

Notes on Gertler's "OG" Model*

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Mark Gertler (Carnegie-Rochester, 1999) has a nice paper that simplifies the usual OG setup by giving people two types: working and retired. If working, there's a constant probability of becoming retired each period, and if retired, there's a constant probability of death. This retains the flavor of a life-cycle without having to keep track of people at lots of different ages.

1 Demography

At date t , we have N_t people working and R_t people retired. Working people have children at rate φ and retire at rate ω . Retired people die at rate μ . Therefore average time working is $1/\omega$ and average time retired is $1/\mu$ (they're geometric random variables).

The components of the population thus evolve according to

$$\begin{bmatrix} N_{t+1} \\ R_{t+1} \end{bmatrix} = \begin{bmatrix} 1 + \varphi - \omega & 0 \\ \omega & 1 - \mu \end{bmatrix} \begin{bmatrix} N_t \\ R_t \end{bmatrix}.$$

Let all these parameters be positive, with $\varphi > \omega$. Then the population has a long-term growth rate of $1 + \varphi - \omega$, the maximal eigenvalue of the matrix. The stationary dependency ratio is therefore

$$R/N = \omega/(\varphi + \mu - \omega),$$

the associated eigenvector.

2 Preferences

Working-age agents supply one unit of labor inelastically. Agents of type

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*Working notes, no guarantee of accuracy or sense.