



Optimal government spending with labor market frictions

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ABSTRACT

We study optimal government spending in a business cycle model with labor income taxes and unemployment due to hiring costs. Labor market frictions raise the optimal steady state ratio of government spending to private consumption. The labor tax rate is higher since profits are taxed that arise from employed workers which save hirings costs. For calibrated examples, the quantitative effect of labor market frictions on optimal fiscal policy is small. In the short run, optimal policy involves a strongly procyclical reaction of the tax rate to technology and preference shocks, while the ratio of public to private spending is close to flat. This ratio is, however, markedly countercyclical if taxes are constrained to be constant over the cycle.

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1. Introduction

This paper studies optimal government spending and tax policies in an economy with frictional unemployment. We assume that the government produces public goods that yield utility to private households, and finances its spending by means of a proportional tax on labor income. Unemployment exists because hiring is costly (as in Blanchard and Gali, 2010), such that firms willing to expand their employment have to expend resources that depend on the aggregate tightness of the labor market. Wages are determined through Nash bargaining. Due to the existence of hiring costs, there are generally non-zero profits even though firms are competitive and production takes place under constant returns to scale. The government solves a Ramsey problem by choosing sequences of labor tax rates and spending levels that lead to the equilibrium allocation yielding the highest level of welfare.

We analyze in how far the existence of labor frictions matters for optimal fiscal policies with respect to both government spending and labor taxation. We are particularly interested in the optimal relation between public and private consumption. Previous papers have analyzed optimal taxation problems in economies with unemployment for exogenously given government expenditures (see Domeij, 2005; Arsenau and Chugh, 2009). Further, the joint determination of government spending and taxes has been analyzed by Lansing (1997), but in the context of a standard real business cycle model where labor markets are frictionless. Our paper merges these strands of the literature in that we consider public spending as an instrument of the government that can be used along with distortionary taxation in a setting with frictional unemployment.

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Our central results can best be understood in relation to a benchmark case where there are no labor market frictions in the sense that there are no hiring costs and the real wage is competitively determined as the marginal rate of substitution between leisure and consumption (i.e. the benchmark case is a real business cycle model with distortionary labor income taxation). In this case, the optimal fiscal policy would be to choose government spending to equalize the marginal utilities of public and private consumption. With logarithmic utility, the optimal ratio of government spending to private consumption is constant, and labor taxation finances this level of expenditures and initial debt. When labor market frictions do exist, however, the steady state ratio of public to private consumption is higher than under optimal policy, and increases with the size of hiring costs and thus of unemployment. At the same time, labor taxes are higher than in the benchmark case. This is first shown analytically for a simplified version of the model where we abstract from capital accumulation, and then confirmed numerically for a calibrated version with physical capital.

We show that this result emerges because hiring costs lead to the existence of profits in equilibrium, whereas government spending and labor taxes in the steady state would be set at the benchmark levels if there were no profits. Profits exist under positive hiring costs, however, since at any point in time the non-separated part of the previous period's employment level is given, which reduces the amount of costly hires that firms need to undertake. To the extent that labor relations last longer than a period, firms thus enjoy economic rents. The government has an incentive to tax these rents. Given that there is no profit tax, labor taxes therefore are higher with labor frictions, and the government partly compensates households for the implied loss in private consumption possibilities by choosing a relatively higher value of utility providing government spending.

Numerically, we find that for plausibly calibrated model versions intended to capture average labor market features of continental European countries in a stylized way, the departure of optimal fiscal policies from the benchmark case in the steady state appears to be quantitatively small. The reason is that the size of labor market frictions depends on the steady state share of the resource costs of hiring in total output, which – following [Blanchard and Gali \(2010\)](#) – are assumed to be about one percent of yearly output. We also present sensitivity analyses to assess the robustness of the results. As it turns out, the departure of the optimal public to private spending ratio and the tax rate from the benchmark case is robustly small (this is also true for different values of workers' bargaining power in wage determination). Thus, the welfare loss from applying policies that would be optimal in the benchmark case to an economy with quantitatively moderate hiring cost frictions appears to be close to negligible.

We further examine the responses under optimal fiscal policy to macroeconomic shocks. A positive technology shock leads to procyclical reactions of employment, government spending, private consumption, and investment, as well as of the ratio of government spending to consumption. However, these responses are quantitatively much smaller in an economy with hiring costs than in the benchmark model, since optimal policy takes the costliness of labor reallocations into account. At the same time, the tax rate response is more pronounced under hiring costs due to the strongly procyclical behavior of profits.

In addition, we consider the case where the tax rate cannot be changed in the short run but is held constant (which we view as a sensible restriction when discussing optimal policy at business cycle frequencies). The government then increases its spending notably less in response to a positive technology shock, letting the ratio of public to private consumption decline under positive hiring costs (whereas it would stay constant in the benchmark case). This muted response of government spending is consistent with limited (costly) labor reallocations and thus reduced profits. We also find that shocks to the disutility of labor generally have effects of the opposite sign than technology shocks.

The rest of the paper is organized as follows. We present the model in [Section 2](#). The Ramsey policy problem is set up in [Section 3](#). We then study the properties of the optimal steady state allocation both analytically and numerically in [Section 4](#). [Section 5](#) then discusses the model economy's responses to technology and preference shocks, whereupon [Section 6](#) concludes.

2. The model

We analyze a dynamic general equilibrium model in which households accumulate capital and supply labor. Fiscal policy decides on the level of government spending, which provides utility to households, and the level of a proportional labor income tax rate. The labor market part is modelled as in [Blanchard and Gali \(2010\)](#), in particular, hiring of labor by firms is costly. Our model differs from theirs in that we also consider capital accumulation and, most importantly, concentrate on fiscal, not monetary policies, assuming flexible prices.¹

Let s_t denote the state realized at date $t \geq 0$ and let s^t denote a particular history of states from period 0 to t , $s^t = \{s_t, s_{t-1}, \dots, s_0\}$, where $S : s_t \in S$ is the set of possible states and S^t is the set of possible histories. Further, let $\pi(s^t | s^{t-1})$ be the period $(t-1)$ probability of the occurrence of the history s^t , and $\pi(s^t) = \pi(s^t | s_0)$ its unconditional probability, where s_0 is the initial state with $\pi(s_0) = 1$. Throughout the paper, we economize on notation by leaving out the reference to the state s^t wherever possible without risk of confusion.

¹ An earlier version of the paper (see [Linnemann and Schabert, 2009](#)) also considered jointly optimal fiscal and monetary policies under price stickiness.

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