

HW 2

Q2

- a) In an N -span simple moving avg, each observation in the window is weighted equally with $1/N$

$$\text{Var}(M_t) = \text{Var}\left(\sum_{t=T-N+1}^{t=T} \left(\frac{1}{N}\right) y_t\right)$$

$$= \sum_{t=T-N+1}^{t=T} \left(\frac{1}{N}\right) \text{Var}(y_t)$$

$$= \frac{1}{N^2} \sum_{t=T-N+1}^{t=T} \text{Var}(y_t) \quad \left(\frac{1}{N} \text{ is a constant}\right)$$

$$= \frac{1}{N^2} N \cdot \text{Var}(y_t) \quad (\text{All vars have same variance})$$

$$= \frac{\sigma^2}{N}$$