

# LFD Medicaid Model

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# General Approach

- ▶ Data driven
  - Actuals from prior years
  - Observed expenditure trends
  - Input from independent economic variables
- ▶ Time series model
  - Annual and monthly data point relationships
  - Incorporates long-term and short-term trends
  - Implicitly accounts for inflationary factors

# The data

- ▶ Medicaid paid claims data (actuals)
  - Most current data are two months old
  - May be paid up to about two years after date of service
  - Reported and modeled by service category
  - Modeled monthly and rolled up to annual
- ▶ Independent economic variables
  - IHS econometrics as used throughout LFD forecasts
  - Use two-year forecasts rather than actuals for fitting
  - Incorporated only when model fit is improved

# Components of a time series model

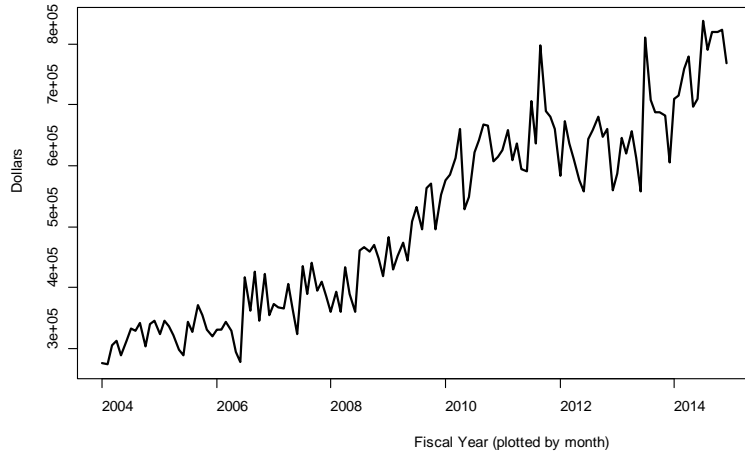
- ▶ Trend: the general tendency of an increase over time
- ▶ Seasonal: fluctuations within a year during the season
- ▶ Cyclical: medium-term cycles, generally over two or more years
- ▶ Irregular variation: unpredictable influences outside of regular patterns

# Seasonal ARMA

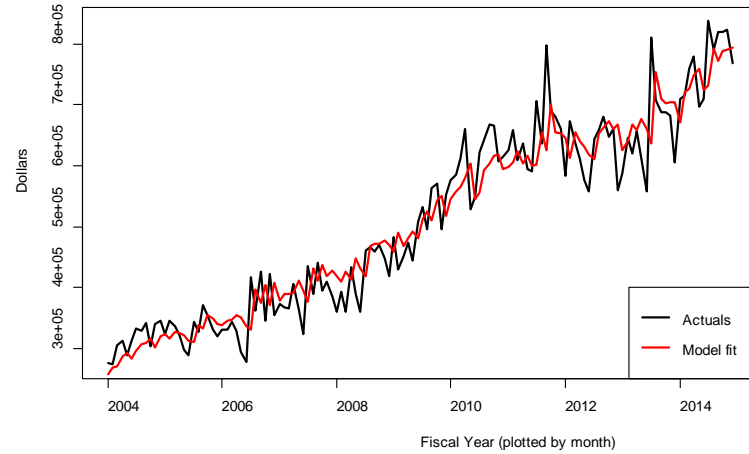
- ▶ MA: Moving average (trend)
  - Accounts for the prior time period's value for the error between the model and the actuals
- ▶ AR: Autoregressive (cyclical)
  - Accounts for the prior time period's value for a variable when making future predictions for that variable
- ▶ Seasonal (seasonal)
  - Accounts for AR or MA effects over seasons as well as over consecutive time periods

# Example: Mid-Level Practitioner

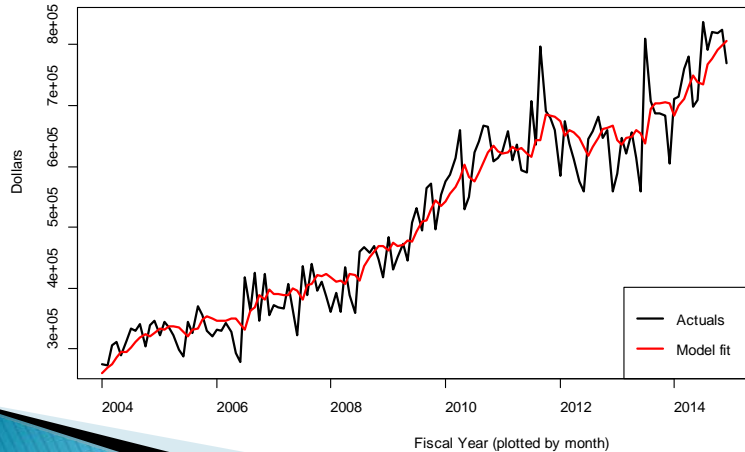
Mid-Level Practitioner(MLP)



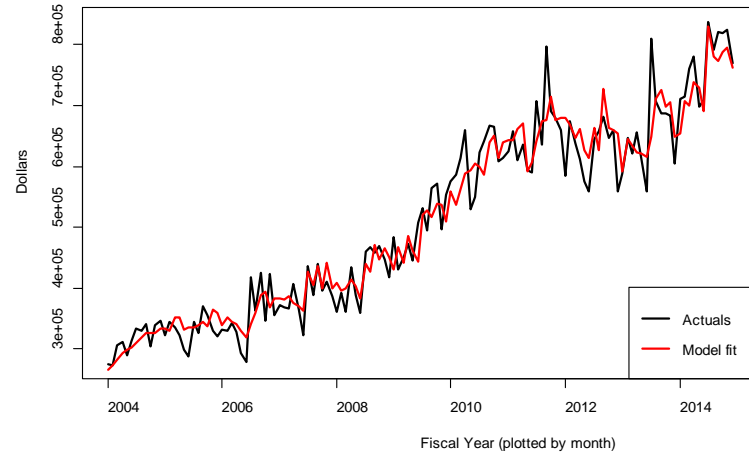
MLP AR(1)



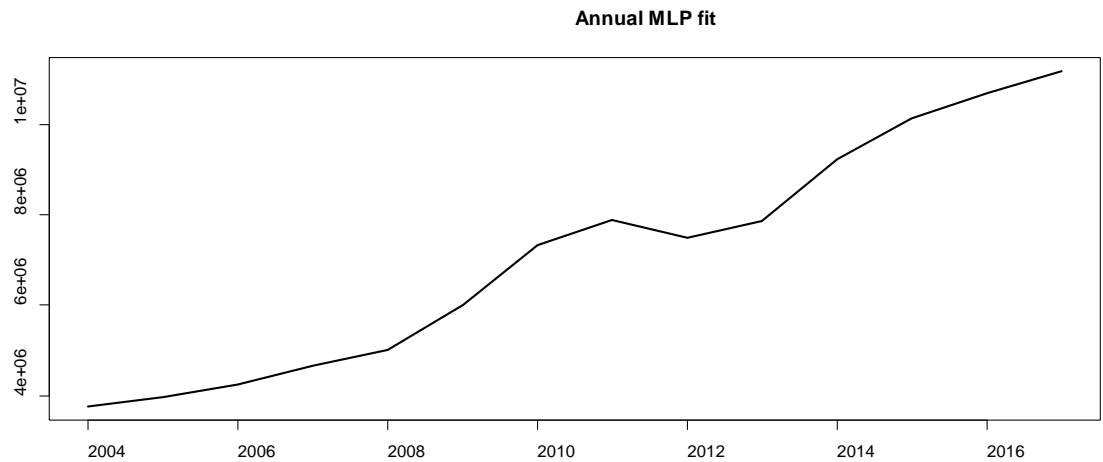
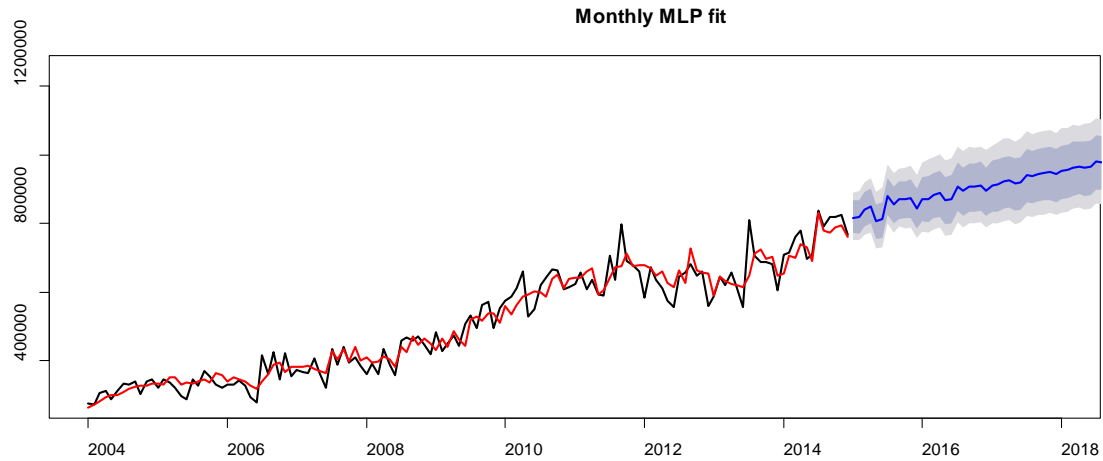
MLP ARMA(1,1)



MLP ARMA(1,1), Seasonal AR(1)



# Transition to annual data



# In Summary

- ▶ Solely a numerical, statistical model
- ▶ Relies on relationships between years and growth trends as seen in prior years
- ▶ Modeled at a granular level and rolled up to useful values