Table 2 - Consumption Assets

2022-03-16

Load the **consumption assets** model variables

**consumption assets**: This is the basic benchmarking model utilizing the default, uninformed priors

consumption\_assets\_bayesmodel <-  
 brm(formula = assetsconsumption\_asinh | weights(samp\_wgt) ~  
 cost\_deviation + treat\_any + treat\_GK +  
 assetsconsumption\_asinh\_R1 + Lhh\_wealth\_asinh + Lvill\_eligible\_ratio + Lroomsnumb + Ldurablesexpenditure +  
 Ldietarydi\_x\_Lassetscon + Lproductiv\_x\_Lassetscon +  
 (1 | block) + (1 | vid),  
 data = consumption\_assets\_data,  
 family = gaussian("identity"),  
 seed = 1272022,  
 warmup = 1000,  
 iter = 2000,  
 thin = 1,  
 control = list(adapt\_delta = .95, max\_treedepth = 10),  
 #backend = "cmdstanr",  
 cores = 4, #overrides default 1 core  
 #threads = 3,need to get cmdstanr package working here  
 save\_pars = save\_pars(all = TRUE), # potentially allows for more post-processing functionality  
 file = "uninformed\_prior\_outcomes\\consumption\_assets\_bayes")

Model Summery

summary(consumption\_assets\_bayesmodel)

## Warning: Parts of the model have not converged (some Rhats are > 1.05). Be  
## careful when analysing the results! We recommend running more iterations and/or  
## setting stronger priors.

## Family: gaussian   
## Links: mu = identity; sigma = identity   
## Formula: assetsconsumption\_asinh | weights(samp\_wgt) ~ cost\_deviation + treat\_any + treat\_GK + assetsconsumption\_asinh\_R1 + Lhh\_wealth\_asinh + Lvill\_eligible\_ratio + Lroomsnumb + Ldurablesexpenditure + Ldietarydi\_x\_Lassetscon + Lproductiv\_x\_Lassetscon + (1 | block) + (1 | vid)   
## Data: consumption\_assets\_data (Number of observations: 1751)   
## Draws: 4 chains, each with iter = 2000; warmup = 1000; thin = 1;  
## total post-warmup draws = 4000  
##   
## Group-Level Effects:   
## ~block (Number of levels: 22)   
## Estimate Est.Error l-95% CI u-95% CI Rhat Bulk\_ESS Tail\_ESS  
## sd(Intercept) 0.89 1.09 0.00 2.73 3.55 4 12  
##   
## ~vid (Number of levels: 248)   
## Estimate Est.Error l-95% CI u-95% CI Rhat Bulk\_ESS Tail\_ESS  
## sd(Intercept) 0.73 0.58 0.30 1.71 2.78 5 11  
##   
## Population-Level Effects:   
## Estimate Est.Error l-95% CI u-95% CI Rhat Bulk\_ESS  
## Intercept 0.35 5.63 -15.70 4.75 2.59 5  
## cost\_deviation 0.00 0.00 -0.00 0.01 2.15 5  
## treat\_any 0.16 1.22 -1.47 1.93 3.61 4  
## treat\_GK 0.58 1.27 -1.54 1.79 2.90 5  
## assetsconsumption\_asinh\_R1 0.12 0.62 -1.32 0.82 3.06 5  
## Lhh\_wealth\_asinh -0.19 0.22 -0.57 -0.02 2.10 5  
## Lvill\_eligible\_ratio 0.72 0.61 -0.24 1.56 3.46 4  
## Lroomsnumb -0.09 0.84 -1.49 1.14 4.08 4  
## Ldurablesexpenditure -0.00 0.00 -0.00 0.00 2.02 5  
## Ldietarydi\_x\_Lassetscon 0.18 0.28 0.01 0.70 1.88 6  
## Lproductiv\_x\_Lassetscon 0.00 0.08 -0.17 0.12 3.14 5  
## Tail\_ESS  
## Intercept 11  
## cost\_deviation 30  
## treat\_any 11  
## treat\_GK 24  
## assetsconsumption\_asinh\_R1 11  
## Lhh\_wealth\_asinh 11  
## Lvill\_eligible\_ratio 14  
## Lroomsnumb 11  
## Ldurablesexpenditure 11  
## Ldietarydi\_x\_Lassetscon 11  
## Lproductiv\_x\_Lassetscon 11  
##   
## Family Specific Parameters:   
## Estimate Est.Error l-95% CI u-95% CI Rhat Bulk\_ESS Tail\_ESS  
## sigma 7.20 6.32 3.34 19.92 2.13 6 12  
##   
## Draws were sampled using sampling(NUTS). For each parameter, Bulk\_ESS  
## and Tail\_ESS are effective sample size measures, and Rhat is the potential  
## scale reduction factor on split chains (at convergence, Rhat = 1).

Prior summery - how informative are priors

prior\_summary(consumption\_assets\_bayesmodel)

## prior class coef group resp dpar  
## (flat) b   
## (flat) b assetsconsumption\_asinh\_R1   
## (flat) b cost\_deviation   
## (flat) b Ldietarydi\_x\_Lassetscon   
## (flat) b Ldurablesexpenditure   
## (flat) b Lhh\_wealth\_asinh   
## (flat) b Lproductiv\_x\_Lassetscon   
## (flat) b Lroomsnumb   
## (flat) b Lvill\_eligible\_ratio   
## (flat) b treat\_any   
## (flat) b treat\_GK   
## student\_t(3, 9.8, 2.5) Intercept   
## student\_t(3, 0, 2.5) sd   
## student\_t(3, 0, 2.5) sd block   
## student\_t(3, 0, 2.5) sd Intercept block   
## student\_t(3, 0, 2.5) sd vid   
## student\_t(3, 0, 2.5) sd Intercept vid   
## student\_t(3, 0, 2.5) sigma   
## nlpar bound source  
## default  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## default  
## default  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## (vectorized)  
## default

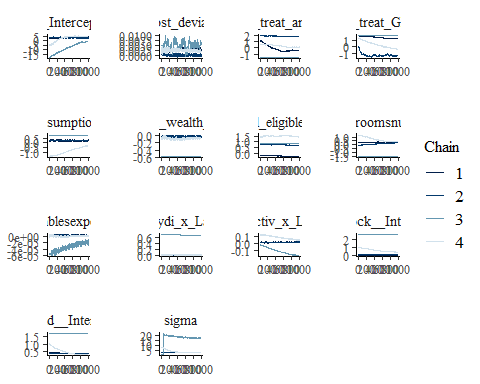
check\_prior(consumption\_assets\_bayesmodel)

## Warning: Some priors could not be simulated.

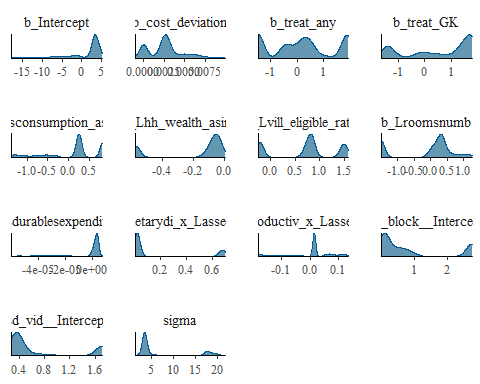
## Parameter Prior\_Quality  
## 1 b\_Intercept informative  
## 2 b\_cost\_deviation not determinable  
## 3 b\_treat\_any not determinable  
## 4 b\_treat\_GK not determinable  
## 5 b\_assetsconsumption\_asinh\_R1 not determinable  
## 6 b\_Lhh\_wealth\_asinh not determinable  
## 7 b\_Lvill\_eligible\_ratio not determinable  
## 8 b\_Lroomsnumb not determinable  
## 9 b\_Ldurablesexpenditure not determinable  
## 10 b\_Ldietarydi\_x\_Lassetscon not determinable  
## 11 b\_Lproductiv\_x\_Lassetscon not determinable

Diagnostics

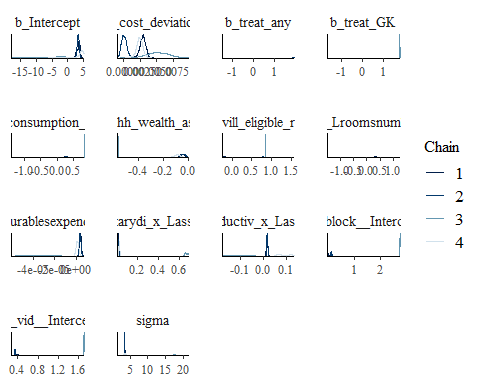
# trace diagnostic plot  
mcmc\_trace(consumption\_assets\_bayesmodel, n\_warmup = 0,  
 pars = c("b\_Intercept", "b\_cost\_deviation", "b\_treat\_any", "b\_treat\_GK",  
 "b\_assetsconsumption\_asinh\_R1", "b\_Lhh\_wealth\_asinh", "b\_Lvill\_eligible\_ratio",   
 "b\_Lroomsnumb", "b\_Ldurablesexpenditure",  
 "b\_Ldietarydi\_x\_Lassetscon", "b\_Lproductiv\_x\_Lassetscon",  
 "sd\_block\_\_Intercept", "sd\_vid\_\_Intercept", "sigma"))



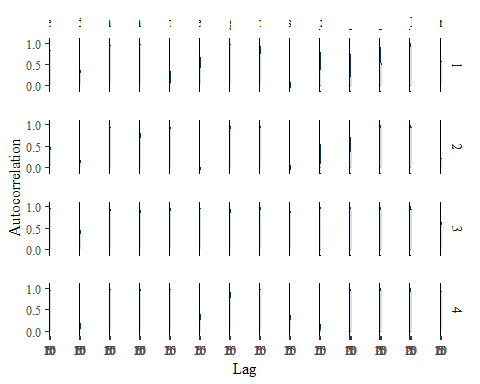
ggsave("table\_2\_diagnostics\\consumption\_assets\_trace.png", plot = last\_plot(), width = 12, height = 5)  
  
#density diagnostic plots  
mcmc\_dens(consumption\_assets\_bayesmodel,  
 pars = c("b\_Intercept", "b\_cost\_deviation", "b\_treat\_any", "b\_treat\_GK",  
 "b\_assetsconsumption\_asinh\_R1", "b\_Lhh\_wealth\_asinh", "b\_Lvill\_eligible\_ratio",   
 "b\_Lroomsnumb", "b\_Ldurablesexpenditure",  
 "b\_Ldietarydi\_x\_Lassetscon", "b\_Lproductiv\_x\_Lassetscon",  
 "sd\_block\_\_Intercept", "sd\_vid\_\_Intercept", "sigma"))



ggsave("table\_2\_diagnostics\\consumption\_assets\_dens.png", plot = last\_plot(), width = 12, height = 5)  
  
mcmc\_dens\_overlay(consumption\_assets\_bayesmodel,  
 pars = c("b\_Intercept", "b\_cost\_deviation", "b\_treat\_any", "b\_treat\_GK",  
 "b\_assetsconsumption\_asinh\_R1", "b\_Lhh\_wealth\_asinh", "b\_Lvill\_eligible\_ratio",   
 "b\_Lroomsnumb", "b\_Ldurablesexpenditure",  
 "b\_Ldietarydi\_x\_Lassetscon", "b\_Lproductiv\_x\_Lassetscon",  
 "sd\_block\_\_Intercept", "sd\_vid\_\_Intercept", "sigma"))



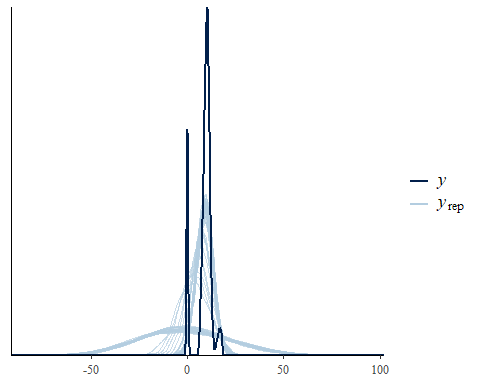
ggsave("table\_2\_diagnostics\\consumption\_assets\_dens\_overlay.png", plot = last\_plot(), width = 12, height = 5)  
  
#acf (auto-correlation) diagnostic plot  
mcmc\_acf(consumption\_assets\_bayesmodel,  
 pars = c("b\_Intercept", "b\_cost\_deviation", "b\_treat\_any", "b\_treat\_GK",  
 "b\_assetsconsumption\_asinh\_R1", "b\_Lhh\_wealth\_asinh", "b\_Lvill\_eligible\_ratio",   
 "b\_Lroomsnumb", "b\_Ldurablesexpenditure",  
 "b\_Ldietarydi\_x\_Lassetscon", "b\_Lproductiv\_x\_Lassetscon",  
 "sd\_block\_\_Intercept", "sd\_vid\_\_Intercept", "sigma"))



ggsave("table\_2\_diagnostics\\consumption\_assets\_assets\_acf.png", plot = last\_plot(), width = 12, height = 5)

posterior predictive checks

pp\_check(consumption\_assets\_bayesmodel, ndraws = 100)



pp\_check(consumption\_assets\_bayesmodel, ndraws = 10, type = 'error\_scatter\_avg', alpha = .1)

