



Intergenerational policies, public debt, and economic growth: A politico-economic analysis[☆]

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ABSTRACT

This study presents a two-period overlapping-generations model with endogenous growth. In each period, the government representing young and old generations provides a public good financed by labor income taxation and public debt issuance, and the government's policies are determined by probabilistic voting. Increased political power of the old lowers economic growth. A debt-ceiling rule is considered to resolve the negative growth effect, but it creates a trade-off between generations in terms of welfare.

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1. Introduction

In nearly every developed country, the government finances the cost of various types of public good provision by issuing public debt. Public debt issuance affects household savings and thus, has crucial effects on long-term economic growth and welfare. Several studies show that public debt crowds out physical capital accumulation and so slows down economic growth (e.g., Saint-Paul, 1992; Bräuninger, 2005; Josten, 2000). This model prediction fits recent empirical evidence (e.g., Checherita-Westphal and Rother, 2012; Reinhart et al., 2012; Kumar and Woo, 2015; Chudik et al., 2017).¹

[☆] This is a merged version of two earlier papers: Arai and Naito (2014) and Ono (2015).

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¹ The relationship between public debt and economic growth has been discussed in recent years. Some studies find no evidence of causal effects of public debt on economic growth (e.g., Panizza and Presbitero, 2014). However, many studies show negative effects of public debt on economic growth. Our analysis is based on the latter group of empirical studies on public debt and economic growth.

Public debt issuance implies an inter-temporal transfer of income, because debt repayment costs are passed onto the future. This suggests a conflict over fiscal policy among different generations, giving fertile ground for politico-economic analysis of public debt. Given this political background, several studies analyze the politics of public debt in overlapping-generations frameworks (e.g., Song et al., 2012; Müller et al., 2016; Röhrs, 2016). However, these studies abstract from physical capital accumulation and thus, show nothing about how public debt affects capital accumulation and economic growth via the political process.

Two notable exceptions are Cukierman and Meltzer (1989) and Barseghyan and Battaglini (2016). Cukierman and Meltzer (1989) consider majority voting on debt-financed social security in an overlapping-generations model with a neoclassical production technology. The authors assume that within a generation, there are two types of agents, bequest-constrained and unconstrained agents, and focus on an intra-generational conflict over fiscal policy. An inter-generational conflict is inherent in their model, but little attention is given to that conflict and its impact on growth and welfare across generations.

Barseghyan and Battaglini (2016) present an infinitely lived agent model demonstrating economic growth via technology

accumulation. Within this framework, they consider fiscal policy determined through legislative bargaining, and investigate its impact on economic growth. In particular, they use the model to evaluate the welfare implications of an austerity program that reduces debt below a given debt-ceiling level. However, their analysis is silent on the issue of intergenerational conflict owing to the model assumption of the infinitely lived agent.²

To resolve the above-mentioned issues, this study extends the model of Song et al. (2012) by incorporating physical capital accumulation into it. Each individual lives two periods, youth and old age. We assume a technology represented as a Romer (1986)-type production function for the tractability of analysis. The government provides a public good financed by labor income taxation and/or public debt issuance. The policies are determined in a probabilistic voting modeled by Lindbeck and Weibull (1987), in which in each period, a weighted sum of utility of the young and old is maximized in a competition between political candidates. Specifically, we focus on Markov perfect equilibrium in which policy proposal today depends on the current payoff-relevant state variables, namely, physical capital and public debt.

Based on the above setting, we first demonstrate a case in which the government is allowed to issue public debt in the absence of any legal rules or constraints. We show that the ratio of public debt to GDP decreases as the political power of the old increases. Greater power of the old incentivizes the government to increase public good expenditure. To finance increased expenditure, the government issues more debt and raises the tax rate. A rise in the tax rate in turn works to control public debt issuance. Thus, there are two opposing effects on debt issuance and in the present framework, the negative effect is shown to outweigh the positive one.

We also show that the ratio of capital to GDP decreases as the political power of the old increases. The two opposing effects on public debt issuance imply that, given a crowding-out effect of public debt, there are two opposing effects on capital formation. In addition, there is a negative effect on capital accumulation via a rise in the tax rate. Taking these effects together, we show that increased political power of the old results in a decrease in the ratio of physical capital to GDP. In other words, the growth rate decreases as the political power of the old increases.

In reality, several developed countries have introduced fiscal rules to control their debt issues from the viewpoint of fiscal sustainability. For example, the Maastricht Treaty convergence criteria require EU member countries to keep public debt within 60% of GDP. In the United States, the total amount of new bonds that can be issued is limited by the Second Liberty Bond Act of 1917. However, in Japan, there is no such law associated with public debt issuance, although Japan has experienced the highest debt-to-GDP ratio among Organisation for Economic Co-operation and Development (OECD) countries for the past decade.

Motivated by these contrasting examples, we undertake the analysis in the presence of a debt-ceiling rule that controls the ratio of public debt to GDP. We show that the introduction of the debt-ceiling rule mitigates the crowding-out effect, raises the growth rate, and thereby improves the welfare of future generations. However, to compensate for the loss of revenue from issuing public debt, the government raises the initial-period tax rate and thereby harms the current generation. Thus, introduction of the debt-ceiling rule creates a trade-off between current and future generations in terms of welfare.

Our results on the each generation's welfare imply that it is difficult to introduce or sustain the debt-ceiling rule. Actually,

we consider that the implication is consistent with actual fiscal management. For example, according to the US Department of the Treasury, the US debt ceiling has been raised 78 times since 1960.³ Another example involves the Maastricht Treaty convergence criteria in the EU, which have not been basically modified since their establishment, although in 2005, the EU relaxed the Stability and Growth Pact, which imposed financial penalties on countries that violated a 3% deficit rule in 2005 (Arellano et al., 2010). In addition, several countries (e.g., Greece, Ireland, and Portugal) have public debt of more than 60% of GDP criteria.

In addition to the above-mentioned studies, the present study is related to the following three strands of literature. The first is the literature on Markov voting on public policy in overlapping-generations models (Hassler et al., 2003; Forni, 2005; Hassler et al., 2005; Hassler et al., 2007; Bassetto, 2008; Gonzalez-Eiras and Niepelt, 2008; Gonzalez-Eiras and Niepelt, 2012; Song, 2011). However, public debt issuance is omitted from their analyses, because they assume a balanced government budget. The present study contributes to the literature by exploring the politics of public policy when public expenditures are financed by taxes as well as debt issues.

The second strand is the literature on dynamic political economy analysis of public debt in two-period models (Alesina and Tabellini, 1989, 1990; Persson and Svensson, 1989; Tabellini, 1990) and infinitely lived agent models (Battaglini and Coate, 2008; Caballero and Yared, 2010; Yared, 2010; Azzimonti et al., 2016). The present study departs from these studies by assuming overlapping generations to demonstrate an intergenerational conflict over public debt issuance and its impacts on growth and welfare across generations.

The third strand is the literature on time-consistent optimal fiscal policy (Klein and Ríos-Rull, 2003; Klein et al., 2008; Ortigueira et al., 2012). In this framework with infinitely lived agents, in each period, the government chooses Markov strategy, that is, current policies depend on payoff-relevant state variables. The present study follows the equilibrium concept of these works but departs from theirs by assuming a short-lived government, representing only existing generations. Under this alternative assumption, we consider the conflict of interest between generations and its generational consequence.

The rest of this paper is organized as follows. Section 2 presents the model. Section 3 considers voting on fiscal policy in the absence of any legal constraints on debt issues, and its impact on economic growth. Section 4 introduces the debt-ceiling rule and investigates its effects on growth and welfare across generations. Section 5 provides concluding remarks.

2. Model

We consider a closed economy version of the model in Song et al. (2012). Individuals who are born in period t are called generation t ($= 0, 1, 2, \dots$). They are homogeneous within each generation and live for two periods, youth and old age. There is no population growth, and the size of each generation is normalized to be unity.

Individuals obtain utility from consumption of private and public goods in both periods. Their preferences are specified by

$$\log c_t^y + \theta \log g_t + \beta \log c_{t+1}^o + \beta \theta \log g_{t+1}, \quad \beta \in (0, 1), \quad \theta > 0,$$

where c_t^y and c_{t+1}^o are private consumption when young and old, respectively, and g_t and g_{t+1} are per capita public good consumption when young and old, respectively.⁴ The parameter β is the discount

² The politics of public debt are also analyzed in a companion paper by Ono (2018). His model includes unemployment, and thus, the focus is rather on the intra-generational conflict between the employed and unemployed.

³ Source: The US Department of the Treasury. <https://www.treasury.gov/initiatives/Pages/debtlimit.aspx> (Accessed on November 5, 2017).

⁴ Precisely, public goods here are publicly provided private goods. In what follows, we simply call them "public goods".

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