1
Introduction

In most countries, public sector jobs offer some advantages over private sector jobs. In particular, governments usually provide protection against dismissals for public workers. In Brazil, for instance, job stability is a right guaranteed by constitution for those that, after entering the public sector, have stayed at the job for at least three years.[1] In a similar vein, many empirical studies have found that wages in the public sector are more compressed and less dispersed than their counterparts in the private sector.[2]

Job stability compounded with a more compressed and less volatile wage distribution can be interpreted as a source of insurance against income risk. Indeed, whoever enters the public sector is exchanging a more volatile, but potentially higher, income for a less volatile one. Hence, by increasing the number of public employees, the government enhances the overall degree of insurance in the economy.[3]

The aim of this paper is to explore the welfare gains or losses due to a larger government. The novelty is to properly account for the aforementioned source of insurance. To do so, we introduce public employment in a standard incomplete markets model with overlapping generations (e.g. Huggett (1996)). In particular, the size of the government, defined by the number of agents employed in the public sector, affects not only the degree of insurance in the economy, but

[1] High public job security is also present among other countries as noted in OECD (2008): "A stronger protection against dismissals and other forms of termination of the employment is also normally a part of the special arrangements [of government employment]. This would traditionally guarantee employment for life with dismissal only possible for misconduct." (OECD, 2008, p. 21)

[2] This pattern holds in several countries. See Gregory and Borland (1999) for a review.

[3] Notice that this source of insurance might not be available to everyone. If earnings dynamics in the public sector are too generous, there will be a larger number of candidates than public vacancies. Hence, a set of rules is necessary to match candidates and vacancies. In Brazil, for instance, most public servants are selected based on merit through a public exam. In particular, each exam is designed to test the knowledge necessary to perform a specific job.

also the distribution of consumption. Hence, from a utilitarian perspective, whether a larger government increases or decreases welfare is an empirical question.

In a model economy calibrated to Brazil, we find that if changes in the public wage bill associated with changes in public employment are financed with consumption taxes, the optimal size of public employment is nearly flat, ranging from 8 to 12 percent of the workforce. However, if the public employment is reduced from 12 to 8 percent, welfare losses due to a reduction in the degree of insurance are around 2 percent, which are compensated by welfare gains due to level and inequality effects. If changes in the wage bill are financed by capital taxes instead, the optimal size of public employment is 6 percent of the workforce, which is associated with welfare losses of 5.9 percent due to a lower degree of insurance than in the benchmark calibration.

The model has three main ingredients. First, we consider an overlapping generations model with heterogeneous agents. In particular, heterogeneity regards their income profiles that vary with age, a fixed level of human capital, and an uninsurable idiosyncratic risk (i.e. productivity). Second, we consider a competitive economy with incomplete markets in the sense that borrowing-constrained agents can only save trough risk-free bonds. Third, there are two sectors: public and private. The private sector combines effective labor and capital to produce a single good. The public sector employs effective labor and capital to produce public goods, which have opposing effects on aggregate output. Since we consider a closed economy, private production is crowded out. In contrast, public goods enhance productivity in the private sector.

During their life cycle, the agents choose whether to work in the private sector or to apply for a public job. In line with the aforementioned evidence, we assume that public workers cannot be fired, but they may quit. Similarly, once in the public sector, risk becomes less volatile at the expense of a more compressed distribution of wages. Finally, we assume that income profiles also vary across sectors.

The government opens a given number of vacancies for each level of human capital it is willing to fill. Depending on the model's parameters, the public wage scheme might attract a larger number of candidates than open vacancies. If this is the case, in order to fill the vacancies, the government hires the most

productive candidates. Notice that this selection mechanism emulates a public exam in which performance is positively associated with productivity. Finally, as some agents with a high-income profile in the private sector might not apply for a public job, the effects of a larger government on the overall distribution of income, wealth and consumption are ambiguous. In our benchmark calibration, for instance, only agents with intermediate levels of productivity are hired by the government.

The optimal size of public employment maximizes an ex-ante utilitarian welfare criterion. Following Conesa et al. (2009), we consider only the welfare of newborn agents. In particular, the overall welfare effect associated with a given policy is defined by how much lifetime consumption has to increase uniformly across newborn agents in the benchmark economy in order to equalize welfare measures across stationary equilibria. By adapting the methodology from Flodén (2001) to an environment with overlapping generations, we decompose the overall welfare effect of a change in public employment into three categories: (i) the level effect associated with changes in aggregate consumption; (ii) the inequality effect associated with changes in the distribution of consumption; and (iii) the uncertainty effect associated with changes in the degree of insurance in the economy.

Table 1 anticipates some of the results in this paper. The second column reports the optimal levels of public employment. In the benchmark economy, for instance, public employment is calibrated at 13.5 percent of the workforce. Since different sizes of public employment imply changes in the wage bill, we assume that these changes are financed with a single policy instrument. In particular, we consider capital, consumption and lump-sum taxes. Columns three to six of Table 1 report the welfare effects from moving from the benchmark economy to the economy associated with the optimal policy.

Instrument	Optimal public employment (%)	Total welfare effect (%)	Level effect (%)	Inequality effect (%)	Uncertainty effect (%)
Consumption taxes	8 to 12	0.5	1.7 to 0.7	0.7 to -0.5	-1.8 to 0.2
Capital taxes	6	2.6	7.9	1.1	-5.9
Lump-sum taxes	2 to 4	11.5	0.7 to 2.5	10.6 to 8.2	0.2 to 0.6

Table 1: Summary of the main results.

If the single instrument used to balance the government budget is a linear tax on consumption, the optimal size of public employment is nearly flat, ranging from 8 to 12 percent of the workforce. In particular, total welfare gains are only 0.5 percent in this range. However, if public employment is reduced from 12 to 8 percent, losses due to the uncertainty effect are around 2 percent, which are compensated by welfare gains due to level and inequality effects. If a linear tax on capital is considered instead, the optimal size of public employment is around 6 percent of the workforce, which is associated with total welfare gains of 2.6 percent. These gains come from both inequality and level effects. In contrast, losses due to the uncertainty effect are 5.9 percent. Hence, we conclude that public employment is an important source of insurance in this economy.

If lump-sum taxes are considered, the optimal size of public employment ranges from 2 to 4 percent of the workforce, which is associated with a total welfare effect of 11.5 percent. Notice that these large welfare gains result from a large inequality effect. Intuitively, a large public sector benefits individuals with intermediate levels of productivity. Once the size of the government becomes smaller, the extra resources obtained from the reduction in the public wage bill is converted into lump-sum taxes, which particularly improves the welfare of those agents at the bottom of the consumption distribution.

We decompose welfare effects by human capital levels. We find that larger governments benefit mostly individuals with the highest level of human capital (college education). We argue that public wages represent a more effective insurance scheme to them.

Finally, we also claim that the calibrated model can explain, albeit imperfectly, some features of the distribution of workers across age groups.

The paper is structured as follows. Section 2 presents a brief review of the relevant literature. Section 3 presents the model. Section 4 presents the quantitative analysis, including the calibration procedure, results and sensitivity analysis. Section 5 concludes.