Intertemporale Nutzenmaximierung

$$V_{i,t}\left(a_{i,t-1}\right)=\max\left\{u\left(c_{i,t},h_{i,t}\right)+\beta\,E_t\left[V_{i,t+1}\left(a_{i,t}\right)\right]\right\}\quad+\lambda_t\left(c_{i,t}+a_{i,t}-w_t\,h_{i,t}-\left(1+r_{t-1}\right)a_{i,t-1}\right)\ \text{mit}\ \ \beta=\frac{1}{1+\rho}$$

Bedingung 1. Ordnung der Entscheidungsvariablen:

$$(1)\qquad \frac{\partial V_{i,t}}{\partial c_{i,t}}=\frac{\partial u_{i,t}}{\partial c_{i,t}}+\lambda_t=0$$

$$(2)\qquad \frac{\partial V_t}{\partial h_{i,t}}=\frac{\partial u_{i,t}}{\partial h_{i,t}}-\lambda_t w_t=0$$

$$(3)\qquad \frac{\partial V_t}{\partial a_{i,t}}=\beta\,E_t\left[\frac{\partial V_{t+1}}{\partial a_{i,t}}\right]+\lambda_t=0$$

Bedingung 1. Ordnung der Statusvariablen:

$$(4)\qquad \frac{\partial V_t}{\partial a_{i,t-1}}=-\lambda_t\left(1+r_{t-1}\right)<=>\frac{\partial V_{t+1}}{\partial a_{i,t}}=-\lambda_{t+1}\left(1+r_t\right)$$

(4) in (3) => $(5)\qquad \lambda_t=\beta\,E_t\left[\lambda_{t+1}\left(1+r_t\right)\right]$

(1) => $(6)\qquad \frac{\partial u_{i,t}}{\partial c_{i,t}}=-\lambda_t$

(6) in (5) => $(7)\qquad \frac{\partial u_{i,t}}{\partial c_{i,t}}=\frac{\left(1+r_t\right)}{1+\rho}E_t\left[\frac{\partial u_{i,t+1}}{\partial c_{i,t+1}}\right]$