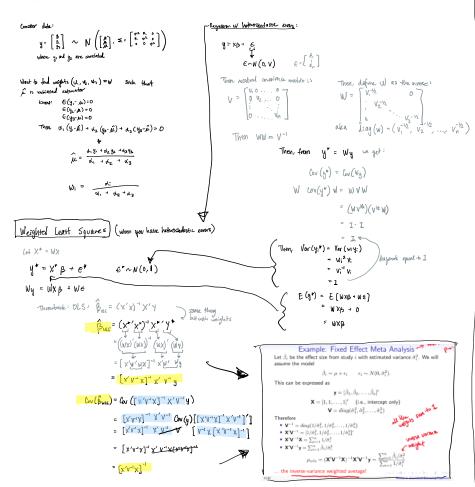
GEE derivation stuff

Saturday, November 25, 2023 17:16



Generalized Least Squares

V is non-diagraph (so there is both beforeskedathing & carclation between obj)

Bgs = [X'V-'X] X'V-'y (p) = [X'V-1X]-1

If we know V,
the weighing scheme will give us
the smallest various as among
the unliased estimators

If homoscedaetic but still con between abs:

 $\hat{\beta}_{gl,c}:\left(x'\kappa^{-1}\,x\right)^{-1}\,x'\,R^{-1}\,y\qquad\text{for slave: USe }\mathcal{T}^{-2}\,R^{-1}=V^{-1}$ 1/2/2 [Cov(Bgus): 02(X'R'X)

| Robust Regression]

Don't know V. y= 1/3+E

 $\hat{\beta}_{old} = (X'X)^{-1} X'y$ still unbiased of consistant Con (pas) never = (x'x) x' ([y x pre] (y x pre]) x(x'x)

La Ideal conditions: -balancel data

To converse to the missing Converges to the (thick) for $\ell \sim N(0, \nu)$

Tradeoffs in modeling

weaker assumptions = less accurate if there is more structure to exploit.

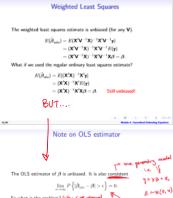
When assumptions are false:

• stronger assumptions = incorrect inference. > were type 1 events
• weaker assumptions = more robust.

For example, we see this in non-parameteric tests, which are generally less powerful when parameteric assumptions hold.

Contact the parameteric security of the contact of but if it is not, t-text I type I over

ON WHY NO DLS IN THIS CASE (Netwoscodartify)



And, Cov(Bois) doesn't hold anymore for weighted

So what is the problem? (why r we working)

O Inference : p-values on he wrong

$$C_{ov}(\hat{\beta}_{ox}) = G_{ov}((x'x)^{-1}x'y)$$

$$= (x'x)^{-1}x' \quad (xvy) \quad x(x'x)^{-1}$$

$$= (xx)^{-1}x' \quad \forall \quad x(xx)^{-1}$$

$$= (xx)^{-1}x' \quad \forall \quad x(xx)^{-1}$$

$$= (xy)^{-1}\hat{\sigma}_{ox}^{2}$$

$$= (xy$$

Two issues with OLS when heteroscedasticity

The OLS estimate of the SE of $\hat{\beta}_{ols}$ can lead to invalid inference Under the null. $\hat{\beta}_b/\widehat{SE}_{cl}(\hat{\beta}_b)$ does not follow a t distribution. Moreover, the true variance of $\hat{\beta}_{nls}$ is larger than $\hat{\beta}_{wls}$ – OLS is int and WLS is more accurate.

OLS inference is invalid when the errors are not iid.

We can do a better job of estimating the coefficient