Detailed derivation on page 13:

Rearrange (1) and (2) to obtain:

$$V_c^1 = \lambda \hat{V}_c^2 + \gamma$$
$$V_y^1 = \lambda \hat{V}_y^2 - \gamma$$

Dividing the second equation by the first gives

$$\frac{V_y^1}{V_c^1} = \frac{\lambda \hat{V}_y^2 - \gamma}{\lambda \hat{V}_c^2 + \gamma}$$
$$\frac{V_y^1}{V_c^1} = \frac{\frac{\lambda}{\gamma} \hat{V}_y^2 - 1}{\frac{\lambda}{\gamma} \hat{V}_c^2 + 1}$$

Multiplying gives

$$\left(\frac{\lambda}{\gamma} \hat{V}_c^2 + 1 \right) \frac{V_y^1}{V_c^1} = \frac{\lambda}{\gamma} \hat{V}_y^2 - 1$$

Rearrange:

$$\frac{V_y^1}{V_c^1} = \frac{\lambda}{\gamma} \left(\hat{V}_y^2 - \hat{V}_c^2 \frac{V_y^1}{V_c^1} \right) - 1$$

And again:

$$\frac{V_y^1}{V_c^1} = \frac{\lambda}{\gamma} \hat{V}_c^2 \left(\frac{\hat{V}_y^2}{\hat{V}_c^2} - \frac{V_y^1}{V_c^1} \right) - 1$$