The MA Model

Full Name:

The **M**oving **A**verage Model

Mathematical Notation:

$$r_t = c + \theta_1 \varepsilon_{t-1} + \varepsilon_t$$

r_t	The values of "r" in the current period
θ_1	A numeric coefficient for the value associated with the 1st lag
ε_t	Residuals for the current period
ε_{t-1}	Residuals for the past period

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Description:

The name of the model comes from the moving averages of fixed period intervals as we cruise move through the data set.

This implies that there are other factors apart from the previous values of the variable that need to be accounted for. Therefore, if we know how far off our predictions were last time, then we have a better chance of estimating the prices better this time.

This is why, these models incorporate past residuals (also known as error terms) to help us improve our estimations. These make sure our model handles unexpected shocks well, which is why it's also known as a smoothing model.

The MA Model

Implementation of the Simple Model in Python:

The library the *ARMA* method comes from

The method we are importing

```python
from statsmodels.tsa.arima_model import ARMA
```

```python
model_ma = ARMA(df.market_value, order=(0,1))
```

The variable storing the model characteristics that we will fit later

The time series we wish to analyse

The order of the model *(we use (0,1), since MA(1) = ARMA (0,1))*

*For an MA(q) model, simply change the order from (0,1) to (0,q).

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