Tax competition and the political economy of public employment: a model for Austria

Agenda Austria

Working Paper – No. 04

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02/2017

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Tax competition, Lobbying, Probabilistic voting, Austria

Tax competition and the political economy of public employment: a model for Austria

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Abstract

In this work we simulate the effects of tax autonomy of the Austrian states on the levels of public employment in each state. We show that depending on the strength of the public sector lobby, tax autonomy would require reduction of employment in the public sector between 25% and 35% of the current level. We also show that tax autonomy increases welfare levels by 1% to 1.5%, that is that the positive change in the disposable income of the workers more than offsets the welfare loss resulting from lower public goods' provision. Finally, we show that reduction of public employment is welfare superior to an alternative scenario, in which employment levels are held constant but the wage levels in the public sector need to be adjusted.

JEL Classification: D72, H71, H77

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1. Introduction

After the seminal work of Oates (1972) was published, an international debate began regarding the effects of tax competition. The classical school of public finance stresses the fiscal externalities of tax competition which lead to, e.g., the underprovision of public goods and "the race to the bottom". These views are summarized, for example, in the survey by Wilson (1999). The opposite view of tax competition, which was introduced by Brennan and Buchanan (1977, 1980) argues that tax competition tames the (over–

expanding) government and increases efficiency.

More recently, the literature (e.g. Fuest, 2000; Keen and Kotsogiannis, 2003; Eggert and Sørensen, 2008) has combined the two views and analyzed the effects of tax competition when politicians divert resources to their private use or become involved in rent seeking. These models conclude that both effects are in place: firstly, tax competition reduces wasteful spending by the government; secondly, tax competition may cause the underprovision of public goods. The overall welfare effect typically depends on the elasticity of the tax base and the propensity to "waste" public resources, and can be established only empirically.

Much of the "Leviathan" literature assumes the wasteful nature of political rents. Modeling rents as pure waste has a problematic feature: it would in fact reduce political support for the policy maker, as these rents are created at the expense of large groups of voters. Intuitively, most political rents should instead be created with the purpose of obtaining *more* rather than fewer votes. There is empirical evidence supporting the latter. For instance, Ansolabehere and Snyder (2006) find that in the United States, the governing political parties at state level skew the distribution of public funds in favor of areas that provide the strongest political support. In light of these results, this work assumes that the rents are created as means of political strategy to maximize the probability of winning the election. We believe that for the case of Austria, an important channel of such rent creation works by establishing the political support of the unionized workers in the public sector.

Given that when exposed to tax competition, the states are likely to reduce tax rates and therefore public spending, there are several possible channels of reduction. We analyze one possibility: the reduction of public goods and services via decreased public employment. In our model, the parties have an incentive to over-expand public employment to benefit from the political support of public employees compared to workers in the private sector.

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Tax competition would force the states to consolidate their expenditure on public wages and public employment, and reduce the size of the public administration. We also analyze whether the overall welfare effect is positive, given that public sector workers contribute to the provision of public goods. In other words, we check whether negative welfare effects from the underprovision of public goods do in fact arise for the Austrian case, or whether they are offset by increasing the disposable income of all groups of society.

In the main step of the analysis, we analyze the effects of tax competition on public employment and wages. The initial state, before the start of tax competition, is equivalent to a state of autarky for each state. Since the centrally allocated revenues and tax rates are exogenous[2] from the perspective of each state, this can involve the inefficient expansion of the public sector to secure the political support of the voters. If the economic benefits offered to public sector insiders generate more votes than the benefits offered to outsiders, there is an incentive for politicians to offer rents to the former. Moreover, when a politician offers high public sector wages, s/he may also promise more jobs in the public sector, since this may convince outsiders to vote for the candidate in the prospect of an increased chance of receiving a public sector job.

On the other hand, politicians can also create votes by offering higher private consumption opportunities through lower taxation. In a political equilibrium, policy makers strike a balance between these two competing ways of obtaining support. When tax competition is allowed, the relatively high public sector wages make the creation of public sector jobs more expensive by requiring a higher tax rate. In other words, the cost of private consumption lost due to higher taxation now exceeds the benefit of additional public employment, which therefore needs to fall. Hence, politicians must trade off the political gain from high public sector wages and/or employment against the political cost of having to

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[2]This is a simplifying assumption, as in the course of the negotiations of fiscal equalization laws, the states' representatives unquestionably bring substantial power to bear.

increase taxes. Tax competition, through its effect on the allocation of mobile production factors, reduces incentives to offer rents, since an inefficient use of taxpayers' money could lead to an erosion of the tax base. This disciplining mechanism is expected to reduce the expansion of the public sector, as now the vote-maximizing political strategy will involve lower rents to public sector workers and fewer public sector jobs, and also less public service provision.

An important aspect of the analysis is that the reduction in the size of the public sector could lead to welfare losses, as argued in the public finance literature, due to the underprovision of public goods and services compared to the socially optimal level. As shown by Eggert and Sørensen (2008), given the other parameters of the model there is an optimal level of tax competition which increases the efficiency of the public employment without reducing the welfare of society. In the model, there are three channels through which tax competition affects the welfare of society:

1. It drives a wedge between the marginal rate of substitution and the marginal rate of transformation between public and private goods; that is, it tends to reduce the provision of public goods. This is the standard channel of the public finance literature, which stresses the role of tax coordination in ensuring sufficient provision of public goods.

2. It reduces rents to public sector workers, thereby causing an outward shift in the production possibility frontier, which tends to increase social welfare through an increase in the disposable income of citizens.

3. By reducing rents to public sector workers, it ensures the equalizing of the marginal utility of income for all citizens, or at least a reduction in the difference.

In this work, we focus on the first and the second channels, and analyze the overall welfare effect for the case of Austria.

Our main results show that a substantial decrease in public employment is expected as a result of tax autonomy. Moreover, we show that the expected welfare effect is moderately positive; that is, the decrease in public rents and public employment, although associated with a decreased provision of public goods, is more than offset by the increase in the disposable income of all groups of workers. Additionally, we show that the reduction of public employment while keeping public wages relatively high provides welfare which is superior to the possibility of the reduction in public wages to the private sector level, while keeping public employment high.

This work is structured as follows: the next section presents a short description of the Austrian federal system, with a focus on a discussion of the necessity for reform. Section 3 gives an overview of the theoretical model. Section 4 presents the details of the calibration. Section 5 presents the main results when we assume unchanged wages in the public sectors. Section 6 presents the main results when public wages can change. Section 7 compares welfare effects of different policy options. Section 8 concludes the paper.

2. The Austrian federal system

Austria is a federation of nine states ("Länder"), and 2,100 municipalities.[3] The country is frequently characterized as a system of cooperative federalism, with substantial overlaps in the competences of governmental levels, and very low tax autonomy of states and municipalities. Around 85 percent of total tax revenues are 'joint taxes'. Among others, revenues from personal income tax, corporate income tax, and VAT are shared among all three governmental levels, according to the rules of the national Fiscal Equalization Law (German: "Finanzausgleichsgesetz" or FAG). Even though the revenues from shared taxation give slightly more autonomy to regional and local governments than intergovernmental grants,

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[3]This number was higher until the end of 2012, which saw a major wave of municipal amalgamations in the federal state of Steiermark.

individual decision-making sovereignty regarding taxes at the sub-central level is highly limited. The incentives of states and municipalities to maintain and develop their own tax base are rather weak. Austrian states receive slightly more than 20% of the shared revenue from joint taxation, as well as diverse intergovernmental grants and subsidies.[4]

In general, the tax autonomy of Austria's states is extremely low. Austrian states have the right to set rates for the tourist tax and fishing and hunting licenses, which are, however, of very low relevance to the overall revenue; states have no discretion over setting the rates for the fire protection tax and limited discretion over administrative fees, which generate some of their own revenues. All in all, taxes over which states have full discretion constitute less than 1% of state revenues.

The degree to which state governments in Austria are free to decide on their own spending figures is substantially higher than on the revenue side. In general, the principle of budgetary autonomy provides state governments with considerable decision-making autonomy. This holds especially with respect to revenue shares from joint taxes and from non-earmarked transfer receipts. Only when it comes to expenditure on education, culture and transportation are expenditures financed to a higher degree with earmarked grants. Other categories, for example public administration, subsidies to individuals and firms, and public services, are typically covered by general grants.

This combination of rather low tax autonomy and relatively high discretion over spending undoubtedly creates the familiar common-pool problem. State governments can make decisions where higher expenditures do not correspond to local tax increases, since the resources stem from a common pool. In addition, the smaller the share of their own tax revenues, the greater the incentives to expand regional spending in an inefficient way, as the corresponding cost increases are not fully internalized by the local units. Thus, schol-

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[4]The actual shares of joint taxation for each state result from a fairly complex calculation which includes additions and deductions as stipulated in §10(2) of the FAG.

ars and diverse stakeholders have long suggested a major reform of the federal system (compare, e.g., Bauer et al., 2010; Bröthaler et al., 2011).

Most studies regarding the possibility of a reform have stressed the need to increase the tax autonomy of the regions. In this context, diverse taxes have been proposed as candidates for increasing the tax autonomy of the states, e.g., a surcharge on the income taxation of individuals or companies, as well as contributions to subsidize the construction of residential buildings (see, e.g., Strohner, L. et al., 2015)[5]. Since some policy makers, mostly representatives of the states, oppose fiscal competition, most of these oppose autonomous taxes on a mobile tax base. On the other hand, supporters of tax autonomy over a mobile base (see, e.g., Keuschnigg and Loretz, 2015b) suggest that fiscal competition is a better means for reducing the inefficient growth of the public sector.

Indeed, competition over a mobile base is expected to result in more radical changes to public policy compared to the case of an immobile base, such as the real-estate tax. Thus, in this analysis we aim to estimate the *upper bound* of the possible effects of fiscal competition by allowing the tax base to be fully mobile. We restrict attention to the possibility of reducing public employment in the states, and our theoretical approach models this exact channel. High personal costs have also been stressed in the public discussion (see, e.g., Rechnungshof, 2016). Another channel which is relevant for the budget consolidation of the states, that is, an increased transparency of subsidies and grants to firms and individuals, is not analyzed in this work.

3. The model

The model is a variant of a tax competition model for Austria developed by Keuschnigg and Loretz (2015a) based on Zodrow and Mieszkowski (1986) which incorporates a model

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[5]The states will become fully autonomous with tax-rate discretion in the latter contribution, starting from the fiscal year 2018.

of political competition with lobbying by Persson and Tabellini (2000). We do not assume any symmetry with respect to endowments of the mobile factor, as the model will be solved numerically to guarantee close correspondence with the actual tax structure in Austria. For a analytically-tractable symmetric version of the model, including comparative statistics, please consult Eggert and Sørensen (2008).

In the model, the world consists of a country further divided into federal states, and the rest of the world. Residents may work either in the public or in the private sector, and consume private and public goods. The immobile factor is the only means of production of public goods, while private goods are produced by means of mobile and immobile factors. The mobile factor is perfectly mobile, both across the federal states and the rest of the world. There are no spillovers from the consumption of public goods in each state, but since the public sector is financed by means of source–based tax, there is a horizontal fiscal externality arising from competition for the mobile tax base. Politicians choose the levels of taxation in each state, as well as the employment in the public sector and, implicitly, the wage in the public sector, which will be determined from equilibrium in the tax rate and employment, by the means of balanced budget constraints.

3.1. Private sector, production and tastes

Private agents in the economy have consumption preferences of the form:

$$U_j = c_j + G, \tag{1}$$

where $j = p, g$ correspond to employment in the private (p) and public sector (g) respectively. States are denoted by the index i. $\alpha_i \in (0,1)$ is the fraction of population in each state employed in the public sector. Therefore, the total mobile input in the private sector equals $(1 - \alpha_i)m$, where m is the ratio of mobile/immobile factors. The total output of private goods is given by a linearly homogenous production function $Y =$

$F((1 - \alpha_i)m, 1 - \alpha_i)$, or in per capita terms:

$$y = \frac{Y}{1 - \alpha_i} \equiv f(m), \tag{2}$$

where $f' > 0$ and $f'' < 0$. The production of public goods takes public employment as its input $G = g(\alpha_i)$. Competitive profit–maximizing firms invest up to the point where the marginal product of the mobile factor equals the cost; that is, for all states it holds that

$$\rho + \tau_i = f'(m), \tag{3}$$

where ρ is the return on the mobile factor and τ_i denotes the tax rate on the mobile factor. The market–clearing condition gives:

$$\sum_i^n (1 - \alpha_i)m_i = \bar{m}, \tag{4}$$

where $\bar{m} = \sum_i^n \bar{m}_i$ is the world endowment of the mobile factor, and i includes the rest of the world. Given a linearly homogenous production function, the wage in the private sector is given by

$$w_i = f(m_i) - m_i \cdot f'(m_i). \tag{5}$$

We assume that the capital endowment is equally distributed across the working population, that is, across public and private sector workers. Given source–based taxation, this implies that the consumption of each type of worker is given by

$$c_{pi} = w_i + \rho \bar{m}_i \tag{6}$$

and

$$c_{gi} = W_i + \rho \bar{m}_i, \tag{7}$$

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where W_i is the wage level in the public sector.

The model predicts full employment; that is, a worker leaving the public sector will find a job in the private sector, possibly for a lower wage. This is likely to hold true in the long run, since as a result of tax competition, additional capital expenditures require either an increase in private wages or an increase in private employment for the same wages. In fact, at equilibrium both of these are expected. In the short run, the existence of labor-market frictions precludes full adjustment and would most likely result in increased unemployment, because public and private employees may not be perfect substitutes. When interpreting the results, especially those relating to welfare, it should be borne in mind that these results may differ, especially in the short run. In reality, there will be shortcomings due to the imperfect flexibility of the labor market and the absorption capacities of the labor market in general. The decrease in the number of public employees will imply additional costs for the transition from public to private employment, especially in the short run. These costs are not covered in our welfare function. The analyzed welfare effects should therefore be interpreted as a description of a new long-run equilibrium, rather than a short-run effect.

3.2. Political economy of the public sector

The policy variables are W_i, α_i and τ_i. The decision making of the government is determined by a probabilistic voting model with lobbying following Persson and Tabellini (2000). The voters belong to two groups: *insiders*, who are employed in the public sector and are members of a lobby (i.e., trade union) and *outsiders*, who do not belong to the lobby, and can be employed in either the private or the public sector. Insiders enforce the wage rate W_i. The marginal jobs in the public sector that are not already filled by insiders are allocated to the outsiders. Wage adjustment in the private sector ensures full employment. There are two parties competing for government office. This is a simplified way of describing competition between the incumbent party (or typically a coalition) and an entrant, as in each state at least one of two major national parties, the Social Democrats

and the Christian Democrats, belongs to the ruling coalition. Modeling coalitional behavior would not change the results qualitatively. Quantitatively, however, it would predict the lower reduction of employment; this is consistent with the political economy literature, which finds that coalitional governments tend to expand budgets more than one-party governments. Each party chooses a vector of policy variables, which differ in their "ideological" dimensions. Voters have particular a preference for the fiscal package as well as for the ideology. Let U_i^P be the welfare of a public sector insider if party $P = A, B$ is in power. S/he votes for party A iff

$$U_i^A > U_i^B + \zeta_i^j + \tilde{\omega}, \tag{8}$$

where ζ is the individual ideological bias in favor of B, with zero mean value across all lobby members, and $\tilde{\omega}$ is a general stochastic ideological preference towards party B. The stochastic bias is given by

$$\tilde{\omega} = \omega + h(\alpha_{i0} Z_B - \alpha_{i0} Z_A), \tag{9}$$

where $\omega \sim U\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$, Z_P is the public sector lobby's campaign effort in support of P and α_{i0} is the predetermined fraction of voters belonging to the lobby. Denoting p_A the probability that party A wins the election, the lobby official maximizes the following utility function:

$$L = p_a U_i^A + (1 - p_A) U_i^B - \frac{1}{2}(Z_A^2 + Z_B^2). \tag{10}$$

Optimal campaign efforts are

$$Z_A = \max[0, \alpha_{i0} \psi h(U_i^A - U_i^B)], \qquad Z_B = \max[0, \alpha_{i0} \psi h(U_i^B - U_i^A)] \tag{11}$$

Given that both parties have symmetric maximization problems, both parties will

choose the same fiscal policies, thus $U_i^A = U_i^B$, implying that no contributions will be offered at equilibrium. The political influence of the lobby thus derives from the *potential* rather than the actual political support. The welfare of an insider, U_g, is simply equal to the welfare of the public sector worker, whereas the welfare of an outsider, U_o, depends on whether she will get a public sector job. The total number of public jobs equals α_i, of which α_{i0} is reserved for the lobby members. Thus, $(\alpha_i - \alpha_{i0})$ is offered to outsiders, and $(1 - \alpha_{i0})$ outsiders compete for these jobs. The probability that an outsider will get a public sector job equals $(\alpha_i - \alpha_{i0})/(1 - \alpha_{i0})$. The expected utility of an outsider therefore equals

$$U_o = \left(\frac{\alpha_i - \alpha_{i0}}{1 - \alpha_{i0}}\right) U_g + \left[1 - \left(\frac{\alpha_i - \alpha_{i0}}{1 - \alpha_{i0}}\right)\right] U_p = \tag{12}$$

$$= \left(\frac{\alpha_i - \alpha_{i0}}{1 - \alpha_{i0}}\right) u(W_i + \rho\bar{m}) + \left[1 - \left(\frac{\alpha_i - \alpha_{i0}}{1 - \alpha_{i0}}\right)\right] u(w_i + \rho\bar{m}) + g(\alpha_i). \tag{13}$$

Finally, the vector of fiscal variables must satisfy the state budget constraints[6], that is:

$$\tau_i(1 - \alpha_i)m_i = \alpha_i W_i. \tag{14}$$

The government's optimization program is therefore:

$$\max_{\tau_i, \alpha_i} V = \max_{\tau_i, \alpha_i} \left[\frac{1}{2} + \alpha_{i0}p_g U_g + (1 - \alpha_{i0})p_o U_o\right], \tag{15}$$

where p_g and p_o are the probabilities that the insider and the outsider vote for the party, respectively. Converting the unit tax into a specific tax denoted by $t_i \equiv \tau \times e \times f'(m_i)$, where e denotes tax–base erosion, the first order conditions for a fiscal package with respect

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[6]Here this is given in simplified form. The full budget constraint additionally involves transfers from the central budget, and can be obtained upon request.

to t_i and α_i (the wage level follows from the budget constraint) are:

$$
\begin{aligned}
\frac{\partial V}{\partial t_i} &= \alpha_{i0} p_g \left[\frac{1-\alpha_i}{\alpha_i}(m_i + t_i \frac{dm_i}{dt_i}) + \bar{m} \frac{d\rho}{dt_i} \right] + (1 - \alpha_{i0}) p_o \times \\
&\quad \left(\frac{\alpha_i - \alpha_{i0}}{1 - \alpha_{i0}} \right) \left(\frac{1-\alpha_i}{\alpha_i}(m_i + t_i \frac{dm_i}{dt_i}) + \bar{m} \frac{d\rho}{dt_i} \right) \left(\frac{1-\alpha_i}{1-\alpha_{i0}} \right) \times \\
&\quad \left(f''(m_i) m_i \frac{dm_i}{dt_i} + \bar{m} \frac{d\rho}{dt_i} \right) = 0
\end{aligned}
\tag{16}
$$

and:

$$
\begin{aligned}
\frac{\partial V}{\partial \alpha_i} &= \alpha_{i0} p_g \left[\frac{\frac{d(t_i(1-\alpha_i)m_i)}{d\alpha_i}\alpha_i - (t_i(1-\alpha_i)m_i + T)}{\alpha_i^2} + \bar{m} \frac{d\rho}{d\alpha_i} + g'(\alpha_i) \right] + \\
&\quad (1 - \alpha_{i0}) p_o \left[\left(\frac{1}{1-\alpha_{i0}} \right) \left(\frac{t_i(1-\alpha_i)m_i + T}{\alpha_i} + \rho \bar{m} \right) + \left(\frac{\alpha_i - \alpha_{i0}}{1-\alpha_{i0}} \right) + \right. \\
&\quad \left(\frac{\frac{d(t_i(1-\alpha_i)m_i)}{d\alpha_i}\alpha_i - (t_i(1-\alpha_i)m_i + T)}{\alpha_i^2} + \bar{k} \frac{d\rho}{d\alpha_i} \right) + \\
&\quad \left(-\frac{1}{1-\alpha_{i0}} \right) (f(m_i) - m_i f'(m_i) + \rho \bar{m}) + \\
&\quad \left. \left(\frac{1-\alpha_i}{1-\alpha_{i0}} \right) \left(f''(m_i)m_i \frac{dm_i}{d\alpha_i} + \bar{m} \frac{d\rho}{d\alpha_i} \right) + g'(\alpha_i) = 0 \right.
\end{aligned}
\tag{17}
$$

where T are the centrally governed taxes and transfers to the states (exogenous tax on the immobile factor, indirect taxation, grants and other fiscal equalization payments).

Initially, the states do not need to consolidate their budgets and may be involved in fiscal expansion. Employment in the public sector is endogenous to the optimization program of each state: if public employees are more likely to vote for the government party, political rents will be created, since without fiscal competition, this comes at a lower cost, i.e., it

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is not fully internalized. Without tax competition, as stated in Section 2, states finance themselves mostly through transfers and shared revenues, and higher expenditure is not associated with higher tax rates at the regional level. This does not necessarily imply that state administration will reach an efficient level after tax competition is allowed, but rather that in an equilibrium with tax competition, the equilibrium level of public employment will be lower than in the state of autarky, whereas in both cases political rents are actually created. Yet, with tax competition, the creation of political rents by "over-staffing" is more costly, so that the chosen level is closer to the welfare optimum.

Once competition for the mobile tax base is allowed, the states need to balance out the political gains from the rents to the public sector and from lowering tax rates to the general population. As shown in Equation 15, states maximize popular support by striking a balance between lower taxation and high public employment. Tax autonomy with respect to the mobile base forces regional governments to consolidate the budgets, and lower the production of public goods.

Social welfare is defined as:

$$SWF_i = \alpha_i c_{gi} + (1 - \alpha_i)c_{pi} + g(\alpha_i), \tag{18}$$

where α_i is the fraction of workers employed in the public sector, c_g and c_p are the disposable incomes of public and private workers respectively and $g(\alpha_i)$ is the provision of public goods. The provision of public goods takes as its input employment in the public sector; that is, the social welfare function considers the possibility of the underprovision of public goods due to tax competition. This social welfare function considers both private income and access to public goods in the evaluation of the welfare effect. Given that private consumption increases and the provision of public goods decreases with lower taxation, the overall effect of the change is not *a priori* clear.

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Outcome variables, the levels of which will be reported, are the α_i parameter measuring public employment, c_{pi} and c_{gi}, which are the consumption levels of private and public employees respectively, the provision of public goods $g(\alpha_i)$, gross regional product y, and the level of social welfare SWF_i.

4. Data, calibration and implementation

The mechanism at work in the simulation model is the role of the public sector lobby, such as trade unions, in the government's policy making. The mechanism is inspired by two observations. Firstly, Visser (2006) observes that public sector workers in the OECD area are much better organized than workers in the private sector, as reflected by the higher degree of unionization for the former group (Eggert and Sørensen, 2008). For the case of Austria, the dataset of Visser (2015) reports that the union density rate for the public sector is 51.6% and for the private sector 21.8%, which confirms this observation. Secondly, there is evidence that public sector workers are better paid than similarly-qualified private sector employees. In Austria, the average wage of a public servant is higher than the average wage of a white-collar employee (compare e.g. de Castro et al., 2013). Additionally, Falch and Strøm (2005) find evidence that indicators of the political strength of public sector employees have a positive impact on public sector wage rates. The above observations indicate that the strength of the public servants' lobby may have an impact on wage levels and employment in the public sector.

In Austria in 2010, the wage differential between public sector and private sector workers was reported as being 23.3% (de Castro et al., 2013). Part of this difference can be attributed to unobservable characteristics, e.g., differences in the distribution of educational attainment, gender, types of positions, etc. de Castro et al. (2013) report, however, that whereas a large part of this difference can be explained, around 26% of the wage differential cannot be explained by any external factors (6.1 percentage points). In some cases, the

wage differential is much higher than the reported average. While managerial and clerical positions in the public sector are lower paid than in the private sector, for plant and elementary activities the difference is high and significant (e.g., 35.3% for the case of plant workers). Significantly higher wages in the public sector can also be observed for the case of older workers.

The main mechanism of the expansion of public expenditure operates through the organized lobby in the public sector. As shown above, the degree of unionization in the public sector is much higher than in the other sectors of the economy, and public sector workers tend to support the government-forming parties more than other groups of workers. These mechanisms create a "political distortion": government parties have an incentive to cater to the economic interests of the member of the lobby (in this case, the trade union) rather than of the other workers, since this is expected to increase the overall number of votes. This "political distortion" can be calculated as

$$\phi \equiv \alpha_{i0} \left(\frac{p_i - p_o}{p_o} \right), \tag{19}$$

where α_{i0} is the size of the insider lobby, that is, the ratio of civil servants to the overall employment in each state, p_i is the probability that the lobby member votes for the government party, and p_o is the overall probability of voting for the government party across the population. The more ϕ exceeds zero, the greater the political influence of the public sector workers relative to that of other voters. It is intuitive that the size of the political distortion increases with an increase in size of the public sector lobby and with the difference between the probability of support between the members of the lobby and the rest of the population.

We consider two types of public employees: civil servants (German: *"Beamten"*) and contracted workers (German: *"Vertragbedienste"*). The current size of public employment

is the sum of both types of employment. We calibrate the model to the actual numbers of civil servants and contracted workers in each state (data source: Austrian stability pact reports, see Popp (2015)[7]) to account for the groups of public employees considered in the theoretical model: the insiders and the outsiders. We assume that the ratio of public servants to the general employment is the bottom–line employment level of the insiders' lobby, and the choice of additional public jobs is the variable of choice for the state governments. We test the sensitivity of our results to the assumption of the size and strength of the insiders' lobby.

The model assumes that only contracted workers can be dismissed, while the civil servants constitute the minimum possible employment levels.[8] Therefore, the political distortion in each state depends not only on the probability of voting for the government parties by the public sector workers, but also on the size of the "insiders" lobby: the higher it is in the overall public employment, the lower will be the effect of tax autonomy on overall public employment.

We use data on nine Austrian states with respect to population, gross regional product, regional taxation, profit shares, transfers and expenditure levels obtained from the Austrian Statistical Office. Other parameters of the model are calibrated to the observables. Mobile factor renumeration is assumed to exceed the private sector wage by 20%, that is, $m_i f_i' = 1.2 w_i$, which implies that the factor income share of the mobile factor is around 55%. We assume a quadratic production function of the form

$$f_i(m_i) = a_i m_i - \frac{b}{2} m_i^2 + d_i. \tag{20}$$

Using estimated values of the elasticity of the mobile basis for Vienna, we find the parameters a_i, b and d_i replicate the data on f_i; that is, the regional product and the factor return f_i'. Thus

$$b = \frac{(1 - \sigma s_i) f_i'}{m_i \varepsilon},$$

where σ is the share of capital inland (against abroad) and s_i is the population size in region i. Other parameters replicate the data on GDP per capita:

$$a_i = f_i' + b k_i, \qquad d_i = f_i - a_i m_i + \frac{b}{2} m_i^2.$$

The production of public goods follows

$$G(\alpha_i) = g \frac{\alpha_i^{1 - 1/\theta}}{1 - 1/\theta}, \tag{21}$$

i.e., a CRRA-type function. Thus, similarly to production in the private sector, it observes positive but decreasing marginal returns on employment, which is a standard assumption in the tax-competition literature. Empirically, major services provided at the state level are typically subject to decreasing returns of scale; see, e.g., Wilson and Carey (2004) for healthcare and Andrews et al. (2002) for educational services. An assumption of, e.g., constant returns to scale would change the results quantitatively, and would imply larger decreases in the production of public goods as a result of the decrease in employment.

Given the value of elasticity ε, and observing data on regional GDP y, local expenditure r^s and central government expenditure r^c, we can calibrate $\delta = r^s / (y - r^c)$ and $\theta = \frac{\varepsilon - \delta}{1 - \delta}$. Political variables are calibrated using election results and the size of the public sector. The parameter p_o is assumed to equal the probability of voting for one of the coalition parties in the general population, and p_i is the same probability as the election of the trade union representatives of the public sector workers (see Die Presse, 2014); these are

$p_o = 0.53$ and $p_i = 0.79$, respectively. The parameter α_{i0} is assumed to equal the ratio of trade union members in the public sector to the overall employment. In 2014, there were 231,000 trade union members in the public sector and overall public sector employment was 574,000. These values imply a fairly small "political distortion" parameter (compare with Eggert and Sørensen (2008), who postulate a higher value of $\phi = 0.12$)

$$\phi \equiv \alpha_i \left(\frac{p_i - p_o}{p_o} \right) = 0.061$$

All calculations were implemented in the R programming language. Since the first order conditions in our non-symmetric case do not have closed–form solutions, the results were found using numerical optimization implemented using the R-package *multiroot*, which uses the Newton-Raphson method.

The data used for calibration is summarized in Table 1. Employment data is taken from Popp (2015), while gross regional products and population are taken from the Austrian Statistical Office for the year 2014. The figures correspond to employees financed from the states' budgets, including outsourced companies (according to ESA 2010). Please note that for the state of Vienna the overall employment also includes persons employed in the *"Magistrat"* (29,478 persons). Some of these persons work at the lower administrative level, i.e., the Viennese districts, yet are financed from the state budget. This does not include the 48,899 public employees at the federal level (e.g., employees of diverse ministries), who work in Vienna but are financed from the federal budget.

Table 1: Summary statistics for the input data

State	Total employment (persons)	Public employees (persons)	Public employees (% of tot. emp.)	Civil servants (lobby) (persons)	Civil servants (lobby) (% of tot. emp.)	GRP (billion €)	GRP per capita (thousand €)
Burgenland	133,700	5,582	4.2%	1,536	1.1%	7.48	25.95
Kärnten	256,800	14,543	5.7%	4,113	1.6%	17.76	31.68
Niederösterreich	790,500	45,644	5.8%	7,413	0.9%	50.50	30.85
Oberösterreich	727,700	29,057	4.0%	11,502	1.6%	54.81	38.13
Salzburg	268,200	11,423	4.3%	4,223	1.6%	23.96	44.49
Steiermark	583,600	29,408	5.0%	7,324	1.3%	41.61	34.06
Tirol	369,000	16,486	4.5%	5,068	1.4%	28.76	39.46
Vorarlberg	191,000	8,372	4.4%	2,089	1.1%	14.89	39.33
Vienna	792,300	76,710	9.7%	33,312	4.2%	82.83	46.09
Total	4,112,800	237,225	5.8%	87,191	1.6%	322.51	37.57

In the next section, we present the results of simulations in which we consider two cases:

- The decentralization of income taxation, in the form of a surcharge on the federal tax.

- An explicit fiscal equalization scheme which changes the current system of implicit equalization to explicit transfers, aiming at reducing the fiscal gap between the states (a system which is similar to the Swiss fiscal equalization scheme).

The first scenario involves a change in the shared-revenue system, which as described in Section 2 allocates about 20% of the tax revenue to the states. Instead of participation in the shared revenue, the uniform nationwide tax rate would be reduced by 20% (e.g., by 5 percentage points in the case of corporate taxation), while the remainder would be assigned to the state in the form of a surcharge. Such a surcharge could be implemented over the income taxation of individuals or corporate taxation. Without tax competition, this change would not change the tax burden within the states; the introduction of tax competition will lead to changes in the surcharge-tax rates in each state.

Figure 1 presents the corporate taxation rates in each state which would result from tax competition, that is, 20 percentage points of unitary tax on the centrally governed tax base, and surcharges which vary by state.[9]

We can see that for the case of variable corporate taxation rates, the strongest reduction would occur in Burgenland, where the rate is 21.62%, and Vorarlberg, where it is 22%. On the other hand, Viennas corporate tax rate would barely change. However, the tax bases will also change in each state. In order to show the effects of tax competition, we assume that the income and profit tax rates are flat, with a 20 percent federal tax rate and a markup by the states according to Figure 1; we compare this to current receipts

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[9]Alternatively, surcharges on income taxation could be visualized. However, since income taxation is progressive, this would require additional assumptions regarding authority over setting the progressivity of the system, as well as the exact shape of the income distribution.

Figure 1: Tax rates on corporate profits resulting from tax competition
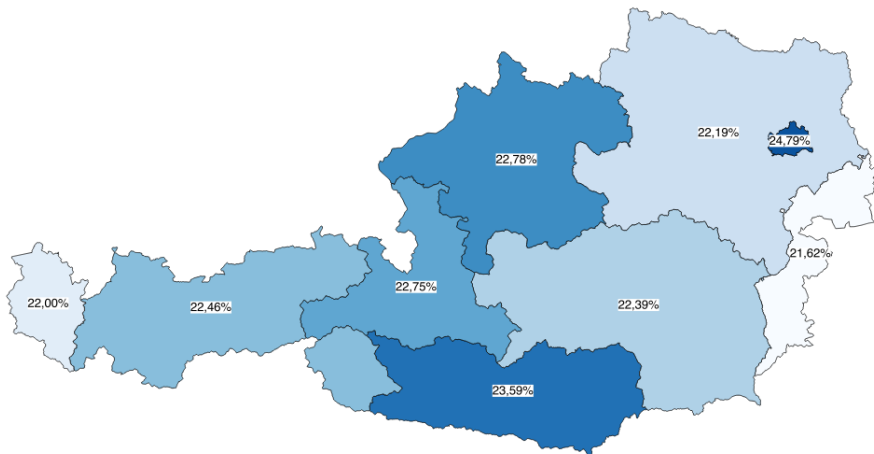
from the shared revenue of direct taxes (shared revenue from indirect taxation remains unchanged).[10]

Our model shows that due to tax competition, Burgenland, Kärnten, Steiermark and Tirol in particular would lose fairly high revenues from direct taxes, although the tax base will generally increase. These states will lower public employment the most, as we will show later. The tax revenue loss is between -30% in Burgenland and -7% in Salzburg and Vorarlberg. Only in Vienna tax revenue would increase by 26%, as indicated in table 2.

The second scenario additionally converts the implicit fiscal equalization into an explicit one, based on a reduction in the differences between the fiscal capacities in each state. We analyze a scenario in which the gap between the fiscal capacities between the states, as measured in terms of the difference between the gross regional products, will be explicitly reduced by 6 percentage points by means of horizontal fiscal equalization.

We present the effects of tax competition on the following parameters of the model:

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[10]This is a simplifying assumption for the case of income taxation, since we are not able to determine the changes in the structure of earnings. It is accurate for corporate taxation, however, as this is subject to a flat rate.

Table 2: Income and profit tax revenue in millions

	Shared income and profit tax revenue	Income and profit tax revenue (tax competition)	Loss of revenue	Loss (in percent)
Burgenland	230	160	-69	-30%
Kärnten	455	355	-99	-22%
Niederösterreich	1291	1140	-151	-12%
Oberösterreich	1133	973	-160	-14%
Salzburg	441	411	-30	-7%
Steiermark	971	715	-256	-26%
Tirol	584	461	-123	-21%
Vorarlberg	310	288	-21	-7%
Wien	1425	1790	365	26%
Total	6839	6294	-545	-8%

- the fraction of the workforce employed in the public sector;

- the disposable income of public and private employees;

- the level of social welfare.

We analyze the overall effects of tax autonomy for two different scenarios:

- **Basic scenario:** This scenario is based on the assumption that support for the government among public sector employees is the same as support for the governmental parties in the 2014 election for the representatives of the public sector trade union, and is equal to 79%.[11] This assumption determines the size of the outcomes. Such an assumption does not necessarily correspond to the parliamentary election choices of public sector workers, which might be different from the choices made at the trade union representatives' election.[12]

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[11]This is in comparison to 53% for the general population.

[12]Unfortunately, there is no reliable data on the parliamentary election choices of different employment groups. We therefore analyze the sensitivity of the results to the assumptions about the strength of the political distortion.

- **Low-political impact scenario:** This scenario assumes that support for the government among public sector workers is 60% and is thus only slightly higher than in the general population. In the Appendix, we also present a full sensitivity analysis for all possible values of the political distortion factor.

We show the overall results for Austria as well as the effects for all nine federal states.

## 5. Empirical findings assuming unchanged wages in the public sector

In this part, we analyze the effects of tax autonomy on public employment, assuming that the policy maker wants to keep public sector wages constant in spite of tax competition (more precisely, the difference between public and private wages is kept unchanged) whereas the levels of public employment are required to be adjusted to the new budget constraints.

5.1. Basic scenario

The overall effects of tax autonomy for Austria can be seen in Figure 2. We can see a decrease in public employment of almost 24 percent, which also reduces the production of public goods. For the case of tax autonomy, the reduction in public employment would be slightly higher (24.06%) than the results of a fiscal equalization reform (23.87%). This negative effect on welfare is compensated for by higher wages (2.74%) and a higher disposable income (2.89%) in both reform schemes. This leads to an overall increase in welfare of 0.84% for the case of tax autonomy and 0.89% in the case of an explicit fiscal equalization scenario.

The positive effect on welfare of an increase in wages and disposable income would overcompensate for the negative effect of decreasing employment in the public sector, leading to an overall increase in welfare for Austria, regardless of which fiscal autonomy scenario is implemented. Part of this increase in welfare is associated with a lower tax rate, which in turn positively affects disposable income; a further part is associated with

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Figure 2: Results for Austria - basic scenario
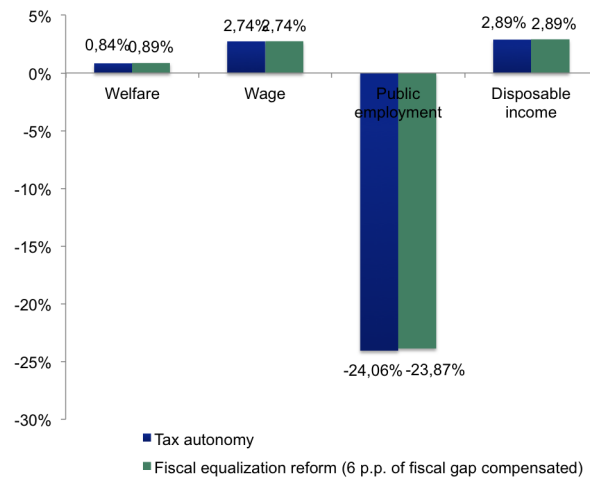
an increase in wages in the private sector, as predicted by Equation 5 and visualized in Figure 3.

Figure 3: Change in private wages as a result of tax competition
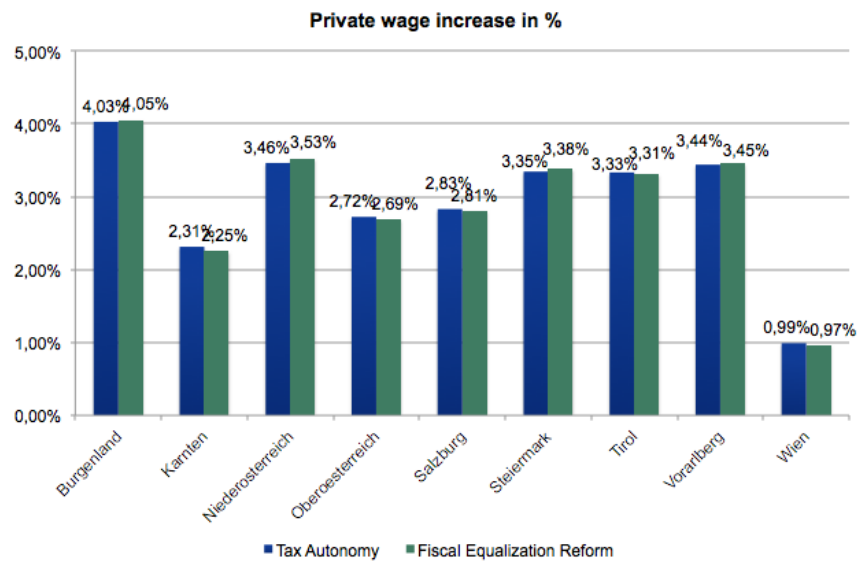
In the next step, we show the results for the federal states. In Table 3,[13] we present the initial levels of public employment (as a percentage of the working population of each

[13]Figures in the first column are based on the states' reports on public employment (including outsourced services - *"Ausgliederungen"*) required by the Austrian Stability Pact.

Table 3: Public employment in the states - as percentages of working population of each state

State	Employment	Tax autonomy	Fiscal Eq.
Burgenland	4.18%	3.18%	3.40%
Kärnten	5.66%	4.71%	4.29%
Niederösterreich	5.77%	4.30%	4.68%
Oberösterreich	3.99%	3.01%	2.87%
Salzburg	4.26%	3.05%	2.85%
Steiermark	5.04%	3.69%	3.93%
Tirol	4.47%	3.20%	3.07%
Vorarlberg	4.38%	3.01%	3.17%
Vienna	9.68%	7.92%	7.70%

state) and the public employment levels resulting from the basic scenario simulations.

The results presented in Table 3 suggest that when states need to compete for the mobile tax base, public employment will be significantly reduced. Of the overall 237,225 outsider employees, about 55,000 would have to switch to employment in the private sector. The strength of this reduction varies from state to state, and reflects both the differences in the size of the insider group in each state and the financial strength which allows states with higher access to resources to reduce taxation by less than the "poorer" states.

Figures 4, 5, and 6 present the changes in public employment, welfare and disposable income, respectively. In each case, the blue bars correspond to the basic tax autonomy scenario, and the green ones to the simulation of a change in the fiscal equalization scheme. The change in the disposable income is calculated as a weighted average of the public and the private sector workers, weighted by the employment of each group.

As presented in Figure 4, a stronger change in public employment is expected in the states of Vorarlberg, Salzburg, Steiermark and Niederösterreich. This arises for two reasons: firstly, these states have only a relatively small fraction of the public servants in the overall total. Secondly, these are the states in which we expect a strong reaction of the tax rates to tax competition. On the other hand, due to a large public lobby, the percentage

Figure 4: Change in public employment

Change in public employment - basic scenario

■ Tax autonomy ■ Fiscal equalization reform (6 p.p. of fiscal gap compensated)
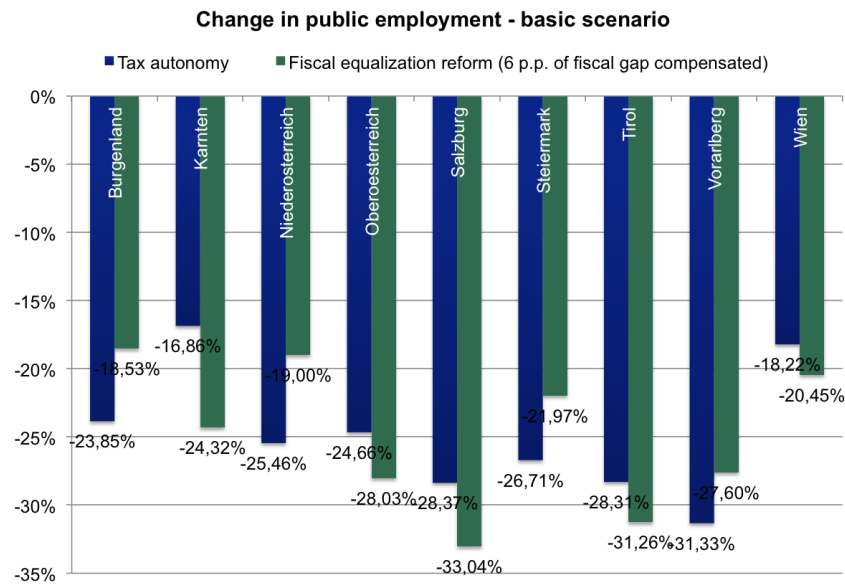
change in employment is expected to be lower than average in the cases of Vienna and Kärnten. In absolute terms, however, the change in employment is highest for the case of Vienna, equalling about 14,000 jobs.
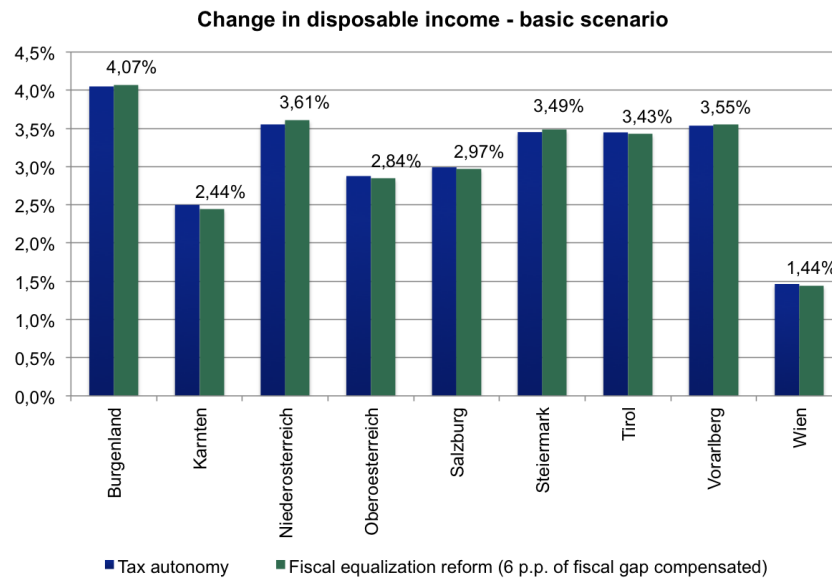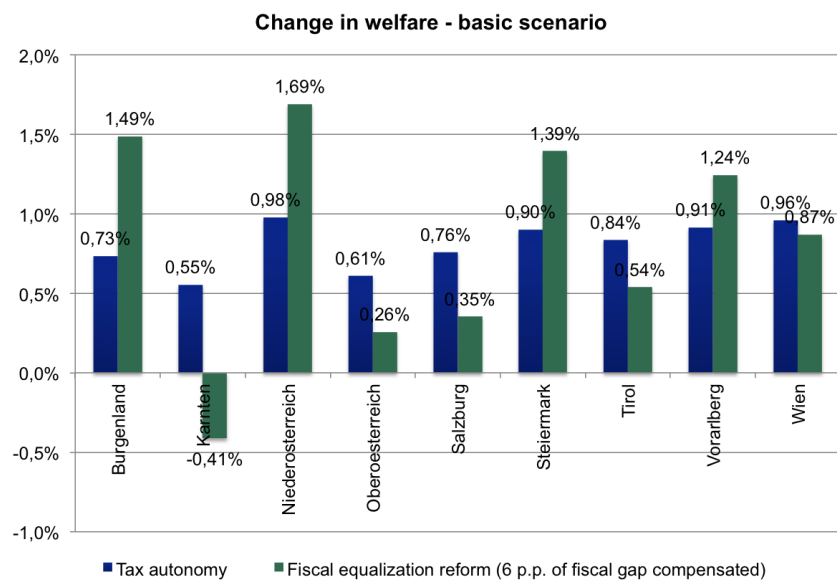
Figure 5: Change in disposable income

Change in disposable income - basic scenario

■ Tax autonomy ■ Fiscal equalization reform (6 p.p. of fiscal gap compensated)

Figure 5 presents the changes in the disposable income of the workers in each state.

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Tax competition affects disposable income in two ways: on the one hand, it affects wages, both in the private and the public sectors. On the other hand, it affects income tax rates. Therefore, as a result of increasing wages and decreasing tax rates, the level of disposable income is expected to rise in all states. The highest increase in disposable income is expected in Burgenland and Niederösterreich, whereas in Vienna the change is moderate.

Figure 6: Change in welfare

Change in welfare - basic scenario

■ Tax autonomy   ■ Fiscal equalization reform (6 p.p. of fiscal gap compensated)

Finally, Figure 6 shows the development of welfare in each state. As a result of tax competition, disposable income increases; however, at the same time, public employment and thus the provision of public services decreases. The overall change in welfare reflects both effects. In almost all cases the overall welfare rises: the positive change in disposable income for both private and public employees more than offsets the negative change in the provision of public goods. The only case in which a negative change in welfare is expected is Kärnten. In this case, the reduction in tax rate and the following negative change in the provision of public goods is not equalized by a sufficient increase in the level of disposable income. This occurs as a result of a comparatively worse endowment of resources in Kärnten combined with a high number of workers, which in our model cannot

be dismissed, that is, the fraction of public servants in overall public employment. These two effects result in an insufficient decrease in the tax rate, given that the provision of public goods decreases, and the overall effect on welfare turns negative.
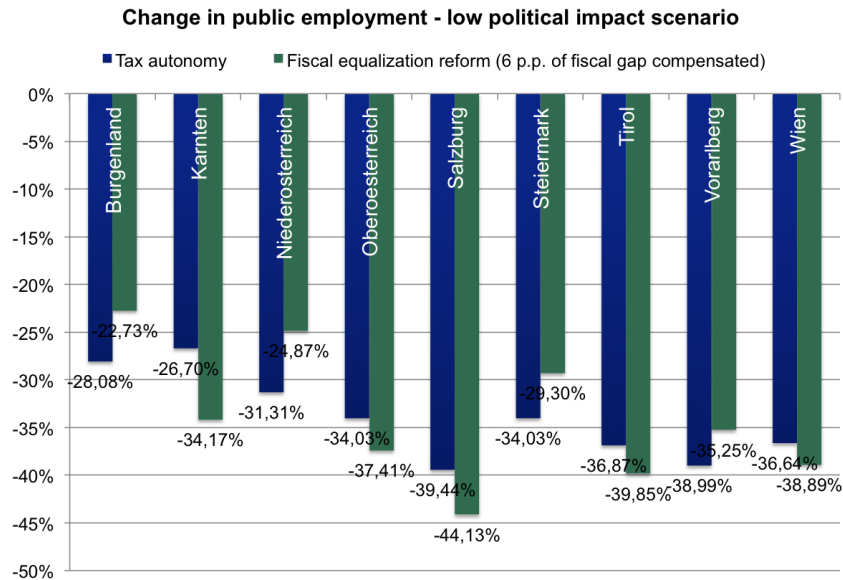
5.2. Low political impact scenario

The overall effects for Austria in the case of low political impact are summarized in Figure 7. We can see that given a lower political strength of the trade unions, employment in the public sector would decrease by more than 34.18% in the case of tax autonomy and by 34.00% in the case of fiscal equalization, which is around 10 percentage points more than in the basic scenario. On the other hand, wages increase by 3.47% in both cases, which also leads to an increase of the average disposable income of more than 4.02%.

Figure 7: Results for Austria low-impact scenario
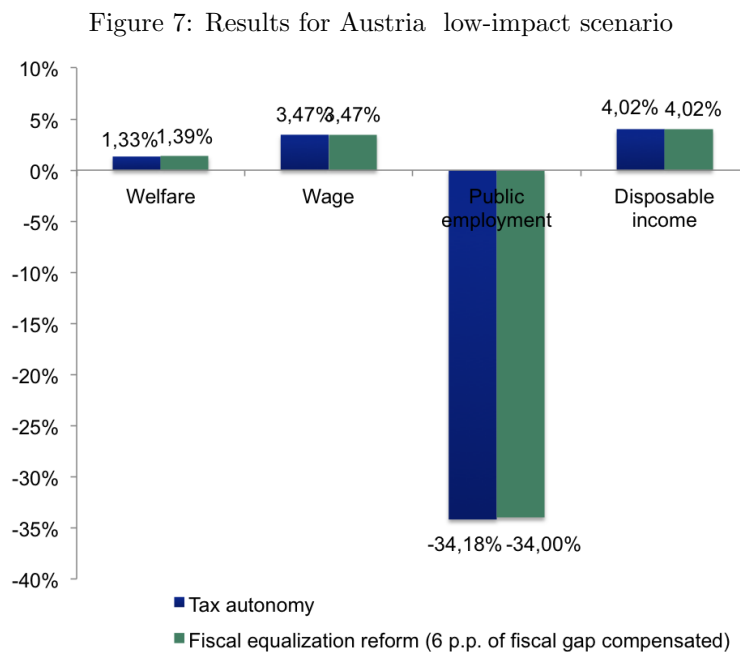
Tax autonomy results in an overall increase in welfare of 1.33%, and fiscal equalization reform results in a welfare effect of 1.39%; this indicates that the overall welfare in Austria would increase more if the strength of the trade unions of public employees was lower.

In the next step, we take a close look at the effects of fiscal autonomy at state level. The absolute change in the public employment is higher than in the basic scenario, and the overall reduction in public employment would be approximately 81,000 jobs. This is due to the fact that political distortion acts as an inhibitor to the lowering of tax rates and the available budget. Lower political distortion means that the political gain from offering public sector positions is lower than the political gain from lowering taxation and offering a higher disposable income to the general population. Therefore, under tax competition, public employment will react more strongly than in the basic case.

Figure 8: Change in public employment low-impact scenario

Change in public employment - low political impact scenario

■ Tax autonomy   ■ Fiscal equalization reform (6 p.p. of fiscal gap compensated)

As Figures 8, 9 and 10 show, all outcomes of the model react more strongly than in the basic scenario. Due to the comparatively lower tax rates, disposable income increases more than in the basic case. In most cases, the overall change in welfare is comparable between the two scenarios: a lower provision of public services is more than compensated for by a higher disposable income. In the case of Vienna, however, we can see that political distortion has a particularly strong impact on welfare. In the basic scenario, the overall change of welfare was around 1%, whereas in the low political impact scenario the change

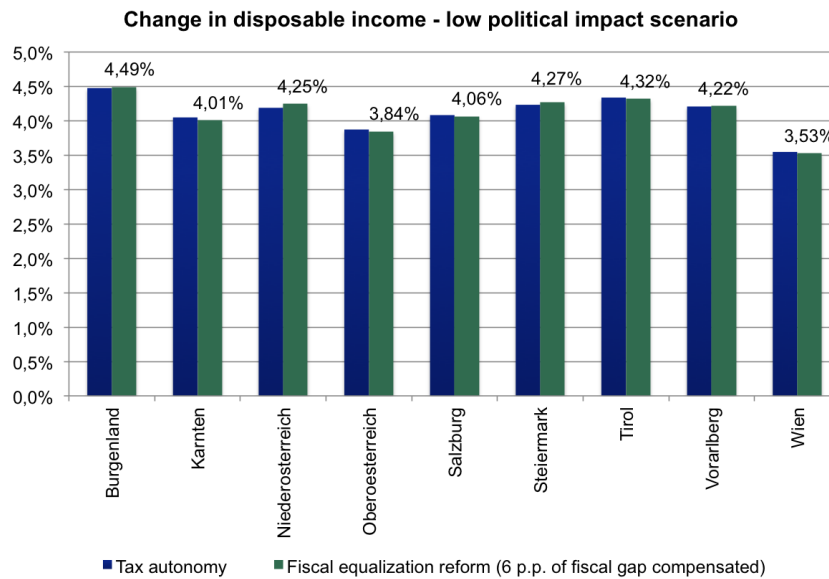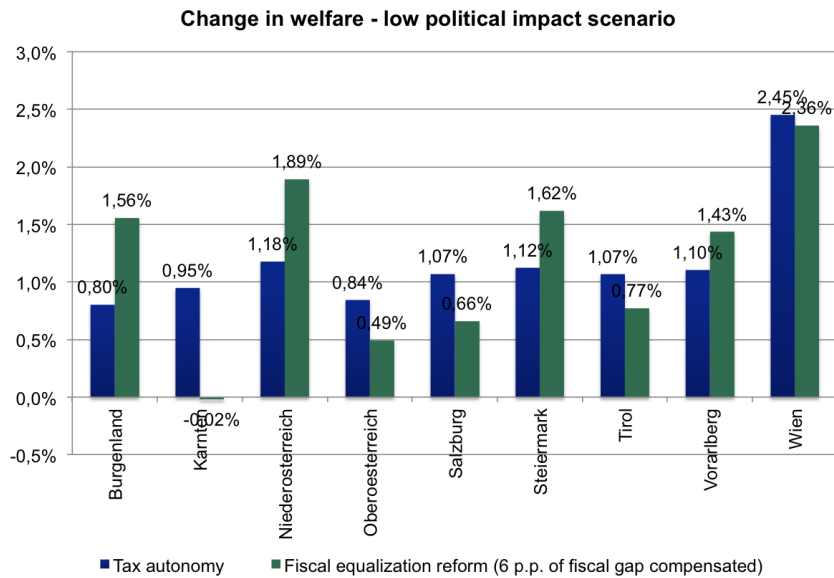Figure 9: Change in disposable income low-impact scenario

Change in disposable income - low political impact scenario

Figure 10: Change in welfare low-impact scenario

Change in welfare - low political impact scenario

was more than twice as high, at 2.5%. This result suggests that in the case of Vienna, employment in the public sector is more strongly driven by political considerations than in the other states. Also, in the case of Kärnten, the overall welfare effect in the low-impact scenario is now zero, compared to the negative effect predicted by the baseline case. Given

the lower political distortion in this scenario, the reaction of the tax rates now is sufficient to outweigh the negative effect of the lower provision of public goods.

6. Empirical findings assuming changes in public wages

In this section, we analyze the effects of tax competition on wage levels in the public sector; that is, we analyze an alternative scenario in which the policy maker in each state aims to keep the public employment constant but needs to adjust the level of public wages, so that the new budget constraint is satisfied with lower taxation. For each state, we can therefore find a new level of public wages for which the employment can be held constant. We also compare the welfare outcomes of the two policies.

6.1. Basic scenario

Figure 11 presents the relationship between public wages and public employment (average over states weighted with population shares) under tax autonomy[14]. We can see that on average, public wages would need to go down by around 24%, that is, to be equalized to the level in the private sector, in order to keep public employment at its current level. Alternatively, any mixture of a decrease in public wages and a decrease in public employment, as represented by the blue line, is feasible for the new budget constraints of the states.

Figure 12 presents the results for each federal state separately. The columns represent the percentage of the initial public wage that the new wage would have to reach in order for each state to keep their employment levels constant. The differences between the tax autonomy and the reformed fiscal equalization stem from the financing streams between the states; the states which would be net beneficiaries under the new scheme (e.g., Steiermark) could keep wages slightly higher compared to the tax autonomy scenario.

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[14]The average under fiscal equalization does not change compared to the tax autonomy, since the explicit fiscal transfers simply redistribute the public means between the states.

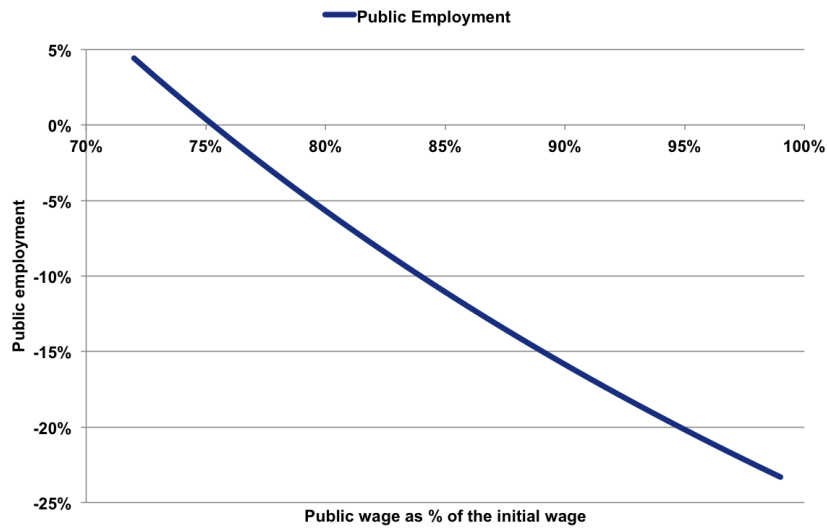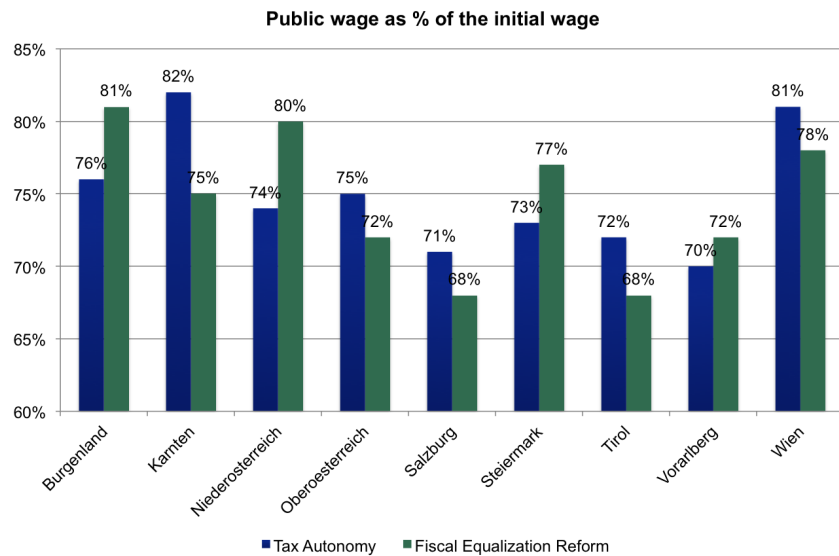Figure 11: Relationship between public employment and public wages

Figure 12: Public wage levels necessary to keep public employment constant, by state

Nevertheless, there is a significant decrease in all federal states of more than 20%. The largest reductions in wages would be necessary in Salzburg, Tirol and Vorarlberg.

6.2. Low political impact scenario

Figure 13 presents the relationship between public wages and public employment in the low political impact scenario. We can see that constant employment in the public sector

can only be guaranteed if the level of public wages is decreased by an average of 35%, that is, *below* the average level in the private sector. In other words, equalizing the wages in the public sector to private sector levels (a decrease of 23%) would still require a reduction in public employment of around 10% to satisfy the new budget constraints of the government.

Figure 13: Relationship between public employment and public wages - low political impact scenario
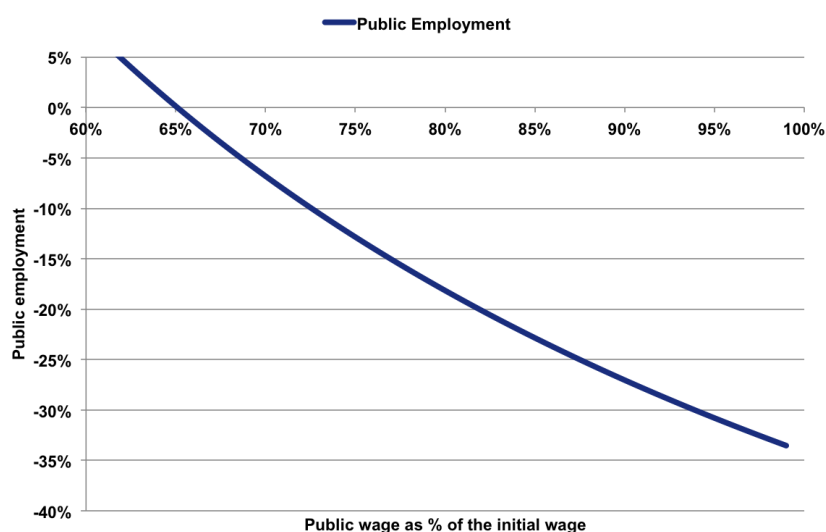
As shown in Figure 14, the results for the federal states in the low political impact scenario prescribe higher wage reductions, which are necessary to keep employment levels constant. Again, there are several states that would be better off in the case of tax autonomy compared to fiscal equalization reform. For Kärnten, Oberösterreich, Tirol and Vienna, tax autonomy would result in less pronounced decreases in public wages to keep public employment constant, while in Burgenland, Niedeösterreich, Steiermark and Vorarlberg, the necessary reductions in wages would be lower if fiscal equalization reform was chosen. For Salzburg, both cases lead to the same reduction.

In the low political impact scenario, Salzburg, Tirol and Vorarlberg would be the federal states required to reduce public wages the most, in order to keep the employment constant. The only exception in the case of low political impact is Vienna. Compared to the basic

Figure 14: Public wage levels necessary to keep public employment constant, by state - low political impact scenario

Public wage as % of the initial wage

■ Tax Autonomy   ■ Fiscal Equalization Reform
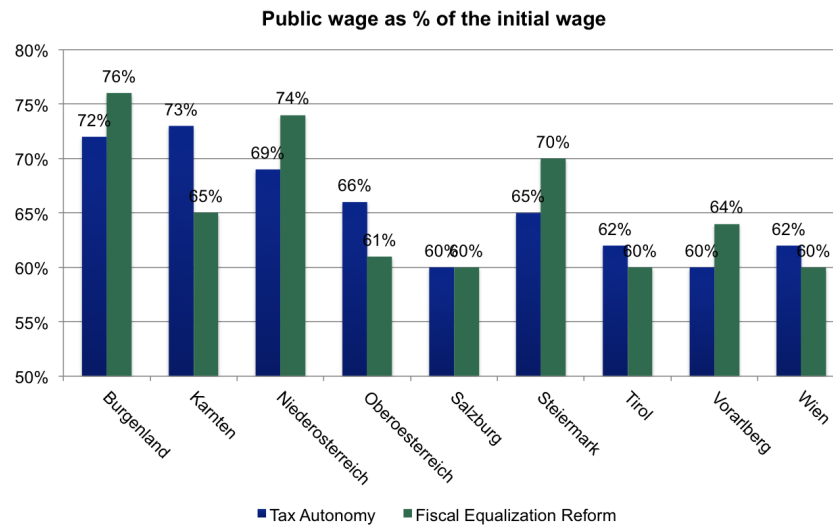
scenario, Vienna is the federal state that is most affected by the political impact. If the political distortion was lower, Vienna would be able to decrease public wages by far more in order to keep employment constant, compared to the basic model.

7. Welfare comparison: reduction in public employment vs. reduction in public wages

Figure 15 presents the relationship between the reduction in public wages and the average change in welfare. While the reduction in public employment has unambiguously led to an increase in average welfare, the reduction in public wages (while retaining higher levels of public employment) could lead to welfare losses. As shown in Figure 15, negative welfare effects are expected, on average, if the public wage is reduced by more than 20%. This effect results from the loss of disposable income for public sector employees, which is not sufficiently compensated for by lower tax rates and an unchanged level of public goods provision.

Figure 15: Change in average welfare at various levels of public wage reduction
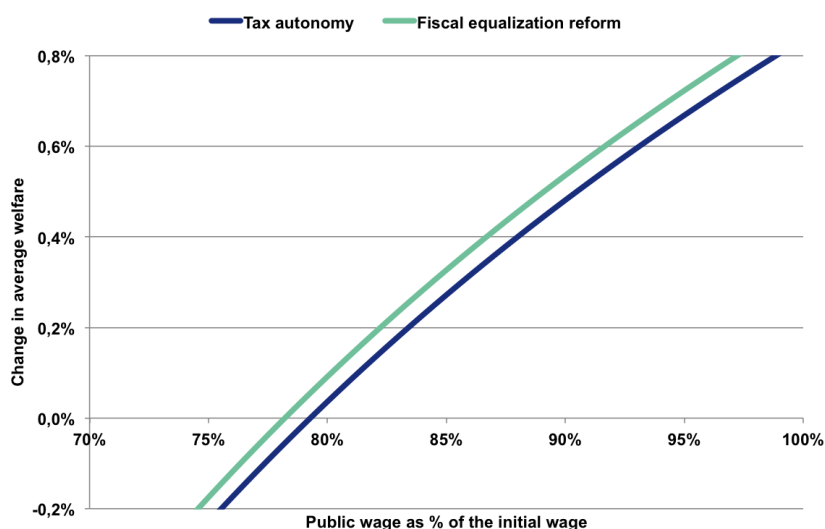

Figures 16 and 17 compare the predicted changes in welfare for the two (extreme) possibilities: a reduction in public employment without any adjustment to wages, or a reduction in public wages without any change in public employment. We can clearly see that the first possibility, that is, a reduction in public employment, is superior in terms of welfare. This relies on the fact that disposable income increases for both groups of workers

due to lower taxation, and that public sector workers in particular profit from constantly high wages and lower taxation. These effects compensate for the lower provision of public goods.

In the case of tax autonomy (see Figure 16, we see that a wage reduction (with constant employment) leads to a decrease in welfare in all federal states except for Burgenland and Vorarlberg, while a reduction in employment (with constant wages) leads to an increase in welfare in all federal states. Comparing both possibilities, we can see that in the case of tax autonomy, a decrease in public employment (with constant public wages) is Pareto superior to a reduction in wages (with constant employment).

Figure 16: Comparison of changes in welfare - tax autonomy
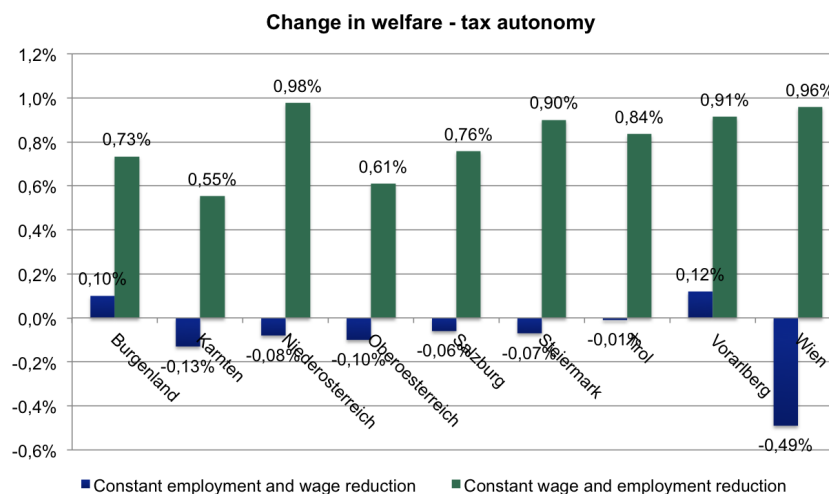
In the case of fiscal equalization reform (see Figure 17, wage reduction (with constant employment) leads to a decrease in welfare for all federal states except for Burgenland, Niederösterreich, Steiermark, Vorarlberg and Vienna, whereas a reduction in employment (with constant wages) leads to an increase in welfare for all federal states except Kärnten. It can therefore be concluded that in the case of fiscal equalization reform, a decrease in public employment (with constant public wages) is Pareto superior to a reduction in wages (with constant employment).

Figure 17: Comparison of changes in welfare - fiscal equalization reform

Change in welfare - fiscal equalization reform

■ Constant employment and wage reduction   ■ Constant wage and employment reduction
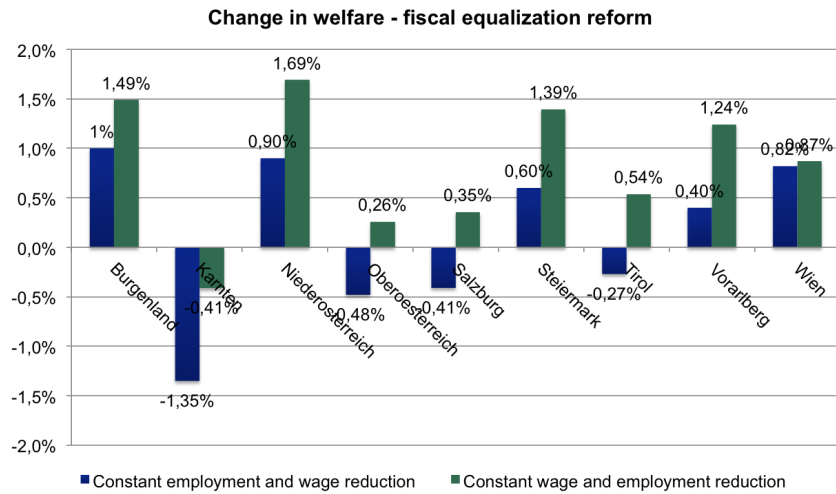
8. Concluding remarks

In this work, we have presented a calibrated model of tax competition and its effects on public employment in Austria. We assume that politicians create rents through higher wages and high employment in the public sector. The introduction of tax competition reduces the rents to the public sector; however, through a simultaneous reduction in public employment, it reduces the provision of public goods and services. Previous research on tax competition suggests that the overall effect on welfare is unclear, and that if tax competition is too strong, a welfare-decreasing underprovision of public goods will develop. However, if tax competition is moderate, that is, the number of competing jurisdictions and/or the elasticity of the tax base is not high, tax autonomy will create welfare.

We calibrate the model to the Austrian data, and show that a substantial decrease in public employment is expected as a result of tax autonomy. Moreover, we show that the expected effect on welfare is moderately positive; that is, a decrease in public rents and public employment, although associated with decreased provision of public goods, is more than offset by the decrease in tax rates and the resulting increase in the disposable income of all groups of workers.

For Austria as a whole, we show that fiscal equalization reform leads to higher welfare than a classical tax autonomy regardless of whether we assume a high or low political impact of the insiders' lobby. This does not, however, hold true for each federal state; in some cases, welfare losses are expected for individual states. We also show that for an assumption of low political impact, the welfare gains from fiscal decentralization in Austria are higher than in the case of high political impact.

In terms of welfare effects, our model additionally predicts that a reduction in public employment while keeping public wages constant provides welfare which is superior to the possibility of a reduction in public wages while keeping public employment constant.

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Appendix

Sensitivity analysis of the model

We demonstrate the sensitivity of our results to the basic assumption of the support from the public sector lobby for the government. We allow this to vary between the value of 53% in the general population, and 80%. Figures 18 and 19 summarize these findings, which present the population-averaged changes in the outcomes of the model in the baseline case of no autonomy for each value of political distortion.

Figure 18: Sensitivity analysis: public employment, public goods, and expenditure on public wages
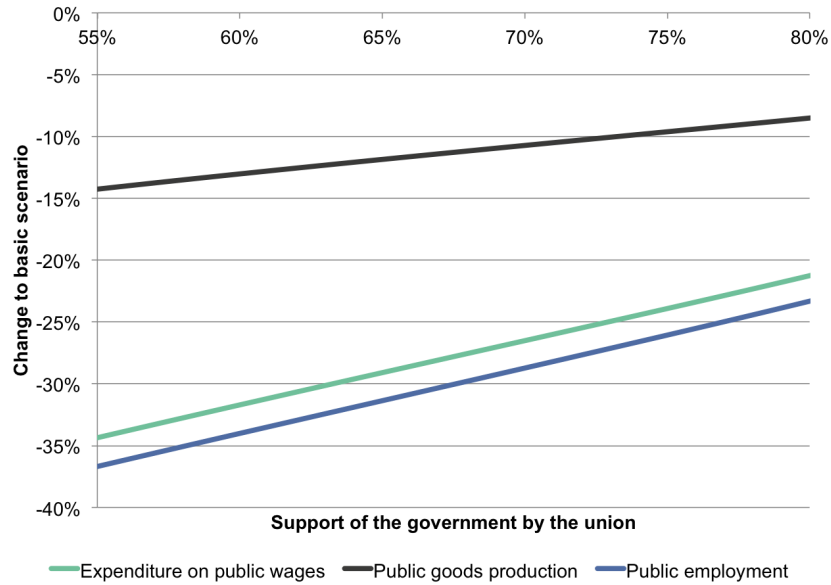
As shown in Figure 18, for any value of political distortion, tax autonomy leads to a decrease in public employment, and consequently in the provision of public services and overall expenditure on public wages. For higher values of political distortion, however, the expected change is lower. For the basic scenario, of p_o=79%, public employment is reduced on average by 24%, expenditure on public wages by 21% and the provision of public goods by 9%. In the opposite case, in which the strength of the public lobby is lower, the changes resulting from tax autonomy are -37%, -35% and -14%, respectively.

Figure 19: Sensitivity analysis: disposable income, and welfare
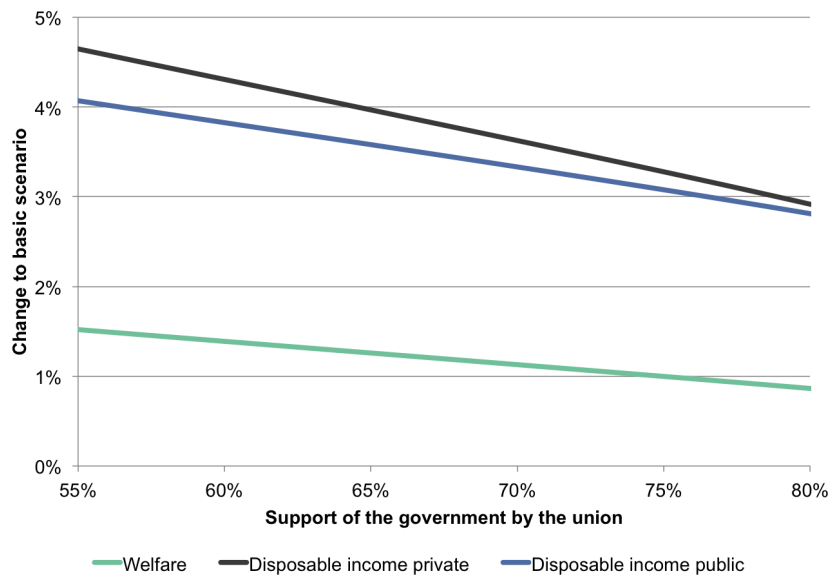
In all cases, tax autonomy is associated with an increase in disposable income, both for public and private employees, and an overall positive change in average welfare. Stronger changes are expected when political distortion is lower. Depending on the value of the political distortion, the change in disposable income varies between +3% and +4.5%, and the change in overall welfare between 0.9% and 1.5%.

Figure 20: Sensitivity analysis: support of the lobby and wage levels necessary to keep employment constant
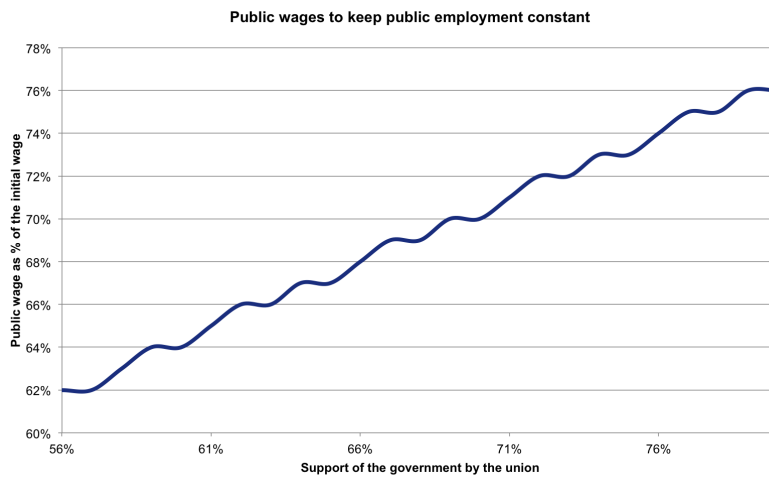
Figure 20 presents the relationship between support for the government from the public sector lobby and the public wage level necessary to keep public employment constant[15]. If the political distortion is low, tax competition will have a stronger impact on tax rates; therefore, the budget constraint would require a higher decrease in public wages, namely to a level of 62% of the current wage, if the state government decides to keep employment levels constant. On the other hand, for high values of political distortion, tax autonomy would force a drop in wages to a level of 75% of the current wage, keeping employment constant. As shown in the previous subsection, all of these changes would be inferior in terms of welfare to the case of a decrease in public employment levels without affecting wages.

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[15]The "jumps" in the progression of the curve stem from rounding up the wage levels to the second decimal place.