FRANCESCO SEBASTIANO MEMMOLA

50893A

Variables descriptions

NA000334Q   Quarterly U.S. nominal GDP
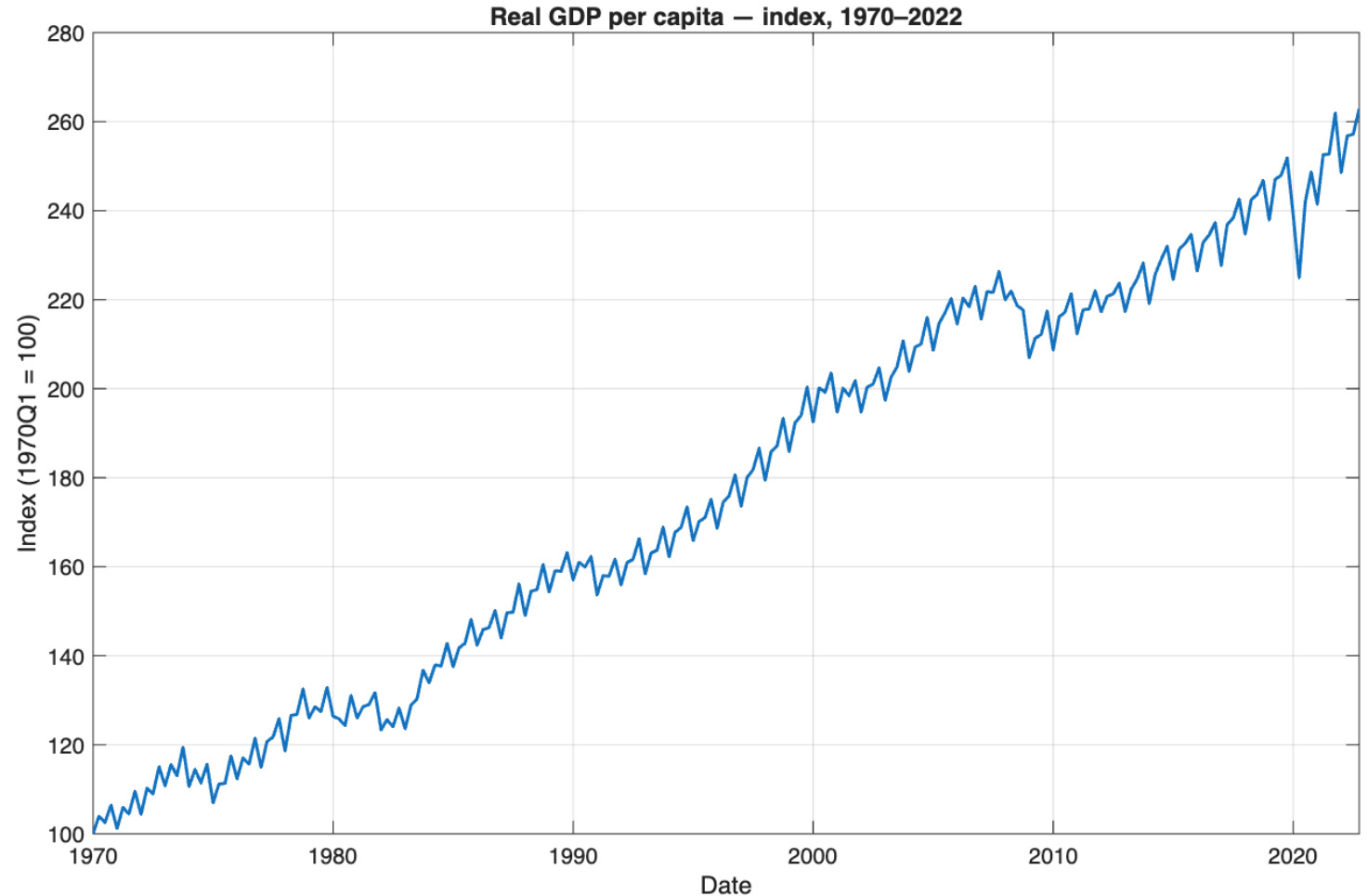
GDPDEF GDP   Quarterly GDP price index (2017=100) deflator (base = 100)
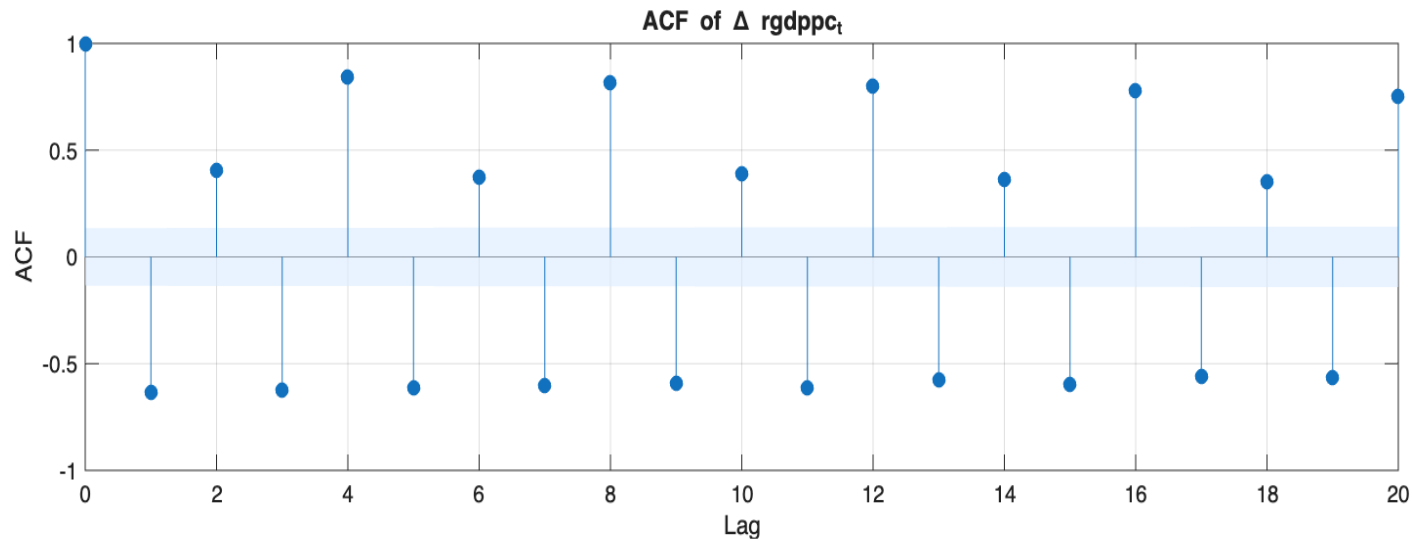
B230RC0Q173SBEA   Quarterly U.S. population

Real GDP per capita

A strong long-run uptrend (≈2.6× since 1970) with brief downturns in the early-1980s, 2008–09, and 2020, followed by rebounds to new highs by 2022 after covid.
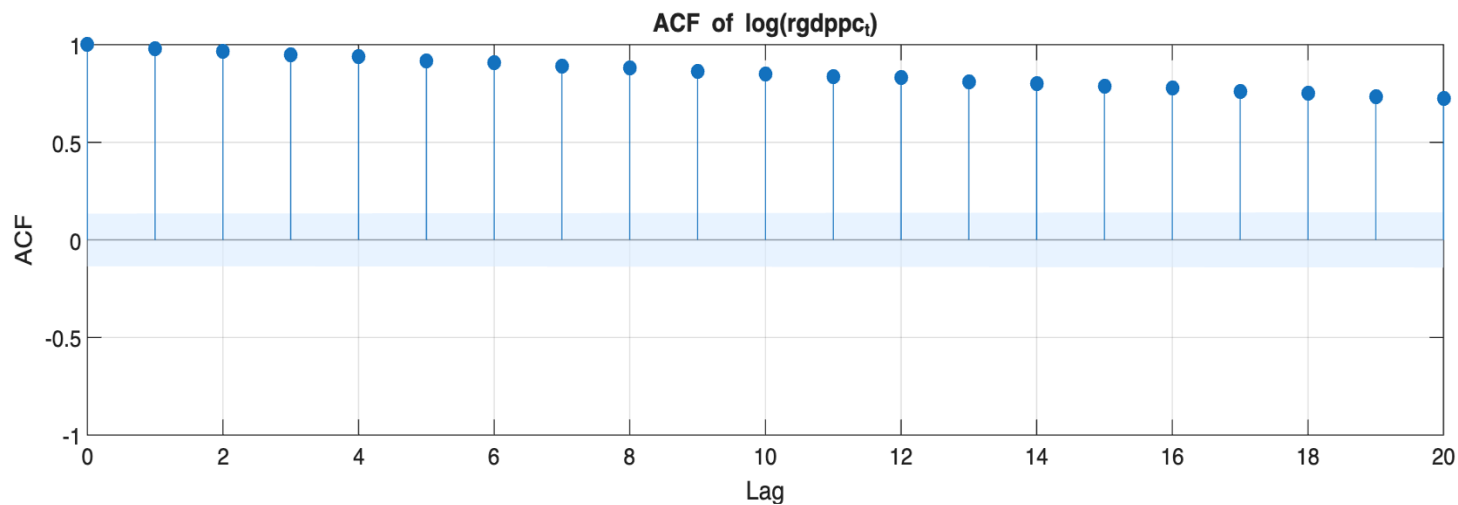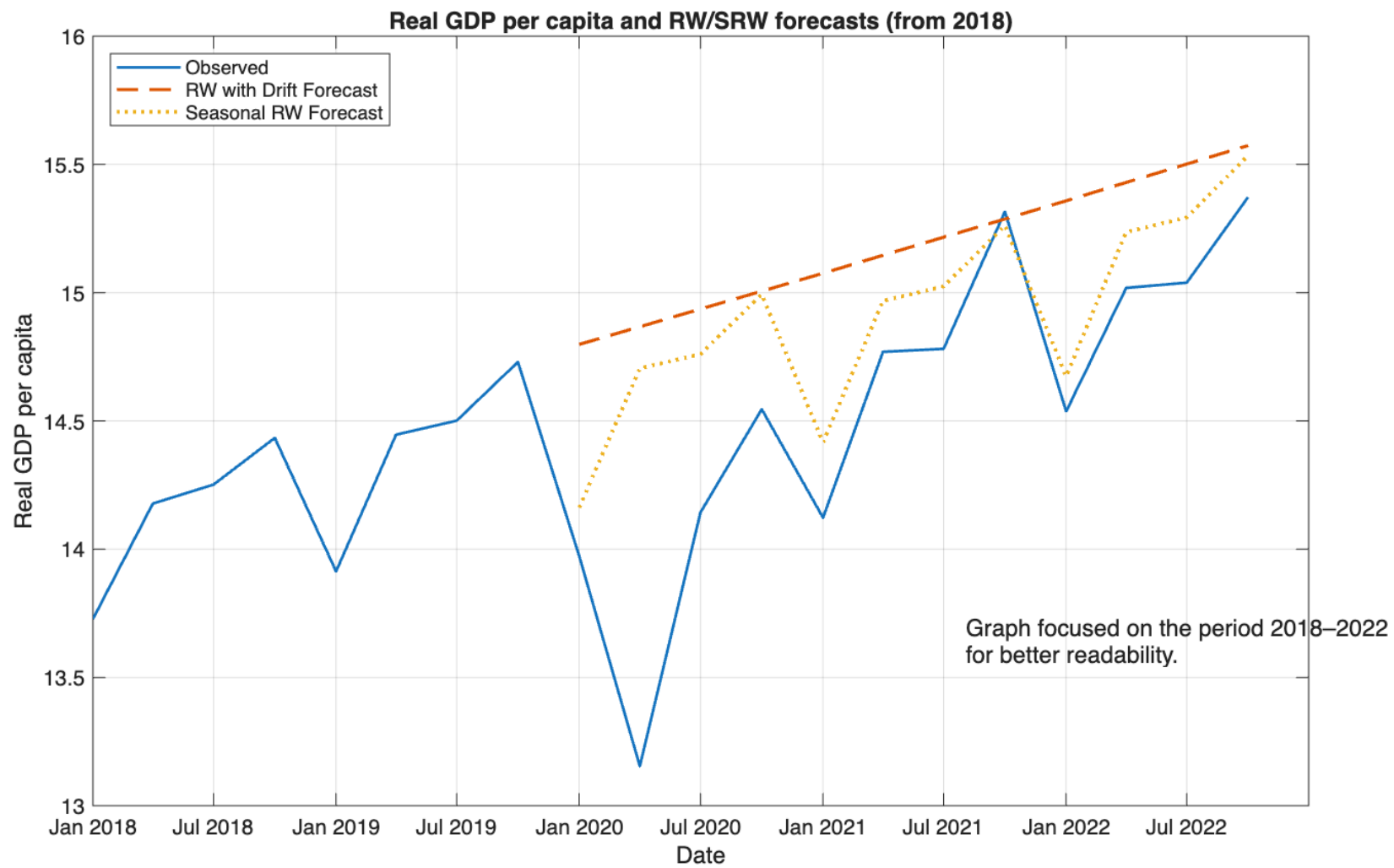

Real GDP per capita — index, 1970–2022

Δrgdppc_t

Avg annualized per-capita real GDP growth (1970–2022): 1.83%

ACF of Δ rgdppc_t

The ACF of GDP growth rates shows low persistence with alternating positive and negative spikes, suggesting little autocorrelation.

ACF of log(rgdppc_t)

In contrast, the ACF of the logarithm shows strong, slowly decaying correlations, indicating strong trend persistence.

Real GDP per capita and RW/SRW forecasts (from 2018)

Legend:
- Observed
- RW with Drift Forecast
- Seasonal RW Forecast

Graph focused on the period 2018–2022 for better readability.

X-axis: Date
Y-axis: Real GDP per capita

Root Mean Squared Forecast Error

• Random Walk with Drift RMSE: 0.75
• Seasonal Random Walk with Drift RMSE: 0.53

The Seasonal Random Walk with Drift achieves a lower RMSE (0.53 vs. 0.75), indicating better forecast accuracy.