Report on

Norman Sedgley and Bruce Elmslie (2015). Taxation and Fiscal Expenditure in a Growth Model with Endogenous Fertility. Economics Discussion Papers, No 2015-35, Kiel Institute for the World Economy. http://www.economics-ejournal.org/economics/discussionpapers/2015-35

The manuscript theoretically explores the link between taxation and economic growth. This goal is pursued by adopting a scale-free endogenous growth model where the main driver of growth is R&D-investment-led-technological progress and innovation (see Haghion-Howitt 1998, ch 3). As for consumers, an infinitely-lived dynastic utility function is assumed, in the spirit of Becker Barro (1988) and Barro-Becker's model (1989).
Under these assumptions it is argued that, differently from previous semi-endogenous growth models, policy instruments may affect levels and growth rates.
General comments
The paper is not particularly innovative.
Assumptions are standard: Utility function, childrearing costs and equilibrium equations are identical to those presented by Barro and Sala-i-Martin (2004), pp. 411-414 (although without taxes). Assumptions on the productive sector are in line with Haghion-Howitt (1998) and standard literature on the subject.
The only main novelty of the paper is the presence of both endogenous population (already done by Connolly and Peretto 2003 in models with R&D driven growth, not mentioned by the authors) and taxes.
As for the present version, I found the motivation somehow weak, the analysis provided hardly readable. It believe that the paper could strongly benefit from a deep and through revision, according to the following lines:
Specific comments

1. Motivation of the paper:
I) at page 1 the authors claim that "Empirically, links have long been established" between taxes and growth. I think that the authors should be more cautious (see also comments at page 14 on the same issue) and possibly put less emphasis on this point, in that this link is not so clear. For example, the authors should cite and discuss the evidence provided by Jaimovich and Rebelo (2012), according to which "The first observation is that the tax rates adopted by different countries are generally uncorrelated with their growth performance" (p. 1).
II) The authors state that some fully-endogenous works already exist in which taxes play a role. I think they should also mention and discuss the work by Connolly and Peretto (2003), which endogenizes population growth. In any case, they should also explain how they depart from existing literature, why and how the results are different.

2. Presentation of the paper: it could be ameliorated in order to be more reader-friendly. For example:
I) page 5: "We follow Aghion and Howitt (1998) in assuming that imitation happens"…explain what this imitation is and where it applies. How many sectors are present in the economy? Specify it from the outset; page 6: "stepping on toes" effect: please explain and so on.
II) Put a number for each equation instead of letters (the latter are misleading because they overlap with symbols: b is both an equation and fertility rate, Z both a variable and an equation. G is the name of an equation and the same letter also enters eq. (RR''!)).

3. Presentation of the results & assumptions
I) The main results should be presented in a separate section, through clear propositions and formal proofs.
II) Provide the conditions on parameters (utility and production ones) which insure non-explosive dynamics (possibly with transversality conditions).
III) The paper could be strengthened by a simulation exercise, at least for comparative statics, calibrated on some developed economy.
IV) Taxes: I cannot understand the reason for allowing for both lump sum transfers and a tax on wages if labour supply is exogenous and fertility choices does not depend on wages. In this scenario one of them is redundant and should eliminated from the outset. On the contrary, I would expect taxes on profits.
V) Childbearing costs: the authors assume, as in Barro Sala-i-Martin (2004), that costs for raising children are a linear function of capital intensity. While it is clear that this is done for the sake of simplicity, as explained in footnote 7, I would expect a deeper discussion on this assumption, which seems rather ad-hoc.
VI) Please check eq. (9). I suggest that the authors provide a full derivation of eq. (9) in a footnote using eqs (1) and (7). Check whether depreciation of capital is missing (is it present in profits?).
VII) Steady state: at page 10 the authors state that eqs. (1) to (15) fully characterize the dynamics of the model at the steady state. I believe this is not fully correct, and in any case these are too many equations. The steady state can be characterized by 3 variables/equations: c/k, Z and b. I suggest that the authors clearly identify the steady state equations for these 3 variables.
VIII) The authors state at page 12 “The model is now expressed in the form of the three equations: (Z), (R), and (P)”. This is not correct: eqs (Z)-(R) and (P) provide steady state relations between gA, Z, and b and c/k. Four variables are involved in these three equations. I suppose also eq. (G) is needed, but the explanation provided in the current version is messy.
IX) Eqs. (Z’), (R’) are hardly readable: I suggest the authors introduce some parameters that collect the coefficients of the relevant variables (Z).
X) Footnote 5. Please provide proof of statement in the last line: “it must be true that in a steady state that gA…”
XI) As far as I can see from the results and the figures, the model implies a positive relation between population growth and economic per capita growth. This outcome, although in line with the semi-endogenous literature a la Jones, seems at odds with the observed data. In fact, recent literature is pushing much effort in providing nonlinear, or a non monotonic relation between these two variables (see, for example, the introduction in Bucci 2013 for a discussion). The author should comment on their outcome in the light of the above literature.
XII) In this respect, the authors could have a look at the other deep parameters (i.e. β,ε, φ in eq. G) of the model to check whether the co-movements between gA and gL are positive or negative, as performed by Connolly and Peretto (2003). This finding, although changing or extending the focus of the paper (possibly also the title), could largely strengthen the work and allow to put less emphasis on the mere relationship between taxation and growth.

References
Aghion, P. & Howitt, P., 1998, Endogenous Growth Theory. Cambridge, MA. MIT Press.
Barro R.J. & Becker G.S., 1989, Fertility Choice in a Model of Economic Growth, Econometrica, 57: 481-501.
Barro R.J. & Sala-i-Martin, X 2004. Economic Growth, Cambridge, MA. MIT Press.
Bucci, A. (2013): “Returns to specialization, competition, population, and growth”, Journal of Economic Dynamics & Control 37 2023–2040.
Becker, G.S. & Barro, R.J., 1988, A Reformulation of the Economic Theory of Fertility,

Quarterly Journal of Economics, 103: 1-25.
Connolly M. & Peretto P., 2003, Industry and the family: two engines of growth. Journal of Economic Growth 8: 115–148.
Jaimovich, N & Rebelo S. 2012. Non-linear Effects of Taxation on Growth, NBER Working Papers 18473