

On-line appendix for: "Forecasting Copper Prices with Dynamic Averaging and Selection Models"

1. Robustness checks

This separate (not-for-publication) on-line appendix provides robustness checks with respect to the choice of the various forgetting factors λ and α , as well as the exponentially weighted moving average volatility (EWMA) smoothing parameter κ . In this appendix, we also assess the performance of a simple model averaging scheme which combines the forecasts of all possible 18 univariate prediction models. This simple scheme is a byproduct of the general DMA approach, as all that needs to be done here is to extract and then combine (average) those models that contain only a single regressor (and constant term) in them. For consistency of the prediction environment and for ease of comparison, we construct the prediction probabilities needed to combine the single regressor model forecasts analogous to the DMA/DMS framework.¹

To assess the sensitivity of the out-of-sample forecast performance, we follow [Koop and Korobilis \(2012, see see Tables 4 and 5\)](#) and consider a range of possible values for both α and λ in the interval from 0.8 to 0.999 and 0.9 to 0.999, respectively. To alleviate the computation burden, we consider the following grid values: for $\alpha = \{[0.8 : 0.01 : 0.99], 0.995, 0.999\}$ and for $\lambda = \{0.90, 0.95, 0.99, 0.995, 0.999\}$. Further, to assess the influence of the EWMA smoothing parameter κ , we consider the following four values: 0.8, 0.9, 0.97, 0.99. We report out-of-sample mean squared forecast errors (MSFEs) for each of the possible parameter scenarios for all $h = \{1, 2, 3, 6, 9, 12\}$ forecast horizons that we consider.²

In [Figures A-1 to A-6](#) below we show plots of the MSFEs constructed under the various parameter combinations with the column entries referring to the three different models: DMA, DMS and combined forecasts that are averaged over all 18 single regressor models (DMA univariate regressions) and the row entries corresponding to the four different κ values. In each subfigure there are 5 lines, each corresponding to the 5 different λ values that we consider. The x -axis shows the grid of α values that we used, while on the y -axis, the MSFE is shown. Note that throughout the main part of the paper, inline with the recommendation of [Koop and Korobilis \(2012\)](#), we fix the α , λ , and κ parameters at $\alpha = 0.95$, $\lambda = 0.99$ and $\kappa = 0.97$, with the last one being the suggested value by [RiskMetrics \(1996\)](#) for daily data. The thin black horizontal and vertical lines (making up a cross) mark the MSFE of the DMA model at fixed $\alpha = 0.95$, $\lambda = 0.99$ and $\kappa = 0.97$ values that we use in [Tables 2 and 3](#) of the paper and the $\alpha = 0.95$ point, respectively. These thin black lines were drawn as a reference point to be able to quickly compare the results to the MSFEs of the paper. Note here also that in each plot, the row 3, column 1 entry (ie., the row with the y -axis label MSFE ($\kappa = 0.97$)) is the κ value used in the paper. Each of the 6 figures contain the same information, with the only difference being the forecast horizon for which the MSFEs are computed.

¹We thank an anonymous referee for pointing out that this may be an interesting alternative benchmark model to include.

²To be consistent with the results reported in [Table 3](#) of the paper, we again deflate the MSFE by the forecast horizon h .

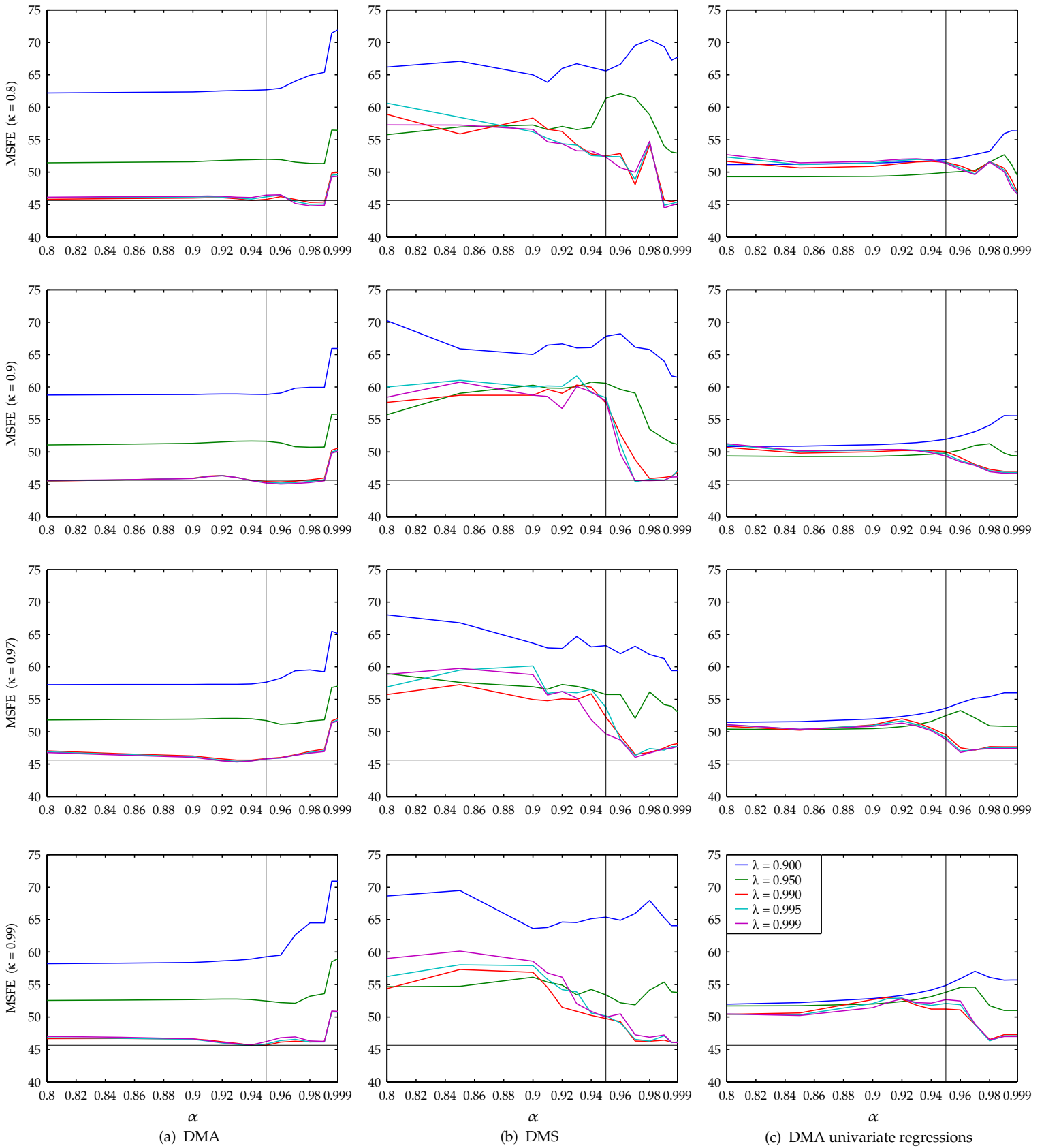


Figure A-1: Robustness check with respect to α, λ and κ at the 1-step-ahead out-of-sample forecasts.

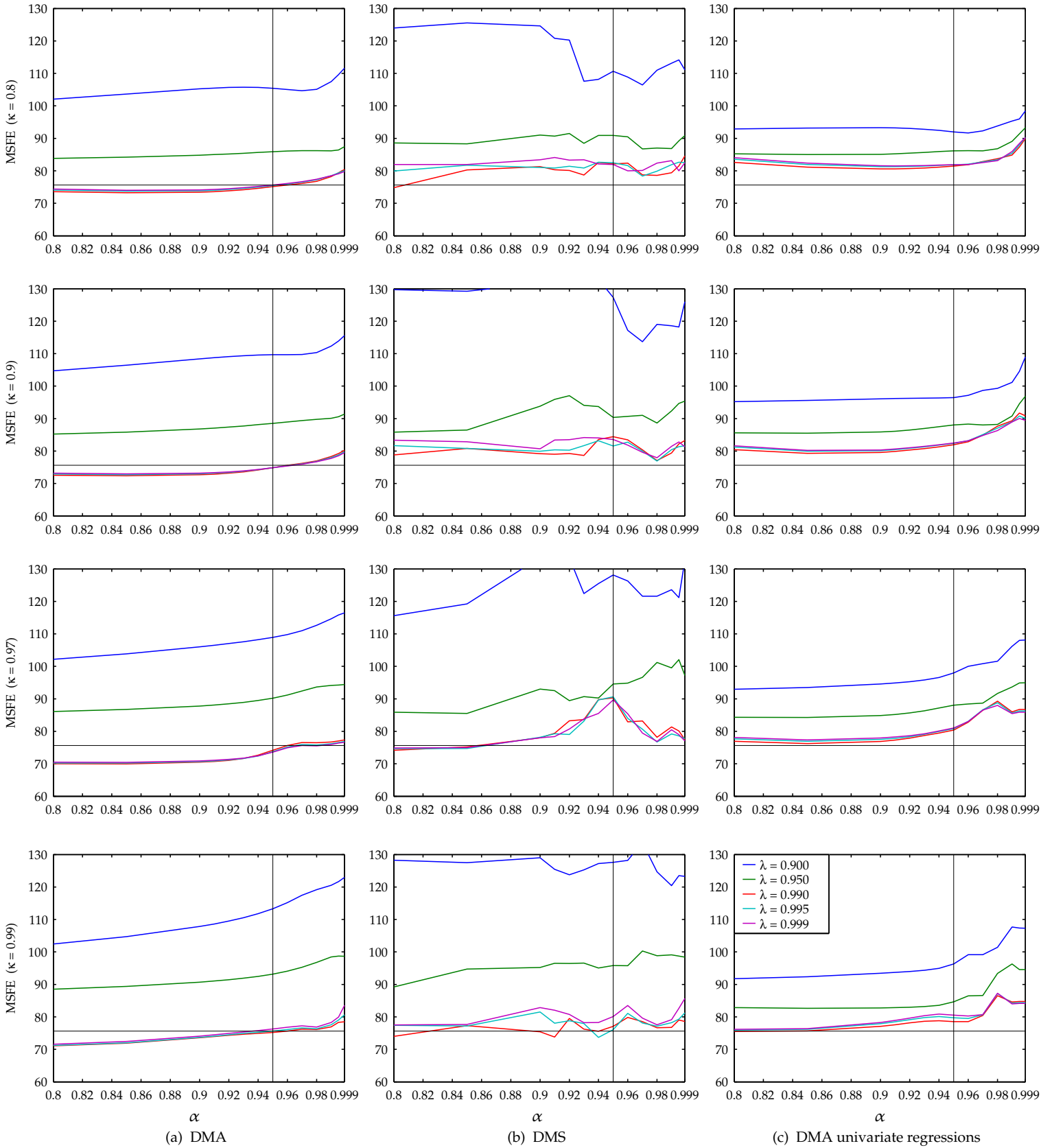


Figure A-2: Robustness check with respect to α , λ and κ at the 2-step-ahead out-of-sample forecasts.

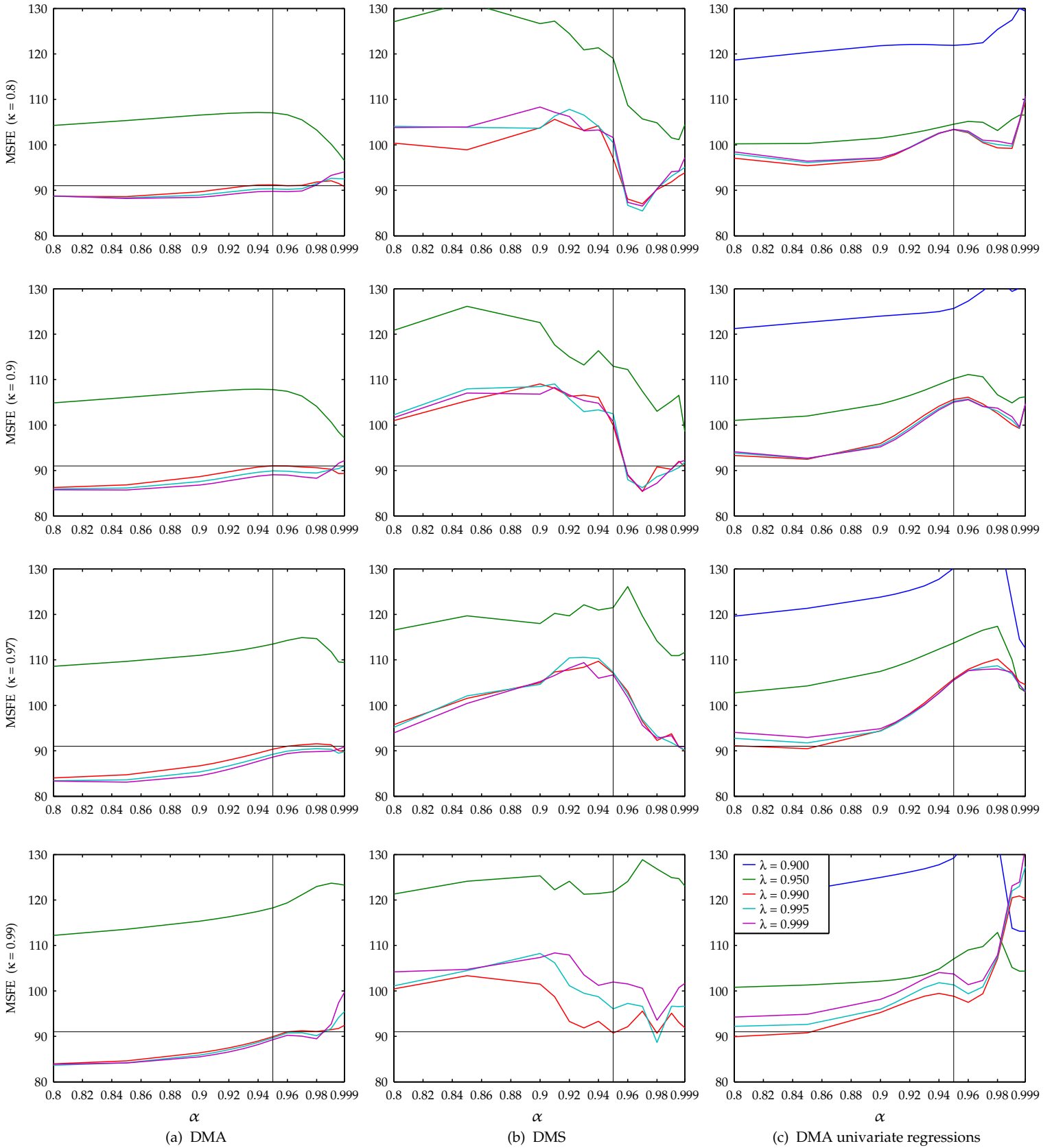


Figure A-3: Robustness check with respect to α , λ and κ at the 3-step-ahead out-of-sample forecasts.

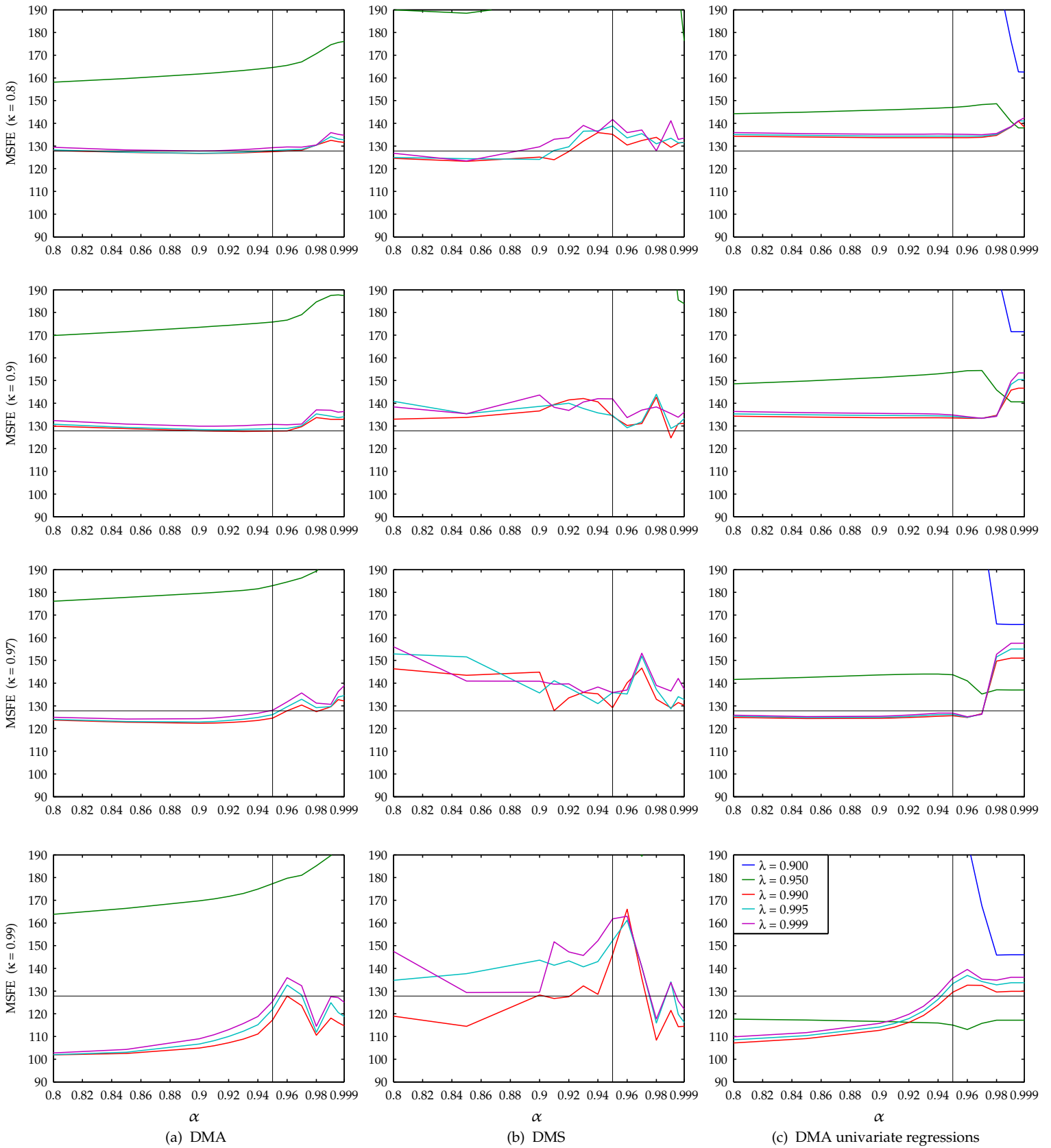


Figure A-4: Robustness check with respect to α, λ and κ at the 6-step-ahead out-of-sample forecasts.

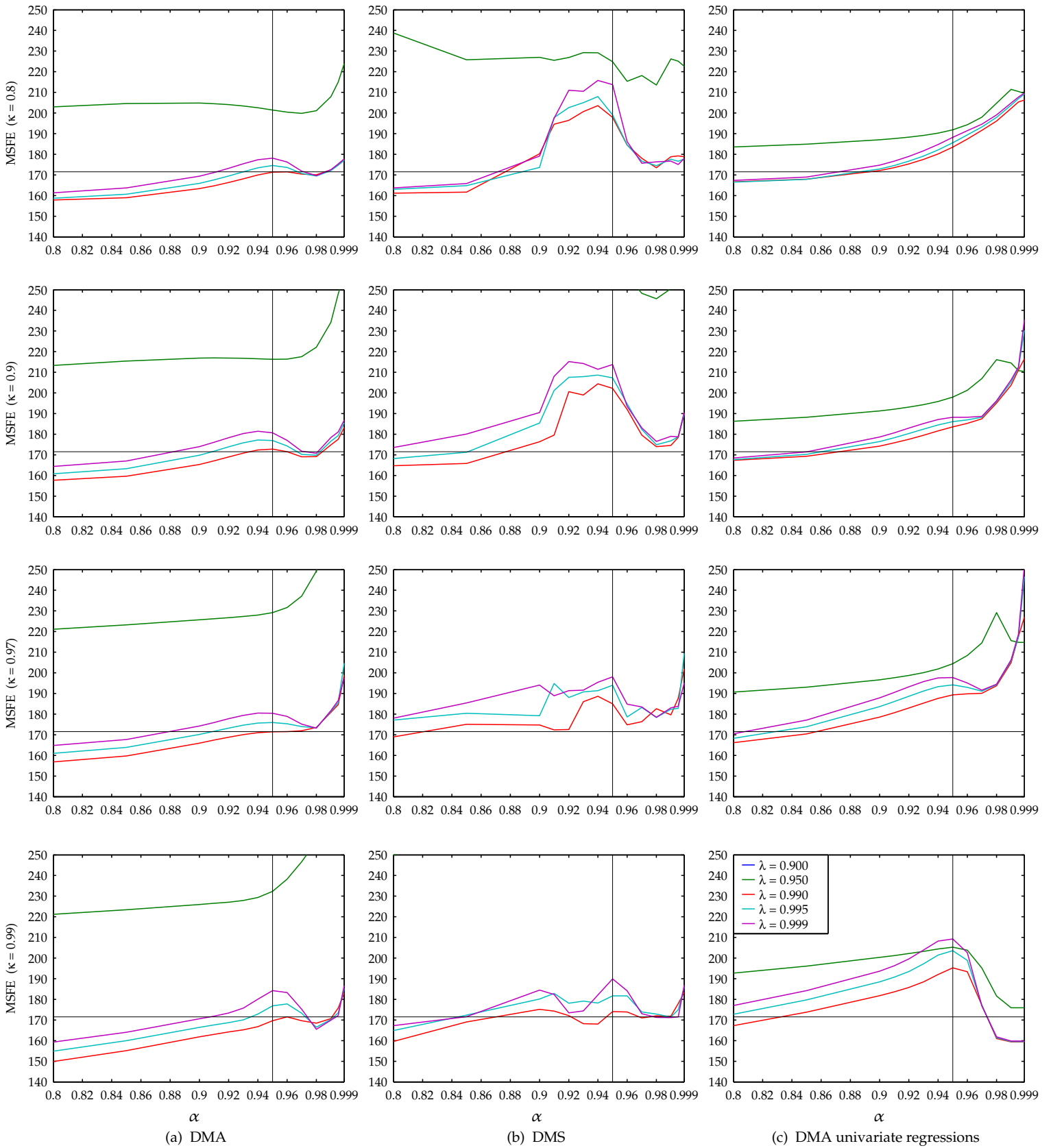


Figure A-5: Robustness check with respect to α , λ and κ at the 9-step-ahead out-of-sample forecasts.

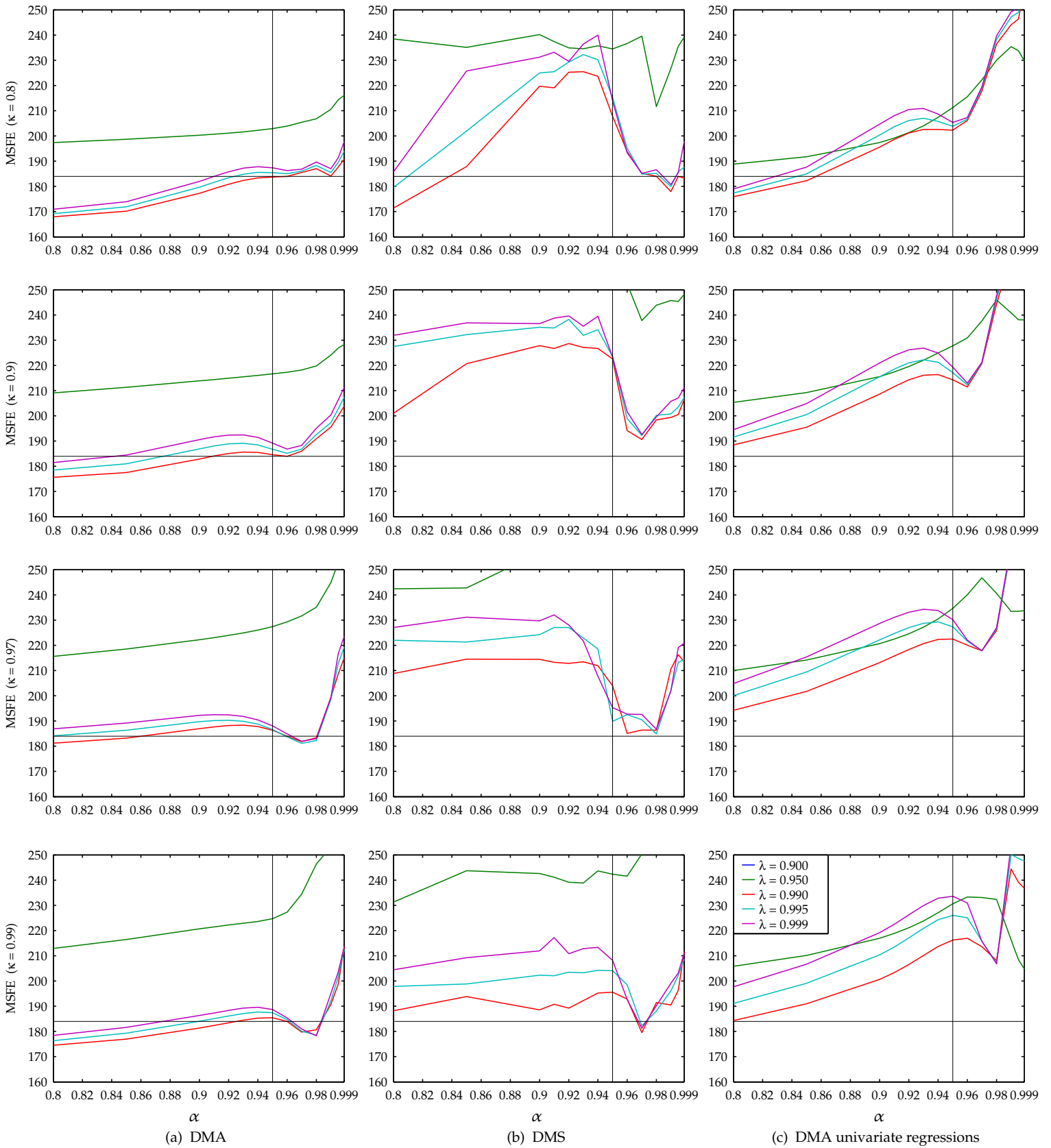


Figure A-6: Robustness check with respect to α , λ and κ at the 12-step-ahead out-of-sample forecasts.

References

- Koop, Gary and Dimitris Korobilis (2012): "Forecasting Inflation Using Dynamic Model Averaging," *International Economic Review*, **53**(3), 867–886.
- RiskMetrics (1996): "RiskMetrics: Technical Document, 4th Edition," J.P.Morgan/Reuters. Available from: <http://www.riskmetrics.com/system/files/private/td4e.pdf>.