

$$\begin{aligned}
tb_t &= y_t - c_t - i_t - g_t \\
&= \bar{y}(H\hat{y}_t) - \bar{c}(H\hat{c}_t) - \bar{i}(H\hat{i}_t) - \bar{g}(H\hat{g}_t) \\
&= \bar{y} - \bar{c} - \bar{i} - \bar{g} + \bar{y}\hat{y}_t - \bar{c}\hat{c}_t - \bar{i}\hat{i}_t - \bar{g}\hat{g}_t \\
&= \bar{tb} + \bar{y}\hat{y}_t - \bar{c}\hat{c}_t - \bar{i}\hat{i}_t - \bar{g}\hat{g}_t
\end{aligned}$$

∴ In model

$$\frac{tb_t - \bar{tb}}{\bar{y}} = \hat{y}_t - \frac{\bar{c}}{\bar{y}}\hat{c}_t - \frac{\bar{i}}{\bar{y}}\hat{i}_t - \frac{\bar{g}}{\bar{y}}\hat{g}_t$$

Measurement equation for trade balance

$$tb_{obs} = tb_t ;$$

\Downarrow
original trade
balance data

Is this right? However, we do not know \bar{y}