

() () ()

$$\begin{aligned}
 & \alpha(t) = C_0(t) + G(t) + i^n(t) + (X-M)(t) & () & : & (GNP - D_m) & . \\
 & \beta(t), i^n(t) = ig(t) - D_m(t) & : & & : & (D_n) \\
 & D_n(t) = F[GNP(t) - D_m(t)] & & & ENP = Y(t) = GNP(t) - D_m(t) - D_n(t) & () \\
 & & & & ENP & GNP \\
 & & F' > 0 \quad F > 0 & & & . \\
 & & : & & & : \\
 & & () & & GNP(t) - D_m(t) = \alpha(t) + \beta(t)Y(t) & () \\
 & D_n(t) = e^{\gamma(t)}(GNP(t) - D_m(t)) = e^{\gamma(t)}[\alpha(t) + \beta(t)Y(t)] & & & \beta \quad \alpha & Y \\
 & & \gamma & & : & . \\
 & & : & & (t) = C_0(t) + \beta(t)Y(t) & () \\
 & & () & & C_0 & C \\
 & & : & & & . \\
 & Y(t) = \alpha(t) + \beta(t)Y - e^{\gamma(t)}[\alpha(t) + \beta(t)Y(t)] & () & & & () \\
 & & & & GNP(t) - D_m(t) = C_0(t) + \beta(t)Y(t) + ig(t) - D_m(t) + G(t) + (X-M)(t) & \\
 & & & & X \quad G \quad ig & \\
 & & & & & M
 \end{aligned}$$

Z	F(E,Z)	E	()	D _n
$\dot{K} = F(K,L) - C - f(E,Z)$		()		
$\dot{Z} = g(Z) - E$		()	NNP	
$\dot{Z} < 0$	$g(z) < E$	S,	R	K C
		=r	=U (n)	(Km)
$ENP = NNP - (\frac{UE}{UC} - f_E) \dot{Z}$	()			=L,S
(Z)				
			Max $\int U(C)e^{-rt} dt$	()
			S.t. $\dot{K} = F(K,L,R) - Cf(R,S), \dot{S} = -R$	()
NNP	$\dot{Z} < 0$		F(..)	S
	NNP $\dot{Z} > 0$	()		$f(..)$
NNP				\dot{K}
		$\dot{Z} = 0$) R	S
			GNP	
				ENP
				()
$\dot{X} = -bx + \gamma F(K,L,X)$	()		$ENP = C + \dot{K} - [F_R - f_R]R = GNP - D_m - [F_R - f_R]R$	
b	(X)		f_R ()	F_R
b=0	γ		GNP-D _m	
		NNP		
$ENP = NNP - V \cdot \dot{X}$	()) MC>AC	
			(GNP) ENP	(
$V = \frac{\dot{U}_c / U_c + \rho - F}{\gamma F_k}$	()			
			(H)	
			U=U(C,E)	
	f(b)			
$ENP = NNP - \frac{\sigma f(b)}{\sigma_X} \dot{X}$	()			

$$\sum_{i=0}^{\infty} \frac{SI}{(1+r)^n} = \frac{SI(1+r)}{r} = \frac{SI}{1-(1.1+r)} \quad ()$$

$$SI = RR \left[1 - \frac{1}{(1+r)^{n+1}} \right] \quad ()$$

$$RR - SI = RR \frac{1}{(1+r)^{n+1}} = (P-AC)R \frac{1}{(1+r)^{n+1}} \quad ()$$

$$n > 0 \quad r > 0$$

$$(P-AC)R$$

(Net Price)

$$()$$

(WRI)

$$P_{t-1} = P(1+i) \quad ()$$

(R_t)

$$V_t = R_t + \left(\frac{1}{1+i}\right)R_{t+1} + \dots + \frac{1}{(1+i)^n}R_{t+n} + \dots \quad ()$$

$$V_t = P_t Q_t + \frac{1}{1+i} Q_{t+1} \times P_t (1+i) + \dots + \frac{1}{(1+i)^n} Q_{t+n} \times$$

$$P_t (1+i)^n + \dots$$

$$V_{t+1} = (Q_t + Q_{t+1} + \dots + Q_{t+n}) P_t = Q P_t \quad ()$$

$$V_{t+1} - V_t = (Q - Q_t) P_t (1+i) - Q P_t \quad ()$$

$$()$$

$$P \quad \dots \quad (\dots)$$

$$TC \quad q \quad \Pi$$

$$\Pi_t = P_t q_t - TC_t \quad ()$$

$$V_t = \frac{\Pi_t}{r} \quad ()$$

$$V_t - V_{t-1} = \frac{\Pi_t - \Pi_{t-1}}{r} \quad ()$$

$$(\Delta V = V_t - V_{t-1})$$

$$R \quad AC \quad P$$

$$n \quad r$$

$$\sum_{n=0}^n \frac{RR}{(1+i)^n} = \frac{RR[1-(1.1+r)^{n+1}]}{1-(1.1+r)} \quad ()$$

$$RR = (P-AC)R$$

(S)

$$()$$

GNP

() t

Q_t Q

t

()

GNP

()

GNP

() ()

(

/

:

()

$$\sum_{n=0}^{65} \frac{(26-6)3.5 \times 365}{(1+0.05)^n} = \frac{25550[1-(1.1+0.05)^{66}]}{1-(1.1+0.05)}$$

$$= \frac{70 \times 0.96 \times 365}{0.0476} = 515294$$

()

GNP

:

$$RR - SI = (26-6)3.5 \frac{\times 365}{(1+0.05)^{66}} = 2.79 \times 365$$

$$= 1020$$

	()	
	26-6=20	
)	/	
	(
GNP		:
		$V_{t+1}-V=[90000-(3.5 \cdot 365)] \cdot 20(1.05)-90000$
		$20^*=63172/5$
	GNP	
	() GNP	
	()	
		GNP
		GNP

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Green GNP and its Calculation Methods

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Abstract

In this paper, the defects of System of National Accounts (SNA) concerning environment and natural resources are indicated, empirical studies on natural resources depreciation calculation in SNA are introduced, and importance of interaction between environment and economics is discussed. Then, by presenting a Keynesian model, the green GNP's trend is shown. For accounting depreciation, Hartwick's adjustment at three levels (depletable resources, renewable resources and pollutions) is presented. Finally, the practical methods to assess depreciation accounting for natural resources are discussed. Estimating the depreciation led us from conventional GNP to reach green GNP.

Keywords: National Accounts, ENP (Green GNP), Natural Resources Depreciation, Environment.

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