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**Discussion 12.1: Autoregressive Moving Average**

The autoregressive AR or the moving average MA are the two most common ways of fitting time series models, while you can also use them both known as ARMA which is the autoregressive moving average. As an AR model is also seen as a linear regression of the current value of the time series against previous values. While MA models are seen as being like a linear regression from a current value of the time series which is against the current and previous residuals. As below we see that the formula for an ARMA(p,q) is seen as:

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As seen below we see an example from our book R for Everyone where they use the World Banking API to download gross domestic product for several products for the date range of 1960 through 2011.

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As seen below we see a plot of the data which shows a jump in China’s GDP over the past ten years. While the others have only seen a marginal increase in comparison to China.

Graphical user interface, chart

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While a better option to use in R is the arima function which can fit and combine models for AR and MA to be seen as an ARMA model. While also being able to diff the series and fit seasonal effects.

Reference: LANDER, J. A. R. E. D. P. (2021). *R For Everyone*. ADDISON-WESLEY.