ECONOMIA APPLICATA M - LEZIONE 7-2

Titolo nota ~~06/12/2016~~ 13/12/19

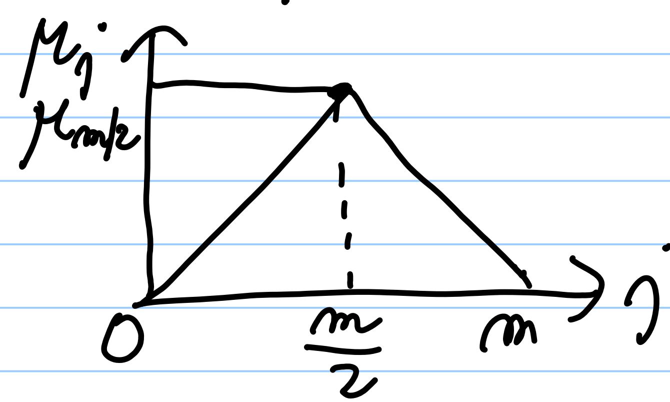
APPROFONDIMENTO DEI MODELLI DL (SECONDA PARTE)

$$y_t = \sum_{j=0}^{\infty} \mu_j x_{t-j} + u_t$$

$$y_t = \sum_{j=0}^{m} \mu_j x_{t-j} + u_t, \quad \underbrace{m}_{\text{FINITO}} < T$$

STRATEGIE PER RIDURRE IL N° DI PARAMETRI DA STIMARE EFFETTIVAMENTE :

1) $\mu_j = \frac{\mu_{m/2}}{m/2} j \quad , \quad j = 0, \dots \frac{m}{2}$



2) $\mu_j = \lambda^j \mu_0 \quad , \quad 0 < \lambda < 1$

$$(1-\lambda L) y_t = \mu_0 x_t + (1-\lambda L) u_t$$

$\rightarrow y_t = \lambda y_{t-1} + \mu_0 x_t + v_t \quad , \quad v_t = u_t - \lambda u_{t-1}$ $(MA(1))$

$\rightarrow ARDL(1,0)$

$\rightarrow \hat{\lambda}, \hat{\mu}_0 \longrightarrow \hat{\mu}_j = \hat{\lambda}^j \hat{\mu}_0$

3) POLINOMI DI ALMON

$$f(j) = \alpha_0 + \alpha_1 j + \alpha_2 j^2 + \dots + \alpha_k j^k = \sum_{i=0}^{k} \alpha_i j^i$$

DOVE $k < m$

$$\mu_j = f(j) = \sum_{i=0}^{k} \alpha_i j^i$$

$$y_t = \sum_{j=0}^{m} \mu_j x_{t-j} + u_t = \sum_{j=0}^{m} \left(\sum_{i=0}^{k} \alpha_i j^i \right) x_{t-j} + u_t$$

$$y_t = \sum_{i=0}^{k} \alpha_i \underbrace{\left(\sum_{j=0}^{m} j^i X_{t-j} \right)}_{X_{it}\ \text{(DEFINIZIONE)}} + u_t$$

$$\Downarrow$$

$$\boxed{y_t = \sum_{i=0}^{k} \alpha_i X_{it} + u_t}$$

↳ MODELLO STIMABILE – OTTENIAMO STIME DEI COEFFICIENTI α_i (IN NUMERO PARI A $K<m$) – DAI COEFFICIENTI α_i RICAVIAMO I COEFFICIENTI μ_j –

ES. $K=2 \; ; \; m=3$

$$\Downarrow \qquad\qquad \Downarrow$$

$$i=0,1,2 \qquad j=0,1,2,3$$

$$\mu_j = \sum_{i=0}^{2} \alpha_i j^i$$

$$j=0 \Rightarrow \mu_0 = \alpha_0 0^0 + \alpha_1 0^1 + \alpha_2 0^2 = \alpha_0$$

$$j=1 \Rightarrow \mu_1 = \alpha_0 1^0 + \alpha_1 1^1 + \alpha_2 1^2 = \alpha_0 + \alpha_1 + \alpha_2$$

$$j = 2 \Rightarrow \mu_2 = \alpha_0 2^0 + \alpha_1 2^1 + \alpha_2 2^2 = \alpha_0 + 2\alpha_1 + 4\alpha_2$$

$$j = 3 \Rightarrow \mu_3 = \alpha_0 3^0 + \alpha_1 3^1 + \alpha_2 3^2 = \alpha_0 + 3\alpha_1 + 9\alpha_2$$

$$\vdots$$

$$j = m \Rightarrow \mu_m = \alpha_0 m^0 + \alpha_1 m^1 + \alpha_2 m^2 = \boxed{\alpha_0 + m\alpha_1 + m^2\alpha_2}$$

$$X_{it} \equiv \sum_{j=0}^{3} j^{i} X_{t-j}$$

$$i=0 \Rightarrow X_{0t} = 0^0 \cdot X_t + 1^0 X_{t-1} + 2^0 X_{t-2} + 3^0 X_{t-3} = X_t + \\ + X_{t-1} + X_{t-2} + X_{t-3}$$

$$i=1 \Rightarrow X_{1t} = 0^1 X_t + 1^1 X_{t-1} + 2^1 X_{t-2} + 3^1 X_{t-3} = \\ = X_{t-1} + 2X_{t-2} + 3X_{t-3}$$

$$i=2 \Rightarrow X_{2t} = 0^2 X_t + 1^2 X_{t-1} + 2^2 X_{t-2} + 3^2 X_{t-3} = X_{t-1} + 4X_{t-2} \\ + 9X_{t-3}$$

SE u_t NON AUTOCORRELATO,

$y_t = \sum_{i=0}^{2} \alpha_i x_{it} + u_t$ PUÒ ESSERE STIMATO CON

OLS $\Longrightarrow \hat{\alpha}_0, \hat{\alpha}_1, \hat{\alpha}_2 \Longrightarrow \hat{\mu}_0, \hat{\mu}_1, \hat{\mu}_2, \hat{\mu}_3$