Journal of Economic Dynamics & Control 37 (2013) 265–295

Contents lists available at SciVerse ScienceDirect

Journal of Economic Dynamics & Control

journal homepage: www.elsevier.com/locate/jedc

Determining the motives for a positive optimal tax on capital

William B. Peterman *,[1]

Board of Governors of the Federal Reserve System, 20th and C Street NW, Washington, DC 20551, United States

ARTICLE INFO

Article history:
Received 2 September 2010
Received in revised form
1 May 2012
Accepted 7 August 2012
Available online 17 August 2012

JEL classification:
E62
H21

Keywords:
Optimal taxation
Capital taxation

ABSTRACT

Previous literature demonstrates that in a standard life cycle model the optimal tax on capital is large. This paper highlights that after changing two assumptions in the standard model the optimal tax drops by almost half. First, the utility function is altered such that it implies that an agent's Frisch labor supply elasticity is constant over his lifetime. Second, the government is allowed to tax accidental bequests and ordinary capital income at separate rates. Quantifying the effect of these assumptions is important because the first has limited empirical evidence and the second confounds a motive for taxing capital and accidental bequests.

Published by Elsevier B.V.

1. Introduction

Receipts from taxes on individuals' capital income (capital gains and dividends) in 2005 were approximately $140 billion, or 15% of total personal income tax receipts.[2] Based on the sizable tax receipts from capital income in the U.S. economy and savings disincentives created by a capital tax, considerable research has been devoted to determining whether a non-zero tax on capital income is optimal.[3] In the seminal works on this topic, Chamley (1986) and Judd (1985) conclude that it is not optimal to tax capital in a model with infinitely lived agents who face no idiosyncratic risk. Atkeson et al. (1999) show that the optimal tax on capital is still zero in a two-period overlapping generations model when the government is allowed to condition the labor income tax on age. Other works, such as Aiyagari (1995), Hubbard and Judd (1986), İmrohoroğlu (1998), Erosa and Gervais (2002), Conesa et al. (2009), Garriga (2003), Jones et al. (1997) and Correia (1996), identify theoretical conditions under which it is optimal to tax capital.

When determining the optimal tax on capital, the policymaker must weigh the relevant benefits versus the distortions imposed by the tax. Since a tax on capital discourages saving, it is important to analyze the tax in an overlapping generations (OLG) model that includes the life cycle factors that motivate saving. One such study, Conesa et al. (2009), uses a calibrated life cycle model and finds that the optimal tax policy consists of flat tax rates on capital and labor income of 34% and 14%, respectively.[4] Additional studies such as Gervais (2012), Garriga (2003), Peterman (2012), Smyth (2006), and

* Tel.: +1 202 452 3703.
E-mail address: william.peterman@gmail.com

[1] The views presented here are solely those of the authors and do not necessarily represent those of the Board of Governors of the Federal Reserve System, or members of their staff.

[2] See www.treas.gov/offices/tax-policy/library/capgain3-2008.pdf and www.irs.gov/taxstats/indtaxstats/article/0,,id=129270,00.html.

[3] Following Conesa et al. (2009), I define an optimal tax policy as one that maximizes the expected lifetime utility of a newborn in a stationary equilibrium, holding tax revenue constant.

[4] This is model M4 in Conesa et al. (2009), which excludes idiosyncratic risk.

0165-1889/$ - see front matter Published by Elsevier B.V.
http://dx.doi.org/10.1016/j.jedc.2012.08.004

İmrohoroğlu (1998) find that a non-zero tax on capital is optimal in an OLG model. Given the computational complexities of these OLG models, it is helpful to determine the economic factors driving these results. Studies that quantify the optimal tax on capital weigh the trade-off between realism and computational intensity when choosing simplifying assumptions. This paper quantifies the relative importance of two of the key modelling assumptions that motivate a positive tax on capital in a canonical OLG model. Understanding the effect of these assumptions is relevant in order to more accurately determine the optimal tax on capital.

I start by solving for optimal tax policy in a benchmark model similar to the model in Conesa et al. (2009). Next, in order to measure the assumptions effects on optimal tax policy, I solve for the optimal tax policy in an altered model in which I eliminate two commonly adopted assumptions that generate a non-zero tax on capital. First I eliminate the assumption that the Frisch elasticity varies over the life cycle.[5] Second I relax several restrictions in the benchmark model regarding how the government is allowed to tax accidental bequests. I test the effect of a varying Frisch elasticity since there is limited empirical evidence on whether the Frisch labor supply elasticity varies over the lifetime.[6] Therefore, it is important to understand the impact of this assumption on optimal tax policy. The restrictions regarding taxing accidental bequests are used to make the model more tractable, but these restrictions confound a motive for taxing ordinary capital with a motive to tax accidental bequests and are not consistent with actual policy.

The main finding of this paper is that these two assumptions are responsible for almost half of the positive optimal tax on capital in the benchmark OLG model. When these two assumptions are removed from the model the optimal tax on capital is reduced from approximately 30% to 16%. Additionally, I find that welfare losses are equivalent to 0.35% of total consumption if I implement the optimal tax policy from the benchmark model in the altered model. Altering just one of either two assumptions causes the optimal tax on capital to drop by approximately one-third. Therefore, the simplifying restrictions on the tax function regarding accidental bequests should not be included when determining optimal tax policy. These results also indicate that to more precisely determine the optimal tax on capital, one needs to empirically determine if the Frisch elasticity varies over the life cycle.

A varying Frisch elasticity over the life cycle motivates a positive optimal tax on capital because it causes the government to want to condition labor income taxes on age. If the government is disallowed from using age-dependent taxes, then a non-zero tax on capital can be used to mimic age-dependent taxes since a capital tax implicitly taxes younger labor income at a relatively higher rate. In a related work, Gervais (2012) demonstrates that a progressive labor income tax can also be used in tandem with a tax on capital to mimic an age-dependent tax policy.[7] The benchmark utility function in Conesa et al. (2009) is non-homothetic in labor, which implies that the Frisch elasticity varies over the life cycle with hours worked.[8] Therefore, in order to test the impact of this assumption, I determine the effect on optimal tax policy of changing the utility function such that it is homothetic in labor, which implies that the Frisch elasticity does not vary.[9]

Restricting how the government can tax accidental bequests confound a motive for a non-zero tax on ordinary capital income. In the benchmark model, it is assumed that the government cannot distinguish accidental bequests from ordinary capital, which implies that the government has to tax the returns from both sources at the same rate. Additionally, the government is restricted to taxing only the return on the accidental bequests and not the principal. Since accidental bequests are inelastic income, the government would like to fully tax them. If they cannot distinguish between the two incomes, the optimal tax on capital is a mix of the optimal tax on ordinary capital income and the optimal tax on accidental bequests. I test the effect of relaxing these tax restrictions by allowing the government to separately tax accidental bequests and ordinary capital income.

Given that these two assumptions motivate approximately half of the optimal tax on capital in the benchmark model, it becomes relevant to quantify the individual effect of all the modelling features that could motivate a non-zero tax on capital within a common framework. Four common features in an OLG model that motivate a non-zero optimal tax on capital are: (i) a varying lifetime Frisch labor supply elasticity, (ii) restrictions on how the government can tax accidental bequests, (iii) the inability of individuals to borrow, and (iv) the inability of the government to facilitate a social security program.[10] I solve for the optimal tax policy in four other models with one of the four features that motivate a non-zero optimal tax on capital changed in order to determine the effect of each feature. Additionally, I solve for the optimal tax policy with an exogenously determined level of government debt or savings in order to ascertain its effect on optimal tax policy.[11]

[5] The Frisch labor supply elasticity is the labor supply elasticity holding the marginal utility of wealth constant.

[6] Two exceptions are (French, 2005; Clark and Summers, 1981).

[7] In a similar model to mine that excludes any within cohort heterogeneity, Conesa et al. (2009) find that it is optimal to only use a tax on capital to mimic an age-dependent tax system. I find similar results in my model. Gervais (2012) finds a different result. He finds that the optimal age-independent tax system includes a both a large tax on capital and a progressive tax on labor income.

[8] Formally Erosa and Gervais (2002) demonstrate that in order to eliminate the motive to condition labor income taxes on age, the utility function must be both separable and homothetic in both consumption and labor.

[9] In order to fully eliminate this motive, the utility function must be separable and homothetic in both labor and consumption. Since the benchmark utility function is already separable, I focus on the homotheticity assumption. An alternative way to assess the impact of this assumption would be to allow the government to condition labor income taxes on age.

[10] See Conesa et al. (2009), Smyth (2006), Conesa and Krueger (2006), Guvenen et al. (2009), Fuster et al. (2008), Garriga (2003), Erosa and Gervais (2002), and Nakajima (2010) for examples of papers that include similar assumptions when analyzing tax policy in an OLG framework.

[11] I test both savings and debt hence, I explore two additional models for a total of six models in addition to the benchmark.