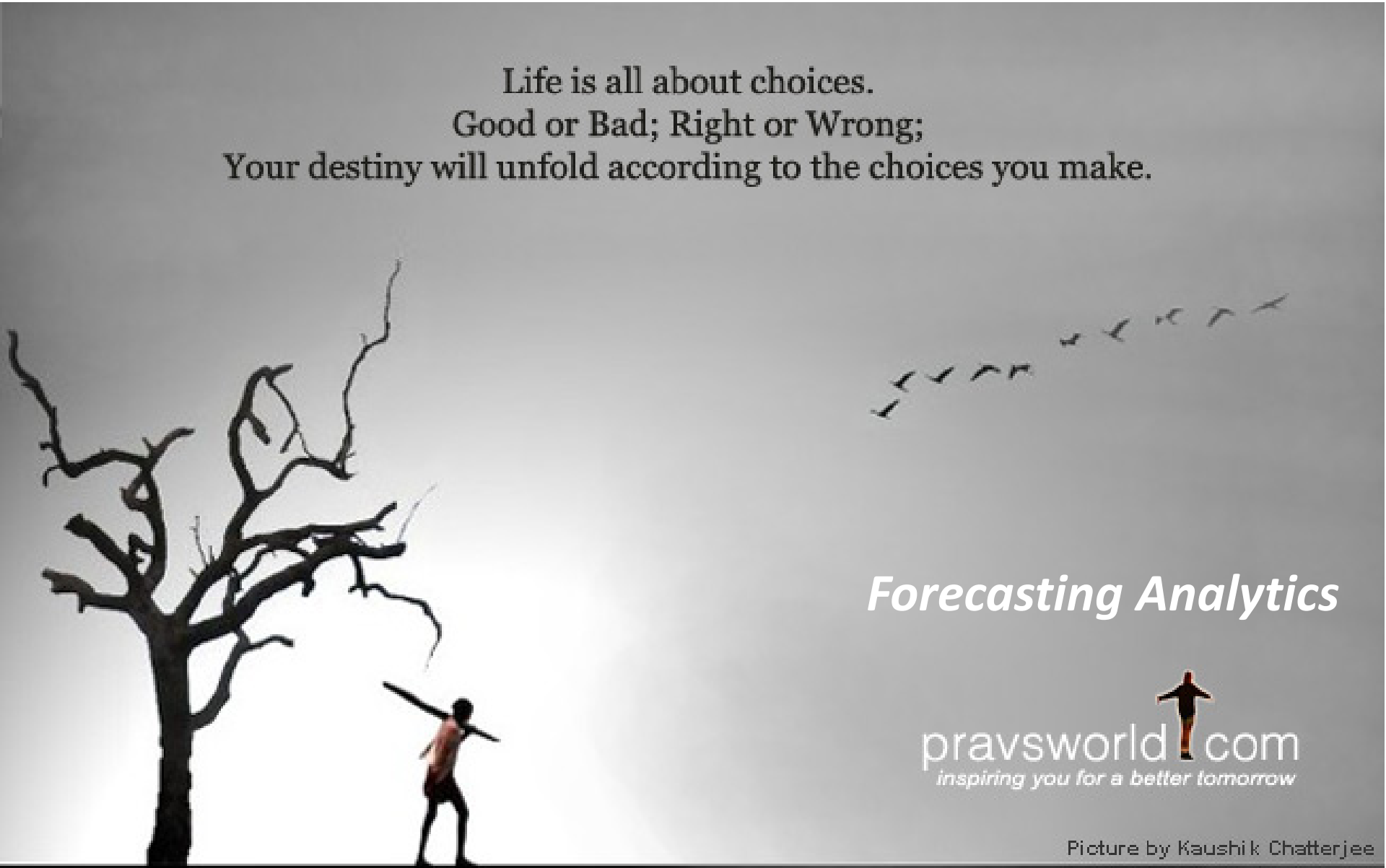
Types of Forecasting Methods



Why so many different methods?

Model-based

Linear regression

Autoregressive models

ARIMA

Logistic regression

Econometric models

Data-driven

Naïve forecasts

Smoothing

Neural nets

Amount of data

Amount of knowledge

Global/local patterns

Why so many different methods?

Extrapolation methods

Use only history of series itself

$$Y_t = f(Y_{t-1}, Y_{t-2}, \ldots)$$

Econometric models

Use history of series and other series

Inclusion on the basis of causality

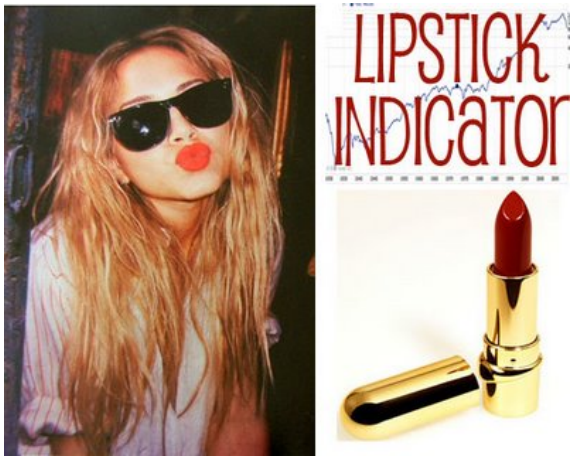
$$Y_t = 2 + 3Y_{t-1} + 4X_t + 5X_{t-2} + 2Z_{t-1}$$

Z is a leading indicator for Y
(current value not used)
X is a coincident indicator Y
(current value used)

External information

Use history of other series

Inclusion on basis of correlation

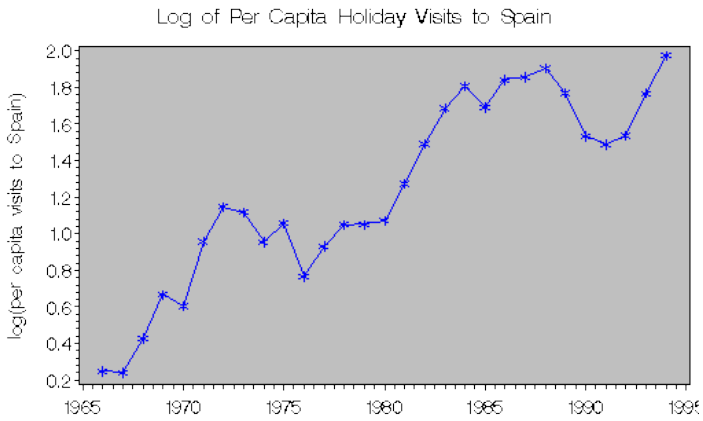


This term was coined by Leonard Lauder (chairman of Estee Lauder), who consistently found that during tough economic times, his lipstick sales went up.

Econometric Model Example: Tourist Demand

Goal: forecast the annual number of holidays in Spain taken by U.K. residents

Data: annual tourism data 1966-1994 (Song & Witt 2000)



$$LPVSP_t = c_1 + \phi_{11} LPVSP_{t-1} + \phi_{12} LPPDI_{t-1} + \phi_{13} LRCSP_{t-1} + \epsilon_{1t}$$

log

log{(CRISP/EXSP)/(PUK/EXUK)}

VSP	The number of holidays in Spain taken by U.K. residents
PDI	U.K. real personal disposable income
PUK	The implicit deflater of U.K. consumer expenditure
EXSP	Exchange rate index of Spanish pesetas against the US dollar
EXUK	Exchange rate index of U.K. pound against the U.S. dollar
POP	U.K. population
CPISP	The consumer price index in Spain

Why so many different methods?

Manual

One time forecasting

In-house expertise

Small number of series

Typically model-based methods

Automated

Ongoing forecasting

No in-house expertise

Many series to forecast

Typically data-driven methods

Computationally fast