MICROECONOMETRIA - LEZIONE 1 (7/5/19)

Titolo nota 05/05/2019

ORARIO

LUN	8~~30~~ (45) - 1030	U9/11
MAR	1030 - 12~~30~~ (15)	U3/11
VEN	8~~30~~ (45) - 1130	U4/LAB4A1

ARGOMENTI

1) DATI PANEL
2) VARIABILI DIPENDENTI QUALITATIVE
3) " " "LIMITATE"

PREREQUISITI

CORSO BASE DI ECONOMETRIA: OLS / GLS / IV
TEST DI IPOTESI

TESTO DI RIFERIMENTO

GREENE, W., ECONOMETRIC ANALYSIS,
PRENTICE-HALL INTL

CONTATTI

MATTEO.MANERA@GMAIL.COM

WWW.MATTEOMANERA.IT

FACEBOOK.COM/PROFMATTEOMANERA

DATI PANEL

Z_{it}

$i = 1 \dots N$

(INDIVIDUI, CROSS-SECTION)

$t = 1 \dots T$

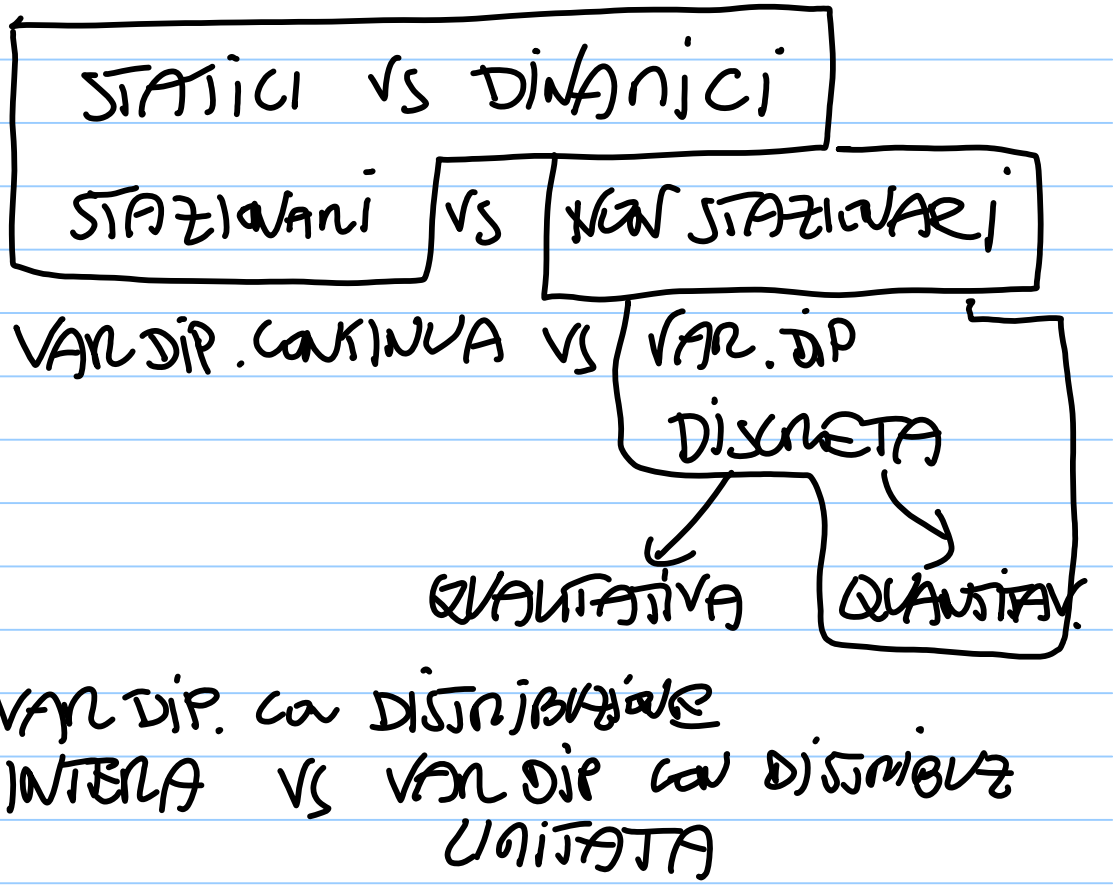
(TEMPO, TIME SERIES)

INDIVIDUI IN SENSO "LATO":

PERSONE FISICHE, FAMIGLIE, IMPRESE, PAESI, ETC.

MODELLI PER DATI PANEL

DISTINZIONI:



VAR DIP. con DISTRIBUZIONE INTERA VS VAR DIP con DISTRIBUZ UNITATA

DATI PANEL

(z_{it})

$i = 1 \dots N$

$t = 1 \dots T$

- $N > T$ — LONGITUDINALI
- $N < T$ — "POOLED" TIME SERIES

DATI PANEL STATICI / STAZIONARI

"POOLED" TIME SERIES $(N < T)$

NOTAZIONE

UN solo individuo:

$$y_t = \alpha + \sum_{i=2}^{k} \beta_i x_{it} + u_t \qquad t = 1 \dots T \qquad (1)$$

N INDIVIDUI : $y_{it} = \alpha_i + \sum_{r=2}^{K} \beta_{ri} x_{rit} + u_{it}$

(2)

AGGREGAZIONE DELLA (2) RISPETTO A $t = 1 \dots T$:

(3) $y_i = \alpha_i \underset{(T\cdot 1)}{\iota} + \underset{(T\cdot (K-1))}{X_i^*} \underset{((K-1)\cdot 1)}{\beta_i} + \underset{(T\cdot 1)}{u_i} = \underset{T\cdot K}{X_i} \underset{K\cdot 1}{\delta_i} + \underset{(T\cdot 1)}{u_i}$

Dove

$$y_i = \underset{(T\cdot 1)}{\begin{pmatrix} y_{i1} \\ y_{i2} \\ \vdots \\ y_{it} \\ \vdots \\ y_{iT} \end{pmatrix}} \quad ; \quad U_i = \underset{(T\cdot 1)}{\begin{pmatrix} U_{i1} \\ U_{i2} \\ \vdots \\ U_{it} \\ \vdots \\ U_{iT} \end{pmatrix}}$$

$$J = \underset{(T\cdot 1)}{\begin{pmatrix} 1 \\ 1 \\ 1 \\ \iota \\ 1 \end{pmatrix}} \quad ; \quad \beta_i = \underset{(k-1)\cdot 1}{\begin{pmatrix} \beta_{2i} \\ \beta_{3i} \\ \beta_{2i} \\ \beta_{ki} \end{pmatrix}}$$

X_{nzit}

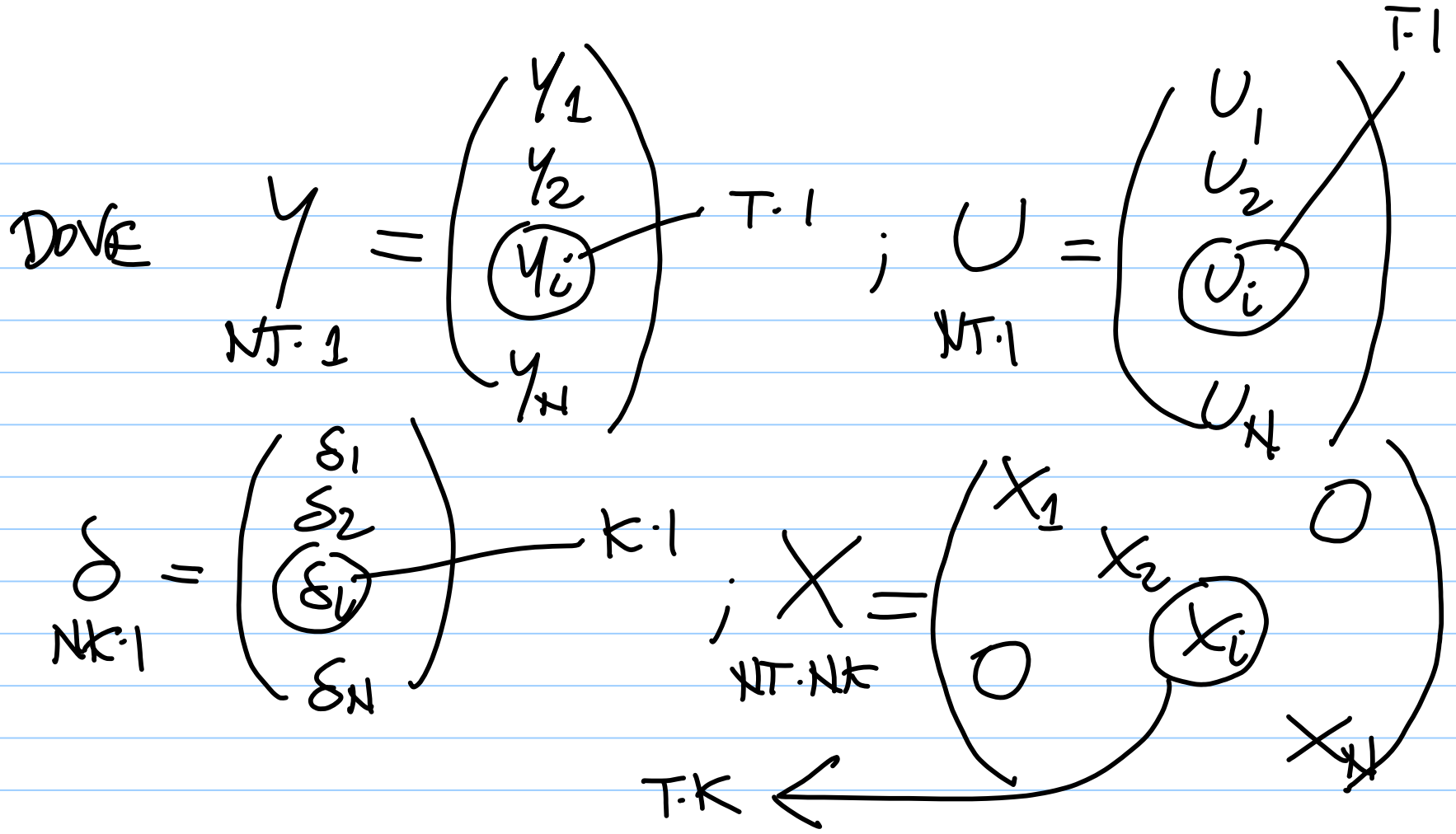
$$X_i^* = \underset{T\cdot(K-1)}{\begin{pmatrix} X_{2i1} & X_{3i1} & \cdots & X_{Ki1} \\ X_{2i2} & X_{3i2} & \cdots & X_{Ki2} \\ X_{2it} & X_{3it} & \cdots & X_{Kit} \\ X_{2iT} & X_{3iT} & \cdots & X_{KiT} \end{pmatrix}}$$

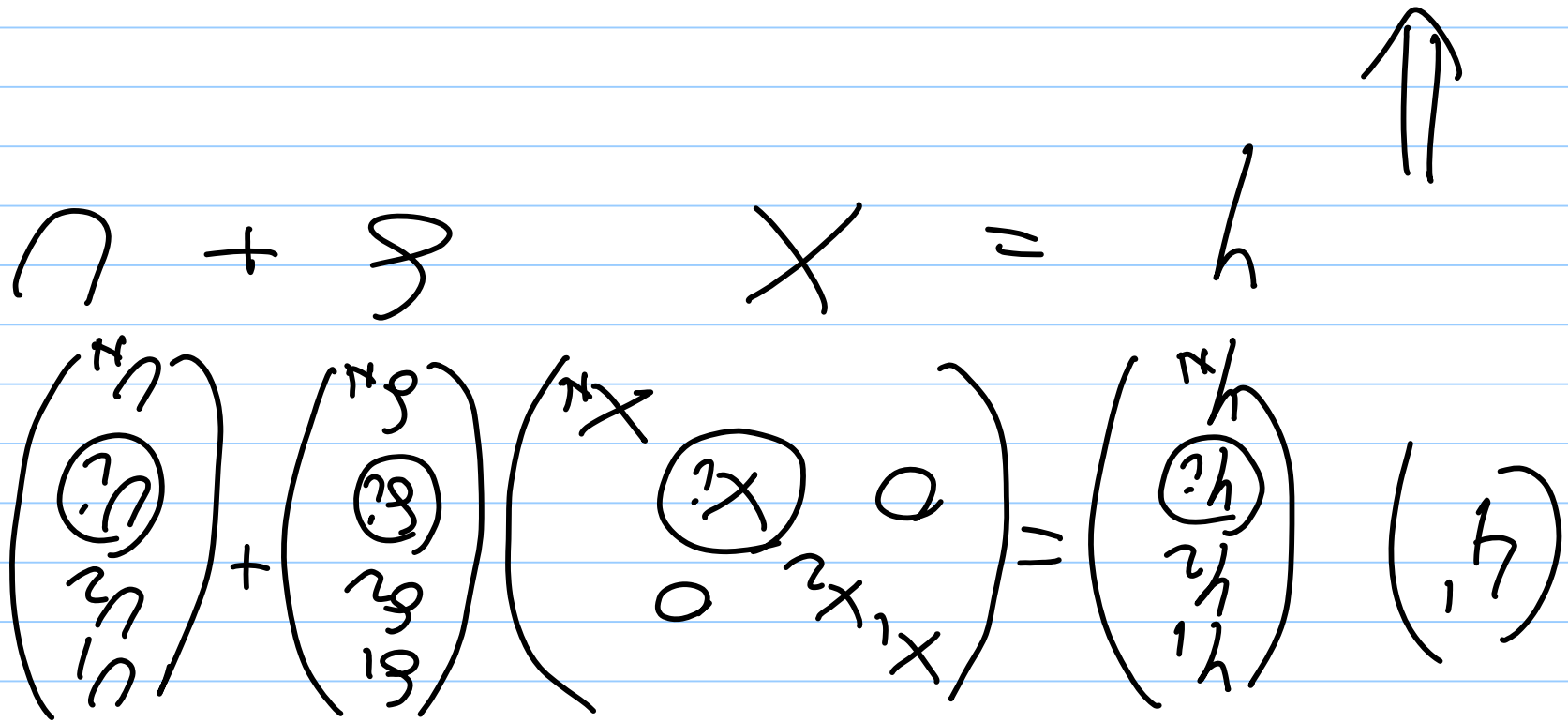
$$\delta_i = \underset{K\cdot 1}{\begin{pmatrix} 1\cdot 1 \\ \alpha_i \\ \beta_i \end{pmatrix}} \quad (K-1)\cdot 1$$

; $x_i = (J \vdots x_i^*)$

AGGREGAZIONE DELLA (3) RISPETTO A $i = 1 \_ N$:

$$(4) \quad \underset{NT \cdot 1}{y} = \underset{NT \cdot NK}{X} \underset{NK \cdot 1}{\delta} + \underset{NT \cdot 1}{U}$$


DOVE
$y_{NT \cdot 1} = \begin{pmatrix} y_1 \\ y_2 \\ y_i \\ y_N \end{pmatrix}$ T·1
; $U_{NT \cdot 1} = \begin{pmatrix} U_1 \\ U_2 \\ U_i \\ U_N \end{pmatrix}$ T·1
$\delta_{NK \cdot 1} = \begin{pmatrix} \delta_1 \\ \delta_2 \\ \delta_i \\ \delta_N \end{pmatrix}$ K·1
; $X_{NT \cdot NK} = \begin{pmatrix} X_1 & 0 & \\ & X_2 & \\ 0 & & X_i \\ & & X_N \end{pmatrix}$
T·K



$\Downarrow$

$(4')$

$$\begin{cases} y_1 = x_1 \delta_1 + v_1 \\ y_2 = x_2 \delta_2 + v_2 \\ \vdots \\ y_i = x_i \delta_i + v_i \\ \vdots \\ y_N = x_N \delta_N + v_N \end{cases}$$

SISTEMA DI N EQUAZIONI

CONSISTENZA & NELLA (4) ?

$$\underset{NT\cdot 1}{y} = \underset{NT\cdot NK}{X} \underset{NK\cdot 1}{\delta} + \underset{NT\cdot 1}{U}$$

DIPENDE DALLE IPOTESI

IPOTESI:

1) $E(U) = 0 \quad \left[E(u_{it}) = 0, \forall i, t \right]$

2) $E(UU') \equiv \overline{\Phi} = \Sigma_N \otimes I_T$

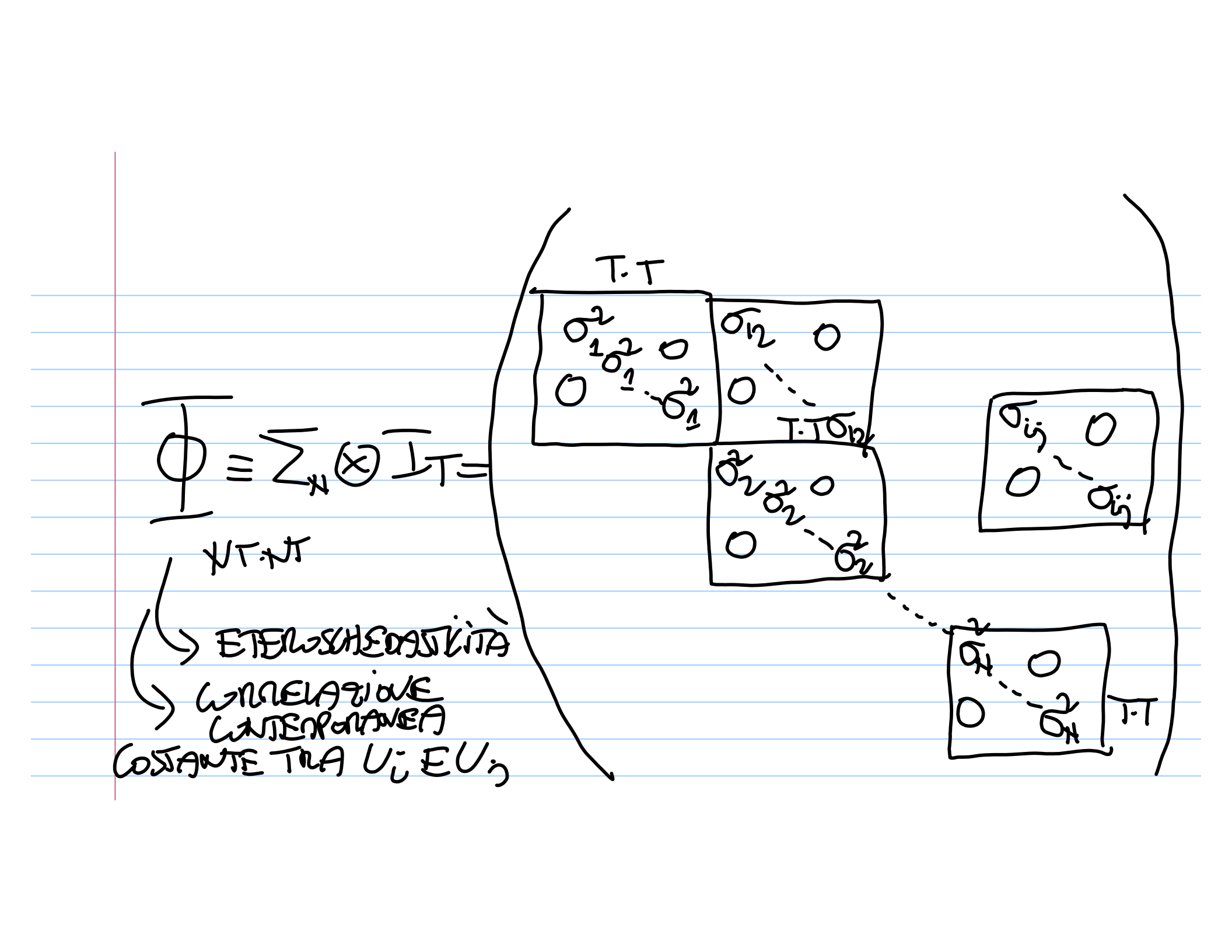
$NT \cdot NT$

VAR/COV ERRORI

PRODOTTO DI KRONECKER

DOVE $\underset{N \cdot N}{\Sigma_N} \equiv \begin{pmatrix} \sigma_1^2 & \sigma_{12} & \sigma_{13} & & \\ & \sigma_2^2 & & & \\ & & \sigma_i^2 & \sigma_{ij} & \\ & & & & \sigma_N^2 \end{pmatrix}$

VARIANZE/COV ERRORI DELLE DIVERSE EQUAZIONI DEL SISTEMA (4)


$\Phi \equiv \Sigma_N \otimes I_T =$
$NT \cdot NT$
ETEROSCHEDASTICITÀ
CORRELAZIONE CONTEMPORANEA COSTANTE TRA U_i E U_j
T·T
T·T
T·T

3) X NON STOCASTICA

COME STIMARE δ NELLA (4)?

GLS (DI SISTEMA), CIOÈ IL COSIDDETTO STIMATORE SUR → REGRESSIONS

SEEMINGLY UNRELATED

$$\hat{\beta}_{SUR} = \left(X' \Phi^{-1} X\right)^{-1} X' \Phi^{-1} y$$

(NK·1)