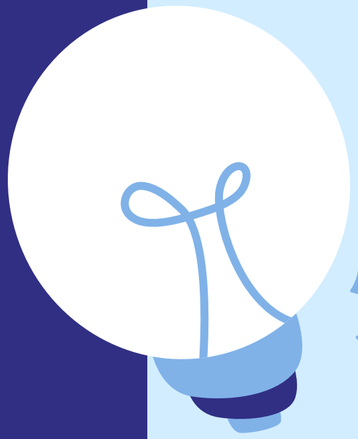
PREDICCIÓN DEL DÓLAR A TRAVÉS DE LSTM



MONTSERRAT ARÁNGUIZ
NATALY CÁCERES

TRATAMIENTO DATOS

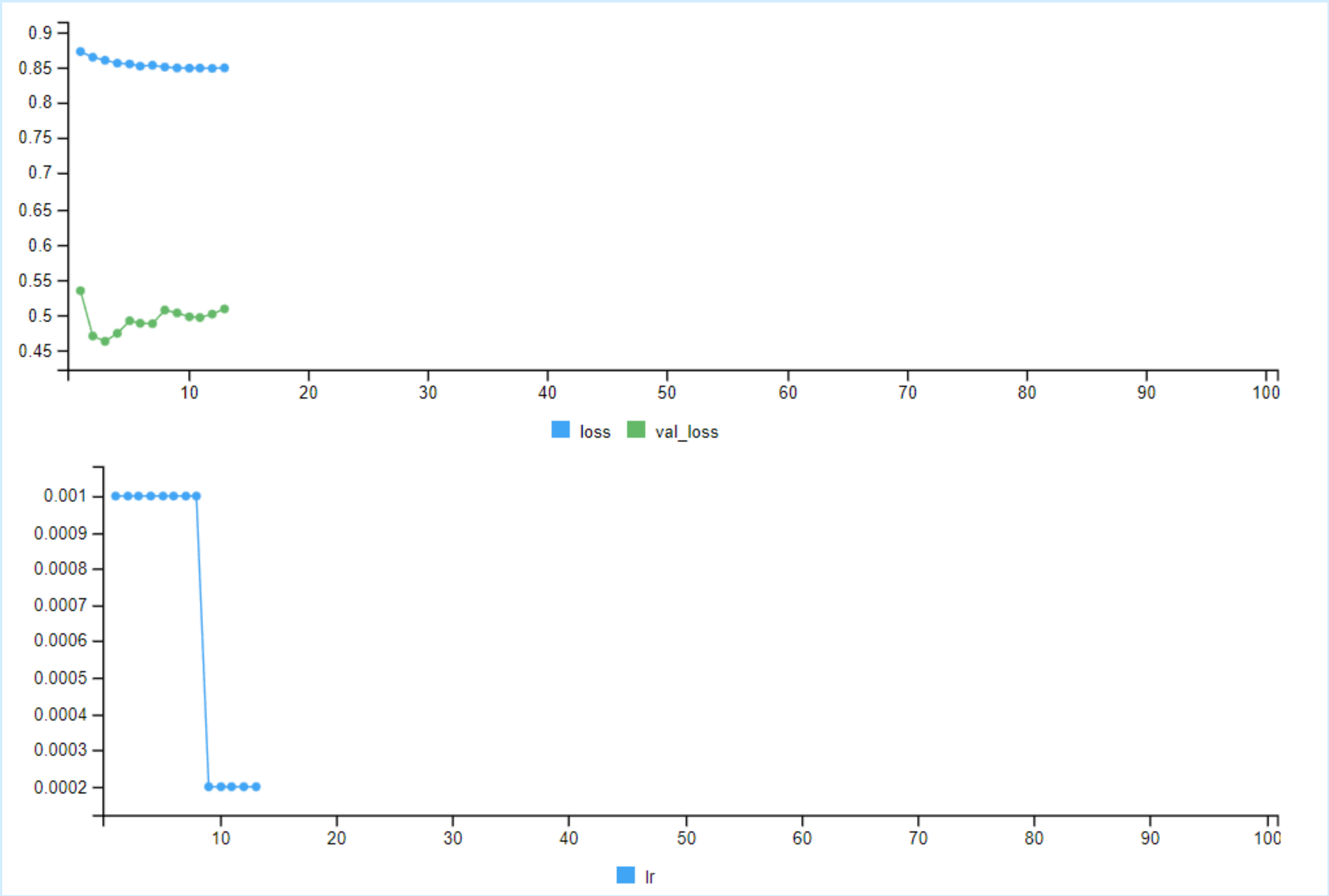
```r
# Escalar los datos
data_scaled <- as.data.frame(scale(data))

# Crear una función para generar las secuencias con lags, incluyendo los lags de la variable "Dolar"
create_sequences <- function(data, n_lags) {
  X <- NULL
  y <- NULL
  for (i in (n_lags + 1):nrow(data)) {
    # Crear una matriz con las variables predictoras y los lags de "Dolar"
    predictors <- data[(i - n_lags):(i - 1), -which(names(data) == "Dolar")]
    dolar_lags <- data[(i - n_lags):(i - 1), "Dolar"]
    X <- rbind(X, cbind(predictors, dolar_lags))
    y <- c(y, data[i, "Dolar"])
  }
  list(X = array(X, dim = c(nrow(X), n_lags, ncol(data))), y = y)
}

# Generar las secuencias
sequences <- create_sequences(as.matrix(data_scaled), n_lags)
X <- sequences$X
y <- sequences$y
```

IMPLEMENTACIÓN I

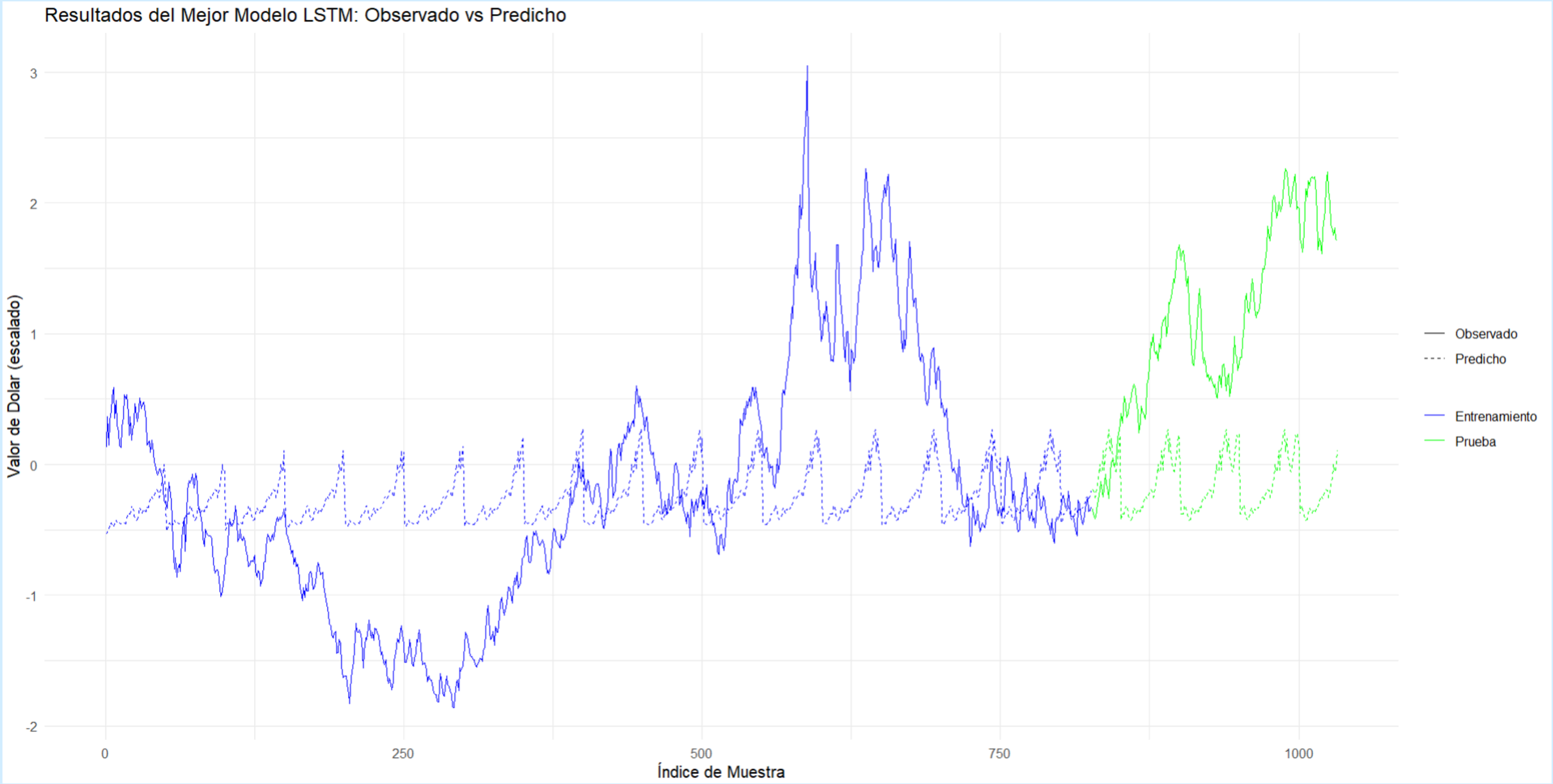
```r
# Crear el modelo LSTM
model <- keras_model_sequential() %>%
  layer_lstm(units = 50, input_shape = c(n_lags, dim(X_train)[3])) %>%
  layer_dense(units = 1)
```

```r
# Entrenar el modelo
history <- model %>% fit(
  X_train, y_train,
  epochs = 100,
  batch_size = 32,
  validation_split = 0.2,
  callbacks = list(checkpoint, early_stopping, reduce_lr),
  verbose = 1
)
```

PROCESO DE ENTRENAMIENTO I

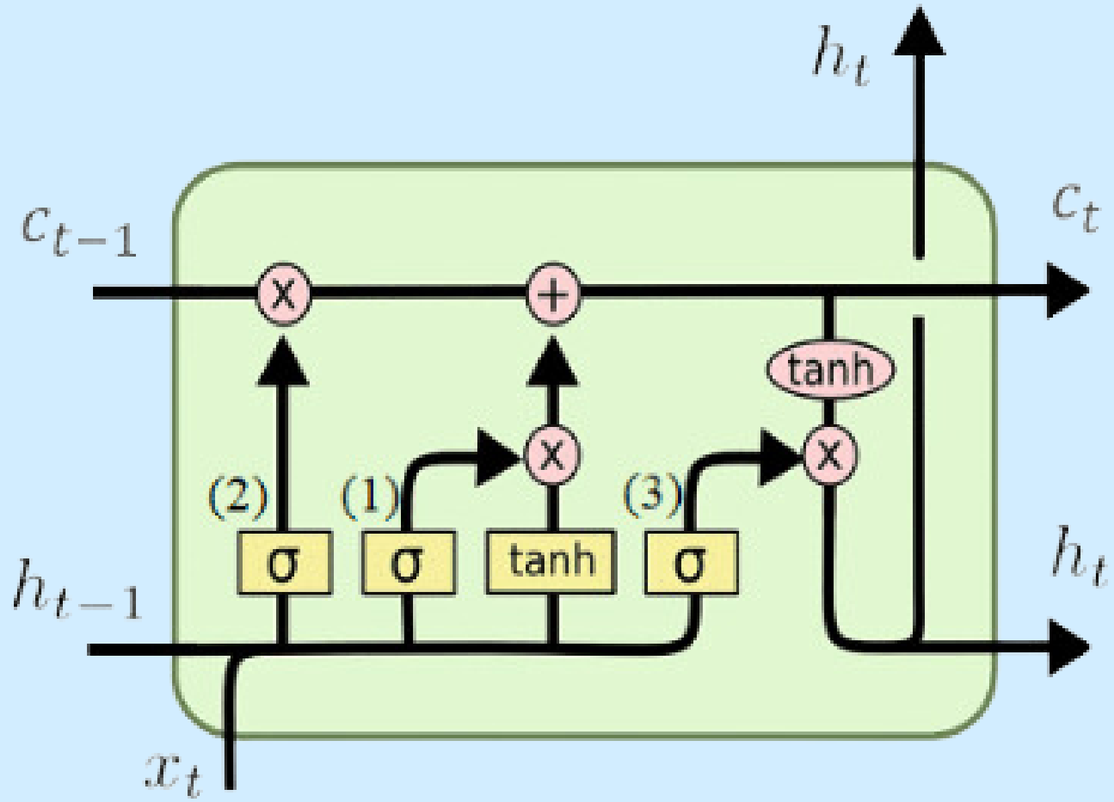


VALIDACIÓN I

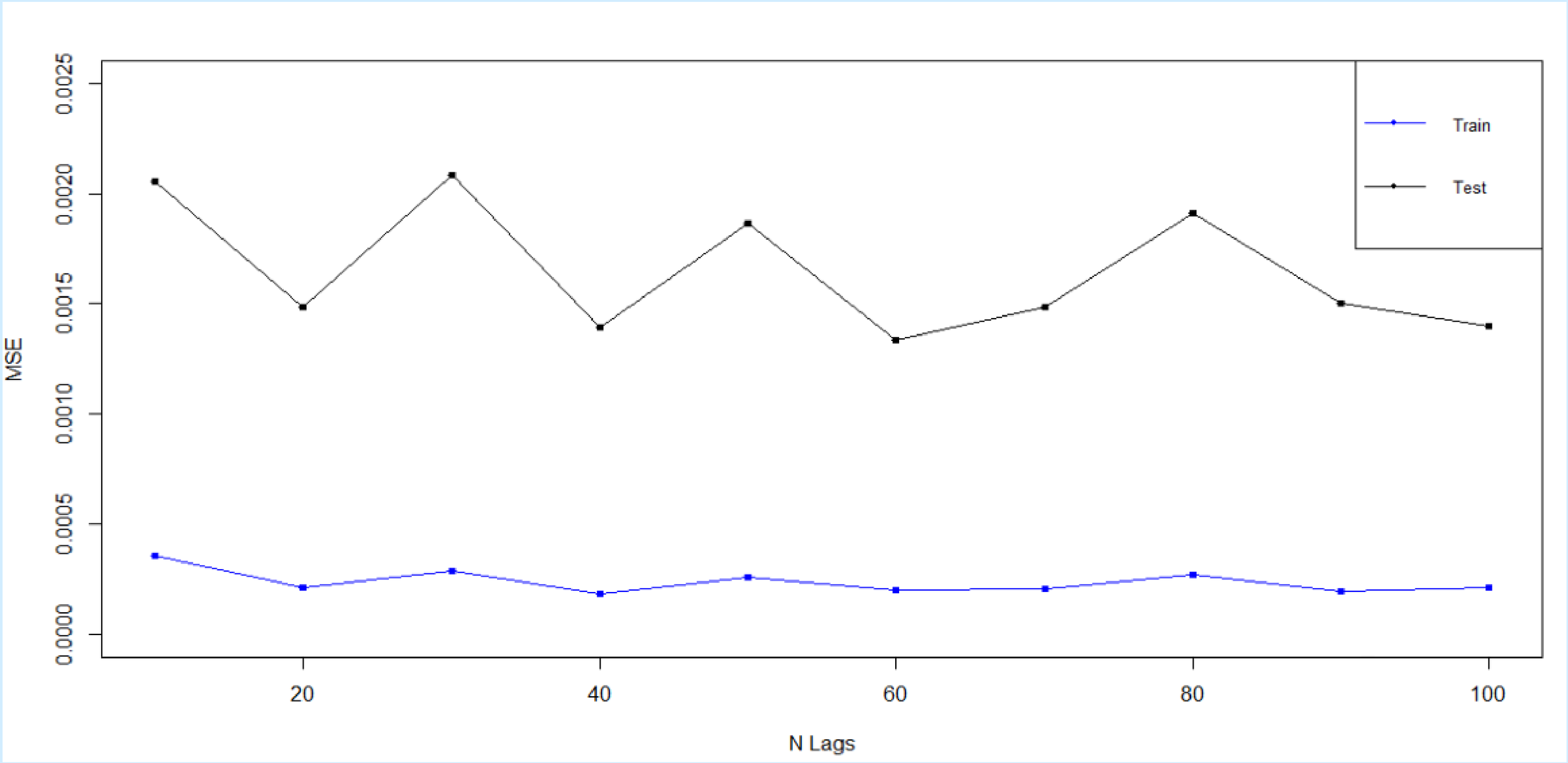


IMPLEMENTACIÓN II

```
model <- keras_model_sequential() %>%
  layer_lstm(units = 50, input_shape = c(n_lags, 1)) %>%
  layer_dense(units = 1)
```



IMPLEMENTACIÓN II

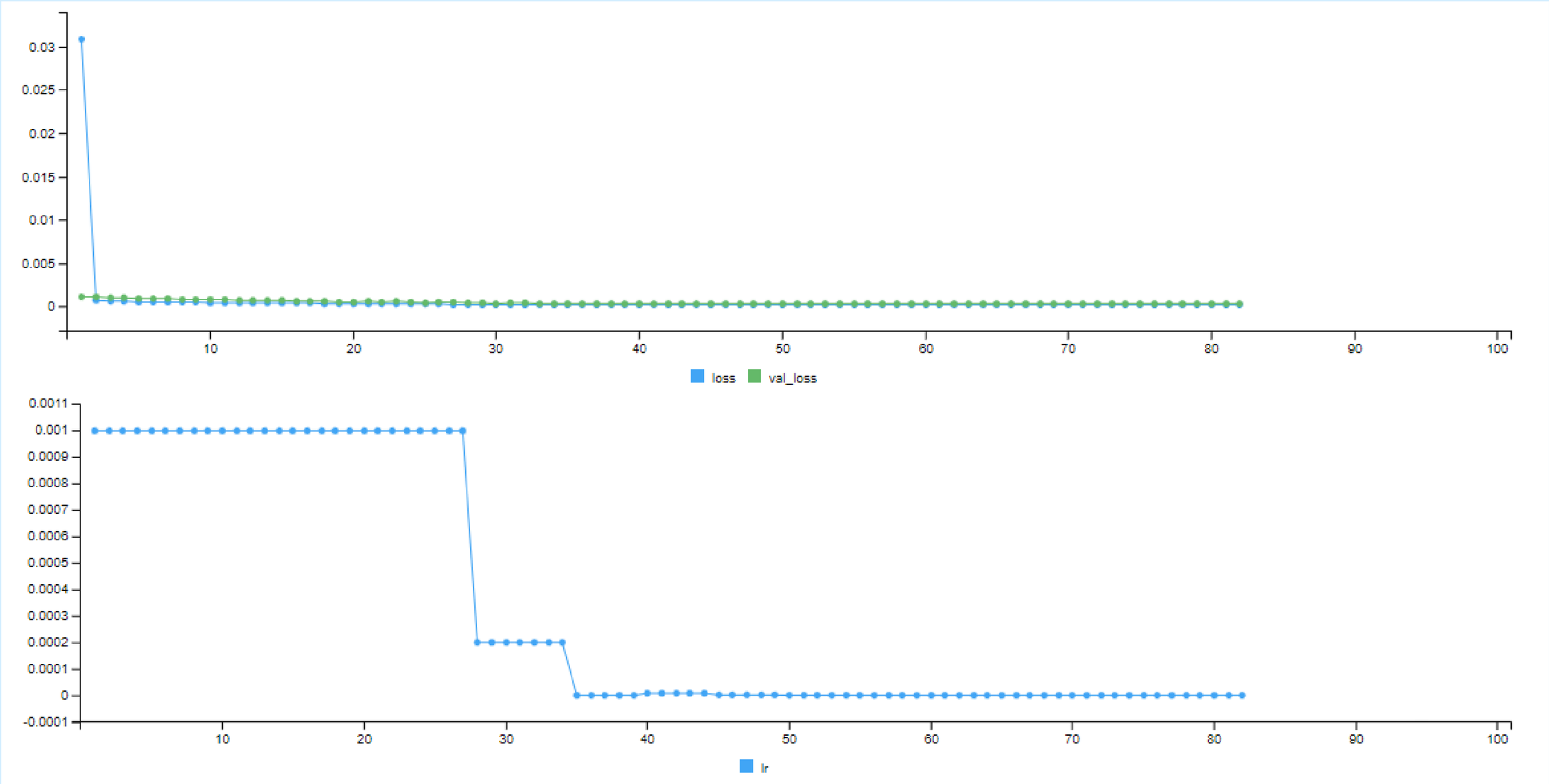


PROCESO DE ENTRENAMIENTO II

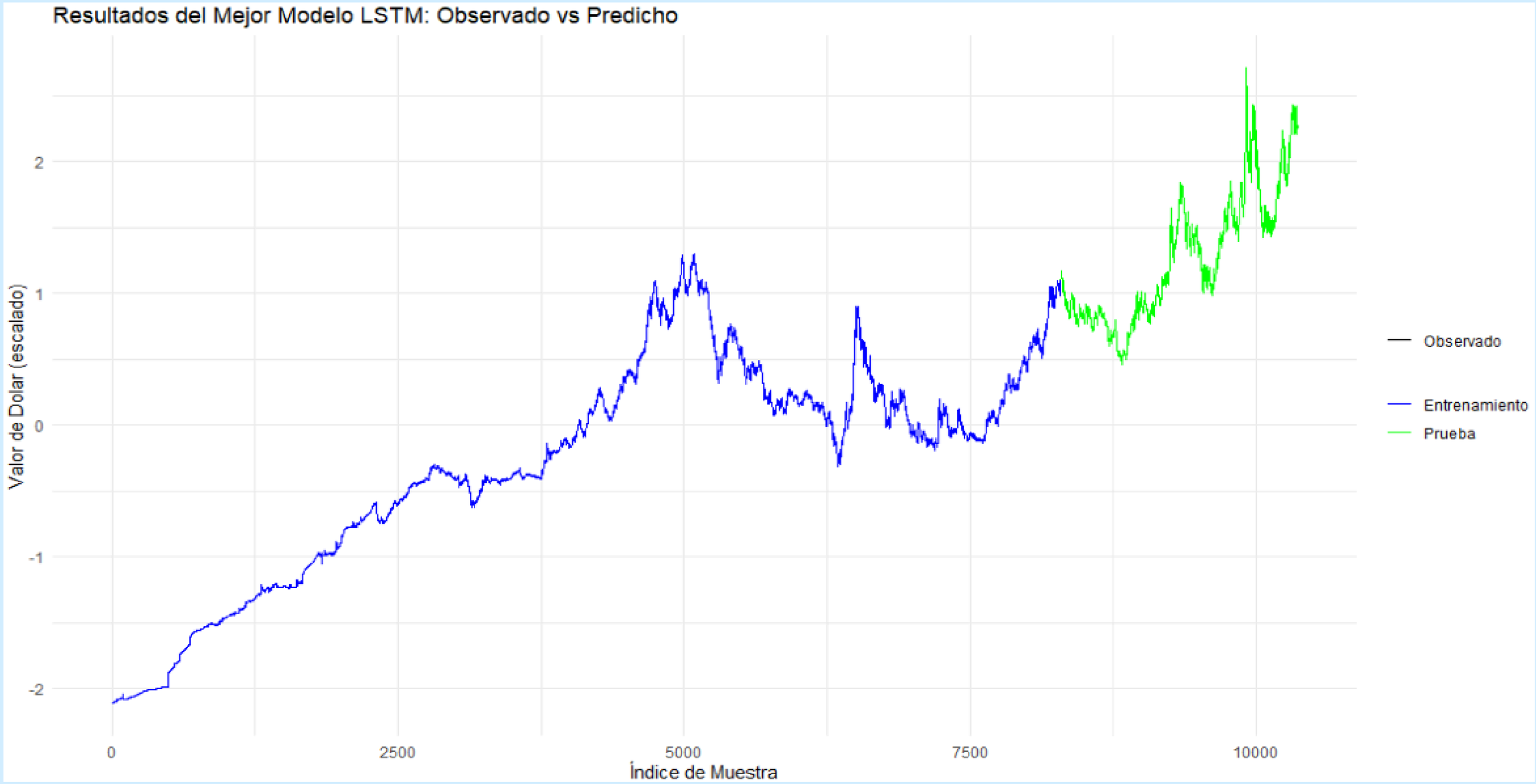
```
# Entrenar el modelo
history <- model %>% fit(
  X_train, y_train,
  epochs = 100,
  batch_size = 32,
  validation_split = 0.2,
  callbacks = list(checkpoint, early_stopping, reduce_lr),
  verbose = 1
)
```

```
   user  system elapsed
262.37   10.44  365.98
```

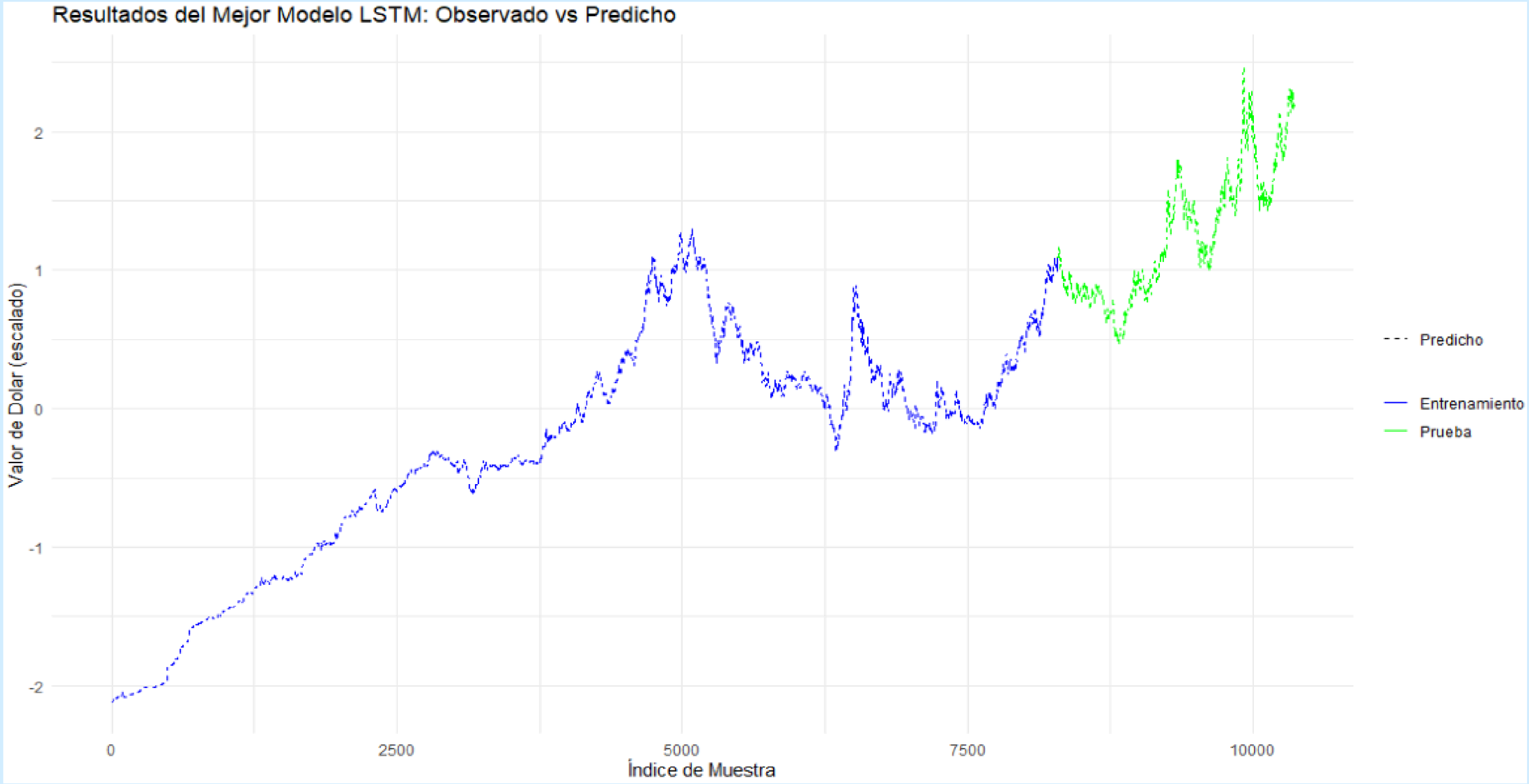
PROCESO DE ENTRENAMIENTO II



VALIDACIÓN II

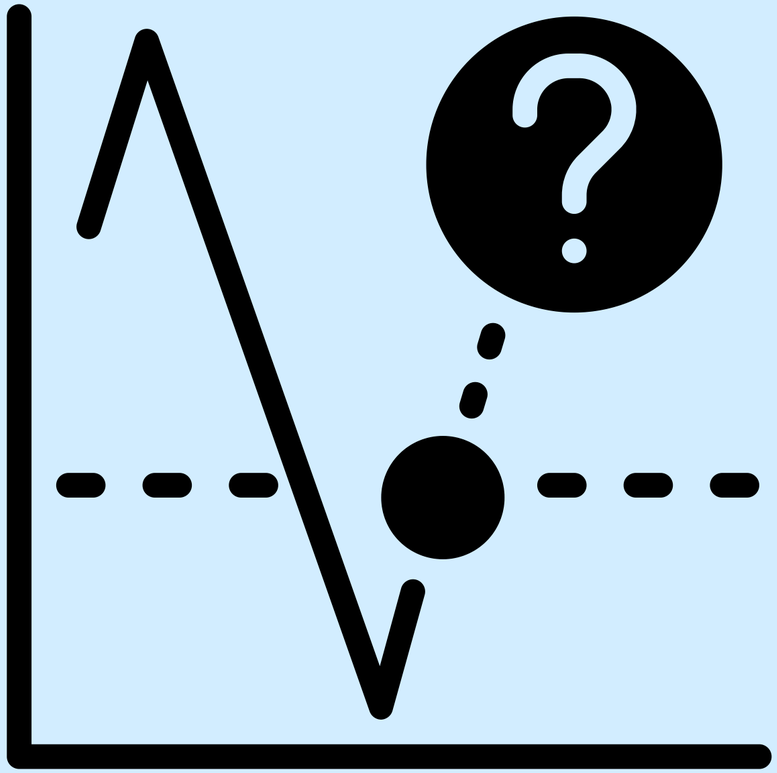


VALIDACIÓN II



VALIDACIÓN II

```
>    mse_value <- mse(y_test, predictions_test); mse_value
[1] 0.00251544 3
```



CONCLUSIONES

Muchas gracias por su atención.