

Speyer's suggestion

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7:55 PM

w_0	y	$-$
x	α	β
1	γ	δ
\cdot	σ_y	σ

 $\xrightarrow{\text{shrink } x}$

$w_1 = w_0 + \alpha$	y	$-$
x	$\sigma_y \alpha$	$\sigma_y \beta$
1	γ	$\frac{(w_0 + \alpha)\delta - \gamma\beta}{w_0} = \delta + \frac{\alpha\delta - \gamma\beta}{w_0}$
\cdot	σ_y	σ

$$\begin{pmatrix} \alpha & \beta \\ \gamma & \delta \end{pmatrix} = \begin{pmatrix} \alpha_0 & \beta_0 \\ \gamma_0 & \delta_0 \end{pmatrix} + w \begin{pmatrix} \alpha_1 & \beta_1 \\ \gamma_1 & \delta_1 \end{pmatrix}$$

$$\alpha_0 \alpha_0' = \alpha - w \alpha_1$$

$$\delta + \frac{\alpha\delta - \gamma\beta}{w} = \frac{(w + \alpha)\delta}{w} - \frac{\gamma\beta}{w} =$$

$$\frac{w + \alpha}{w} (\gamma_0 \beta_0 + w \delta_1) - \frac{1}{w} ((\gamma_0 \alpha_0' + w \gamma_1) (\alpha_0 \beta_0 + w \beta_1))$$

$$= (w + \alpha) \delta_1 + \frac{1}{w} ((w + \alpha) \gamma_0 \beta_0 - \alpha \gamma_0 \beta_0 - \alpha_0' w \gamma_1 \beta_0 - \alpha_0' w \gamma_0 \beta_1 - w^2 \gamma_1 \beta_1)$$

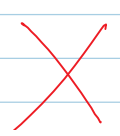
$$= (w + \alpha) \delta_1 + \gamma_0 \beta_0 - \alpha_0 \gamma_1 \beta_0 - \alpha_0' \gamma_0 \beta_1 - w \gamma_1 \beta_1 + \alpha_1 \gamma_0 \beta_0$$

$$= (w + \alpha) \delta_1 + (\gamma_0 - \alpha_0 \gamma_1) (\beta_0 - \alpha_0' \beta_1) - \alpha_0 \alpha_0' \gamma_1 \beta_1 - w \gamma_1 \beta_1 + \alpha_1 \gamma_0 \beta_0$$

$$= (w + \alpha) \delta_1 + (\gamma_0 - \alpha_0 \gamma_1) (\beta_0 - \alpha_0' \beta_1) - (w + \alpha) \gamma_1 \beta_1 + w \alpha_1 \gamma_1 \beta_1 + \alpha_1 \gamma_0 \beta_0$$

$$= (w + \alpha) (\delta_1 - \gamma_1 \beta_1) + (\gamma_0 - \alpha_0 \gamma_1) (\beta_0 - \alpha_0' \beta_1) + \alpha_1 (\delta - w \delta_1 + w \gamma_1 \beta_1)$$

So the new μ must be:



$$\begin{pmatrix} \alpha_0' \\ \gamma_0 - \alpha_0 \gamma_1 \end{pmatrix} (\alpha_0' \beta_0 - \alpha_0' \beta_1) + (w+1) \begin{pmatrix} \delta_1 - \gamma_1 \beta_1 \end{pmatrix}$$

Question. Given a matrix M , how do I detect if it is of the form

$$M = \gamma \beta + W \mu' \quad ?$$

$$\frac{w_1}{\gamma_1 \beta_1} \cdot \frac{w_2}{\gamma_2 \beta_2} = \frac{w_1 w_2}{\begin{array}{c|c} w_2 \gamma_1 \beta_1 & 0 \\ \hline 0 & w_1 \gamma_2 \beta_2 \end{array}}$$

$$\neq \frac{w_1 w_2}{\begin{array}{c|c} w_2 \beta_1 & \beta_2 \\ \hline \gamma_1 & \\ \hline w_1 \gamma_2 & \end{array}}$$

