Example of HP filter on Argentina data

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HP filter

- A Hodrick Prescott filter generates a smoothed version of the data
- the data is the sequence of y_t
- The data is filtered by choosing $\{\tau_t\}_{t=1}^{T}$ to minimize

$$\sum_{t=1}^{T}(y_t - \tau_t)^2 + \lambda \sum_{t=2}^{T-1}\left[(\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1})\right]^2$$

- Subtracting the HP filtered data from the real data gives the cycles
- The choice of λ determines how much curvature is allowed in the filtered data
  - when λ is small, the filtered data has a lots of curves
  - when λ is larger, the filtered data is more like a straight line

Hp filter on Argentina real gdp lambda=10

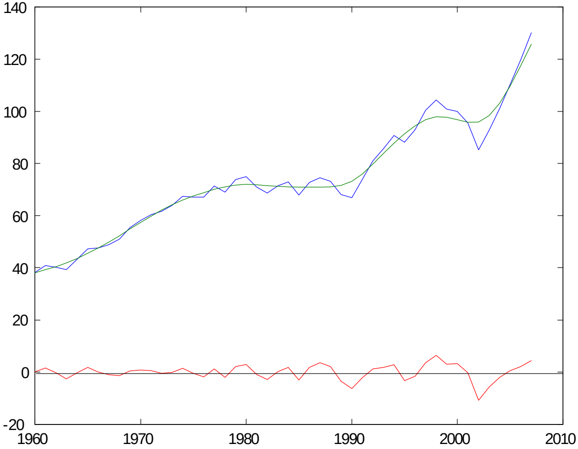

Figure: Hp filter with $\lambda = 10$

Hp filter on Argentina real gdp lambda=30

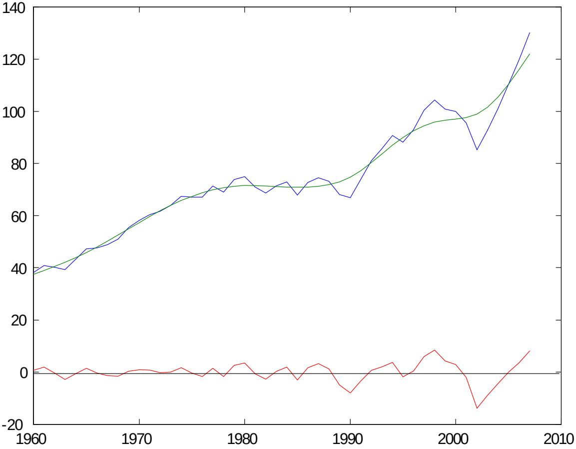

Figure: Hp filter with $\lambda = 30$

Hp filter on Argentina real gdp lambda=100

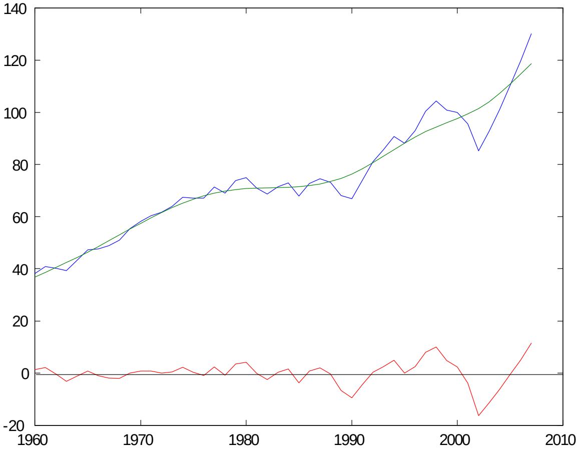

Figure: Hp filter with $\lambda = 100$

Hp filter on Argentina real gdp lambda=1600

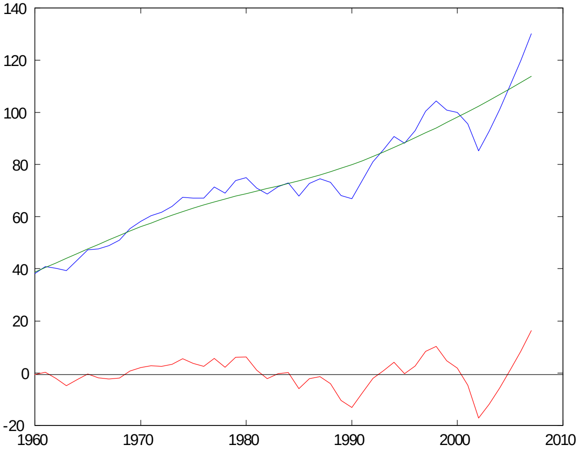

Figure: Hp filter with $\lambda = 1600$

Hp filter on Argentina real gdp lambda=10000

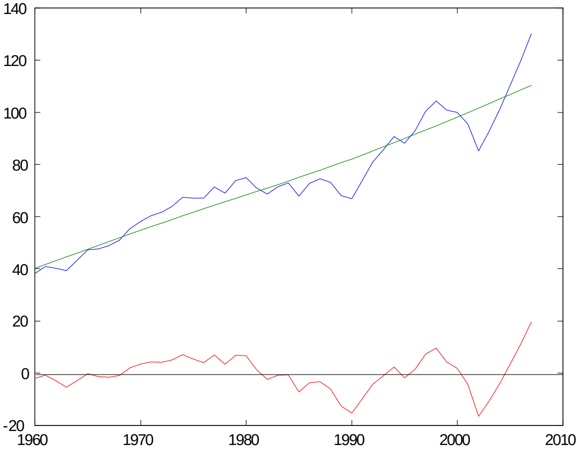

Figure: Hp filter with $\lambda = 10000$

Hp filter on Argentina real gdp lambda=100000

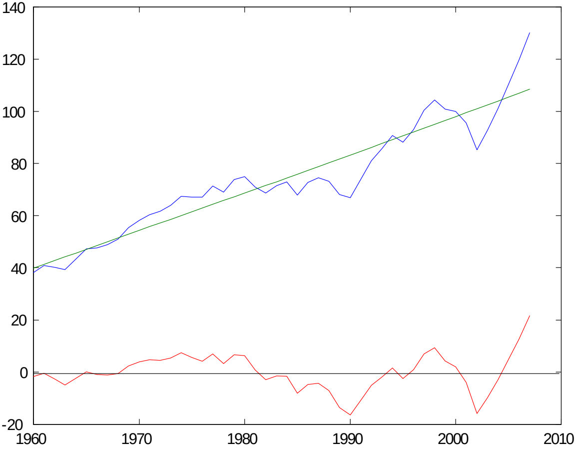

Figure: Hp filter with $\lambda = 100000$