**Econ 475 - HAT ALGEBRA / BASIC LOGOW**

**Notation:**
- \( \hat{X} \): Growth Rate
- \( \dot{X} \): Derivative with respect to time

**Relationship between variable levels:**

\[
x_t = \text{Level of } X \text{ at time } t
\]

\[
\hat{x}_t = \text{Growth rate of } x_t \text{ at time } t
\]

\[
\dot{x}_t = \frac{dx_t}{dt}
\]

\[
x_t = \frac{\hat{x}_t}{x_t}
\]

\[
X_t = X_t^\uparrow \cdot x_t
\]

**Basic Logow (Original Variables) vs. Modified:**

<table>
<thead>
<tr>
<th>Original Variables</th>
<th>Modified</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Y_t = k_t )</td>
<td>( Y_t = \frac{h_t}{k_t} )</td>
</tr>
<tr>
<td>( k_t = \rho Y_t - S k_t )</td>
<td>( k_t = \rho \frac{h_t}{k_t} - S k_t )</td>
</tr>
<tr>
<td>( c_t = (1-\alpha) Y_t )</td>
<td>( c_t = \alpha \frac{h_t}{c_t} - \delta h_t )</td>
</tr>
<tr>
<td>( x_t = \gamma )</td>
<td>( x_t = \alpha x_t - (\delta + \gamma) x_t )</td>
</tr>
</tbody>
</table>

**System:**
- \( 0 < \rho < 1 \) (Pen Capita/Worker)