TIME SERIES ANALYSIS -GLOBAL EXPORT DATA

GROUP MEMBERS

Yashi (2033170)

Gaurav Tomar(2033132)

Shashwat(2033160)

Vishal(2033116)

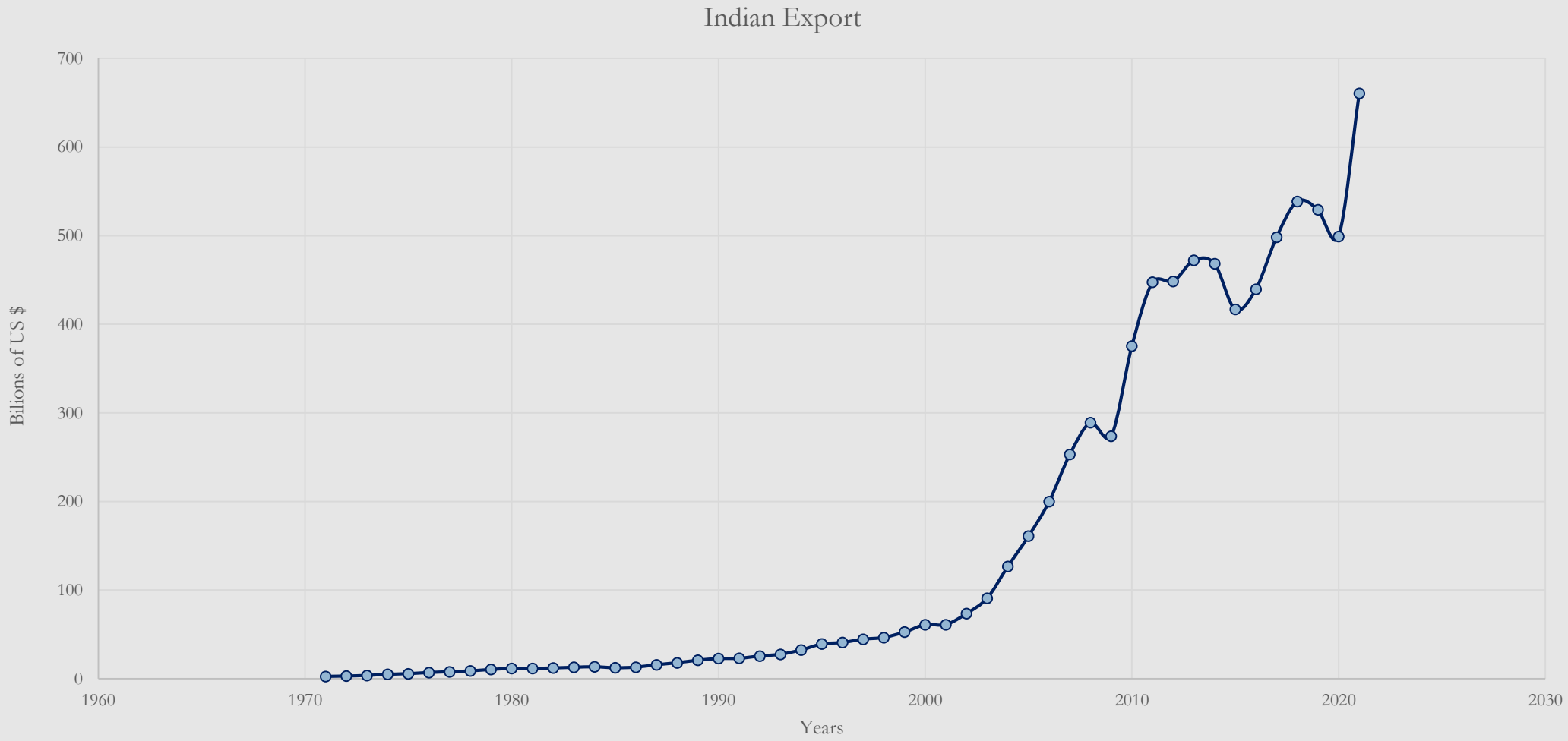
Mayank(2033157)

Akanksha(2033136)

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.

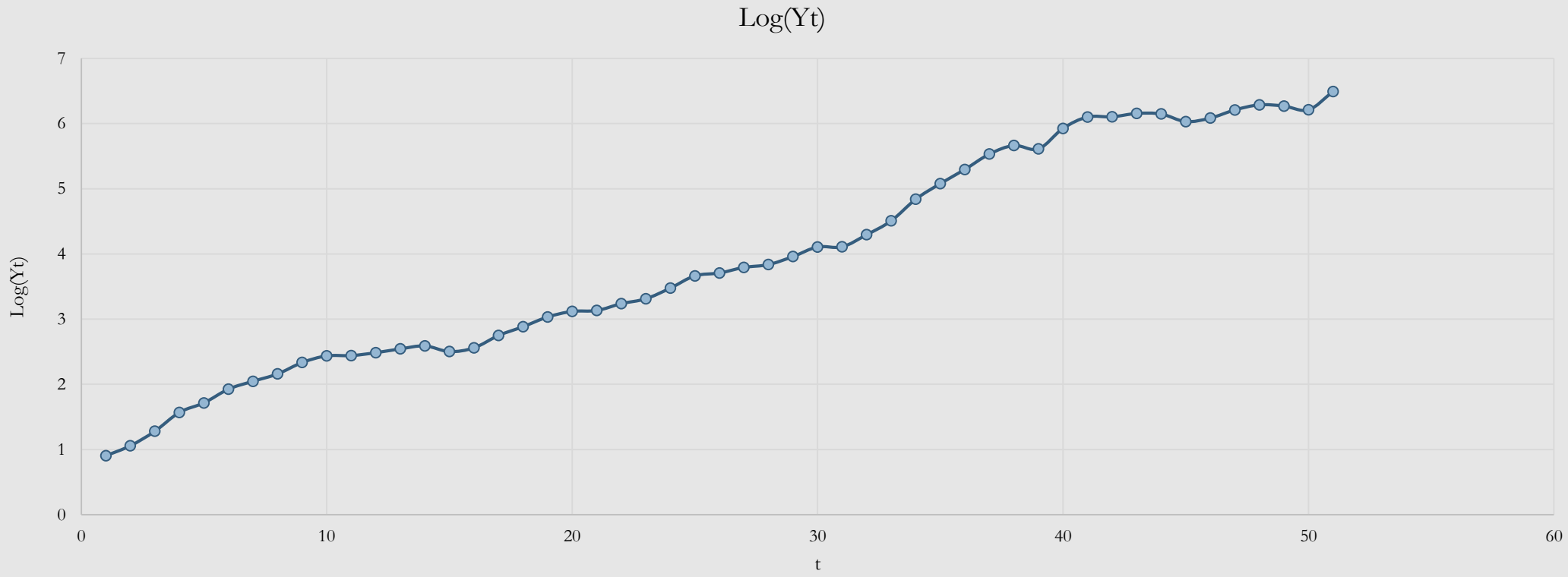
- **Reference**: https://www.macrotrends.net/countries/IND/india/exports#:~:text=India%20exports%20for%202021%20was,a%208.1%25%20increase%20from%202017


Indian Export
Bilions of US $
700
600
500
400
300
200
100
0
1960
1970
1980
1990
2000
2010
2020
2030
Years

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.
  -


Log(Yt)
Log(Yt)
7
6
5
4
3
2
1
0
0
10
20
30
40
50
60
t

TIME SERIES DECOMPOSITION

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

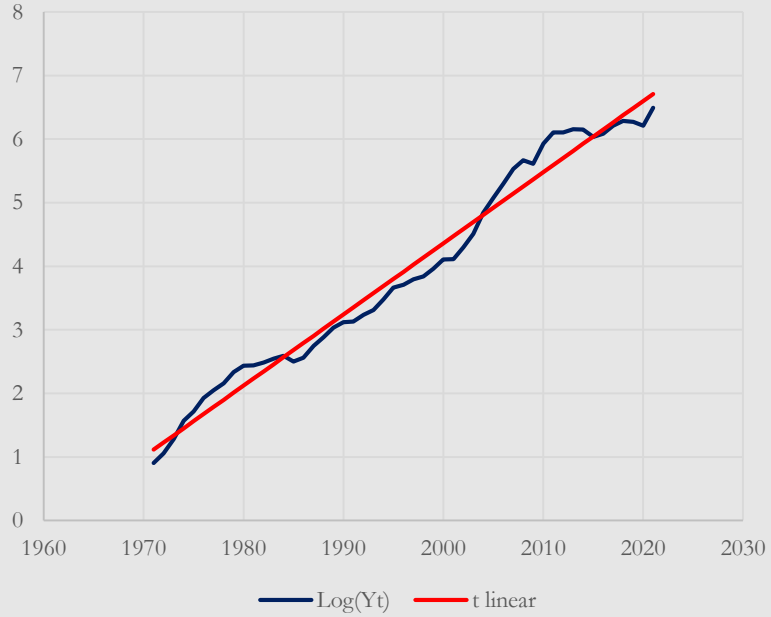
$yt = Tt + Ct + Rt$

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

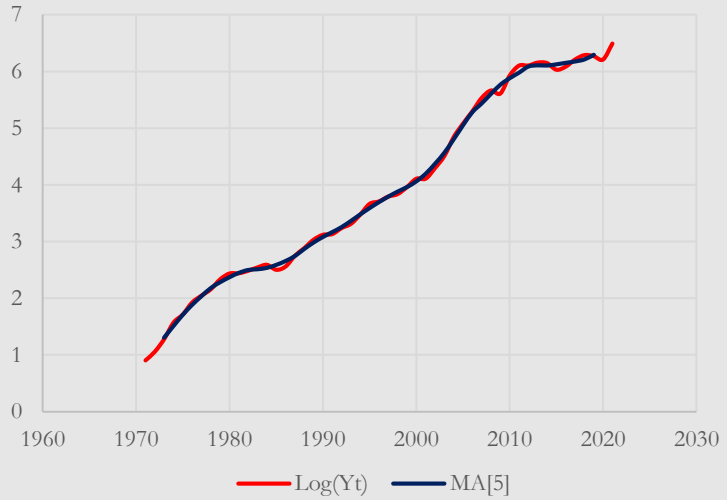
SELECTION OF BEST POSSIBLE TREND LINE

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

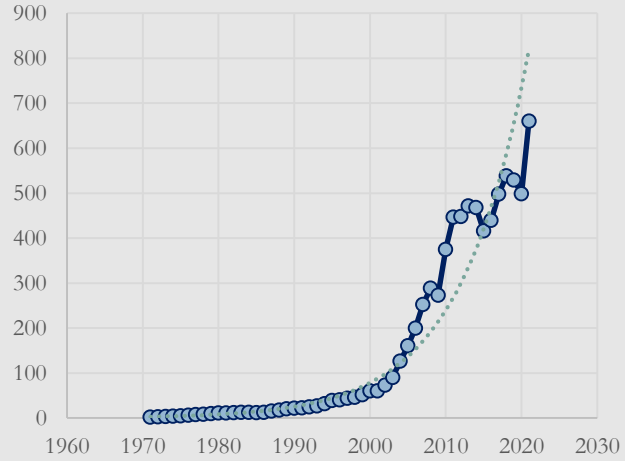
Linear Trend line for transformed data



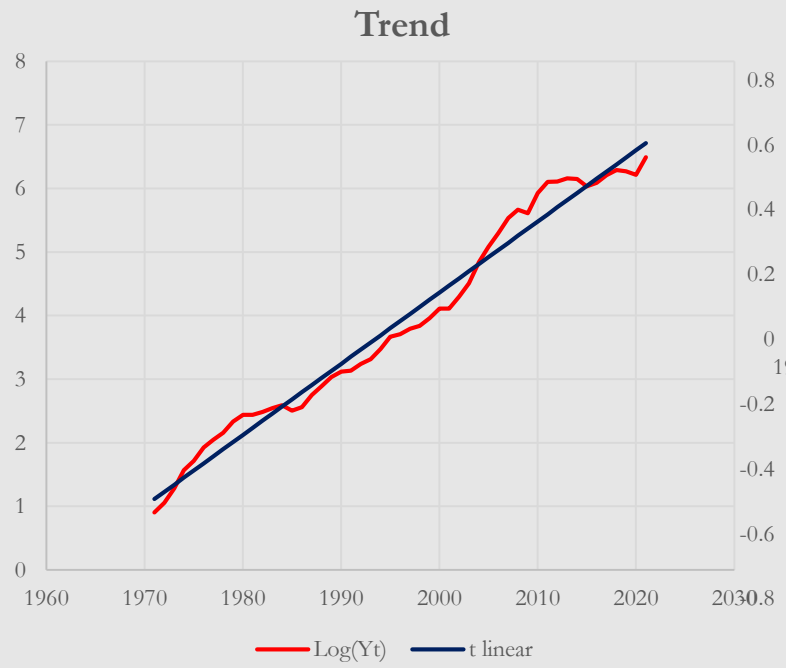
MA Trend line for transformed data

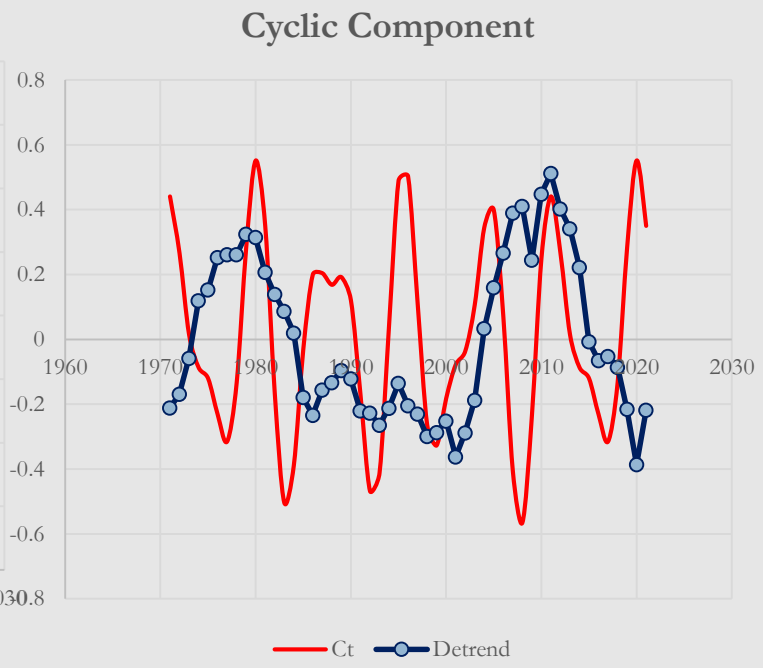


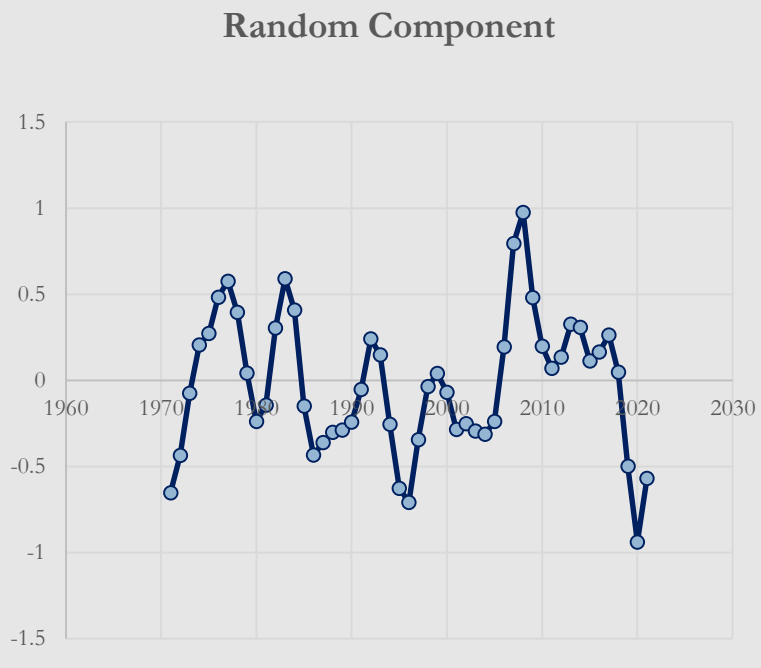
Exponential trend line in actual data



TIME SERIES DECOMPOSITION







THANK YOU