



# Optimal tax structure and public expenditure composition in a simple model of endogenous growth



Lifeng Zhang\*, Yucong Ru, Jingkui Li

School of Economics, Zhejiang University of Finance & Economics, China

## ARTICLE INFO

### Article history:

Received 15 December 2015

Received in revised form 5 August 2016

Accepted 9 August 2016

Available online xxxx

### JEL classification:

E62

H29

H54

### Keywords:

Public spending composition

Tax structure

Growth

## ABSTRACT

In this paper, using an endogenous growth model where the structural relationship between public expenditures and taxes is considered, we investigate how the optimal tax structure is determined by public spending structure. Public spending provides two public goods, public service and public capital that impact production, the former as a flow, the latter as a stock, and these can be financed by flat rate taxes on consumption and income. Our theoretical model suggests that the optimal tax structure is equivalent to the public spending composition. Our numerical example provides a further proof for the theoretical propositions.

© 2016 Elsevier B.V. All rights reserved.

## 1. Introduction

Since the seminal work of Barro (1990), endogenous growth theory has stressed the relation between fiscal policy and long-run economic growth. However, one problem with most studies in this area is that they do not explore the growth effects of fiscal policy taking into account the structure of both taxation and expenditure (Nikos, 2009). In other words, these studies focus on either the influence of public spending or the influence of taxes on growth, and take the other side of government's activity as given (Marrero, 2010). Therefore, much less is known about the relation between public expenditure composition and tax structure. Yet this may be the central question.

The first reason for the importance of this question is that both government spending and taxation are linked through government budget constraints in the long run. How taxes are raised should depend on how revenues are spent (Burgess and Stern, 1993). The revenue side and the spending side of government actions cannot be separated, and we should remember that government expenditure and fiscal revenues are jointly determined. A substantial body of empirical evidence indicates the importance of considering both public spending and taxation in determining the relation between fiscal policy and growth. For

example, empirical works by Kneller et al. (1999), Bleaney et al. (2001) and Nikos (2009) show that studies that fail to consider both taxation and public expenditure suffer from substantial biases in their coefficient estimates. In a recent empirical work, Debortoli and Gomes (2012) argue that consideration of how both government expenditure and fiscal revenues are determined may help to explain some of the basic fiscal trends observed in many countries over the past 40 years.

The second reason why our question is important is that different kinds of taxes and public expenditure have different effects on economic outcomes. Changes in the tax structure or in the government spending composition can affect long-term economic performance (Lee and Gordon, 2005; Gómez, 2007; Glomm and Ravikumar, 1997; Arnold et al., 2011). Additionally, the tax structure and the public spending composition may be more important for growth than either the total tax or total expenditure levels. Furthermore, the determination of the government expenditure composition and of the tax structure may be two interrelated choices. Therefore, this paper pursues two objectives: (a) to simultaneously explore the optimal public spending composition and the optimal tax structure, and (b) to describe the link between the choices of how to allocate public expenditure and how to finance it.

Our theory is based on the crucial idea that choosing between different kinds of tax revenues may be intrinsically related to the allocation of expenditure across different public goods. We develop this concept through a simple model of endogenous growth with the public sector. More specifically, the model developed here assumes that the government uses two distinct taxation schemes to finance public spending,

\* Corresponding author at: School of Economics, Zhejiang University of Finance & Economics, China.

E-mail address: [zlfzjg@gmail.com](mailto:zlfzjg@gmail.com) (L. Zhang).

namely consumption (indirect) tax, and income (direct) tax.<sup>1</sup> Government spending provides two distinct public goods: public services (e.g., the creation of a rule of law and the enforcement of property rights), and public capital (e.g., highways, railways and airports).<sup>2</sup> Both of these public goods can raise the productivity of the private sector. Given the public spending composition and the tax structure, representative households tend to optimize their consumption and savings choices.<sup>3</sup> The task of the government is to run the public sector in the interest of these households, taking the private sector's choices as a given. Within this framework, the public expenditure composition and the tax structure are determined endogenously.

The central argument made in this paper is that the determination of the government's expenditure composition and of the taxation structure are two interrelated choices. Mallick (2001) tried to link a particular type of tax (consumption tax) with a particular type of expenditure (capital expenditure). Traditional theories have lacked an explicit description of the intrinsic relation between the composition of tax revenues and the allocation of public expenditure (see, e.g., Turnovsky, 2000, Debortoli and Gomes, 2012). We derive an explicit expression for the intrinsic relation between the composition of tax revenues and the allocation of public expenditure. In our model, the financing of spending on public services through income tax revenues and the financing of public capital through consumption tax revenues can be viewed as the optimal policy scheme. The intuition behind this argument is as follows.

When the government's policy instruments are distorted, the fiscal authorities tend to create other policies to reduce these distortions. In our model, taxes affect the decisions of private agents, creating a tax wedge, and hence distorting economic growth. Public expenditure can work as a positive externality in private production (Park and Philippopoulos, 2002), and can increase the marginal productivity of private factors, thereby partially counteracting the distortions created by taxation. The government should consider how to allocate public expenditure across different public goods in a way that mitigates the distortions of the tax system. Income taxes lead to heavier taxation on deferred (future) consumption than on current consumption, but consumption taxes are uniform over time, imposing the same burden on both current and future consumption (Milesi-Fereti and Roubini, 1998). Income taxes, therefore, tend to cause greater consumption in the present, so that taxes on income have more immediate effects. Choosing between income and consumption taxes represents a trade-off between current and future consumption (Marrero & Novales, 2005). Government spending that involves the provision of public services instantly affects the production technology of firms. Today's government spending adds to the stock of public capital, which enables firms to improve their future production technology (Irmen and Kuehnel, 2009). Therefore, government spending on public services has an immediate effect (Ghosh and Roy, 2004). Choosing between the provision of public services and the accumulation of public capital represents a trade-off between current and future growth. Given these facts, the best way to mitigate the distortions created by the taxation system may be to finance spending on public services through income taxes, and to finance spending on public capital through consumption taxes. In the model economy presented in this paper, the public service versus public capital investment ratio is equivalent to the income tax versus consumption tax ratio.

Our results fill a gap in the extensive literature on fiscal policy and growth.<sup>4</sup> Although various previous works have found that both the composition of government spending and that of revenue matter for balanced growth (e.g., Kneller et al., 1999; Bleaney et al., 2001; Nikos, 2009), these findings have been quantitative rather than theoretical. Marrero (2010) develops a theoretical framework to study the reaction of the tax composition to changes in the public expenditure composition. However, because Marrero only considers the case involving an exogenous path of wasteful public expenditure, he fails to consider the endogenous public spending composition. Marrero also fails to examine the endogenous link between the choice of how to allocate public expenditure and how to finance it. Our research considers these factors, and therefore complements the existing works in this area.

There is a large body of literature on the composition of public expenditure and its effects on growth (e.g., Devarajan et al., 1996; Chen, 2006; Ganelli, 2010). This literature considers the optimal spending composition, and does so under the assumption that government expenditure is fully financed by income taxes. However, this assumption means that the associated models ignore the problem of tax composition, and that they fail to consider the joint determination of the structure of government expenditure and the composition of fiscal revenues.

Our paper is also related to the large volume of fiscal literature on the link between tax composition and economic growth, in the framework of various endogenous growth models (e.g., Barro and Sala-i-Martin, 1992; Jones et al., 1993). These models show that any tax policy that distorts the incentives for factor accumulation can have a permanent effect on growth (Xing, 2011), so that tax policy can have a major influence on trends in long-run growth. Although this literature focuses on the question of how the choice of tax structure affects growth, most of these studies fail to consider the question of how to allocate public expenditure across different public goods.

Although our model framework is somewhat similar to the frameworks used by Ghosh and Roy (2004) and by Irmen and Kuehnel (2009), our results are different from either of those studies. Irmen and Kuehnel (2009, Section 3.1) show that the optimal income tax rate is zero, and that productive public expenditure is financed by the time-invariant flat rate consumption tax, or lump-sum tax. We obtain different results from Irmen and Kuehnel (2009, Section 3.1), because these authors consider a model without public capital, and we consider a model with public capital. We show that the Ramsey government should finance all public expenditures through the combination of tax instruments, not only through consumption tax. The consumption tax in our paper has crowding-out effect on the consumption and is not equivalent to the lump-sum tax. This is different from Irmen and Kuehnel (2009). Ghosh and Roy (2004) describe both public capital and public services as inputs to the production of final goods when government expenditure is fully financed via income tax. Ghosh and Roy focus on the optimal spending composition and reveal that when the government considers how to allocate public expenditure across different public goods, it has to face trade-offs between the long-term goal of accumulating public capital goods and the short-term need to provide public services. However, they consider neither the tax structure nor the relation between public spending composition and tax structure, because in their model government expenditure is fully financed via income tax. Unlike Ghosh and Roy (2004), we simultaneously explore both the optimal composition of public spending and the optimal tax structure. Our model derives an explicit expression for the intrinsic relation between the composition of tax revenues and the allocation of public expenditure, because government expenditure in our model

<sup>1</sup> Following Atkinson (1977), we refer to taxes on consumption as "indirect taxes" and to taxes on income as "direct taxes."

<sup>2</sup> Public spending, which includes investment in both public capital and public services, is extensively examined in the literature. See Irmen and Kuehnel (2009) for further analysis of this issue.

<sup>3</sup> In the model proposed here, the public spending composition is represented by the ratio of public services to public capital investment, and the tax structure is represented by the ratio of income taxes to consumption taxes.

<sup>4</sup> Irmen and Kuehnel (2009) provide one survey of literature on the link between productive government expenditure and economic growth, and Myles (2009) reviews the available studies on the growth effects of taxation. Recent works have been debating the relative importance of tax cuts versus higher government spending (see Mountford and Uhlig, 2009; Jha et al., 2014; Hur et al., 2014).

Download English Version:

<https://daneshyari.com/en/article/5053300>

Download Persian Version:

<https://daneshyari.com/article/5053300>

[Daneshyari.com](https://daneshyari.com)