Appendices

12.11-2020

1 Appendices

1.1 Appendix A

As researchers typically do not typically post underlying data with their research, various plot digitizers have seen an exponential increase in use. Drevon et al. (2017) researched intercoder reliability, during which over 3500 data points were extracted with WebPlotDigitizer from 36 different graphs. Nevertheless, they controlled the validity of the results and concluded that there was a near perfect correlation (r=0.989 with p-value <0.01) between extracted and actual data. Nevertheless, the limitations mentioned highlight coders previous experience with plot-digitizing tools.

Furthermore, Burda et al. (2017) also highlight that systematic reviewers often tend to have data constraints which is why plot digitizers are of a great help. They estimated data using WebPlotDigitizer and conclude that the extraction done by different coders was consistent; nevertheless, in the case of continuous data (compared to event data), the distribution varied more. Whatsoever, the intreclass coefficient for both types of plots was over 95%.

We also used the WebPlotDigitzer in our research and as validity test extracted GDP from the same graph as YIV time series & plotted it with actuals - see the graph below.

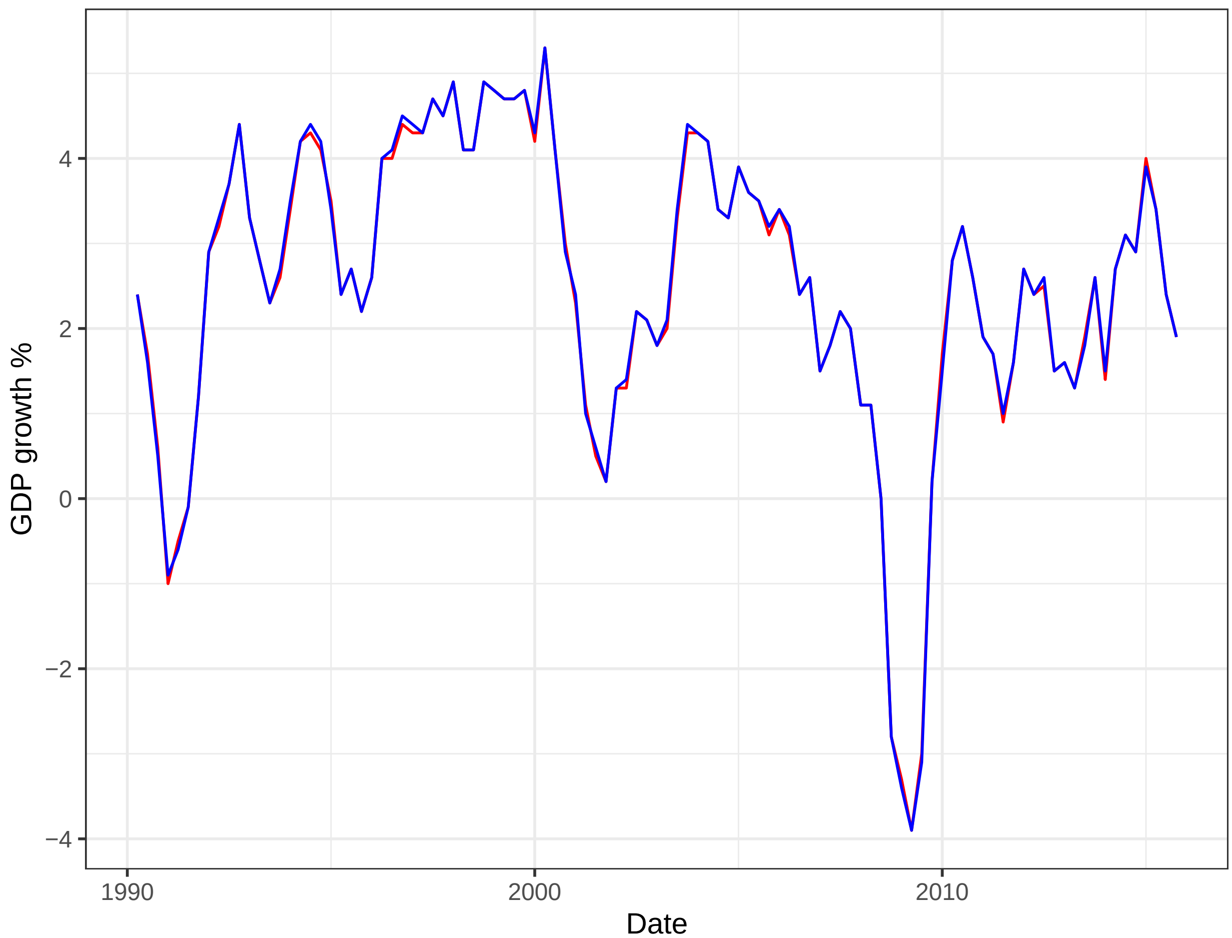


Figure 1.1: Actual vs Extracted GDP growth rate in %

1.2 Appendix B

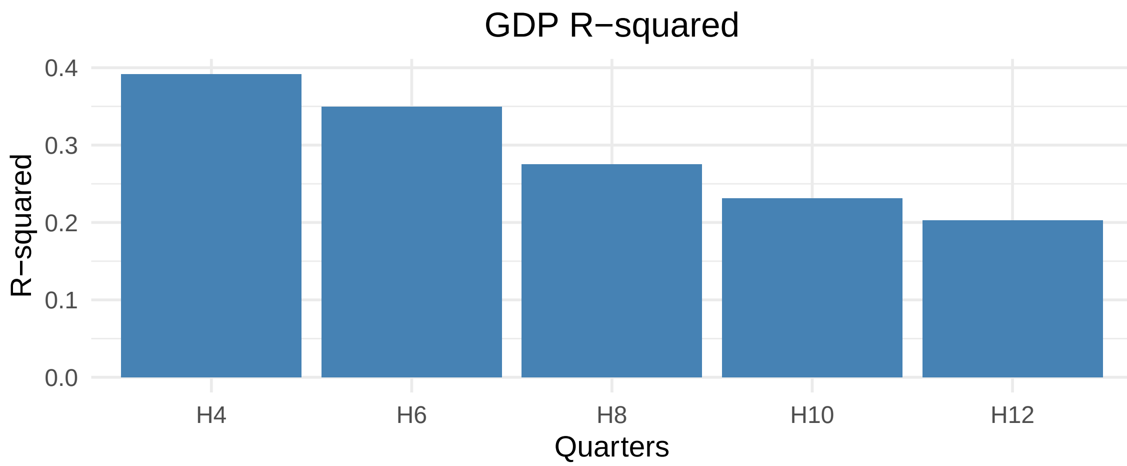


Figure 1.2: Regressions' R-squared

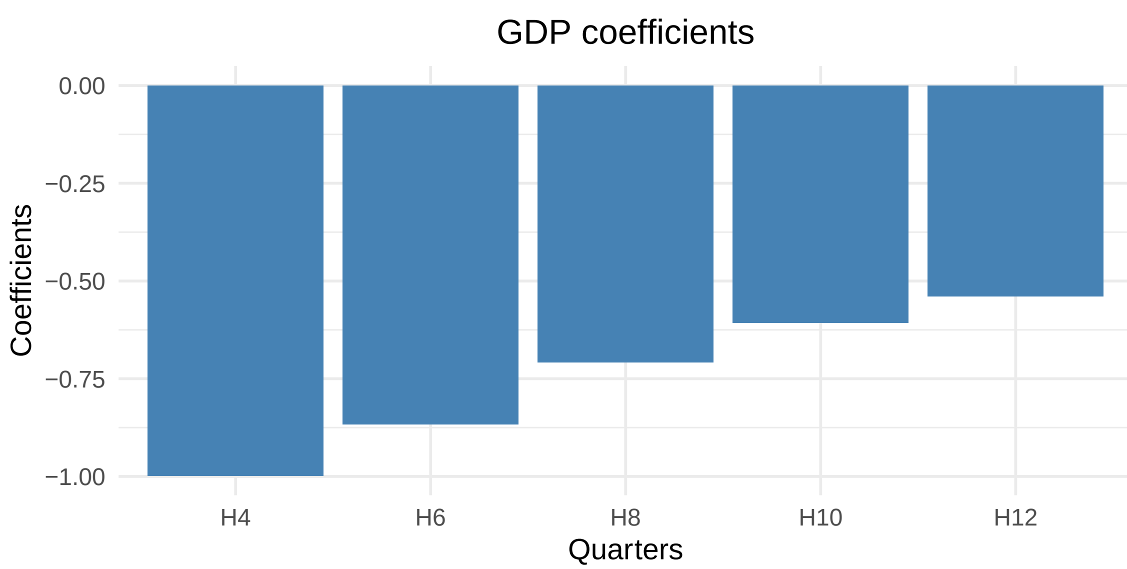


Figure 1.3: Regressions' coefficients

1.3 Appendix D

Notes: This table includes regression with controls. The equation for the regression is following:

$$\sum_{j=1}^{j=H} log(1 + GDP_{i,t+j})/H = \alpha_H + \beta_H \sigma_{IV,t}^{INT} + \varepsilon_{t+H} \quad (1)$$

Table 1.1: Regression with state-dependency

	H4	H6	H8	H10	H12
DGS1__estimate	0.31	0.51	0.87	1.23	1.52
DGS1__std.error	0.46	0.51	0.53	0.55	0.55
DGS1__p.value	0.49	0.32	0.10	0.03	0.01
TRM1012__estimate	0.42	0.57	0.82	1.12	1.34
TRM1012__std.error	0.36	0.44	0.48	0.51	0.51
TRM1012__p.value	0.25	0.20	0.09	0.03	0.01
SRT03M__estimate	0.23	0.23	0.18	0.09	-0.01
SRT03M__std.error	0.21	0.28	0.29	0.25	0.23
SRT03M__p.value	0.28	0.42	0.53	0.74	0.95
baa__aaa__estimate	-0.44	-0.16	-0.09	-0.19	-0.28
baa__aaa__std.error	0.24	0.29	0.30	0.30	0.29
baa__aaa__p.value	0.07	0.60	0.78	0.52	0.34
VIX__estimate	-0.12	-0.22	-0.19	-0.12	-0.10
VIX__std.error	0.21	0.25	0.24	0.22	0.21
VIX__p.value	0.57	0.39	0.43	0.61	0.63
housng__estimate	0.08	0.18	0.33	0.38	0.29
housng__std.error	0.15	0.17	0.20	0.20	0.16
housng__p.value	0.59	0.28	0.11	0.07	0.08
gz__spr__estimate	-0.53	-0.80	-0.76	-0.50	-0.28
gz__spr__std.error	0.33	0.33	0.39	0.46	0.48
gz__spr__p.value	0.12	0.02	0.06	0.29	0.56
spy__logreturn__estimate	0.02	0.01	0.00	0.00	0.00
spy__logreturn__std.error	0.02	0.02	0.02	0.02	0.02
spy__logreturn__p.value	0.20	0.66	0.96	0.96	0.90
r.squared	0.75	0.64	0.58	0.57	0.60
adj.r.squared	0.72	0.59	0.52	0.52	0.54

Note:

*** - p<0.01, ** - p<0.05, * - p<0.1. Reported standard error is adjusted for heteroskedasticity

1.4 Appendix E

Notes: YIV, dummy and controls as independent variables. The equation for the regression is following:

$$\sum_{j=1}^{j=H} log(1 + GDP_{i,t+j})/H = \alpha_H + \beta_H \sigma_{IV,t}^{INT} + \varepsilon_{t+H} \tag{2}$$

Table 1.2: Regression with state-dependency

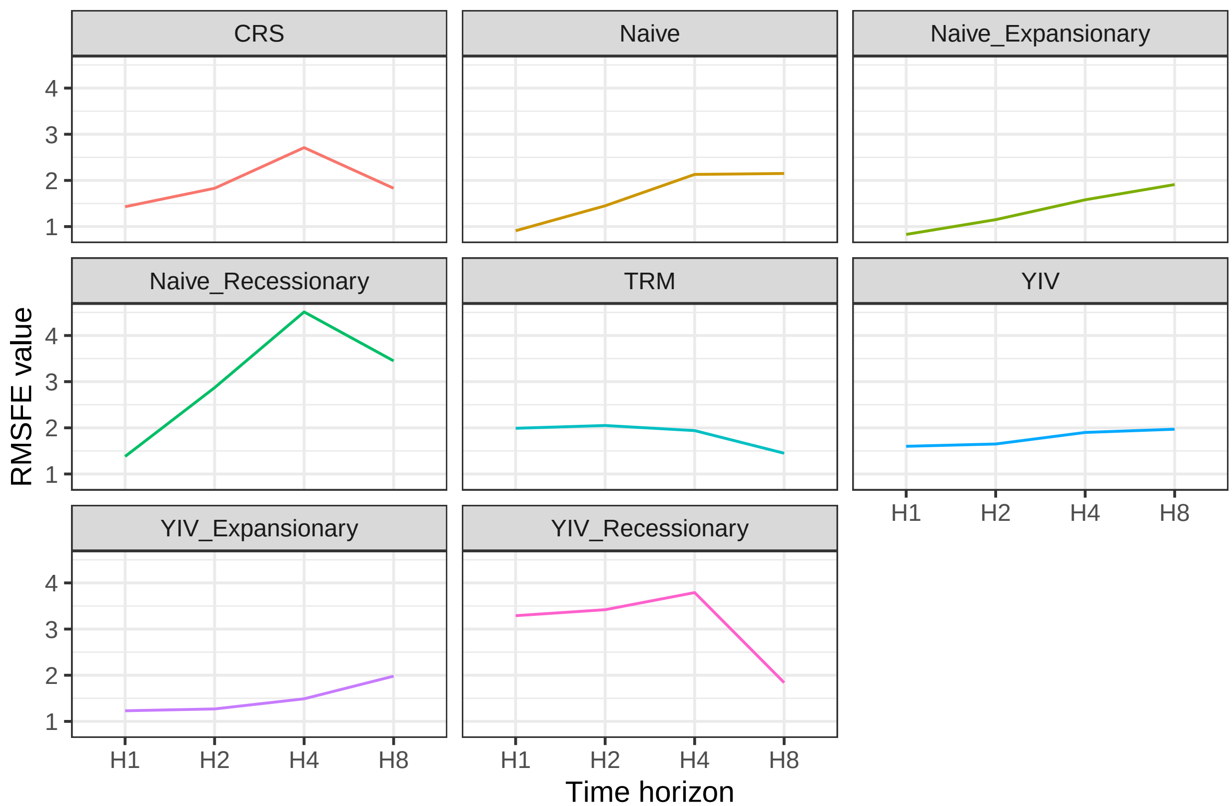
	H4	H6	H8	H10	H12
YIV__estimate	-0.59	-0.68	-0.57	-0.47	-0.33
YIV__std.error	0.14	0.19	0.18	0.15	0.15
YIV__p.value	0.00	0.00	0.00	0.00	0.03
dum__estimate	-1.11	-0.99	-0.88	-0.63	-0.63
dum__std.error	0.51	0.68	0.66	0.56	0.50
dum__p.value	0.04	0.15	0.18	0.27	0.21
DGS1__estimate	0.43	0.63	0.97	1.30	1.58
DGS1__std.error	0.39	0.46	0.49	0.53	0.53
DGS1__p.value	0.27	0.18	0.05	0.02	0.00
TRM1012__estimate	0.51	0.67	0.91	1.19	1.38
TRM1012__std.error	0.32	0.42	0.48	0.52	0.50
TRM1012__p.value	0.12	0.12	0.06	0.03	0.01
SRT03M__estimate	0.02	0.03	0.01	-0.04	-0.13
SRT03M__std.error	0.20	0.28	0.31	0.28	0.25
SRT03M__p.value	0.92	0.91	0.99	0.88	0.59
baa__aaa__estimate	-0.03	0.29	0.29	0.11	-0.05
baa__aaa__std.error	0.22	0.30	0.32	0.32	0.31
baa__aaa__p.value	0.88	0.33	0.37	0.73	0.87
VIX__estimate	0.09	0.00	0.00	0.03	0.02
VIX__std.error	0.17	0.18	0.18	0.18	0.18
VIX__p.value	0.60	1.00	0.99	0.88	0.93
housng__estimate	0.18	0.28	0.41	0.44	0.34
housng__std.error	0.15	0.19	0.24	0.23	0.19
housng__p.value	0.24	0.14	0.09	0.07	0.08
gz__spr__estimate	-0.32	-0.58	-0.57	-0.35	-0.16
gz__spr__std.error	0.35	0.36	0.40	0.47	0.49
gz__spr__p.value	0.38	0.11	0.16	0.46	0.74
spy__logreturn__estimate	0.03	0.01	0.00	0.00	0.00
spy__logreturn__std.error	0.01	0.02	0.02	0.02	0.02
spy__logreturn__p.value	0.06	0.40	0.79	0.80	0.82
r.squared	0.84	0.75	0.67	0.64	0.64

adj.r.squared	0.81	0.71	0.61	0.58	0.58

Note:
*** - p<0.01, ** - p<0.05, * - p<0.1. Reported standard error is adjusted for heteroskedasticity

1.5 Appendix F

	H1	H2	H4	H8
YIV	1.60	1.65	1.90	1.97
YIV-Recess.	3.29	3.42	3.79	1.84
YIV-Expans.	1.23	1.27	1.49	1.98
Naive	0.91	1.45	2.13	2.15
Naive-Recess.	1.38	2.87	4.51	3.45
Naive-Expans.	0.83	1.15	1.58	1.91
TRM	1.99	2.05	1.94	1.45
CRS	1.43	1.83	2.71	1.83



Naive refers to regressions with GDP and its lags, TRM − term spreads, CRS − credit spreads

1.6 Appendix G

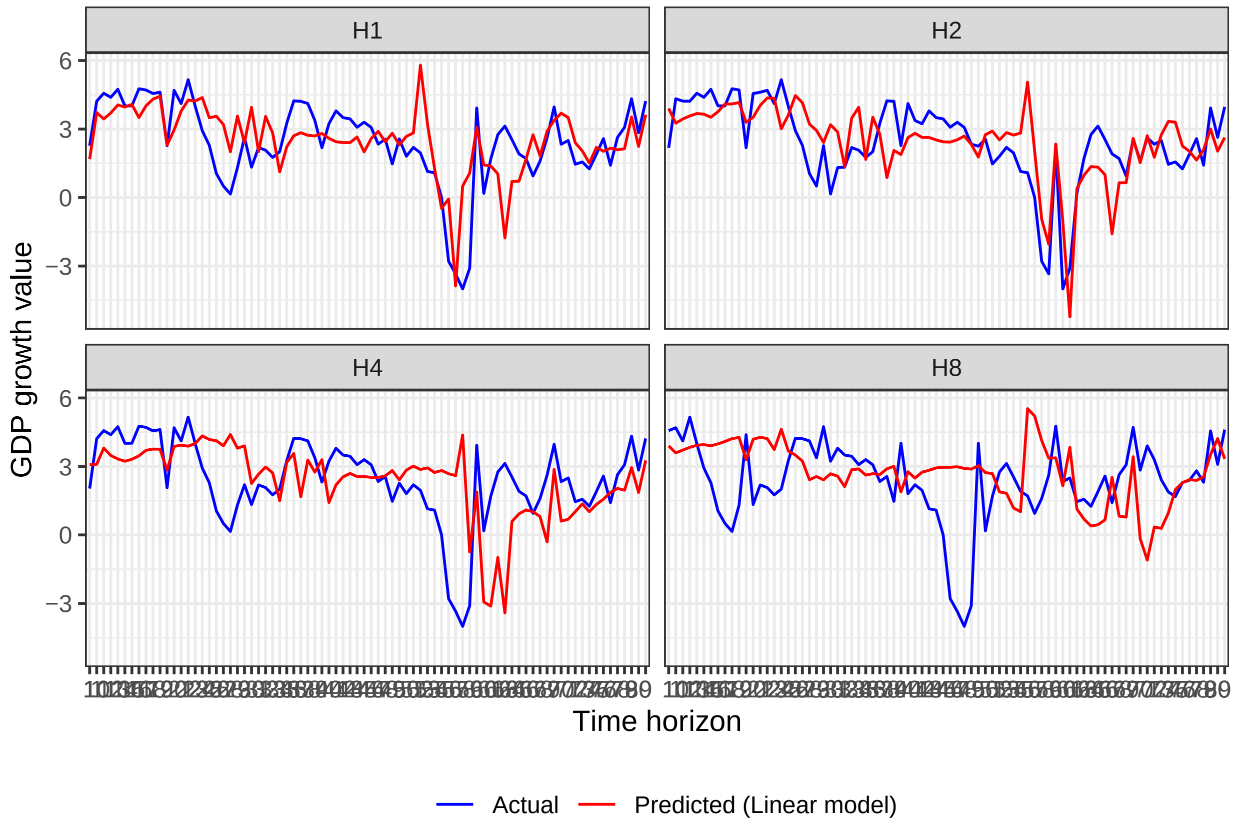


Figure 1.4: Predicted vs actual results (Linear model)

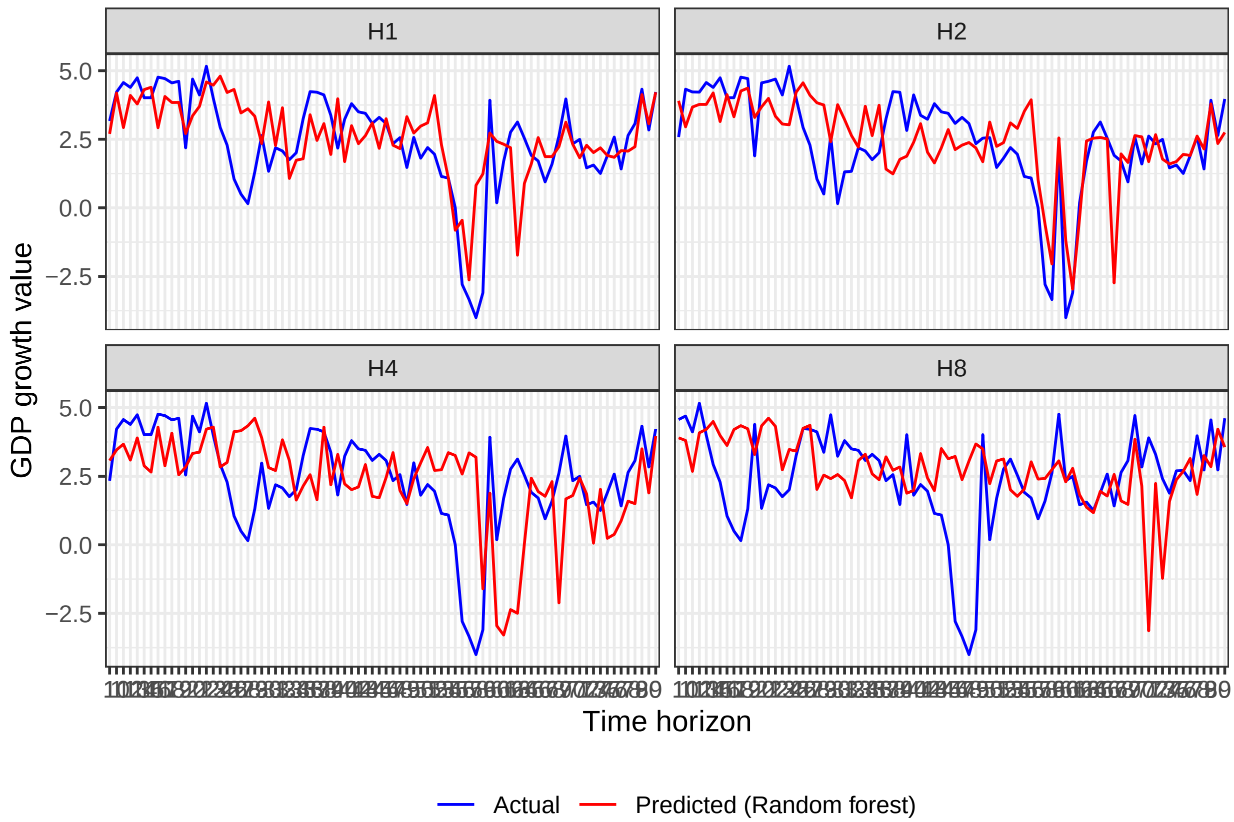


Figure 1.5: Predicted vs actual results (Random forest)

1.7 Appendix H[1]

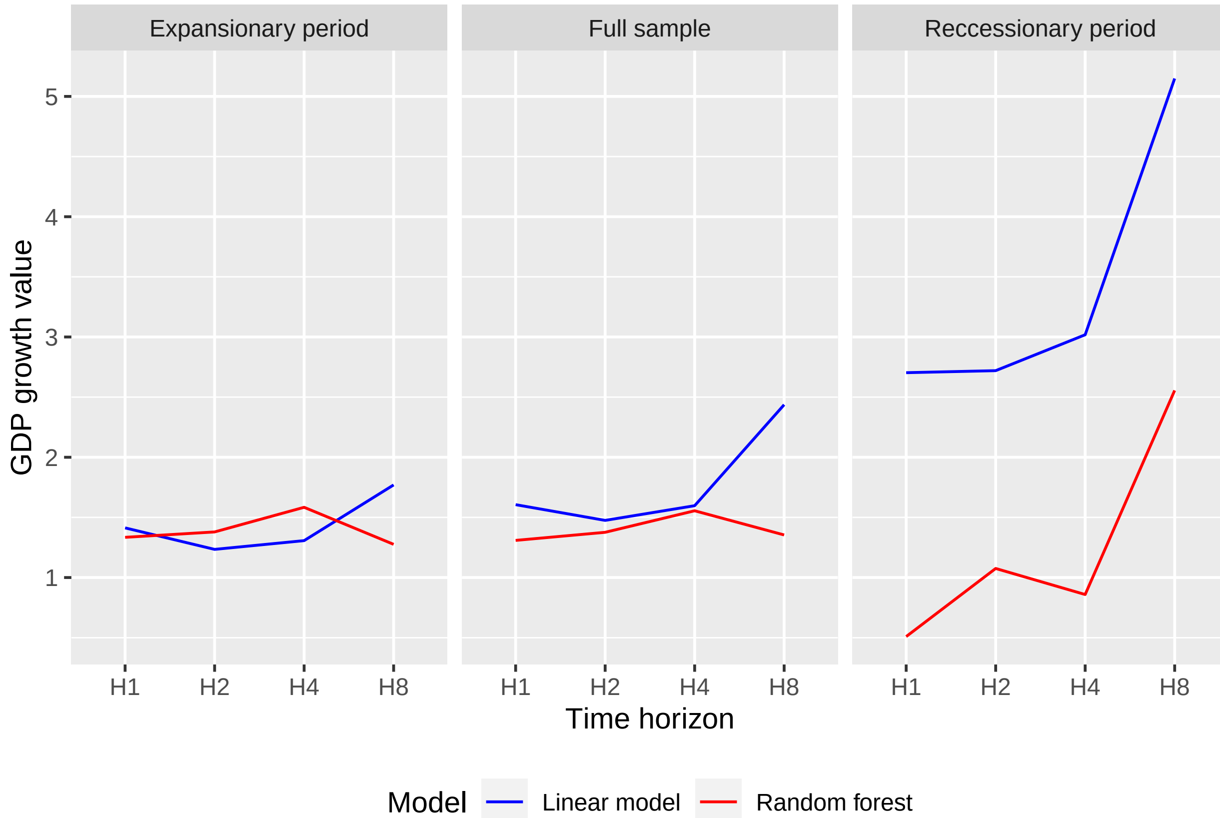
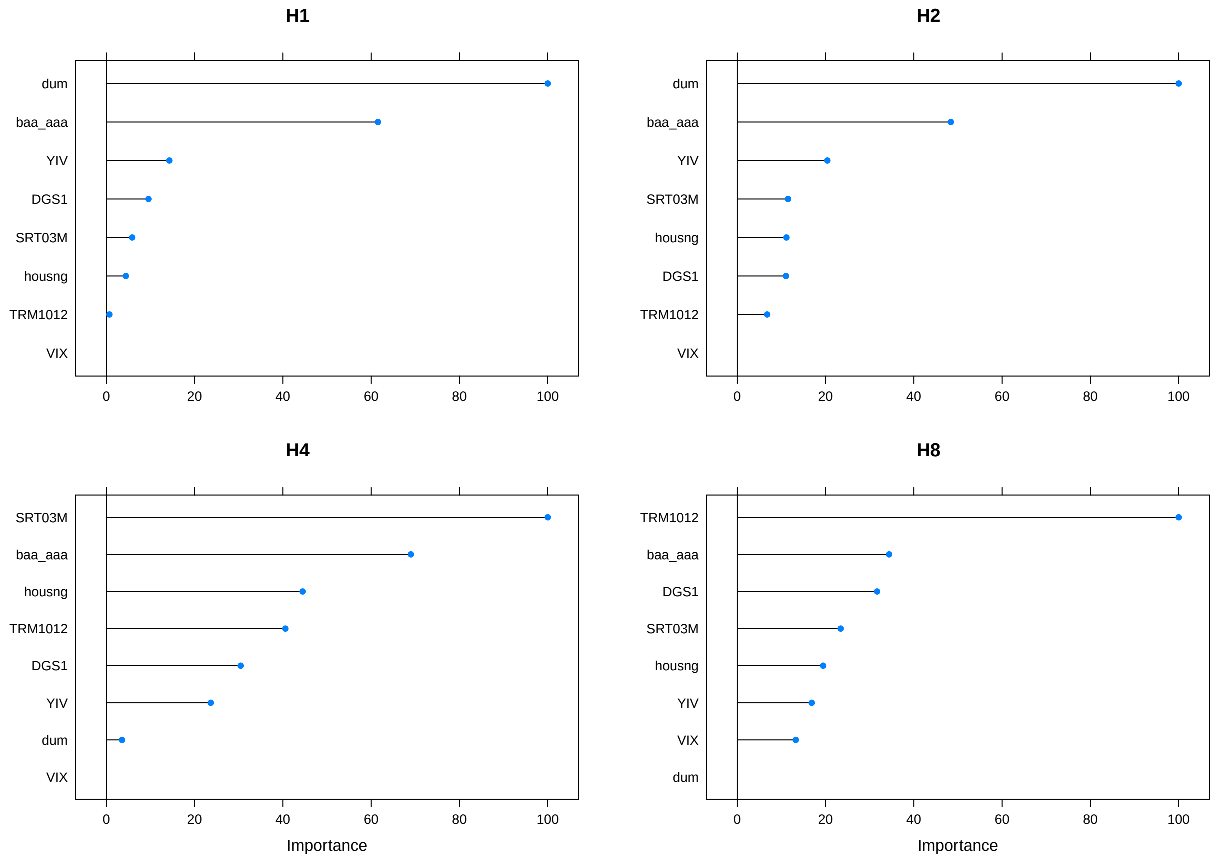


Figure 1.6: RMSFE-s of linear model and random forest

[1]Full R-Code with data is available upon request in github repository: https://github.com/karelrappo/thesis2020

1.8 Appendix I



Burda, B. U., O'Connor, E. A., Webber, E. M., Redmond, N., & Perdue, L. A. (2017). Estimating data from figures with a Web-based program: Considerations for a systematic review. *Research Synthesis Methods*, *8*(3), 258–262. https://doi.org/10.1002/jrsm.1232

Drevon, D., Fursa, S. R., & Malcolm, A. L. (2017). Intercoder Reliability and Validity of WebPlotDigitizer in Extracting Graphed Data. *Behavior Modification*, *41*(2), 323–339. https://doi.org/10.1177/0145445516673998