

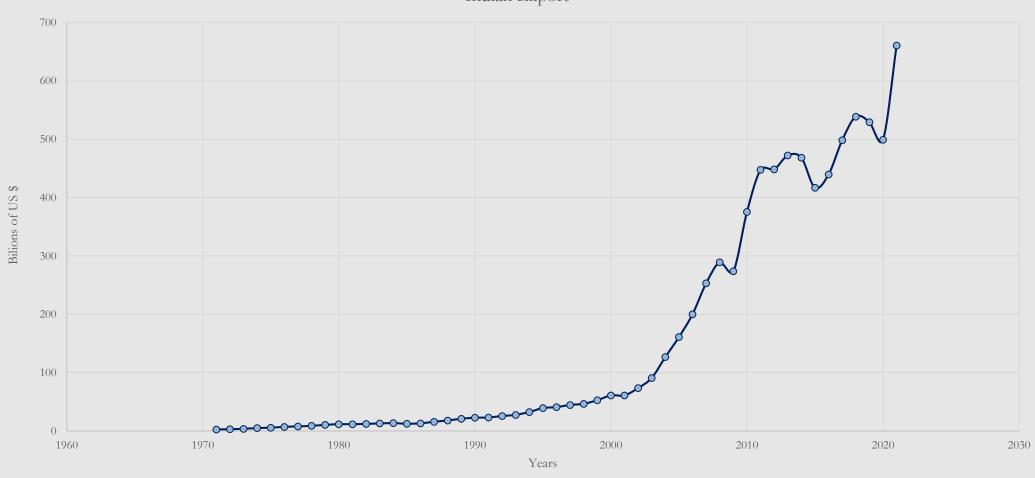
# **ABOUT THE DATA**

• Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. Data are in current U.S. dollars.

### • Reference:

https://www.macrotrends.net/countries/IND/india/exports#:~:text=India%20exports%20for%202021%2 0was,a%208.1%25%20increase%20from%202017



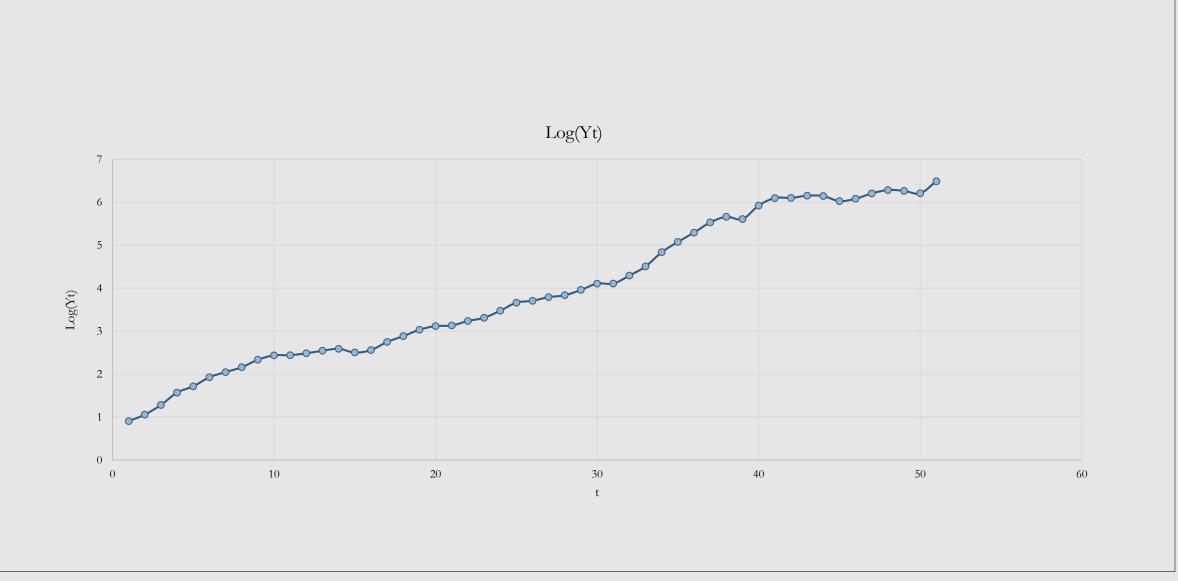


# **DATA EXPLORATION**

### From the data and time plot, we can make some initial inferences:

- Initially, data increases with negligible rate and slowly increases its rate of increment. i.e. exponential
- Since, this data have yearly observations, data can't have seasonal component.
- Export data appears to be additive time series with no seasonal component as cyclic trend is not much increasing with the trend.
- There are no outliers in the data, so no data cleaning is required.

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## TIME SERIES DECOMPOSITION

If yt represents the global export in year t, the additive model is:

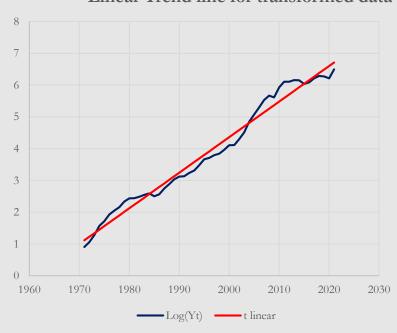
$$yt = Tt + Ct + Rt$$

where Tt, St, Ct, Rt represent Trend, Cyclical and random components respectively.

### SELECTION OF BEST POSSIBLE TREND LINE

(From simple inspection, moving average of periodicity 5 estimates the observation more precisely than linear trend. And its easier to work with transformed data.)

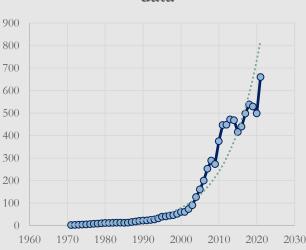
#### Linear Trend line for transformed data



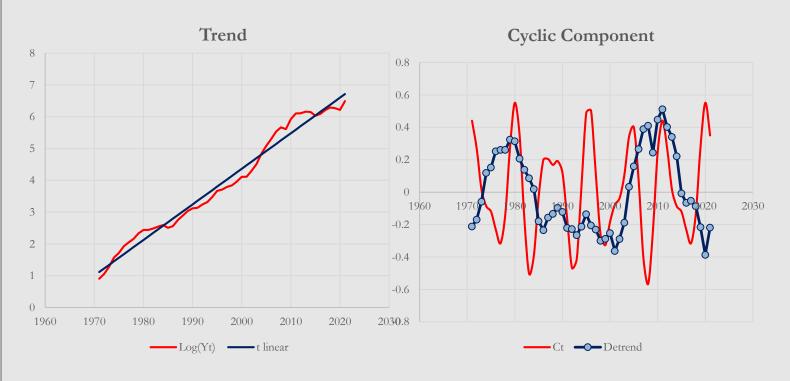
MA Trend line for transformed data



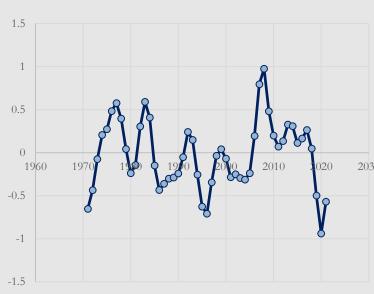
Exponential trend line in actual data



# TIME SERIES DECOMPOSITION



### Random Component



# THANK YOU