

経済の潜在的生産能力

1 潜在的生産能力の決定因

1.1 要素投入量

集計的生産関数

$$Y = F(K, L) \quad (1)$$

$$\frac{\Delta Y}{Y} = \frac{F_K K}{F} \frac{\Delta K}{K} + \frac{F_L L}{F} \frac{\Delta L}{L} \quad (2)$$

$$\frac{\Delta Y}{Y} = (1 - \theta) \frac{\Delta K}{K} + \theta \frac{\Delta L}{L} \quad (3)$$

$$\left(\frac{\Delta Y}{Y} - \frac{\Delta L}{L} \right) = (1 - \theta) \left(\frac{\Delta K}{K} - \frac{\Delta L}{L} \right) \quad (4)$$

1.2 要素生産性

ソロウ残差 Solow residual

$$a = \left(\frac{\Delta Y}{Y} - \frac{\Delta L}{L} \right) - (1 - \theta) \left(\frac{\Delta K}{K} - \frac{\Delta L}{L} \right) \quad (5)$$

2 最適貯蓄の理論 — 離散型

2.1 2期間の問題

消費可能性

$$c_2 = f(z), \quad y = c_1 + z \quad (6)$$

$$c_2 = f(y - c_1) \quad (7)$$

効用最大化

$$\max u(c_1, c_2) \quad (8)$$

$$\mathcal{L} = u(c_1, c_2) + \lambda [f(y - c_1) - c_2] \quad (9)$$

$$u_1 - \lambda f'(y - c_1) = 0, \quad u_2 - \lambda = 0, \quad f(y - c_1) - c_2 = 0 \quad (10)$$

2.2 多期間の問題

$$\max_{\{c_t\}, \{k_t\}} \sum_{t=0}^{T-1} \beta^t u(c_t) + S(k_T) \quad (11)$$

$$k_{t+1} - k_t = f(k_t) - c_t, \quad t = 0, 1, \dots, T-1 \quad (12)$$

$$\mathcal{L} = \sum_{t=0}^{T-1} \beta^t u(c_t) + S(k_T) + \sum_{t=0}^{T-1} \lambda_t [f(k_t) - c_t - k_{t+1} + k_t] \quad (13)$$

$$\beta^t u'(c_t) - \lambda_t = 0 \quad (14)$$

$$\lambda_t [f'(k_t) + 1] - \lambda_{t-1} = 0 \quad (15)$$

$$S'(k_T) - \lambda_T = 0 \quad (16)$$

3 最適貯蓄の理論 — 連続型

3.1 ラムゼイの問題

$$\min_{\{c\}, \{k\}} \int_0^{\infty} [B - u(c)] dt \quad (17)$$

$$\dot{k} = f(k) - c \quad (18)$$

$$\int_0^{\infty} [B - u(c)] dt = \int_0^{\infty} \frac{B - u(c)}{\dot{k}} dk = \int_0^{\infty} \frac{B - u(c)}{f(k) - c} dk \quad (19)$$

$$-[B - u(c)] + u'(c)\dot{k} = 0 \quad (20)$$

$$\dot{k} = \frac{B - u(c)}{u'(c)} \quad (21)$$

3.2 一般的な問題

$$\max_{\{v\}} \int_0^T u[x(t), v(t), t] dt + S[x(T)] \quad (22)$$

$$\dot{x} = f[x(t), v(t), t] \quad (23)$$

$$H = u[x(t), v(t), t] + \lambda f[x(t), v(t), t] \quad (24)$$

$$H[x^*(t), v^*(t), \lambda^*(t), t] = \max_{x, v} H[x(t), v(t), \lambda^*(t), t] \quad (25)$$

$$\dot{\lambda} = H_x[x(t), v(t), \lambda, t] \quad (26)$$

$$\lambda(T) = S'[x(T)] \quad (27)$$

参考文献

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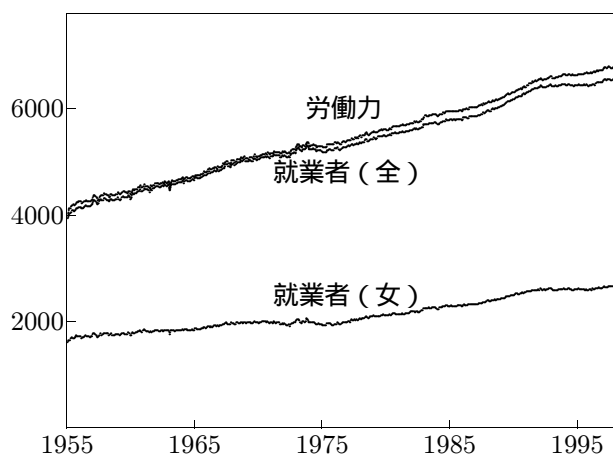
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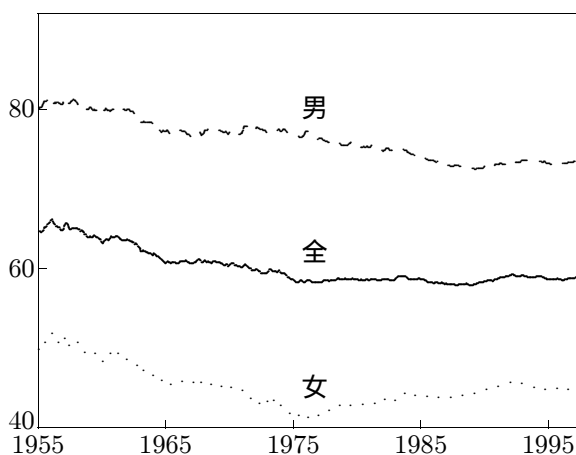
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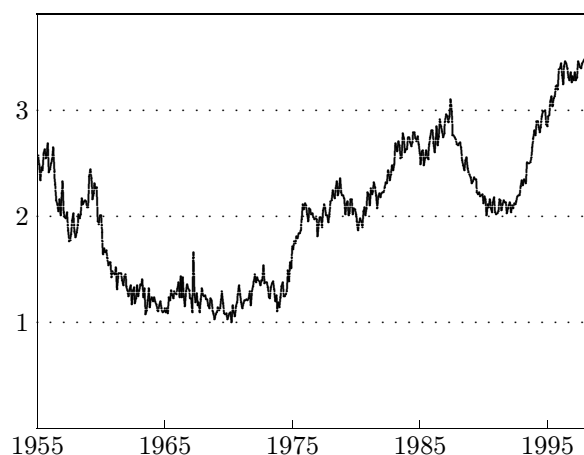
労働力と就業者 (万人)



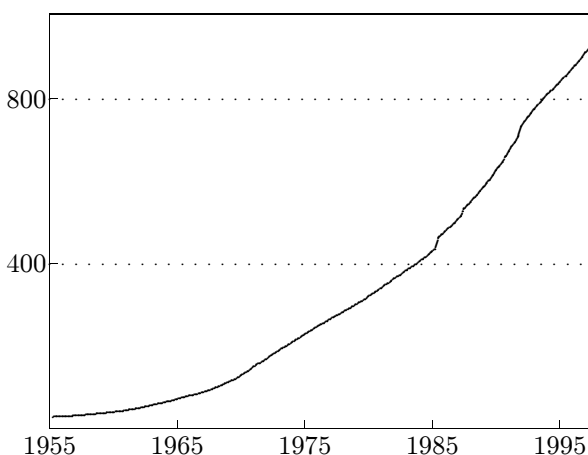
労働力率 (%)



失業率 (%)



民間企業資本ストック (兆円)



増加率 (単位: パーセント)

	Y	L	K	Y/L	K/Y	θ
高成長期	9.3	0.5	11.0	8.8	1.7	0.57
低成長期	3.8	0.4	6.6	3.4	2.9	0.55
停滞期	1.3	0.1	4.5	1.3	3.1	0.55

Y: 実質国内総生産, L: 就業者数, K: 実質民間企業資本ストック

高成長期: 1955 I - 1973 II, 低成長期: 1973 III - 1990 IV, 停滞期: 1991 I - 1997 IV

資料: 経済企画庁『国民経済計算』および『民間企業資本ストック』, 労働省『労働力調査』