# Abstract

Discussion has beer ia either earmarking or a ger neral fund financing based on f the nature of public goods, earma d financing may be destabilizing and cause fluctuations. The underlying mechanism in favor of earmarked taxes against general fund financing is that general fund financing creates intersectoral externalities and strategic complementarities that are sufficiently large to exert endogenously persistent and recurring fluctuations in aggregate activities in the absence of shocks to fundamentals. Earmarked taxing generates only sector-specific externalities that are too small to exert local indeterminacy. In a calibrated version, we compute the level of long-run welfare, and the results reflect favorably on the use of earmarked taxing.



1.

1. See Wagner (1991, 110) for gasoline taxes and vehicle fees, Stiglitz (1988, 177) for airport and airline ticket taxes and tolling, and Bailey (1995, 216) for road fuel duties, road fund license fees, television licensing fees, hotel bed taxes, cigarette taxes, carbon taxes, and air pollution fees.

2.

2. In the United States, for example, the fraction of earmarked tax in the state tax dropped from 51.4 percent in 1954 to 41.1 percent in 1964, to 23 percent in 1979 (Wyrick and Arnold 1989), and to a stable

24 percent in 2000 (Novarro 2002). In Canada, the fraction of earmarked tax was 36 percent at the federal level and 25 percent at the provincial level (Hickling Corporation 1991). Finally, in Japan, only 20.6 percent of indirect tax was earmarked for specific appropriations of government-provided services in the 1990 fiscal year (Ishi 2001).

3.

3. There is growing literature that analyzes aggregate economic stability of government policy rules. See, for example, the study of balanced-budget fiscal policy rules by SchmittGrohé and Uribe (1997) and of the inflation-forecast targeting rule by Benhabib, Schmitt-Grohe, and Uribe (2001).

4.

4. Recent studies concerning public goods such as Barro (1990), Glomm and Ravikumar (1994), and Chen (2003) have adopted the production specification, while other studies such as Cazzavillan (1996), Bianconi and Turnovsky (1997), and Devereux and Wen (1998) have used the utility strategy. Chen (2006) used both types of specification.

5.

5. In addition to externality, local indeterminacy may arise from distortionary factor taxation with two sectors (Bond, Wang, and Yip 1996), from the presence of increasing returns with one sector (Farmer and Guo 1994) and trade (Nishimura and Shimomura 2002). See Benhabib and Farmer (1999) for a survey of the literature.

6.

6. See also Benhabib and Farmer (1996), Benhabib and Nishimura (1998), Harrison (2001), Weder (2001), Benhabib, Nishimura, and Venditti (2002), and Nishimura and Venditti (2002), among others.

7.

7. Although a fraction of the government's revenue may be from consumption, the assumption of output tax is innocuous. To allow for a consumption tax in our model, two consumption goods are necessary. In the environment with two consumption goods in section 3 below, if the output taxation is replaced by a consumption tax, the underlying dynamic structure is the same and the results remain unchanged. We thus maintain the taxation of output throughout the article. Literature concerning the output taxation in an endogenous growth model starts from Barro (1990) and Rebelo (1991).

8.

8. In this presentation, earmarking regime is reduced to $G_X = T_X$ and $G_Y = T_Y$ when $\theta = Z = 1/2$.

9.

9. Together equations (6a,b) and (8a,b), the production functions (1a) and (1b) are X = (sK )1 — α (uT$_X$ )α y (vT$_Y$ )α (1 — y) ; and Y = [(1 — s)K ]1 — b [(1 — u)T$_X$ ]bZ [(1 — v)T$_Y$ ]b(1 — Z):

10.

10. Alternatively, if σ < 1 — b, the R(s) is zero only at s = 0, with the value being negative and decreasing in s and approaching to negative infinity as s is close to 1. In general σ ≥ 1, this case is less interesting.

11.

11. Let s≡≡ [φ2 +b1 (1—α)]— [φ2 +b1 (1—α)]2 —4φ2 b1 (1—α)[1—(1—b)/σ] 2φ2 : Then, R(s) is the maximal value. It is obvious that R(s) > R(β) = (1—τ)Φ (σ—1)b (1—b) : Two BGPs are obtained if L ≤ R(s): It suffices to require L ≤ R(b); from which condition A is obtained.

12.

12. q $_{qs}$ = —(1 — t) a + φ$_{4\ 1—s}$γ ( σ — 1) +φ$_{4\ σ\ 1—s\ 1—s}$γ ( σ — 1) = $_{σs(1—s)}$ fσs(1 — s)+ σ[σ(1 — s) + γ(σ — 1)]N (s)g; where N (s) ≡ s $_{1—s}$ : If σ(1—s) + γ(σ—1) ≥ 0, then ∂RH(s) /∂s< 0: Alternatively, in a less plausible case where σ(1—s) + γ(σ—1) < 0, we may use s = 0 to rewrite N (s) = (1 — s) — 1/Φ $_2$(1 — t — d

— p) + δ : Then, under condition B, N(s) < (1—s). That means ðRH(s)/ðs < -(1-τ)/σs(1-s){σs(1 - s) + [σ(1 — s) + γ(σ — 1)](1 — s) = —(1—τ)φ $_{2\ \sigma s}$ < 0 under condition B. As a consequence, RH(s) is decreasing in s under condition B.
13.
13. To summarize the benchmark parameter values, economic growth rate = 0.02, t = 0.2, δ = 0.05, ρ = 0.025, σ = 2, θ = η = 0.5, u = v = 0.5, α = b = 0.8, a (earmarking) = 0.2179 and a (general fund) = 0.2064.
14.
14. To summarize the benchmark parameter values, economic growth rate = 0.02, = 0.2, δ = 0.05, ρ = 0.025, σ = 2, θ = η = 0.5, u = v = 0.5, γ = 0.3, and a = 0.1512.
15.
15. We thank an anonymous referee for bringing this point to our attentions.

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