	43.72	0.854	85
10	1	77.38	10647.78	103.19	0.9797	66
10	2	57.95	7182.32	84.75	0.9549	96
10	3	40.47	3779.54	61.48	0.961	86
10	4	42.4	16151.57	127.09	-0.2336	110
25	1	68.42	9334.52	96.62	0.9822	70
25	2	60.9	7569.84	87.0	0.9525	80
25	3	39.12	4107.88	64.09	0.9577	73
25	4	84.99	45443.46	213.17	-2.4707	75
50	1	125.93	22084.32	148.61	0.9578	66
50	2	67.24	8259.67	90.88	0.9482	77
50	3	46.18	4832.42	69.52	0.9502	83
50	4	194.8	169849.69	412.13	-11.9722	73
100	1	272.49	98990.05	314.63	0.8109	68
100	2	88.92	14196.38	119.15	0.9109	67
100	3	52.16	5937.29	77.05	0.9388	84
100	4	248.61	193975.31	440.43	-13.8147	98

Table B.53: Result metrics for the *VolumeOrg<sub>c</sub>* model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	113.05	21199.28	145.6	0.9596	66
2	2	86.08	13341.7	115.51	0.915	77
2	3	56.13	6915.12	83.16	0.9268	73
2	4	38.84	14464.98	120.27	-0.1227	79
5	1	95.31	16180.7	127.2	0.9692	85
5	2	85.15	13399.44	115.76	0.9146	92
5	3	60.02	7022.88	83.8	0.9257	68
5	4	80.03	81232.48	285.01	-5.3047	69
10	1	80.81	14232.51	119.3	0.9729	82
10	2	87.11	13532.8	116.33	0.9138	67
10	3	56.17	7174.59	84.7	0.9241	68
10	4	117.48	95856.81	309.61	-6.4398	71
25	1	119.87	21371.01	146.19	0.9593	82
25	2	86.69	13418.66	115.84	0.9145	67
25	3	61.64	8083.78	89.91	0.9144	69
25	4	244.85	294180.12	542.38	-21.8323	83
50	1	135.67	25810.3	160.66	0.9509	66
50	2	105.7	17916.2	133.85	0.8858	66
50	3	69.64	9623.04	98.1	0.8981	91
50	4	590.85	1040531.2	1020.06	-79.7592	85
100	1	287.18	124917.15	353.44	0.7622	78
100	2	105.97	18699.8	136.75	0.8808	102
100	3	83.86	13478.49	116.1	0.8573	71
100	4	443.22	455015.1	674.55	-34.3153	80

Table B.54: Result metrics for the *VolumeOrg<sub>c</sub>* model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	146.88	37238.86	192.97	0.9293	67
2	2	106.91	18243.8	135.07	0.8793	78
2	3	84.74	13271.77	115.2	0.848	80
2	4	82.71	83214.64	288.47	-5.2662	73
5	1	123.67	30175.53	173.71	0.9427	75
5	2	114.04	19174.25	138.47	0.8732	83
5	3	84.83	13068.64	114.32	0.8503	70
5	4	153.61	170717.02	413.18	-11.8552	66
10	1	128.15	28057.59	167.5	0.9467	66
10	2	118.94	21044.13	145.07	0.8608	111
10	3	92.08	14908.66	122.1	0.8293	77
10	4	294.19	480030.88	692.84	-35.147	78
25	1	152.02	35537.91	188.52	0.9325	74
25	2	120.74	21359.76	146.15	0.8587	74
25	3	95.97	16909.32	130.04	0.8064	71
25	4	558.82	791502.4	889.66	-58.6013	75
50	1	252.41	93455.65	305.71	0.8225	68
50	2	143.52	39919.6	199.8	0.7359	82
50	3	97.35	17461.84	132.14	0.8	80
50	4	804.7	1385771.4	1177.19	-103.3506	78
100	1	300.6	127951.53	357.7	0.757	66
100	2	355.91	201395.45	448.77	-0.3323	67
100	3	133.58	28516.26	168.87	0.6734	67
100	4	981.97	3877172.8	1969.05	-290.9567	81

Table B.55: Result metrics for the *VolumeOrg<sub>c</sub>* model trained to predict the next interval’s price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	182.9	60623.63	246.22	0.8809	66
2	2	134.04	31148.41	176.49	0.7785	74
2	3	108.7	24889.16	157.76	0.6991	70
2	4	152.57	247198.38	497.19	-16.4132	83
5	1	175.43	56145.18	236.95	0.8897	66
5	2	231.84	72311.31	268.91	0.4859	66
5	3	111.8	25411.61	159.41	0.6928	71
5	4	230.05	231710.81	481.36	-15.3222	73
10	1	178.94	56265.08	237.2	0.8894	66
10	2	280.71	115634.44	340.05	0.1779	76
10	3	128.24	29645.0	172.18	0.6416	74
10	4	681.83	1465308.6	1210.5	-102.2194	69
25	1	259.72	92573.99	304.26	0.8181	66
25	2	383.89	171923.27	414.64	-0.2223	66
25	3	109.15	31660.03	177.93	0.6172	66
25	4	903.31	1703651.4	1305.24	-119.0087	70
50	1	225.45	98325.3	313.57	0.8068	75
50	2	553.64	452244.1	672.49	-2.2154	68
50	3	197.6	66330.7	257.55	0.1981	80
50	4	505.07	544805.44	738.11	-37.3772	66
100	1	752.35	964484.75	982.08	-0.8955	65
100	2	561.06	400690.2	633.0	-1.8488	89
100	3	214.71	65606.86	256.14	0.2068	78
100	4	301.83	154284.06	392.79	-9.8681	77

Table B.56: Result metrics for the *VolumeOrg<sub>c</sub>* trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.3.2 The Time Differenced Original Tweet Volume Model**  
*VolumeOrg<sub>td</sub>*

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	10.48	297.8	17.26	-0.0003	196
2	2	11.83	363.37	19.06	-0.0017	188
2	3	8.46	215.25	14.67	-0.002	112
2	4	4.61	92.06	9.6	-0.0059	121
5	1	10.48	297.8	17.26	-0.0003	305
5	2	11.83	363.41	19.06	-0.0019	187
5	3	8.45	215.22	14.67	-0.0019	203
5	4	4.74	93.28	9.66	-0.0192	81
10	1	10.48	297.82	17.26	-0.0004	376
10	2	11.84	363.66	19.07	-0.0025	216
10	3	8.45	215.14	14.67	-0.0015	107
10	4	4.65	92.37	9.61	-0.0092	127
25	1	10.48	297.76	17.26	-0.0002	249
25	2	11.83	363.1	19.06	-0.001	246
25	3	8.45	215.16	14.67	-0.0016	71
25	4	4.66	92.44	9.61	-0.01	70
50	1	10.48	297.79	17.26	-0.0003	186
50	2	11.83	363.16	19.06	-0.0012	130
50	3	8.45	214.99	14.66	-0.0008	274
50	4	4.56	91.64	9.57	-0.0012	82
100	1	10.48	297.83	17.26	-0.0004	299
100	2	11.83	363.12	19.06	-0.001	240
100	3	8.45	214.96	14.66	-0.0007	153
100	4	4.57	91.7	9.58	-0.0018	70

Table B.57: Result metrics for the *VolumeOrg<sub>td</sub>* model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	17.55	909.41	30.16	-0.0048	70
2	2	19.84	1010.93	31.8	-0.001	120
2	3	14.79	743.21	27.26	-0.0068	71
2	4	7.36	263.36	16.23	-0.0003	100
5	1	17.47	906.06	30.1	-0.0011	68
5	2	19.84	1011.08	31.8	-0.0012	71
5	3	14.98	749.23	27.37	-0.015	117
5	4	7.39	263.33	16.23	-0.0001	77
10	1	17.49	907.0	30.12	-0.0021	76
10	2	19.83	1010.8	31.79	-0.0009	83
10	3	14.84	744.77	27.29	-0.009	74
10	4	7.37	263.29	16.23	-0.0	77
25	1	17.51	907.79	30.13	-0.003	99
25	2	19.83	1010.66	31.79	-0.0007	76
25	3	14.85	745.23	27.3	-0.0096	152
25	4	7.38	263.29	16.23	-0.0	81
50	1	17.48	906.29	30.1	-0.0014	86
50	2	19.84	1010.39	31.79	-0.0005	66
50	3	14.84	745.0	27.29	-0.0093	66
50	4	7.38	263.29	16.23	-0.0	73
100	1	17.53	908.63	30.14	-0.0039	68
100	2	19.84	1010.42	31.79	-0.0005	82
100	3	14.79	743.33	27.26	-0.007	75
100	4	7.36	263.35	16.23	-0.0002	71

Table B.58: Result metrics for the *VolumeOrg<sub>td</sub>* model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	25.01	1815.27	42.61	-0.0031	71
2	2	28.65	2064.56	45.44	-0.0003	80
2	3	20.07	1175.57	34.29	-0.0053	89
2	4	9.87	466.45	21.6	-0.0001	71
5	1	25.08	1820.44	42.67	-0.0059	77
5	2	28.59	2064.83	45.44	-0.0004	66
5	3	20.05	1174.03	34.26	-0.0039	103
5	4	9.88	466.58	21.6	-0.0003	94
10	1	25.06	1819.05	42.65	-0.0052	78
10	2	28.69	2065.84	45.45	-0.0009	74
10	3	20.06	1174.64	34.27	-0.0045	66
10	4	9.87	466.44	21.6	-0.0	67
25	1	25.08	1821.04	42.67	-0.0063	82
25	2	28.62	2064.03	45.43	-0.0	75
25	3	20.06	1174.79	34.28	-0.0046	83
25	4	9.88	466.52	21.6	-0.0002	69
50	1	25.1	1821.86	42.68	-0.0067	71
50	2	28.66	2064.95	45.44	-0.0005	66
50	3	20.03	1172.16	34.24	-0.0024	73
50	4	9.87	466.43	21.6	-0.0	98
100	1	25.09	1821.17	42.68	-0.0063	66
100	2	28.67	2064.99	45.44	-0.0005	70
100	3	20.03	1172.28	34.24	-0.0025	77
100	4	9.87	466.42	21.6	-0.0	74

Table B.59: Result metrics for the *VolumeOrg<sub>td</sub>* model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	36.07	3739.66	61.15	-0.0069	127
2	2	42.16	4291.12	65.51	-0.0001	77
2	3	29.37	2165.15	46.53	-0.0013	81
2	4	12.84	559.72	23.66	-0.0	78
5	1	36.07	3739.72	61.15	-0.0069	143
5	2	42.15	4290.97	65.51	-0.0	76
5	3	29.38	2162.64	46.5	-0.0001	81
5	4	12.86	560.43	23.67	-0.0013	95
10	1	36.08	3740.6	61.16	-0.0072	124
10	2	42.15	4291.02	65.51	-0.0001	95
10	3	29.38	2162.47	46.5	-0.0	74
10	4	12.84	559.72	23.66	-0.0	84
25	1	36.08	3740.73	61.16	-0.0072	119
25	2	42.14	4290.92	65.51	-0.0	85
25	3	29.46	2178.31	46.67	-0.0073	69
25	4	12.84	559.73	23.66	-0.0	80
50	1	36.05	3738.47	61.14	-0.0066	86
50	2	42.12	4290.79	65.5	-0.0	86
50	3	29.38	2162.61	46.5	-0.0001	107
50	4	12.85	560.11	23.67	-0.0007	75
100	1	35.99	3733.68	61.1	-0.0053	116
100	2	42.12	4290.77	65.5	-0.0	78
100	3	29.38	2162.5	46.5	-0.0	84
100	4	12.84	559.72	23.66	-0.0	67

Table B.60: Result metrics for the *VolumeOrg<sub>td</sub>* model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	45.25	6169.4	78.55	-0.0115	109
2	2	53.54	6324.49	79.53	-0.0002	78
2	3	34.73	3209.49	56.65	-0.0001	97
2	4	14.88	871.45	29.52	-0.0008	72
5	1	45.24	6168.92	78.54	-0.0114	80
5	2	53.53	6324.28	79.53	-0.0002	69
5	3	34.68	3209.31	56.65	-0.0	105
5	4	14.87	871.19	29.52	-0.0005	93
10	1	45.1	6151.49	78.43	-0.0085	91
10	2	53.45	6323.2	79.52	-0.0	68
10	3	34.64	3209.35	56.65	-0.0	78
10	4	14.85	870.95	29.51	-0.0002	76
25	1	45.12	6153.44	78.44	-0.0088	66
25	2	53.44	6323.19	79.52	-0.0	121
25	3	34.65	3209.34	56.65	-0.0	67
25	4	14.85	870.92	29.51	-0.0002	66
50	1	45.11	6152.85	78.44	-0.0087	88
50	2	53.51	6323.82	79.52	-0.0001	66
50	3	34.7	3209.34	56.65	-0.0	78
50	4	14.86	871.07	29.51	-0.0003	66
100	1	45.0	6138.77	78.35	-0.0064	122
100	2	53.48	6323.38	79.52	-0.0	68
100	3	34.69	3209.31	56.65	-0.0	84
100	4	14.86	871.01	29.51	-0.0003	82

Table B.61: Result metrics for the *VolumeOrg<sub>td</sub>* model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	69.34	12267.02	110.76	-0.0241	66
2	2	81.04	13361.77	115.59	-0.0022	78
2	3	52.3	6361.56	79.76	-0.0098	69
2	4	25.59	2593.76	50.93	-0.5477	67
5	1	68.6	12145.46	110.21	-0.0139	68
5	2	79.22	12581.7	112.17	0.0563	69
5	3	52.41	6412.18	80.08	-0.0179	81
5	4	67.16	29082.74	170.54	-16.3536	71
10	1	69.25	12253.03	110.69	-0.0229	74
10	2	81.77	13334.68	115.48	-0.0001	79
10	3	51.68	6300.02	79.37	-0.0001	69
10	4	21.65	1676.9	40.95	-0.0006	81
25	1	68.69	12164.85	110.29	-0.0155	66
25	2	81.9	13336.97	115.49	-0.0003	77
25	3	51.84	6299.66	79.37	-0.0	69
25	4	21.82	1679.67	40.98	-0.0023	75
50	1	68.49	12122.59	110.1	-0.012	67
50	2	81.69	13333.56	115.47	-0.0001	85
50	3	51.92	6299.84	79.37	-0.0	68
50	4	21.7	1677.55	40.96	-0.001	83
100	1	68.18	12031.2	109.69	-0.0044	67
100	2	81.02	13342.63	115.51	-0.0007	78
100	3	51.08	6310.77	79.44	-0.0018	67
100	4	21.43	1676.44	40.94	-0.0003	68

Table B.62: Result metrics for the *VolumeOrg<sub>td</sub>* model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	101.87	26594.9	163.08	-0.0439	81
2	2	110.83	20139.71	141.91	-0.0047	76
2	3	81.76	13661.9	116.88	-0.0457	66
2	4	36.93	4152.37	64.44	-0.2648	69
5	1	104.63	27614.48	166.18	-0.0839	83
5	2	110.81	20298.23	142.47	-0.0126	79
5	3	81.97	13636.72	116.78	-0.0438	68
5	4	193.25	264172.4	513.98	-79.4692	78
10	1	104.47	25269.48	158.96	0.0081	66
10	2	114.98	21476.5	146.55	-0.0714	81
10	3	82.02	13597.74	116.61	-0.0408	70
10	4	269.84	393074.38	626.96	-118.7339	74
25	1	102.68	26061.4	161.44	-0.023	66
25	2	111.21	20073.88	141.68	-0.0014	66
25	3	79.04	13144.93	114.65	-0.0062	77
25	4	30.34	3288.33	57.34	-0.0017	92
50	1	102.26	25819.26	160.68	-0.0135	69
50	2	109.41	20112.23	141.82	-0.0033	66
50	3	79.21	13127.14	114.57	-0.0048	68
50	4	29.7	3284.41	57.31	-0.0005	66
100	1	108.37	27647.19	166.27	-0.0852	66
100	2	142.83	33543.38	183.15	-0.6734	100
100	3	101.53	20664.85	143.75	-0.5818	79
100	4	303.94	157320.17	396.64	-46.9211	93

Table B.63: Result metrics for the *VolumeOrg<sub>td</sub>* model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	174.43	60588.01	246.15	-0.0827	132
2	2	141.67	31952.42	178.75	0.0775	72
2	3	112.92	29184.88	170.84	-0.0321	67
2	4	147.98	95355.46	308.8	-11.4946	102
5	1	173.32	59170.0	243.25	-0.0573	89
5	2	146.35	33977.05	184.33	0.019	66
5	3	115.34	29117.82	170.64	-0.0297	68
5	4	337.13	388952.62	623.66	-49.9652	68
10	1	169.36	59788.7	244.52	-0.0684	82
10	2	152.24	36510.67	191.08	-0.0541	76
10	3	114.86	30859.28	175.67	-0.0913	75
10	4	158.37	67062.51	258.96	-7.7873	77
25	1	172.64	57939.86	240.71	-0.0353	75
25	2	226.91	66837.06	258.53	-0.9297	80
25	3	119.1	31912.1	178.64	-0.1286	68
25	4	849.59	2011851.2	1418.4	-262.6169	67
50	1	234.21	108320.98	329.12	-0.9356	111
50	2	223.26	92033.89	303.37	-1.6572	96
50	3	137.66	42750.34	206.76	-0.5118	67
50	4	646.51	1115964.5	1056.39	-145.2271	70
100	1	185.32	59386.12	243.69	-0.0612	77
100	2	149.95	38297.26	195.7	-0.1057	131
100	3	125.38	33350.7	182.62	-0.1794	66
100	4	173.29	38224.28	195.51	-4.0086	81

Table B.64: Result metrics for the *VolumeOrg<sub>td</sub>* trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.3.3 The Non-Time Differenced Filtered Tweet Volume Model**  
*VolumeFilt<sub>c</sub>*

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	85.89	10961.9	104.7	0.9793	67
2	2	112.98	15245.49	123.47	0.9064	80
2	3	87.64	9378.92	96.84	0.9038	75
2	4	33.97	1404.49	37.48	0.8945	84
5	1	125.92	21258.2	145.8	0.9598	66
5	2	142.97	23738.46	154.07	0.8543	91
5	3	101.44	13864.34	117.75	0.8579	68
5	4	31.6	1232.77	35.11	0.9074	83
10	1	155.84	32280.18	179.67	0.939	82
10	2	112.17	15890.11	126.06	0.9025	78
10	3	93.82	11388.98	106.72	0.8832	70
10	4	49.26	2995.52	54.73	0.775	76
25	1	151.98	33062.6	181.83	0.9375	72
25	2	97.15	12632.54	112.39	0.9225	92
25	3	85.95	16039.52	126.65	0.8356	77
25	4	43.03	2287.79	47.83	0.8282	75
50	1	171.23	41819.08	204.5	0.9209	70
50	2	104.18	18987.58	137.8	0.8834	88
50	3	76.13	14119.18	118.82	0.8552	75
50	4	40.57	2405.84	49.05	0.8193	74
100	1	125.78	27991.9	167.31	0.9471	72
100	2	154.07	39786.42	199.47	0.7558	78
100	3	89.53	13828.7	117.6	0.8582	87
100	4	53.39	3793.5	61.59	0.7151	79

Table B.65: Result metrics for the *VolumeFilt<sub>c</sub>* model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	83.66	10631.72	103.11	0.9799	77
2	2	28.26	1677.87	40.96	0.9897	74
2	3	34.29	1759.94	41.95	0.9819	67
2	4	13.43	496.67	22.29	0.9626	85
5	1	59.4	5322.39	72.95	0.9899	70
5	2	34.69	2396.04	48.95	0.9852	71
5	3	23.44	1414.32	37.61	0.9855	71
5	4	23.11	1005.02	31.7	0.9243	84
10	1	67.47	8069.47	89.83	0.9847	68
10	2	39.43	2919.47	54.03	0.982	80
10	3	29.56	1918.47	43.8	0.9803	78
10	4	11.99	491.18	22.16	0.963	91
25	1	73.2	10116.62	100.58	0.9809	75
25	2	41.14	3080.42	55.5	0.981	67
25	3	35.86	3218.19	56.73	0.967	76
25	4	13.72	629.79	25.1	0.9526	100
50	1	79.65	9688.04	98.43	0.9817	85
50	2	71.6	7990.95	89.39	0.9507	92
50	3	43.1	3388.87	58.21	0.9652	82
50	4	23.29	1087.02	32.97	0.9181	89
100	1	109.71	15976.68	126.4	0.9698	79
100	2	101.04	14789.71	121.61	0.9088	71
100	3	46.36	4050.45	63.64	0.9584	81
100	4	27.92	1513.23	38.9	0.8861	75

Table B.66: Result metrics for the *VolumeFilt<sub>c</sub>* model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	65.18	8279.77	90.99	0.9843	66
2	2	39.49	2872.9	53.6	0.9822	73
2	3	26.17	1583.72	39.8	0.9837	68
2	4	17.73	714.68	26.73	0.946	66
5	1	47.18	4673.85	68.37	0.9912	66
5	2	51.98	4331.9	65.82	0.9731	70
5	3	26.39	1765.08	42.01	0.9818	81
5	4	11.56	577.94	24.04	0.9563	89
10	1	50.88	4912.29	70.09	0.9907	87
10	2	39.39	3266.55	57.15	0.9797	95
10	3	32.05	2252.89	47.46	0.9768	78
10	4	21.8	928.05	30.46	0.9298	91
25	1	63.31	7186.86	84.78	0.9864	69
25	2	50.54	4776.18	69.11	0.9704	89
25	3	33.96	2508.01	50.08	0.9741	82
25	4	15.24	872.54	29.54	0.934	76
50	1	78.01	10038.04	100.19	0.981	68
50	2	52.24	5249.61	72.45	0.9674	79
50	3	31.26	2469.73	49.7	0.9745	92
50	4	17.13	834.07	28.88	0.9369	78
100	1	144.89	34759.08	186.44	0.9342	79
100	2	75.99	8979.6	94.76	0.9443	70
100	3	38.49	3384.99	58.18	0.9651	95
100	4	35.24	1994.03	44.65	0.8492	76

Table B.67: Result metrics for the *VolumeFilt<sub>c</sub>* model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	102.92	20199.22	142.12	0.9617	66
2	2	47.73	5012.13	70.8	0.9687	92
2	3	30.4	2422.46	49.22	0.9747	82
2	4	13.51	588.63	24.26	0.9552	73
5	1	83.54	12949.93	113.8	0.9755	72
5	2	53.87	5589.51	74.76	0.965	80
5	3	32.94	2821.64	53.12	0.9706	97
5	4	14.33	745.53	27.3	0.9432	93
10	1	80.89	11971.87	109.42	0.9773	70
10	2	49.57	5392.15	73.43	0.9663	84
10	3	34.41	2751.71	52.46	0.9713	72
10	4	16.04	718.57	26.81	0.9453	77
25	1	74.13	9790.82	98.95	0.9815	67
25	2	54.92	6055.07	77.81	0.9621	78
25	3	37.06	3297.62	57.42	0.9656	78
25	4	17.56	830.03	28.81	0.9368	70
50	1	126.54	26934.64	164.12	0.949	67
50	2	62.97	7488.04	86.53	0.9532	95
50	3	43.24	4110.86	64.12	0.9571	100
50	4	20.89	1094.26	33.08	0.9167	101
100	1	143.85	31764.06	178.22	0.9398	66
100	2	96.06	14380.27	119.92	0.9101	81
100	3	63.78	7810.84	88.38	0.9186	85
100	4	34.38	2359.07	48.57	0.8203	105

Table B.68: Result metrics for the *VolumeFilt<sub>c</sub>* model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	85.27	12481.42	111.72	0.9762	77
2	2	56.91	6901.17	83.07	0.9567	66
2	3	36.0	3508.4	59.23	0.9638	87
2	4	16.19	907.79	30.13	0.9307	74
5	1	73.73	10282.55	101.4	0.9804	68
5	2	60.72	7323.35	85.58	0.954	71
5	3	40.11	3817.65	61.79	0.9606	81
5	4	16.26	990.3	31.47	0.9244	82
10	1	79.79	11299.24	106.3	0.9784	79
10	2	59.83	7363.36	85.81	0.9538	83
10	3	38.21	3963.52	62.96	0.9591	75
10	4	16.95	1009.59	31.77	0.9229	66
25	1	79.37	11026.85	105.01	0.9789	69
25	2	63.18	8144.1	90.24	0.9489	69
25	3	46.09	5416.91	73.6	0.9442	82
25	4	24.54	1573.66	39.67	0.8798	80
50	1	134.19	25472.31	159.6	0.9513	68
50	2	74.61	10626.14	103.08	0.9333	79
50	3	54.92	6173.83	78.57	0.9364	74
50	4	24.39	1533.38	39.16	0.8829	68
100	1	204.75	56583.01	237.87	0.8919	69
100	2	97.57	17069.92	130.65	0.8929	67
100	3	56.28	6608.18	81.29	0.9319	71
100	4	45.53	3970.66	63.01	0.6967	66

Table B.69: Result metrics for the *VolumeFilt<sub>c</sub>* model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	105.12	18085.74	134.48	0.9656	117
2	2	80.02	13111.9	114.51	0.9164	73
2	3	51.17	6607.19	81.28	0.9301	69
2	4	23.44	1709.61	41.35	0.8673	68
5	1	85.79	14474.12	120.31	0.9724	66
5	2	86.41	13909.26	117.94	0.9114	78
5	3	54.78	6931.95	83.26	0.9266	69
5	4	24.0	1908.18	43.68	0.8519	67
10	1	83.03	14957.97	122.3	0.9715	86
10	2	85.44	13961.68	118.16	0.911	69
10	3	59.41	6990.08	83.61	0.926	104
10	4	27.57	2064.17	45.43	0.8398	66
25	1	112.89	19441.22	139.43	0.963	67
25	2	92.71	14839.92	121.82	0.9054	80
25	3	64.71	8555.49	92.5	0.9094	82
25	4	45.47	3506.53	59.22	0.7278	73
50	1	184.96	48038.4	219.18	0.9086	67
50	2	102.66	17902.31	133.8	0.8859	68
50	3	81.65	12114.91	110.07	0.8718	80
50	4	39.96	3168.19	56.29	0.7541	74
100	1	351.27	158254.31	397.81	0.6988	68
100	2	132.58	25786.06	160.58	0.8357	72
100	3	89.74	17058.22	130.61	0.8194	92
100	4	54.9	4988.49	70.63	0.6128	111

Table B.70: Result metrics for the *VolumeFilt<sub>c</sub>* model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	158.63	43475.81	208.51	0.9174	73
2	2	107.22	18838.9	137.25	0.8754	69
2	3	82.43	13057.98	114.27	0.8505	71
2	4	35.19	3566.74	59.72	0.7314	72
5	1	120.21	28882.28	169.95	0.9451	66
5	2	112.96	19635.07	140.13	0.8701	66
5	3	78.87	12287.17	110.85	0.8593	72
5	4	38.01	3860.94	62.14	0.7093	77
10	1	131.16	30511.0	174.67	0.942	80
10	2	112.92	20103.6	141.79	0.867	70
10	3	86.84	13903.8	117.91	0.8408	68
10	4	56.29	4944.07	70.31	0.6277	86
25	1	156.25	36265.2	190.43	0.9311	66
25	2	134.01	28838.69	169.82	0.8092	67
25	3	99.88	18585.01	136.33	0.7872	78
25	4	59.16	5892.34	76.76	0.5563	89
50	1	420.66	409114.6	639.62	0.2229	66
50	2	155.58	36495.34	191.04	0.7586	74
50	3	115.53	24636.63	156.96	0.7179	72
50	4	70.58	8188.04	90.49	0.3834	66
100	1	239.71	84905.95	291.39	0.8387	81
100	2	228.06	77675.16	278.7	0.4861	128
100	3	127.86	31274.06	176.84	0.6419	66
100	4	104.31	16616.74	128.91	-0.2513	69

Table B.71: Result metrics for the *VolumeFilt<sub>c</sub>* model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	201.65	68596.49	261.91	0.8652	66
2	2	136.97	33505.5	183.05	0.7618	71
2	3	107.4	24672.18	157.07	0.7017	80
2	4	52.92	6513.8	80.71	0.5412	72
5	1	178.45	58490.22	241.85	0.8851	66
5	2	239.75	85373.41	292.19	0.393	70
5	3	110.33	25443.0	159.51	0.6924	78
5	4	48.62	5443.18	73.78	0.6166	67
10	1	169.34	57698.34	240.2	0.8866	66
10	2	410.71	230005.4	479.59	-0.6353	69
10	3	111.65	28075.92	167.56	0.6606	77
10	4	65.05	7168.83	84.67	0.495	96
25	1	220.65	77534.53	278.45	0.8476	91
25	2	332.12	148859.33	385.82	-0.0584	66
25	3	119.36	32522.28	180.34	0.6068	74
25	4	86.3	13609.14	116.66	0.0413	67
50	1	269.75	133601.67	365.52	0.7374	66
50	2	307.93	136377.62	369.29	0.0304	86
50	3	151.16	40474.79	201.18	0.5107	72
50	4	84.6	13081.18	114.37	0.0785	66
100	1	751.88	963129.44	981.39	-0.8928	65
100	2	283.51	132681.47	364.25	0.0567	90
100	3	188.59	55642.59	235.89	0.3273	98
100	4	130.41	22650.41	150.5	-0.5955	69

Table B.72: Result metrics for the *VolumeFilt<sub>c</sub>* model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.3.4 The Time Differenced Filtered Tweet Volume Model**  
*VolumeFilt<sub>td</sub>*

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	10.48	297.79	17.26	-0.0003	173
2	2	11.83	363.36	19.06	-0.0017	176
2	3	8.45	215.15	14.67	-0.0015	193
2	4	4.65	92.4	9.61	-0.0095	76
5	1	10.48	297.84	17.26	-0.0005	281
5	2	11.83	363.37	19.06	-0.0017	251
5	3	8.45	215.1	14.67	-0.0013	180
5	4	4.65	92.4	9.61	-0.0095	87
10	1	10.48	297.81	17.26	-0.0004	316
10	2	11.84	363.64	19.07	-0.0025	218
10	3	8.45	214.98	14.66	-0.0008	227
10	4	4.55	91.56	9.57	-0.0003	99
25	1	10.48	297.84	17.26	-0.0005	406
25	2	11.84	363.78	19.07	-0.0029	190
25	3	8.46	215.24	14.67	-0.002	87
25	4	4.61	92.01	9.59	-0.0053	226
50	1	10.48	297.77	17.26	-0.0002	232
50	2	11.83	363.23	19.06	-0.0014	146
50	3	8.45	215.13	14.67	-0.0015	241
50	4	4.56	91.62	9.57	-0.001	144
100	1	10.48	297.79	17.26	-0.0003	387
100	2	11.84	363.63	19.07	-0.0025	232
100	3	8.46	215.27	14.67	-0.0021	82
100	4	4.67	92.59	9.62	-0.0116	195

Table B.73: Result metrics for the *VolumeFilt<sub>td</sub>* model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	17.51	907.87	30.13	-0.0031	95
2	2	19.83	1010.86	31.79	-0.0009	90
2	3	14.85	745.15	27.3	-0.0095	114
2	4	7.36	263.32	16.23	-0.0001	68
5	1	17.49	906.87	30.11	-0.002	70
5	2	19.84	1010.59	31.79	-0.0007	66
5	3	14.83	744.56	27.29	-0.0087	154
5	4	7.38	263.29	16.23	-0.0	67
10	1	17.53	908.34	30.14	-0.0036	71
10	2	19.84	1010.98	31.8	-0.001	71
10	3	14.83	744.46	27.28	-0.0085	88
10	4	7.38	263.3	16.23	-0.0	78
25	1	17.56	909.52	30.16	-0.0049	71
25	2	19.84	1010.93	31.8	-0.001	66
25	3	14.79	743.37	27.26	-0.0071	69
25	4	7.38	263.29	16.23	-0.0	78
50	1	17.48	906.54	30.11	-0.0016	91
50	2	19.84	1010.34	31.79	-0.0004	72
50	3	14.85	745.14	27.3	-0.0095	67
50	4	7.37	263.31	16.23	-0.0001	67
100	1	17.53	908.43	30.14	-0.0037	80
100	2	19.84	1010.4	31.79	-0.0005	70
100	3	14.81	744.02	27.28	-0.0079	91
100	4	7.37	263.31	16.23	-0.0001	70

Table B.74: Result metrics for the  $VolumeFilt_{td}$  model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	25.03	1816.89	42.63	-0.004	83
2	2	28.65	2064.59	45.44	-0.0003	96
2	3	20.05	1173.68	34.26	-0.0036	82
2	4	9.87	466.43	21.6	-0.0	70
5	1	25.01	1815.45	42.61	-0.0032	67
5	2	28.64	2064.27	45.43	-0.0002	66
5	3	20.04	1173.52	34.26	-0.0035	88
5	4	9.87	466.42	21.6	-0.0	69
10	1	25.07	1819.7	42.66	-0.0055	79
10	2	28.69	2065.81	45.45	-0.0009	108
10	3	20.06	1174.61	34.27	-0.0045	85
10	4	9.87	466.45	21.6	-0.0001	94
25	1	25.09	1821.3	42.68	-0.0064	84
25	2	28.61	2063.95	45.43	-0.0	76
25	3	20.07	1175.74	34.29	-0.0054	71
25	4	9.88	466.51	21.6	-0.0002	79
50	1	25.07	1820.02	42.66	-0.0057	71
50	2	28.67	2065.01	45.44	-0.0005	73
50	3	20.03	1172.06	34.24	-0.0023	69
50	4	9.87	466.42	21.6	-0.0	79
100	1	25.05	1818.3	42.64	-0.0047	66
100	2	28.67	2065.0	45.44	-0.0005	79
100	3	20.04	1172.85	34.25	-0.0029	66
100	4	9.87	466.43	21.6	-0.0	66

Table B.75: Result metrics for the  $VolumeFilt_{td}$  model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	36.07	3739.51	61.15	-0.0069	119
2	2	42.16	4291.15	65.51	-0.0001	82
2	3	29.38	2162.44	46.5	-0.0	82
2	4	12.84	559.72	23.66	-0.0	69
5	1	36.09	3741.18	61.17	-0.0073	66
5	2	42.18	4291.32	65.51	-0.0001	94
5	3	29.38	2162.46	46.5	-0.0	73
5	4	12.84	559.78	23.66	-0.0001	85
10	1	36.08	3740.61	61.16	-0.0072	116
10	2	42.16	4291.04	65.51	-0.0001	104
10	3	29.38	2162.46	46.5	-0.0	66
10	4	12.84	559.72	23.66	-0.0	67
25	1	36.08	3740.67	61.16	-0.0072	105
25	2	42.15	4290.93	65.51	-0.0	68
25	3	29.38	2162.49	46.5	-0.0	76
25	4	12.84	559.74	23.66	-0.0	69
50	1	36.06	3738.7	61.14	-0.0067	107
50	2	42.16	4291.06	65.51	-0.0001	85
50	3	29.38	2162.5	46.5	-0.0	81
50	4	12.84	559.8	23.66	-0.0002	76
100	1	35.99	3733.69	61.1	-0.0053	142
100	2	42.12	4290.77	65.5	-0.0	67
100	3	29.38	2162.51	46.5	-0.0	69
100	4	12.84	559.72	23.66	-0.0	67

Table B.76: Result metrics for the *VolumeFilt<sub>td</sub>* model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	45.25	6169.68	78.55	-0.0115	74
2	2	53.55	6324.56	79.53	-0.0002	104
2	3	34.73	3209.47	56.65	-0.0001	95
2	4	14.88	871.45	29.52	-0.0008	67
5	1	45.26	6171.03	78.56	-0.0117	147
5	2	53.54	6324.35	79.53	-0.0002	84
5	3	34.71	3209.39	56.65	-0.0	76
5	4	14.88	871.39	29.52	-0.0007	71
10	1	45.1	6151.42	78.43	-0.0085	72
10	2	53.45	6323.19	79.52	-0.0	73
10	3	34.64	3209.35	56.65	-0.0	104
10	4	14.85	870.96	29.51	-0.0002	84
25	1	45.12	6153.45	78.44	-0.0088	69
25	2	53.43	6323.26	79.52	-0.0	105
25	3	34.64	3209.34	56.65	-0.0	107
25	4	14.85	870.94	29.51	-0.0002	124
50	1	45.12	6154.47	78.45	-0.009	68
50	2	53.51	6323.8	79.52	-0.0001	69
50	3	34.7	3209.35	56.65	-0.0	102
50	4	14.86	871.09	29.51	-0.0004	90
100	1	45.0	6138.71	78.35	-0.0064	76
100	2	53.47	6323.33	79.52	-0.0	75
100	3	34.69	3209.31	56.65	-0.0	66
100	4	14.86	871.02	29.51	-0.0003	69

Table B.77: Result metrics for the *VolumeFilt<sub>td</sub>* model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	69.33	12265.26	110.75	-0.0239	80
2	2	80.78	13354.8	115.56	-0.0017	67
2	3	51.64	6363.4	79.77	-0.0101	75
2	4	21.81	1687.34	41.08	-0.0068	87
5	1	68.68	12161.68	110.28	-0.0153	66
5	2	78.3	12679.91	112.61	0.049	67
5	3	52.25	6398.71	79.99	-0.0157	72
5	4	22.56	1839.04	42.88	-0.0974	88
10	1	69.25	12252.72	110.69	-0.0229	66
10	2	81.78	13334.7	115.48	-0.0002	66
10	3	51.68	6300.02	79.37	-0.0001	84
10	4	21.65	1676.9	40.95	-0.0006	72
25	1	68.72	12170.69	110.32	-0.016	66
25	2	81.9	13336.99	115.49	-0.0003	73
25	3	51.84	6299.66	79.37	-0.0	70
25	4	21.82	1679.69	40.98	-0.0023	102
50	1	68.44	12111.5	110.05	-0.0111	66
50	2	81.69	13333.54	115.47	-0.0001	73
50	3	51.92	6299.84	79.37	-0.0	66
50	4	21.7	1677.55	40.96	-0.001	77
100	1	68.18	12030.36	109.68	-0.0043	66
100	2	81.02	13342.7	115.51	-0.0008	136
100	3	51.08	6310.84	79.44	-0.0018	66
100	4	21.43	1676.42	40.94	-0.0003	81

Table B.78: Result metrics for the *VolumeFilt<sub>td</sub>* model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	100.93	26248.04	162.01	-0.0303	72
2	2	110.56	20144.51	141.93	-0.005	94
2	3	80.67	13603.89	116.64	-0.0413	66
2	4	30.42	3412.13	58.41	-0.0394	66
5	1	102.39	27280.47	165.17	-0.0708	88
5	2	111.24	20395.48	142.81	-0.0175	71
5	3	80.95	13429.47	115.89	-0.028	80
5	4	32.93	3545.43	59.54	-0.08	78
10	1	105.2	24740.44	157.29	0.0289	66
10	2	115.67	21743.49	147.46	-0.0847	78
10	3	80.72	13439.79	115.93	-0.0287	67
10	4	34.68	3867.84	62.19	-0.1782	74
25	1	102.68	26061.74	161.44	-0.023	67
25	2	111.22	20074.31	141.68	-0.0015	67
25	3	79.04	13145.03	114.65	-0.0062	71
25	4	30.34	3288.33	57.34	-0.0017	69
50	1	102.26	25817.9	160.68	-0.0134	69
50	2	109.41	20112.04	141.82	-0.0033	66
50	3	79.21	13127.17	114.57	-0.0048	94
50	4	29.7	3284.43	57.31	-0.0005	72
100	1	107.99	27549.92	165.98	-0.0814	66
100	2	134.79	29564.57	171.94	-0.4749	106
100	3	108.07	21824.12	147.73	-0.6705	70
100	4	48.79	5357.24	73.19	-0.6319	83

Table B.79: Result metrics for the *VolumeFilt<sub>td</sub>* model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	173.74	60093.03	245.14	-0.0738	86
2	2	142.67	32243.57	179.56	0.0691	67
2	3	111.42	29152.78	170.74	-0.031	72
2	4	52.96	7405.61	86.06	0.0296	83
5	1	173.35	59223.34	243.36	-0.0583	66
5	2	151.77	35726.49	189.01	-0.0315	66
5	3	115.94	29261.67	171.06	-0.0348	74
5	4	65.68	9497.1	97.45	-0.2444	90
10	1	174.78	59967.75	244.88	-0.0716	66
10	2	149.99	34781.1	186.5	-0.0042	74
10	3	111.58	28732.7	169.51	-0.0161	70
10	4	46.97	7059.04	84.02	0.075	81
25	1	172.4	57338.52	239.45	-0.0246	68
25	2	259.06	91415.48	302.35	-1.6393	122
25	3	113.46	29764.78	172.52	-0.0526	81
25	4	82.29	12471.13	111.67	-0.6341	66
50	1	172.82	58436.1	241.74	-0.0442	88
50	2	188.49	63033.14	251.06	-0.8199	78
50	3	130.36	42307.88	205.69	-0.4962	68
50	4	62.14	9025.99	95.01	-0.1827	70
100	1	185.4	59396.05	243.71	-0.0614	74
100	2	152.88	38817.66	197.02	-0.1207	72
100	3	146.99	37790.8	194.4	-0.3365	96
100	4	116.27	21162.99	145.48	-1.773	97

Table B.80: Result metrics for the *VolumeFilt<sub>td</sub>* model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.3.5 The Non-Time Differenced Sentiment Volume Model**  
*VolumeSent<sub>c</sub>*

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	178.41	48533.12	220.3	0.9082	67
2	2	154.76	27541.98	165.96	0.8309	75
2	3	138.23	23472.77	153.21	0.7593	69
2	4	47.52	2787.9	52.8	0.7906	81
5	1	131.04	26076.96	161.48	0.9507	81
5	2	103.52	12597.28	112.24	0.9227	117
5	3	104.47	14259.06	119.41	0.8538	83
5	4	44.42	2246.23	47.39	0.8313	108
10	1	145.01	30133.44	173.59	0.943	67
10	2	120.51	18065.96	134.41	0.8891	82
10	3	118.62	19840.29	140.86	0.7966	88
10	4	31.72	1444.79	38.01	0.8915	112
25	1	136.62	26768.42	163.61	0.9494	66
25	2	130.99	22178.2	148.92	0.8639	71
25	3	109.83	20783.86	144.17	0.7869	100
25	4	81.59	7321.78	85.57	0.4501	66
50	1	147.25	30261.76	173.96	0.9428	110
50	2	158.46	31792.6	178.3	0.8048	70
50	3	85.52	16067.23	126.76	0.8353	93
50	4	43.19	2862.91	53.51	0.785	67
100	1	204.68	69078.22	262.83	0.8694	75
100	2	160.98	33492.24	183.01	0.7944	69
100	3	72.04	9946.03	99.73	0.898	70
100	4	68.16	6708.84	81.91	0.4962	70

Table B.81: Result metrics for the *VolumeSent<sub>c</sub>* model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	100.72	15988.88	126.45	0.9698	74
2	2	27.75	1676.73	40.95	0.9897	90
2	3	22.26	1116.01	33.41	0.9885	88
2	4	10.76	383.85	19.59	0.9711	76
5	1	43.38	3310.89	57.54	0.9937	67
5	2	35.63	2616.78	51.15	0.9839	80
5	3	27.14	1595.89	39.95	0.9836	82
5	4	11.88	463.11	21.52	0.9651	98
10	1	58.07	5730.31	75.7	0.9892	67
10	2	45.35	3502.37	59.18	0.9784	76
10	3	31.58	2163.2	46.51	0.9778	84
10	4	21.47	974.96	31.22	0.9266	66
25	1	115.67	20690.82	143.84	0.9609	83
25	2	80.34	9991.43	99.96	0.9384	91
25	3	46.15	4444.31	66.67	0.9544	83
25	4	40.46	2255.95	47.5	0.8301	67
50	1	78.3	9222.67	96.03	0.9826	120
50	2	72.99	8172.03	90.4	0.9496	85
50	3	40.12	3016.64	54.92	0.969	71
50	4	21.1	956.85	30.93	0.9279	81
100	1	157.59	35330.49	187.96	0.9332	88
100	2	148.4	29725.09	172.41	0.8168	71
100	3	55.2	5050.14	71.06	0.9482	69
100	4	30.07	1582.93	39.79	0.8808	66

Table B.82: Result metrics for the *VolumeSent<sub>c</sub>* model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	48.22	4865.51	69.75	0.9908	83
2	2	54.83	4650.09	68.19	0.9711	69
2	3	25.88	1652.23	40.65	0.983	83
2	4	19.25	797.09	28.23	0.9397	67
5	1	55.64	6309.92	79.44	0.9881	72
5	2	41.55	3598.15	59.98	0.9777	77
5	3	35.36	2542.43	50.42	0.9738	84
5	4	24.39	1085.26	32.94	0.9179	82
10	1	65.57	8362.02	91.44	0.9842	75
10	2	63.0	6510.24	80.69	0.9596	76
10	3	33.26	2324.01	48.21	0.976	82
10	4	20.35	999.67	31.62	0.9244	72
25	1	78.5	10340.29	101.69	0.9804	105
25	2	105.77	14632.58	120.97	0.9092	82
25	3	35.1	2744.53	52.39	0.9717	82
25	4	21.22	1076.03	32.8	0.9186	72
50	1	68.08	8228.76	90.71	0.9844	81
50	2	72.0	7897.75	88.87	0.951	70
50	3	57.58	5659.08	75.23	0.9417	68
50	4	27.76	1491.25	38.62	0.8873	69
100	1	172.03	47594.86	218.16	0.91	82
100	2	87.66	11609.55	107.75	0.9279	67
100	3	67.86	7809.26	88.37	0.9195	99
100	4	29.45	1647.62	40.59	0.8754	93

Table B.83: Result metrics for the *VolumeSent<sub>c</sub>* model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	78.3	10812.09	103.98	0.9795	79
2	2	48.01	5006.47	70.76	0.9687	77
2	3	32.93	2571.08	50.71	0.9732	76
2	4	15.76	703.22	26.52	0.9464	75
5	1	83.72	12967.82	113.88	0.9754	67
5	2	53.38	5967.82	77.25	0.9627	70
5	3	39.11	3301.5	57.46	0.9656	77
5	4	19.23	966.25	31.08	0.9264	71
10	1	113.2	21035.38	145.04	0.9602	74
10	2	58.81	6388.28	79.93	0.96	66
10	3	37.84	3225.05	56.79	0.9664	67
10	4	22.5	1163.75	34.11	0.9114	75
25	1	80.1	11221.17	105.93	0.9787	68
25	2	69.12	8052.07	89.73	0.9496	73
25	3	42.21	4162.29	64.52	0.9566	71
25	4	24.06	1252.17	35.39	0.9046	69
50	1	140.75	32206.03	179.46	0.939	72
50	2	83.99	10862.43	104.22	0.9321	66
50	3	53.72	5693.57	75.46	0.9406	72
50	4	34.68	2074.73	45.55	0.842	89
100	1	173.31	43120.42	207.65	0.9183	93
100	2	95.94	14340.95	119.75	0.9103	84
100	3	67.89	8906.6	94.37	0.9072	68
100	4	40.23	2909.06	53.94	0.7784	76

Table B.84: Result metrics for the *VolumeSent<sub>c</sub>* model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	84.29	12868.91	113.44	0.9754	78
2	2	60.25	7648.03	87.45	0.952	73
2	3	36.56	3593.8	59.95	0.963	73
2	4	20.85	1200.76	34.65	0.9083	87
5	1	78.0	10975.16	104.76	0.979	72
5	2	61.08	7593.46	87.14	0.9523	71
5	3	40.05	4111.64	64.12	0.9576	66
5	4	21.83	1331.88	36.49	0.8983	106
10	1	86.4	13466.39	116.04	0.9743	67
10	2	65.18	8080.68	89.89	0.9493	84
10	3	42.88	4249.71	65.19	0.9562	77
10	4	22.04	1223.73	34.98	0.9065	111
25	1	83.89	12494.52	111.78	0.9761	78
25	2	70.16	9348.22	96.69	0.9413	80
25	3	48.67	5452.07	73.84	0.9438	86
25	4	29.29	1792.16	42.33	0.8631	68
50	1	132.92	27177.87	164.86	0.9481	69
50	2	81.44	11680.49	108.08	0.9267	70
50	3	62.98	7580.7	87.07	0.9219	69
50	4	31.03	1831.58	42.8	0.8601	81
100	1	228.08	70853.86	266.18	0.8647	69
100	2	102.75	18062.56	134.4	0.8867	73
100	3	78.7	10961.76	104.7	0.887	73
100	4	57.93	5942.06	77.08	0.5462	84

Table B.85: Result metrics for the *VolumeSent<sub>c</sub>* model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	106.64	18761.44	136.97	0.9643	66
2	2	84.15	12853.58	113.37	0.9181	88
2	3	56.25	6885.38	82.98	0.9271	75
2	4	24.31	1764.19	42.0	0.8631	110
5	1	92.88	15223.91	123.39	0.971	97
5	2	90.51	14246.57	119.36	0.9092	80
5	3	60.13	7234.22	85.05	0.9234	69
5	4	26.05	1851.93	43.03	0.8563	71
10	1	93.19	17314.1	131.58	0.967	103
10	2	95.58	14382.08	119.93	0.9083	87
10	3	63.26	7881.81	88.78	0.9166	66
10	4	32.01	2328.15	48.25	0.8193	102
25	1	139.81	28137.45	167.74	0.9464	76
25	2	97.11	16329.89	127.79	0.8959	78
25	3	73.58	11487.05	107.18	0.8784	85
25	4	41.9	3350.85	57.89	0.7399	86
50	1	218.52	63789.17	252.57	0.8786	67
50	2	111.55	20097.79	141.77	0.8719	93
50	3	86.71	15480.37	124.42	0.8361	71
50	4	56.21	5713.49	75.59	0.5566	85
100	1	259.89	94783.65	307.87	0.8196	66
100	2	146.22	30738.6	175.32	0.8041	79
100	3	108.41	22984.1	151.61	0.7567	82
100	4	79.11	10144.01	100.72	0.2127	86

Table B.86: Result metrics for the *VolumeSent<sub>c</sub>* model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	141.79	34640.57	186.12	0.9342	81
2	2	112.02	19073.9	138.11	0.8738	99
2	3	84.04	12642.68	112.44	0.8552	78
2	4	39.56	3776.58	61.45	0.7156	70
5	1	118.12	29707.48	172.36	0.9436	70
5	2	117.01	19701.37	140.36	0.8697	81
5	3	88.06	13822.97	117.57	0.8417	71
5	4	42.03	4025.91	63.45	0.6968	66
10	1	124.75	28038.82	167.45	0.9467	83
10	2	113.19	20983.66	144.86	0.8612	71
10	3	90.73	14450.99	120.21	0.8345	66
10	4	64.55	6437.14	80.23	0.5153	76
25	1	169.08	46990.83	216.77	0.9107	69
25	2	146.75	33979.42	184.34	0.7752	66
25	3	117.04	24353.47	156.06	0.7211	78
25	4	86.27	13307.36	115.36	-0.0021	93
50	1	318.93	134581.97	366.85	0.7444	67
50	2	154.24	37918.06	194.73	0.7492	66
50	3	135.27	29770.36	172.54	0.6591	68
50	4	87.12	13480.34	116.1	-0.0151	73
100	1	236.39	88476.59	297.45	0.8319	66
100	2	236.85	85887.52	293.07	0.4318	71
100	3	134.98	38217.35	195.49	0.5623	85
100	4	130.4	24405.88	156.22	-0.8378	68

Table B.87: Result metrics for the *VolumeSent<sub>c</sub>* model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	175.86	57298.88	239.37	0.8874	66
2	2	141.77	33953.38	184.26	0.7586	81
2	3	110.64	25009.6	158.14	0.6976	66
2	4	49.39	6702.82	81.87	0.5278	78
5	1	171.2	57793.76	240.4	0.8864	66
5	2	188.03	57183.67	239.13	0.5934	68
5	3	124.96	31410.19	177.23	0.6202	66
5	4	78.02	9129.69	95.55	0.3569	75
10	1	196.39	64977.36	254.91	0.8723	66
10	2	218.91	72882.34	269.97	0.4818	66
10	3	142.71	35601.18	188.68	0.5696	76
10	4	70.79	7357.8	85.78	0.4817	69
25	1	302.43	120572.71	347.24	0.763	66
25	2	484.6	279335.84	528.52	-0.986	66
25	3	136.36	39543.79	198.86	0.5219	70
25	4	94.51	14631.6	120.96	-0.0307	74
50	1	488.37	433085.75	658.09	0.1489	69
50	2	311.83	141341.38	375.95	-0.0049	101
50	3	186.36	53522.14	231.35	0.3529	96
50	4	104.57	17426.91	132.01	-0.2276	102
100	1	751.69	963019.6	981.34	-0.8926	65
100	2	342.19	178231.69	422.17	-0.2672	88
100	3	213.81	67156.62	259.15	0.1881	85
100	4	106.05	17194.36	131.13	-0.2112	71

Table B.88: Result metrics for the *VolumeSent<sub>c</sub>* model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.3.6 The Time Differenced Sentiment volume Model***VolumeSent<sub>td</sub>*

<i>w</i>	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	10.48	297.81	17.26	-0.0004	261
2	2	11.83	363.37	19.06	-0.0017	230
2	3	8.45	215.08	14.67	-0.0012	225
2	4	4.55	91.54	9.57	-0.0002	165
5	1	10.48	297.83	17.26	-0.0004	113
5	2	11.83	363.15	19.06	-0.0011	252
5	3	8.45	214.99	14.66	-0.0008	129
5	4	4.56	91.6	9.57	-0.0008	129
10	1	10.48	297.79	17.26	-0.0003	241
10	2	11.84	363.65	19.07	-0.0025	188
10	3	8.45	215.09	14.67	-0.0013	110
10	4	4.55	91.54	9.57	-0.0001	178
25	1	10.48	297.87	17.26	-0.0006	148
25	2	11.84	363.71	19.07	-0.0027	128
25	3	8.45	214.99	14.66	-0.0008	165
25	4	4.56	91.63	9.57	-0.0011	99
50	1	10.48	297.8	17.26	-0.0004	197
50	2	11.83	363.15	19.06	-0.0011	177
50	3	8.45	214.98	14.66	-0.0008	188
50	4	4.56	91.61	9.57	-0.0009	85
100	1	10.48	297.8	17.26	-0.0003	255
100	2	11.84	363.88	19.08	-0.0032	228
100	3	8.46	215.29	14.67	-0.0022	101
100	4	4.63	92.17	9.6	-0.007	212

Table B.89: Result metrics for the *VolumeSent<sub>td</sub>* model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and *w* is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	17.55	909.21	30.15	-0.0046	68
2	2	19.84	1010.97	31.8	-0.001	72
2	3	14.77	742.75	27.25	-0.0062	89
2	4	7.36	263.35	16.23	-0.0002	75
5	1	17.56	909.83	30.16	-0.0053	81
5	2	19.84	1010.98	31.8	-0.001	73
5	3	14.8	743.66	27.27	-0.0074	79
5	4	7.38	263.3	16.23	-0.0	80
10	1	17.51	907.49	30.12	-0.0027	83
10	2	19.83	1010.74	31.79	-0.0008	69
10	3	14.82	744.17	27.28	-0.0081	84
10	4	7.38	263.29	16.23	-0.0	67
25	1	17.57	910.27	30.17	-0.0058	68
25	2	19.84	1010.92	31.79	-0.001	67
25	3	14.82	744.32	27.28	-0.0084	73
25	4	7.38	263.29	16.23	-0.0	66
50	1	17.5	907.3	30.12	-0.0025	90
50	2	19.84	1010.56	31.79	-0.0006	83
50	3	14.85	745.23	27.3	-0.0096	87
50	4	7.39	263.33	16.23	-0.0002	101
100	1	17.5	907.39	30.12	-0.0026	107
100	2	19.84	1010.43	31.79	-0.0005	73
100	3	14.79	743.32	27.26	-0.007	92
100	4	7.37	263.31	16.23	-0.0001	102

Table B.90: Result metrics for the  $VolumeSent_{td}$  model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	25.13	1824.16	42.71	-0.008	77
2	2	28.65	2064.64	45.44	-0.0003	73
2	3	20.05	1174.16	34.27	-0.0041	85
2	4	9.87	466.43	21.6	-0.0	82
5	1	25.02	1815.78	42.61	-0.0034	73
5	2	28.64	2064.4	45.44	-0.0002	95
5	3	20.08	1176.68	34.3	-0.0062	67
5	4	9.87	466.45	21.6	-0.0001	66
10	1	25.05	1818.4	42.64	-0.0048	77
10	2	28.69	2065.87	45.45	-0.0009	92
10	3	20.06	1174.63	34.27	-0.0045	67
10	4	9.87	466.48	21.6	-0.0001	88
25	1	25.04	1818.12	42.64	-0.0046	68
25	2	28.65	2064.54	45.44	-0.0003	66
25	3	20.04	1173.27	34.25	-0.0033	71
25	4	9.88	466.51	21.6	-0.0002	80
50	1	25.09	1821.1	42.67	-0.0063	71
50	2	28.67	2065.14	45.44	-0.0006	78
50	3	20.04	1173.02	34.25	-0.0031	89
50	4	9.87	466.42	21.6	-0.0	69
100	1	25.05	1818.75	42.65	-0.005	75
100	2	28.66	2064.91	45.44	-0.0005	82
100	3	20.03	1171.92	34.23	-0.0021	78
100	4	9.87	466.42	21.6	-0.0	66

Table B.91: Result metrics for the  $VolumeSent_{td}$  model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	36.08	3740.67	61.16	-0.0072	135
2	2	42.12	4290.77	65.5	-0.0	95
2	3	29.38	2162.44	46.5	-0.0	89
2	4	12.84	559.72	23.66	-0.0	98
5	1	36.09	3741.34	61.17	-0.0074	68
5	2	42.18	4291.32	65.51	-0.0001	108
5	3	29.38	2162.46	46.5	-0.0	66
5	4	12.84	559.72	23.66	-0.0	70
10	1	36.08	3740.57	61.16	-0.0072	119
10	2	42.13	4290.8	65.5	-0.0	119
10	3	29.38	2162.63	46.5	-0.0001	95
10	4	12.84	559.72	23.66	-0.0	72
25	1	36.08	3740.76	61.16	-0.0072	121
25	2	42.14	4290.89	65.5	-0.0	67
25	3	29.38	2162.47	46.5	-0.0	71
25	4	12.84	559.73	23.66	-0.0	82
50	1	36.05	3738.61	61.14	-0.0066	113
50	2	42.16	4291.1	65.51	-0.0001	113
50	3	29.38	2162.47	46.5	-0.0	92
50	4	12.84	559.75	23.66	-0.0001	77
100	1	35.99	3733.68	61.1	-0.0053	119
100	2	42.12	4290.77	65.5	-0.0	69
100	3	29.38	2162.51	46.5	-0.0	69
100	4	12.84	559.74	23.66	-0.0001	66

Table B.92: Result metrics for the  $VolumeSent_{td}$  model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	45.24	6168.26	78.54	-0.0113	90
2	2	53.54	6324.45	79.53	-0.0002	101
2	3	34.73	3209.45	56.65	-0.0	69
2	4	14.88	871.39	29.52	-0.0007	74
5	1	45.26	6170.74	78.55	-0.0117	93
5	2	53.54	6324.47	79.53	-0.0002	78
5	3	34.72	3209.4	56.65	-0.0	67
5	4	14.88	871.41	29.52	-0.0007	70
10	1	45.1	6151.45	78.43	-0.0085	69
10	2	53.46	6323.2	79.52	-0.0	68
10	3	34.64	3209.36	56.65	-0.0	90
10	4	14.85	870.96	29.51	-0.0002	71
25	1	45.11	6153.23	78.44	-0.0088	69
25	2	53.44	6323.18	79.52	-0.0	79
25	3	34.64	3209.35	56.65	-0.0	85
25	4	14.85	870.92	29.51	-0.0002	101
50	1	45.11	6153.11	78.44	-0.0088	157
50	2	53.51	6323.84	79.52	-0.0001	79
50	3	34.7	3209.34	56.65	-0.0	67
50	4	14.86	871.05	29.51	-0.0003	93
100	1	45.0	6138.72	78.35	-0.0064	82
100	2	53.47	6323.29	79.52	-0.0	75
100	3	34.69	3209.31	56.65	-0.0	67
100	4	14.86	871.01	29.51	-0.0003	72

Table B.93: Result metrics for the  $VolumeSent_{td}$  model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	69.14	12272.8	110.78	-0.0245	72
2	2	80.65	13087.37	114.4	0.0184	67
2	3	53.2	6479.24	80.49	-0.0285	71
2	4	24.61	1724.47	41.53	-0.029	87
5	1	71.28	12719.66	112.78	-0.0618	67
5	2	80.34	12709.96	112.74	0.0467	75
5	3	53.88	6404.13	80.03	-0.0166	70
5	4	25.54	1910.21	43.71	-0.1398	72
10	1	69.25	12253.14	110.69	-0.0229	66
10	2	81.77	13334.69	115.48	-0.0001	83
10	3	51.68	6300.02	79.37	-0.0001	71
10	4	21.65	1676.89	40.95	-0.0006	94
25	1	68.69	12164.86	110.29	-0.0155	78
25	2	81.9	13337.01	115.49	-0.0003	67
25	3	51.84	6299.66	79.37	-0.0	88
25	4	21.81	1679.66	40.98	-0.0022	95
50	1	68.44	12109.78	110.04	-0.0109	67
50	2	81.69	13333.56	115.47	-0.0001	76
50	3	51.92	6299.84	79.37	-0.0	66
50	4	21.7	1677.55	40.96	-0.001	77
100	1	68.18	12031.12	109.69	-0.0044	66
100	2	81.02	13342.69	115.51	-0.0007	123
100	3	51.08	6310.81	79.44	-0.0018	78
100	4	21.43	1676.44	40.94	-0.0003	80

Table B.94: Result metrics for the  $VolumeSent_{td}$  model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	104.8	26970.3	164.23	-0.0586	265
2	2	107.45	19921.82	141.14	0.0061	73
2	3	84.21	13258.37	115.15	-0.0149	74
2	4	37.47	3834.6	61.92	-0.1681	77
5	1	106.61	28705.51	169.43	-0.1268	104
5	2	107.87	19750.75	140.54	0.0147	72
5	3	81.77	13183.18	114.82	-0.0091	77
5	4	34.63	3647.58	60.4	-0.1111	77
10	1	106.9	25330.24	159.15	0.0057	83
10	2	107.11	19664.52	140.23	0.019	78
10	3	82.8	13276.35	115.22	-0.0162	75
10	4	32.98	3646.91	60.39	-0.1109	79
25	1	118.67	30786.04	175.46	-0.2084	94
25	2	136.65	28870.82	169.91	-0.4403	68
25	3	90.56	14316.9	119.65	-0.0959	74
25	4	49.93	5066.57	71.18	-0.5433	75
50	1	102.26	25818.3	160.68	-0.0134	69
50	2	109.41	20112.07	141.82	-0.0033	66
50	3	79.21	13127.21	114.57	-0.0048	78
50	4	29.7	3284.38	57.31	-0.0004	82
100	1	108.18	27599.07	166.13	-0.0833	66
100	2	131.15	30760.18	175.39	-0.5345	103
100	3	106.82	22021.14	148.4	-0.6856	66
100	4	64.77	7958.87	89.21	-1.4243	90

Table B.95: Result metrics for the *VolumeSent<sub>td</sub>* model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	180.54	66450.36	257.78	-0.1874	71
2	2	135.54	31466.2	177.39	0.0915	96
2	3	128.18	30420.62	174.42	-0.0758	73
2	4	81.83	11409.24	106.81	-0.495	69
5	1	172.59	56901.83	238.54	-0.0168	70
5	2	148.3	33290.98	182.46	0.0388	75
5	3	105.22	27270.79	165.14	0.0356	70
5	4	72.13	12383.46	111.28	-0.6226	70
10	1	170.09	59374.0	243.67	-0.061	67
10	2	151.45	36164.55	190.17	-0.0441	66
10	3	115.48	29614.6	172.09	-0.0473	77
10	4	56.2	6968.35	83.48	0.0869	91
25	1	217.93	78045.16	279.37	-0.3946	66
25	2	280.33	110224.47	332.0	-2.1824	66
25	3	192.52	63928.39	252.84	-1.2608	75
25	4	251.62	97334.52	311.98	-11.7539	68
50	1	179.55	63601.0	252.19	-0.1365	71
50	2	150.06	38045.98	195.05	-0.0985	79
50	3	146.75	43000.4	207.37	-0.5207	66
50	4	60.57	9189.81	95.86	-0.2042	71
100	1	184.73	59237.12	243.39	-0.0585	72
100	2	153.3	39359.01	198.39	-0.1364	67
100	3	138.39	37580.74	193.86	-0.329	81
100	4	84.21	12048.02	109.76	-0.5787	77

Table B.96: Result metrics for the  $VolumeSent_{td}$  model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

## B.4 BERT Models Results

### B.4.1 The Non-Time Differenced Dense-BERT Model *DenseBERT<sub>c</sub>*

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	894.11	1085422.4	1041.84	-1.0526	80
2	2	828.02	833165.75	912.78	-4.1144	81
2	3	814.53	760993.6	872.35	-6.802	77
2	4	706.67	512698.97	716.03	-37.504	66
5	1	811.0	865055.25	930.08	-0.6359	84
5	2	822.53	822916.4	907.15	-4.0515	71
5	3	773.21	694852.25	833.58	-6.1238	69
5	4	208.96	56895.08	238.53	-3.2729	92
10	1	741.09	701637.6	837.64	-0.3268	66
10	2	825.31	828094.6	910.0	-4.0833	83
10	3	781.37	707920.75	841.38	-6.2578	77
10	4	102.28	15207.36	123.32	-0.1421	119
25	1	643.05	630454.06	794.01	-0.1922	81
25	2	824.55	826679.25	909.22	-4.0746	79
25	3	806.19	747478.2	864.57	-6.6634	86
25	4	273.84	88298.59	297.15	-5.6313	88
50	1	679.66	558116.4	747.07	-0.0554	80
50	2	824.67	826899.7	909.34	-4.076	66
50	3	745.78	650842.6	806.75	-5.6726	85
50	4	174.07	42792.99	206.86	-2.2138	95
100	1	849.81	1124591.5	1060.47	-1.1267	96
100	2	212.09	61422.92	247.84	0.623	71
100	3	57.08	6271.36	79.19	0.9357	68
100	4	46.72	2852.59	53.41	0.7858	99

Table B.97: Result metrics for the *DenseBERT<sub>c</sub>* model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	1055.55	1577417.8	1255.95	-1.983	83
2	2	994.96	1152155.4	1073.39	-6.1026	86
2	3	975.64	1049273.1	1024.34	-9.7725	80
2	4	982.7	978985.7	989.44	-72.7186	87
5	1	1055.38	1576886.8	1255.74	-1.982	84
5	2	999.06	1160335.5	1077.19	-6.1531	75
5	3	975.21	1048441.6	1023.93	-9.764	73
5	4	963.42	941456.8	970.29	-69.8926	66
10	1	1051.82	1565494.5	1251.2	-1.9605	67
10	2	129.4	23936.76	154.72	0.8524	101
10	3	51.8	4844.8	69.6	0.9503	69
10	4	19.48	907.59	30.13	0.9317	82
25	1	157.82	39101.99	197.74	0.9261	134
25	2	91.42	12354.63	111.15	0.9238	87
25	3	47.34	4356.81	66.01	0.9553	69
25	4	38.34	2220.81	47.13	0.8328	83
50	1	130.76	25330.6	159.16	0.9521	137
50	2	91.89	12630.04	112.38	0.9221	74
50	3	52.45	5068.53	71.19	0.948	70
50	4	20.51	1140.1	33.77	0.9141	89
100	1	86.38	12241.88	110.64	0.9768	77
100	2	81.28	10687.14	103.38	0.9341	84
100	3	49.9	4781.2	69.15	0.9509	66
100	4	19.01	935.37	30.58	0.9296	99

Table B.98: Result metrics for the *DenseBERT<sub>c</sub>* model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

## B. THE SECOND APPENDIX

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	1010.72	1433413.1	1197.25	-1.7115	69
2	2	1046.69	1256646.8	1121.0	-6.8008	71
2	3	1026.16	1150001.8	1072.38	-10.8562	85
2	4	966.14	946687.44	972.98	-70.5752	76
5	1	1013.33	1441585.5	1200.66	-1.7269	73
5	2	1042.59	1248076.4	1117.17	-6.7476	68
5	3	1006.73	1110549.1	1053.83	-10.4494	75
5	4	1038.12	1090925.1	1044.47	-81.4804	78
10	1	83.1	12050.84	109.78	0.9772	66
10	2	70.34	8135.04	90.19	0.9495	76
10	3	46.01	4908.62	70.06	0.9494	80
10	4	26.2	1443.82	38.0	0.8908	93
25	1	80.8	11721.83	108.27	0.9778	104
25	2	109.53	15568.46	124.77	0.9034	76
25	3	34.23	2913.7	53.98	0.97	92
25	4	17.73	954.84	30.9	0.9278	85
50	1	80.25	11008.1	104.92	0.9792	68
50	2	89.39	11197.37	105.82	0.9305	67
50	3	37.95	3255.46	57.06	0.9664	75
50	4	17.7	972.39	31.18	0.9265	72
100	1	112.84	20461.04	143.04	0.9613	70
100	2	98.99	13649.26	116.83	0.9153	80
100	3	46.99	4808.94	69.35	0.9504	81
100	4	49.23	3469.16	58.9	0.7377	81

Table B.99: Result metrics for the *DenseBERT<sub>c</sub>* model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	963.08	1291626.5	1136.5	-1.4467	75
2	2	1051.84	1266261.6	1125.28	-6.9193	76
2	3	1039.77	1177049.6	1084.92	-11.27	67
2	4	1077.06	1173186.9	1083.14	-88.3542	75
5	1	135.51	24967.44	158.01	0.9527	90
5	2	110.02	16847.41	129.8	0.8946	85
5	3	52.26	5147.86	71.75	0.9463	69
5	4	33.08	2190.7	46.8	0.8331	89
10	1	136.98	30289.68	174.04	0.9426	78
10	2	73.64	9497.76	97.46	0.9406	68
10	3	58.1	6097.07	78.08	0.9364	72
10	4	25.05	1447.7	38.05	0.8897	67
25	1	75.23	10320.42	101.59	0.9805	95
25	2	70.77	8371.27	91.49	0.9476	66
25	3	43.45	3940.84	62.78	0.9589	72
25	4	18.81	1011.45	31.8	0.923	68
50	1	133.34	30365.14	174.26	0.9425	72
50	2	69.65	8926.58	94.48	0.9442	89
50	3	44.71	4372.38	66.12	0.9544	94
50	4	23.36	1283.75	35.83	0.9022	70
100	1	108.03	17777.18	133.33	0.9663	84
100	2	123.36	20840.98	144.36	0.8697	84
100	3	55.65	6025.4	77.62	0.9372	80
100	4	30.75	1883.78	43.4	0.8565	75

Table B.100: Result metrics for the *DenseBERT<sub>c</sub>* model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	176.69	46413.92	215.44	0.9113	93
2	2	64.93	8218.19	90.65	0.9484	74
2	3	46.06	4529.88	67.3	0.9533	88
2	4	30.85	1942.15	44.07	0.8517	76
5	1	141.35	34266.62	185.11	0.9346	78
5	2	78.01	11297.98	106.29	0.9291	70
5	3	62.58	8100.23	90.0	0.9165	80
5	4	33.2	2244.92	47.38	0.8285	69
10	1	95.72	15599.28	124.9	0.9702	75
10	2	71.53	9705.32	98.52	0.9391	87
10	3	58.27	6560.95	81.0	0.9324	93
10	4	30.18	1956.78	44.24	0.8506	77
25	1	84.77	13308.57	115.36	0.9746	78
25	2	68.41	9501.53	97.48	0.9404	69
25	3	49.76	5507.71	74.21	0.9432	79
25	4	23.84	1491.67	38.62	0.8861	72
50	1	98.77	16341.96	127.84	0.9688	75
50	2	74.99	10197.25	100.98	0.936	74
50	3	52.62	6140.41	78.36	0.9367	77
50	4	33.16	2169.01	46.57	0.8343	67
100	1	117.74	20671.06	143.77	0.9605	69
100	2	86.44	13178.61	114.8	0.9173	90
100	3	65.97	7800.6	88.32	0.9196	89
100	4	35.27	2591.75	50.91	0.8021	69

Table B.101: Result metrics for the *DenseBERT<sub>c</sub>* model trained to predict the next interval’s price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	139.29	29795.59	172.61	0.9433	67
2	2	97.02	15355.33	123.92	0.9021	92
2	3	76.83	12439.07	111.53	0.8683	77
2	4	41.99	3323.41	57.65	0.7421	69
5	1	122.82	25848.84	160.78	0.9508	68
5	2	112.97	22002.11	148.33	0.8598	76
5	3	84.8	13834.33	117.62	0.8536	111
5	4	53.75	5374.17	73.31	0.5829	68
10	1	99.29	18154.88	134.74	0.9654	71
10	2	102.33	18583.47	136.32	0.8816	72
10	3	84.73	14740.19	121.41	0.844	77
10	4	62.44	5850.7	76.49	0.5459	82
25	1	134.24	26795.89	163.69	0.949	73
25	2	113.61	23907.17	154.62	0.8476	70
25	3	85.68	16082.74	126.82	0.8298	76
25	4	55.73	5658.96	75.23	0.5608	83
50	1	162.54	40108.24	200.27	0.9237	67
50	2	113.15	22850.76	151.16	0.8544	83
50	3	71.67	11110.04	105.4	0.8824	69
50	4	44.64	3708.21	60.9	0.7122	66
100	1	165.97	40746.65	201.86	0.9224	68
100	2	109.68	19899.53	141.07	0.8732	69
100	3	77.14	11590.27	107.66	0.8773	70
100	4	60.87	6656.1	81.58	0.4834	67

Table B.102: Result metrics for the *DenseBERT<sub>c</sub>* model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	158.93	41695.83	204.2	0.9208	72
2	2	127.44	27117.42	164.67	0.8206	72
2	3	134.93	27425.08	165.61	0.6859	69
2	4	77.66	10117.09	100.58	0.2382	67
5	1	145.04	41409.78	203.49	0.9213	68
5	2	136.4	30199.1	173.78	0.8002	76
5	3	150.82	35386.74	188.11	0.5948	79
5	4	92.66	14812.9	121.71	-0.1154	66
10	1	187.96	59968.08	244.88	0.8861	98
10	2	141.99	32449.88	180.14	0.7853	81
10	3	159.11	46073.6	214.65	0.4724	75
10	4	81.64	11224.14	105.94	0.1548	89
25	1	177.44	47331.98	217.56	0.9101	79
25	2	153.99	40016.29	200.04	0.7353	70
25	3	141.45	43254.96	207.98	0.5046	70
25	4	101.61	17735.6	133.18	-0.3355	91
50	1	167.36	43955.06	209.65	0.9165	96
50	2	117.45	22768.22	150.89	0.8494	68
50	3	110.6	22351.35	149.5	0.744	68
50	4	88.46	13040.37	114.19	0.018	66
100	1	181.0	54814.32	234.12	0.8959	66
100	2	168.09	44616.04	211.23	0.7048	71
100	3	140.34	33662.77	183.47	0.6145	67
100	4	205.54	53674.92	231.68	-3.0418	68

Table B.103: Result metrics for the *DenseBERT<sub>c</sub>* model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	187.54	76032.98	275.74	0.8506	84
2	2	202.71	64950.56	254.85	0.5382	70
2	3	195.4	64777.18	254.51	0.2168	68
2	4	166.18	44900.24	211.9	-2.1629	81
5	1	210.81	71503.5	267.4	0.8595	72
5	2	173.31	42235.9	205.51	0.6997	76
5	3	199.08	70086.16	264.74	0.1527	82
5	4	109.64	19393.54	139.26	-0.3661	87
10	1	252.0	103853.3	322.26	0.7959	73
10	2	214.64	80065.6	282.96	0.4307	73
10	3	143.37	52761.2	229.7	0.3621	71
10	4	175.39	51204.67	226.28	-2.607	69
25	1	243.91	95521.79	309.07	0.8123	69
25	2	226.96	75490.9	274.76	0.4633	90
25	3	174.74	68796.7	262.29	0.1682	66
25	4	192.12	59173.73	243.26	-3.1683	73
50	1	258.99	100834.0	317.54	0.8018	93
50	2	252.18	99161.68	314.9	0.295	68
50	3	185.37	62437.54	249.88	0.2451	78
50	4	158.36	40640.0	201.59	-1.8628	83
100	1	752.22	963893.44	981.78	-0.8943	65
100	2	312.03	126121.91	355.14	0.1033	140
100	3	163.37	53809.4	231.97	0.3494	66
100	4	100.75	19471.03	139.54	-0.3716	79

Table B.104: Result metrics for the *DenseBERT<sub>c</sub>* model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

**B.4.2 The Time Differenced Dense-BERT Model  $DenseBERT_{td}$** 

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	10.48	297.8	17.26	-0.0004	145
2	2	11.83	363.41	19.06	-0.0019	267
2	3	8.46	215.29	14.67	-0.0022	147
2	4	4.69	92.82	9.63	-0.0141	187
5	1	10.48	297.78	17.26	-0.0003	159
5	2	11.83	363.38	19.06	-0.0018	269
5	3	8.45	215.2	14.67	-0.0018	203
5	4	4.71	92.93	9.64	-0.0153	78
10	1	10.48	297.79	17.26	-0.0003	156
10	2	11.84	363.7	19.07	-0.0026	178
10	3	8.45	215.01	14.66	-0.0009	246
10	4	4.56	91.63	9.57	-0.0011	147
25	1	10.48	297.79	17.26	-0.0003	367
25	2	11.84	363.77	19.07	-0.0028	224
25	3	8.46	215.25	14.67	-0.002	89
25	4	4.59	91.85	9.58	-0.0035	208
50	1	10.48	297.81	17.26	-0.0004	131
50	2	11.83	363.2	19.06	-0.0013	108
50	3	8.45	214.99	14.66	-0.0008	176
50	4	4.56	91.64	9.57	-0.0012	72
100	1	10.48	297.82	17.26	-0.0004	153
100	2	11.83	363.14	19.06	-0.0011	236
100	3	8.45	215.01	14.66	-0.0009	103
100	4	4.58	91.74	9.58	-0.0023	80

Table B.105: Result metrics for the  $DenseBERT_{td}$  model trained to predict the next interval's price with a time interval of 10 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	17.51	907.57	30.13	-0.0028	68
2	2	19.83	1010.74	31.79	-0.0008	82
2	3	14.81	743.89	27.27	-0.0078	226
2	4	7.36	263.33	16.23	-0.0001	82
5	1	17.49	906.92	30.12	-0.002	98
5	2	19.84	1010.54	31.79	-0.0006	76
5	3	14.86	745.37	27.3	-0.0098	67
5	4	7.37	263.3	16.23	-0.0	74
10	1	17.55	909.32	30.15	-0.0047	67
10	2	19.83	1010.83	31.79	-0.0009	72
10	3	14.83	744.47	27.28	-0.0085	68
10	4	7.37	263.29	16.23	-0.0	82
25	1	17.54	908.8	30.15	-0.0041	67
25	2	19.84	1010.92	31.79	-0.001	70
25	3	14.81	743.9	27.27	-0.0078	75
25	4	7.37	263.29	16.23	-0.0	71
50	1	17.49	906.66	30.11	-0.0018	81
50	2	19.83	1010.61	31.79	-0.0007	75
50	3	14.83	744.66	27.29	-0.0088	74
50	4	7.37	263.31	16.23	-0.0001	87
100	1	17.49	906.99	30.12	-0.0021	70
100	2	19.84	1010.46	31.79	-0.0005	69
100	3	14.81	744.09	27.28	-0.008	69
100	4	7.37	263.31	16.23	-0.0001	69

Table B.106: Result metrics for the *DenseBERT<sub>td</sub>* model trained to predict the next interval's price with a time interval of 30 minutes and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	25.14	1825.09	42.72	-0.0085	76
2	2	28.66	2064.76	45.44	-0.0004	68
2	3	20.04	1172.9	34.25	-0.003	77
2	4	9.87	466.44	21.6	-0.0001	68
5	1	25.03	1816.89	42.63	-0.004	79
5	2	28.65	2064.64	45.44	-0.0003	72
5	3	20.06	1174.76	34.27	-0.0046	93
5	4	9.87	466.42	21.6	-0.0	82
10	1	25.07	1820.16	42.66	-0.0058	78
10	2	28.69	2065.83	45.45	-0.0009	81
10	3	20.02	1170.64	34.21	-0.0011	66
10	4	9.87	466.44	21.6	-0.0	89
25	1	25.09	1821.63	42.68	-0.0066	87
25	2	28.62	2064.04	45.43	-0.0	87
25	3	20.04	1173.61	34.26	-0.0036	96
25	4	9.88	466.55	21.6	-0.0003	90
50	1	25.06	1819.52	42.66	-0.0054	73
50	2	28.66	2064.81	45.44	-0.0004	66
50	3	20.03	1172.68	34.24	-0.0028	81
50	4	9.87	466.42	21.6	-0.0	71
100	1	25.06	1819.3	42.65	-0.0053	70
100	2	28.66	2064.83	45.44	-0.0004	69
100	3	20.03	1172.53	34.24	-0.0027	67
100	4	9.87	466.42	21.6	-0.0	68

Table B.107: Result metrics for the *DenseBERT<sub>td</sub>* model trained to predict the next interval's price with a time interval of 1 hour and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	36.07	3739.64	61.15	-0.0069	133
2	2	42.16	4291.15	65.51	-0.0001	86
2	3	29.38	2162.45	46.5	-0.0	67
2	4	12.84	559.72	23.66	-0.0	111
5	1	36.08	3741.03	61.16	-0.0073	77
5	2	42.17	4291.27	65.51	-0.0001	91
5	3	29.37	2162.76	46.51	-0.0002	75
5	4	12.84	559.73	23.66	-0.0	81
10	1	36.08	3740.46	61.16	-0.0071	133
10	2	42.15	4291.03	65.51	-0.0001	98
10	3	29.37	2162.72	46.51	-0.0001	71
10	4	12.84	559.72	23.66	-0.0	90
25	1	36.08	3740.85	61.16	-0.0072	176
25	2	42.14	4290.92	65.51	-0.0	66
25	3	29.38	2162.47	46.5	-0.0	76
25	4	12.84	559.87	23.66	-0.0003	79
50	1	36.05	3738.47	61.14	-0.0066	87
50	2	42.15	4291.01	65.51	-0.0001	90
50	3	29.38	2162.51	46.5	-0.0	71
50	4	12.84	559.79	23.66	-0.0001	88
100	1	35.99	3733.6	61.1	-0.0053	130
100	2	42.12	4290.77	65.5	-0.0	78
100	3	29.38	2162.5	46.5	-0.0	79
100	4	12.84	559.72	23.66	-0.0	88

Table B.108: Result metrics for the *DenseBERT<sub>td</sub>* model trained to predict the next interval's price with a time interval of 2 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	45.25	6170.09	78.55	-0.0116	126
2	2	53.55	6324.53	79.53	-0.0002	78
2	3	34.73	3209.49	56.65	-0.0001	108
2	4	14.88	871.41	29.52	-0.0007	72
5	1	45.26	6171.32	78.56	-0.0118	168
5	2	53.54	6324.47	79.53	-0.0002	69
5	3	34.71	3209.39	56.65	-0.0	70
5	4	14.88	871.4	29.52	-0.0007	80
10	1	45.1	6151.54	78.43	-0.0085	91
10	2	53.45	6323.19	79.52	-0.0	81
10	3	34.64	3209.35	56.65	-0.0	79
10	4	14.85	870.93	29.51	-0.0002	75
25	1	45.12	6153.39	78.44	-0.0088	110
25	2	53.44	6323.19	79.52	-0.0	90
25	3	34.65	3209.33	56.65	-0.0	82
25	4	14.85	870.92	29.51	-0.0002	80
50	1	45.11	6153.25	78.44	-0.0088	174
50	2	53.51	6323.83	79.52	-0.0001	105
50	3	34.7	3209.35	56.65	-0.0	103
50	4	14.86	871.09	29.51	-0.0004	78
100	1	45.0	6138.72	78.35	-0.0064	74
100	2	53.48	6323.4	79.52	-0.0	72
100	3	34.69	3209.31	56.65	-0.0	71
100	4	14.86	871.01	29.51	-0.0003	71

Table B.109: Result metrics for the *DenseBERT<sub>td</sub>* model trained to predict the next interval's price with a time interval of 3 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	68.99	12215.52	110.52	-0.0198	66
2	2	88.1	15453.16	124.31	-0.159	67
2	3	51.36	6240.7	79.0	0.0094	76
2	4	38.31	3945.84	62.82	-1.3545	69
5	1	68.61	12148.39	110.22	-0.0141	75
5	2	101.75	19549.0	139.82	-0.4662	68
5	3	51.09	6294.05	79.34	0.0009	106
5	4	34.17	3809.83	61.72	-1.2733	71
10	1	69.25	12253.02	110.69	-0.0229	79
10	2	81.77	13334.68	115.48	-0.0001	71
10	3	51.68	6300.02	79.37	-0.0001	78
10	4	21.65	1676.9	40.95	-0.0006	71
25	1	68.79	12184.44	110.38	-0.0172	66
25	2	81.91	13337.04	115.49	-0.0003	66
25	3	51.84	6299.67	79.37	-0.0	74
25	4	21.82	1679.69	40.98	-0.0023	97
50	1	68.44	12110.06	110.05	-0.0109	66
50	2	81.69	13333.55	115.47	-0.0001	82
50	3	51.92	6299.84	79.37	-0.0	66
50	4	21.7	1677.55	40.96	-0.001	66
100	1	68.18	12030.81	109.69	-0.0043	66
100	2	81.02	13342.63	115.51	-0.0007	67
100	3	51.09	6310.63	79.44	-0.0017	70
100	4	21.43	1676.48	40.94	-0.0003	76

Table B.110: Result metrics for the *DenseBERT<sub>td</sub>* model trained to predict the next interval's price with a time interval of 6 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

---

B. THE SECOND APPENDIX

---

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	108.86	26542.49	162.92	-0.0419	72
2	2	122.31	24131.06	155.34	-0.2038	77
2	3	151.55	41939.19	204.79	-2.2102	71
2	4	93.94	16771.88	129.51	-4.1089	83
5	1	103.58	26377.43	162.41	-0.0354	66
5	2	111.66	19840.73	140.86	0.0102	67
5	3	115.95	23197.22	152.31	-0.7756	78
5	4	58.8	8108.14	90.05	-1.4698	68
10	1	101.74	25811.3	160.66	-0.0132	67
10	2	133.8	27012.18	164.35	-0.3476	66
10	3	142.46	32458.47	180.16	-1.4845	71
10	4	31.13	3362.47	57.99	-0.0242	91
25	1	102.68	26061.57	161.44	-0.023	68
25	2	111.22	20074.13	141.68	-0.0014	66
25	3	79.04	13144.59	114.65	-0.0062	69
25	4	30.34	3288.33	57.34	-0.0017	71
50	1	102.26	25817.67	160.68	-0.0134	69
50	2	109.41	20111.99	141.82	-0.0033	66
50	3	79.21	13127.2	114.57	-0.0048	70
50	4	29.7	3284.42	57.31	-0.0005	66
100	1	108.41	27658.53	166.31	-0.0857	68
100	2	116.78	21084.44	145.2	-0.0519	79
100	3	94.48	18125.0	134.63	-0.3874	93
100	4	75.18	9488.63	97.41	-1.8903	88

Table B.111: Result metrics for the *DenseBERT<sub>td</sub>* model trained to predict the next interval's price with a time interval of 12 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.

$w$	Fold NR.	MAE	MSE	RMSE	R2	Epochs trained
2	1	172.44	54399.54	233.24	0.0279	67
2	2	212.43	63443.02	251.88	-0.8317	69
2	3	285.16	132323.8	363.76	-3.6796	66
2	4	235.11	103506.34	321.72	-12.5626	84
5	1	169.36	56103.26	236.86	-0.0025	68
5	2	277.71	123071.33	350.82	-2.5533	70
5	3	160.5	43538.19	208.66	-0.5397	74
5	4	154.14	39324.43	198.3	-4.1528	72
10	1	173.05	56185.13	237.03	-0.004	66
10	2	262.25	95629.96	309.24	-1.761	92
10	3	213.72	65148.65	255.24	-1.304	68
10	4	163.9	35273.26	187.81	-3.6219	73
25	1	173.75	59777.38	244.49	-0.0682	66
25	2	148.54	35236.92	187.72	-0.0174	72
25	3	132.76	35269.58	187.8	-0.2473	83
25	4	47.47	7654.44	87.49	-0.003	71
50	1	189.91	64485.02	253.94	-0.1523	95
50	2	184.16	50657.77	225.07	-0.4626	71
50	3	189.05	52547.95	229.23	-0.8583	66
50	4	78.16	11217.13	105.91	-0.4698	68
100	1	184.78	59281.5	243.48	-0.0593	77
100	2	128.06	29202.32	170.89	0.1569	79
100	3	171.53	43716.54	209.09	-0.546	67
100	4	168.72	41181.18	202.93	-4.3961	74

Table B.112: Result metrics for the *DenseBERT<sub>td</sub>* model trained to predict the next interval's price with a time interval of 24 hours and a batch size of 64 for different window sizes and data folds. The fold NR. indicates the fold number from Table 3.11 and  $w$  is the window size.



## Appendix C

# The Third Appendix

In this appendix, extra plots regarding the correlation between features can be found.

### C.1 Correlation Plots

#### C.1.1 Sentiment Correlation

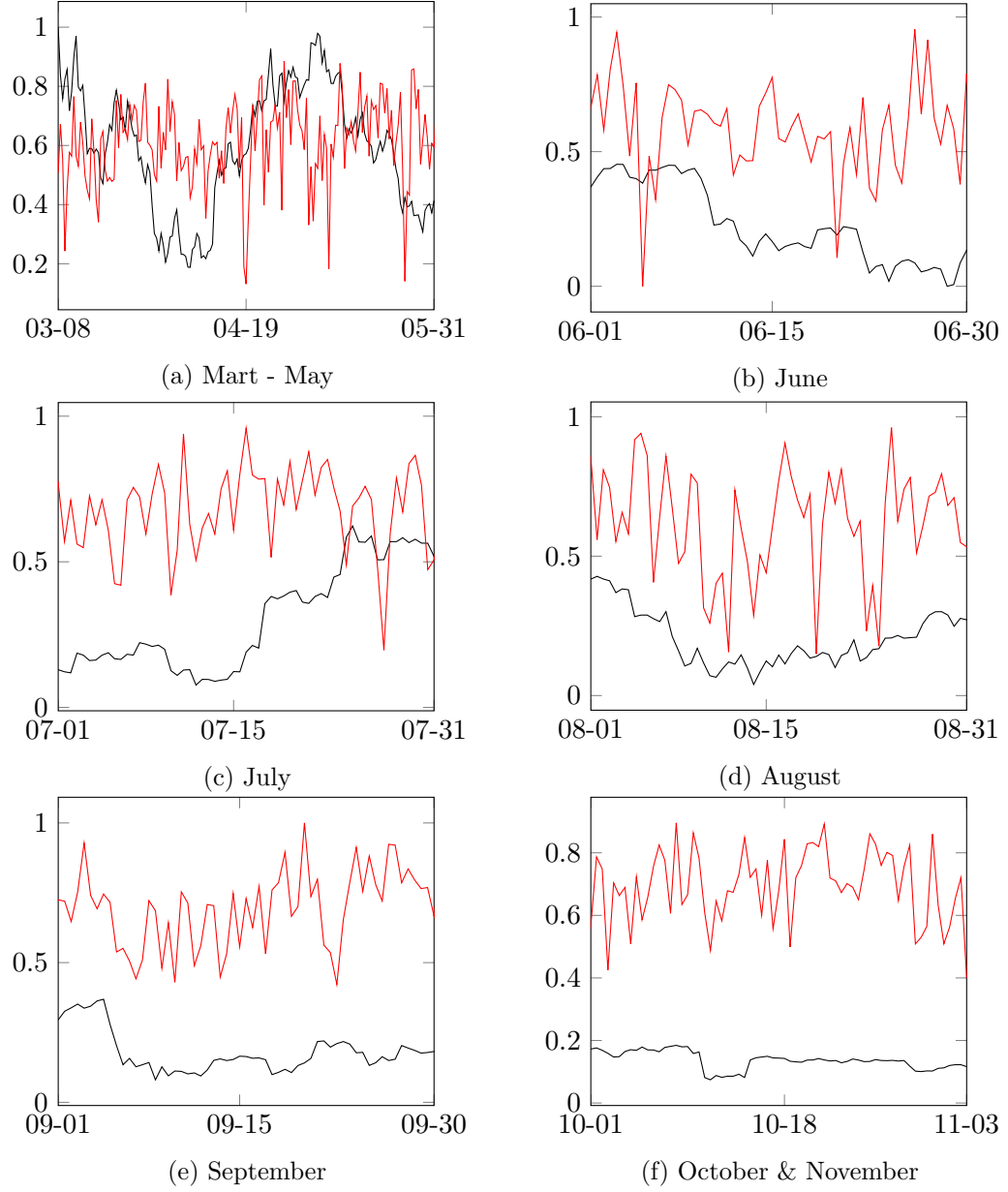


Figure C.1: The normalized actual price (black) and the normalized compound score (red) plotted over time with a time interval of 12 hours. These values are min-max normalized over the whole dataset. The plotted period is different for each of the figures and is noted in their corresponding captions.



## C.1.2 Volume Correlation

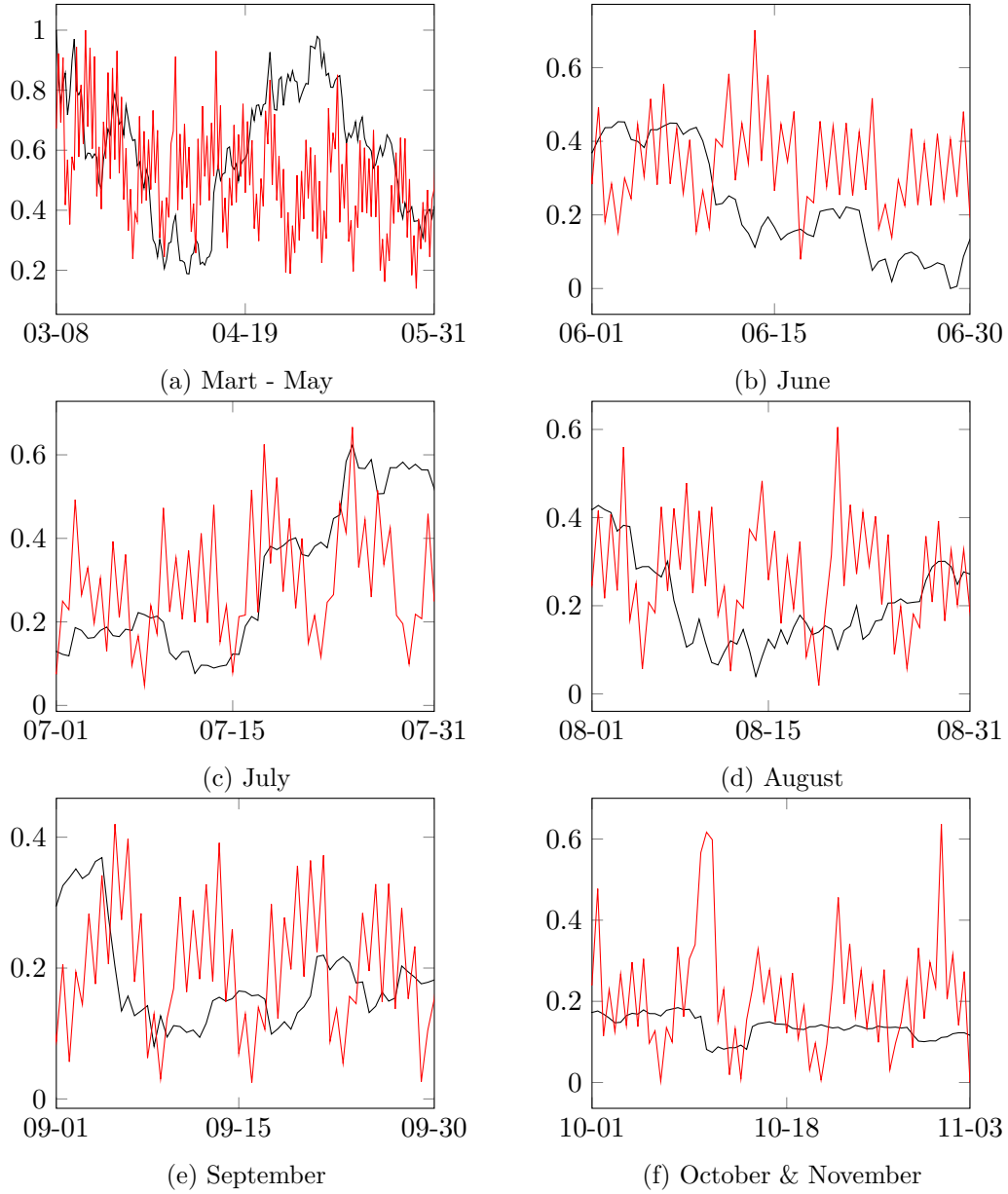
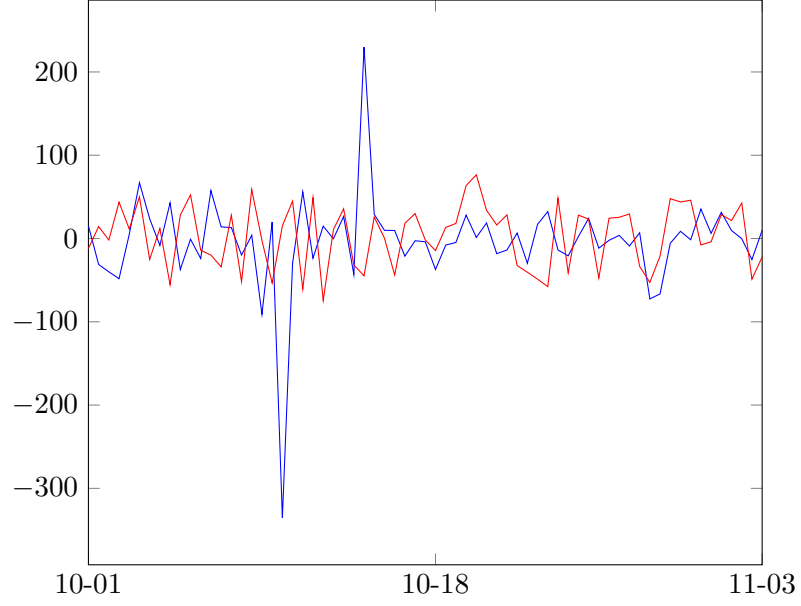
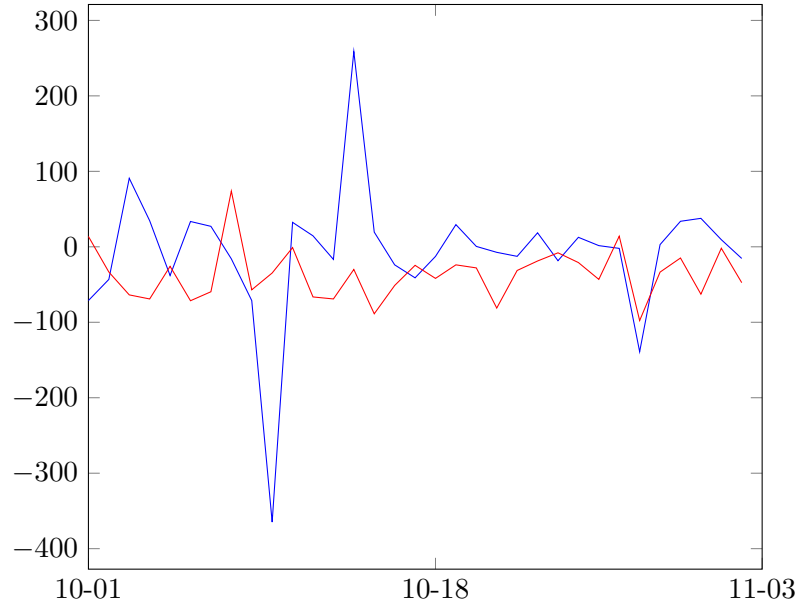


Figure C.2: The normalized actual price (black) and the normalized filtered tweet volume (red) plotted over time with a time interval of 12 hours. These values are min-max normalized over the whole dataset. The plotted period is different for each of the figures and is noted in their corresponding captions.

## C.2 Extra Plots



(a)  $w = 25$ ,  $i = 12$  hours and  $RMSE = 72$ .



(b)  $w = 25$ ,  $i = 24$  hours and  $RMSE = 98$ .

Figure C.3:  $Base_{td}$  model's extra prediction plots.