Do Government Preferences Matter for Tax Competition?

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Abstract

This paper explores how government preferences affect the choices of capital tax rates in the presence of tax competition. We develop a model in which governments, differentiating in their preferences for economic development and regional equality, compete for mobile capital over corporation taxes. The key prediction of the model, borne out in data from OECD countries over the years 1990-2007, is that countries emphasizing more on economic development tend to choose lower level of corporate income tax rates than the counterparts that stressing more on regional equality. Our result contributes to the tax competition literature by advancing a new element, heterogeneous government preferences, as another potential source of asymmetric tax policy responses that is widely observed across countries.

Keywords: Tax competition; heterogeneous government preferences; asymmetric tax rates
JEL Classifications: H25, R11, R50

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1 Introduction

A critical issue of study in the tax competition literature is how competition among government units for capital influences their choices of tax policy. The standard argument in the literature, which originates in the fundamental work of Wilson (1986) and Zodrow and Mieszkowski (1986), is that competition through taxation leads to inefficiently low tax rates.[1] Although this classic view provides valuable insights into the nature of competition among governments, its symmetric implication for all the units in the economy may hide the potential for intergovernmental conflict and so fail to explain the actual asymmetric policy responses of governments as we observe in some regions of the world. For instance, despite the increasing mobility of capital and competitive pressure on the governments in the European Union, the variation of effective average capital tax rates in the members remains high in the year 2007, ranging from 8.8% in Bulgaria to 35.5% in Germany (Elschner and Vanborren, 2009).[2] Other studies also reveal that, although tax rates on capital have fallen substantially since the early 1980s, some countries have continued to tax at higher rates than others (e.g. Devereux and Griffith, 2003; Baldwin and Krugman, 2004; Zissimos and Wooders, 2008). Given this context, a natural question is to ask how can we explain these cross-country differences in tax policy responses when fundamentally all governments face the same incentives to attract mobile capital through corporation taxes.

An important branch of the current literature focused on explaining this asymmetric outcome of tax competition concentrates mainly on the exogenously given asymmetries between the competing government units, such as country size and government efficiency. In particular, Bucovetsky (1991); Wilson (1991) and Bucovetsky and Haufler (2007) analyze asymmetric tax competition between two countries of different size.[3] They show that the

[1] Numerous subsequent works have extended and refined this argument in a variety of directions; see Wilson (1999), Wilson and Wildasin (2004), and de Mello (2008) for excellent surveys on the tax competition literature. However, Becker and Runkel (2012) show that in the presence of transport cost of trade, the inefficiency of tax competition can be restored.

[2] Most of the countries are distributed around an average of 22.3%.

[3] Kächelein (2014) examines a similar issue but under the context of tax competition among small jurisdictions within the metropolitan areas, where labor is assumed to be a second mobile factor. He shows that

small country tends to set lower tax rates than the large country in equilibrium, since the former has the higher elasticity of capital supply.[4] Dharmapala and Hines (2009) confirm this prediction by providing empirical evidence that most tax havens tend to be small, though they attribute the reason to the quality of governance. From a different angle, Ivanyna (2010) shows that if the governments of the competing countries are different in their efficiency (i.e. one of them is able to produce more public good for the same revenue), then in equilibrium the more efficient government sets the higher tax rate and also has higher public infrastructure investment which reduces the cost of firms. Less efficient governments, in contrast, choose to attract the firms with lower taxes and lower level of public infrastructure.[5]

Another branch of literature argues that the asymmetric policy responses may even be obtained for ex ante symmetric countries as a consequence of increasing returns to scale or agglomeration economies. Papers by Kind et al. (2000); Ludema and Wooton (2000); Baldwin and Krugman (2004) and Bucovetsky (2005) point to the fact that industrial concentration generates "agglomeration rent", which provides industrialized nations an advantage to extract some of these rents through higher taxation. Furthermore, Zissimos and Wooders (2008) show that even without agglomeration economies, variation in the extent to which firms can use public goods to reduce costs yields the asymmetric outcome that the core nations would set a higher tax rate and provide a higher level of public infrastructure than the periphery nations.

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the secondary fiscal externality implied by labor mobility gives rise to the size-related tax differentials.

[4]Country size is measured by the population endowment in these studies. However, this result is shown to be quite consistent with the other measures of country size. For example, Marceau et al. (2010) model the country size as their stocks of immobile capital, and obtain a similar result that only the two smallest countries compete for mobile capital by reducing their tax rates; the rest are content to maximize the revenues obtained from the immobile capital. Haufler and Wooton (1999) also consider competition between two countries of unequal size with trade barriers and conclude that the large country wins the game due to the larger market it possesses.

[5]Cai and Treisman (2005) explain the asymmetric response of expenditure policy across-country by the heterogeneity of initial endowments. They argue that if regions or countries differ markedly in initial endowments, symmetric equilibria of fiscal competition will not exist, and as a matter of fact, only well-endowed regions will engage in competition for capital and end up with more business-friendly expenditure policies. Poorly-endowed units, in anticipating losing the game, will simply give up on competition and turn to less business-friendly expenditure policies. Building on a similar setup, Liu (2013) provides a possible solution to this issue through the use of fiscal equalization schemes.

In this paper we explore a different explanation for the asymmetric outcome of tax competition. The vast majority of current studies assume that all the competing units have exactly the same preferences, in particular, the same utility functions.[6] However, this assumption is unlikely to hold for most real world cases. Relaxing this assumption and giving alternative, empirical plausible assumptions on the heterogeneity of government preferences, this paper seeks to provide another possible explanation for the cross-country differences in the choices of tax policy under the context of tax competition. We argue that, in the presence of heterogeneity in countries' development levels, cultural beliefs, governance regimes and even the viewpoint of politicians, it is likely that governments on behalf of the voters or politicians themselves may pursue different social objectives,[7] even when they face the same incentives for competing capital. For simplicity, we explore the effects of the heterogeneous preferences in a tax competition model where government units only face different tradeoffs between pursuing economic development and regional equality.[8] We show that in equilibrium, governments emphasizing more on economic development tend to choose a lower level of corporate income tax rate than the counterparts stressing more on regional equality. This theoretical prediction is then tested and confirmed by data from OECD countries for the years 1990-2007. The empirical results are also shown to be robust across alternative measures of corporate income tax rates and government preferences, and also

[6]In these studies, the governments involved are assumed symmetrically to act as either benevolent or Leviathan, or some combination of the two. Bucovetsky et al. (1998) consider a federation in which local jurisdictions are identical in every respect, except their inhabitant's tastes for public spending. They show that in the absence of any corrective action by the federal government, the tax rate levied in the high-taste jurisdictions is higher than in the low-taste one. Koethenbuerger (2014) analyzes how homogenous jurisdictions versus heterogeneous jurisdictions in terms of their preferences for attracting different type of households shape their competitive policies for migrants, particularly taxes and transfers policies. However, these are not what we consider in this paper.

[7]For instance, an initial poor country may have relatively more incentives than the rich one to promote economic development rather than reduce income inequality. In a well-known paper, Alesina and Angeletos (2005b) show how a country's social belief of fairness would affect its preference in choosing tax and especially redistribution policy. They claim that: "If a society believes that individual effort determines income, and that all have a right to enjoy the fruits of their effort, it will choose low redistribution and low taxes;... If instead, a society believes that luck, birth, connections, and/or corruption determine wealth, it will levy high taxes."(p.960)

[8]Upon this assumption, we assume that economic development and regional equality are the two main objectives of all the competing units. In a related study, Matsumoto (2008) shows how capital tax competition may lead to inefficient mix of transfer and development policies in the presence of regional income disparity.

across subsample of countries.

The rest of this paper proceeds as follows. Section 2 sets up the basic model. Section 3 develops the empirical methodology and discusses the measurements of our key variables of interest and data sources. Section 4 presents the empirical results. Finally, section 5 concludes.

2 The Model

Consider an economy that is divided into N countries, indexed by i, each of which has a central government. Each country i is composed of two asymmetric regions A and B, denoted by j. It is assumed that each region has an immobile (representative) resident, who owns identical endowments with fixed amounts of immobile factor (e.g., land or labor) $\bar{L}$ and fixed amounts of mobile capital $\bar{K}$.[9] Within each country, the two types of regions are heterogeneous with respect to their development level, and we label them as the "active" region A and the "inactive" region B. The former is assumed to have a relatively higher marginal productivity of capital, because of its higher development level. As a result, production is only conducted in the active region of the country after the location of capital is decided. The inactive region shares the production outcome through the income received from its capital stock and, also from a transfer from the central government. The transfer in turn is financed with a tax on capital. In addition, the countries differ in their exogenous preferences, by which we mean that the central governments care about two objectives—overall economic development and equality in the distribution of resident incomes between the two regions—with different weights. In this setting, the central government chooses the rate of the source-based unit tax t_i levied on mobile capital to influence the allocation of capital across countries. Finally, the transfer policy g_i is introduced in the model to adjust regional incomes and also to balance the budget of the central government.

[9]Capital is assumed to be perfectly mobile across both regions and countries.

The production in country i is given by the function $F_i(K_i, L_i)$,[10] where K_i is the amount of mobile capital and L_i is the amount of a fixed production factor such as labor or land. For analytical convenience the fixed factor is normalized to unity and the production function can be rewritten as $F_i(K_i)$, which is increasing, twice continuously differentiable concave in the level of capital K_i, i.e. $\frac{\partial F_i}{\partial K_i} > 0 > \frac{\partial^2 F_i}{\partial K_i^2}$. More precisely, following Bucovetsky (1991); Grazzini and Van Ypersele (2003); Hindriks et al. (2008); Liu and Martinez-Vazquez (2013), we assume a quadratic specification of the production, which is well behaved over its increasing range and allows us to introduce several simplifications. Specifically, the production function is given by,

$$F_i(K_i) = \alpha K_i - \frac{\beta}{2} K_i^2 \tag{1}$$

where β is the rate of decline of the marginal product of capital with the amount of capital invested in the country; technology parameter α is assumed to be sufficient large relative to β, which ensures a positive level of production and the standard properties of the production function.

Since capital is perfectly mobile across regions and countries, profit maximization implies that the net return of capital in every country must be equalized,

$$\frac{\partial F_i}{\partial K_i} - t_i = \rho, \text{for all} \quad i \tag{2}$$

where ρ is the cross-country economy-wide net return to capital. Since we assume that each country is small relative to the whole economy, then ρ is fixed across countries. With equation (1), we can solve (2) for the capital allocated in country i, to obtain,

$$K_i = \frac{\alpha - t_i - \rho}{\beta} \tag{3}$$

[10] Again, it is noted that production in a country is assumed to be conducted in the active region of the country only.

As indicated, capital flows to country i are determined by the country's tax policy along with other exogenous factors. Once capital is allocated across countries, production takes place in the active region of the each country. Residents in the active regions earn income from both the immobile factor and the capital stock. In the inactive region where production does not occur, residents can earn only capital income through investing their own capital stock in outside markets. Thus, the income gap between the two regions emerges as a result of capital mobility. To reduce regional income disparity, the central government transfers an amount of income g_i to the inactive region. Resident's income in each region of country i is given by,[11]

$$\begin{cases} y_{iA} = F_i(K_i) - (\rho + t_i)K_i + \rho\bar{K} & \text{(Active region)} \\ y_{iB} = \rho\bar{K} + g_i & \text{(Inactive region)} \end{cases} \tag{4}$$

where $F_i(K_i) - (\rho + t_i)K_i$ is the immobile factor income of the residents in active region where production occurs. $\rho\bar{K}$ is the income from local ownership of capital in both active and inactive regions. Due to the concern for fairness, we further assume that even with the transfer policy, residents in the active region have no less income than residents in the inactive region, i.e. $y_{iA} \geqslant y_{iB}$. Under capital-tax financing, the budget constraint of the central government is simply,

$$t_i K_i = g_i \tag{5}$$

To complete the model, we assume the objectives of the central government are to pursue overall economic development, regional equality, or some combination of the two. More specifically, the social welfare function (of the central government) W_i is a function of F_i, the aggregate product in the country, and $|y_{iA} - y_{iB}| = y_{iA} - y_{iB}$, the income disparity between the two regions. In order to capture government's preference for economic development relative to regional equality in a simple way, we assume that W_i takes a linear form,

[11] This setting is similar to that in Matsumoto (2008).

$$W_i = \lambda_i F_i - (y_{iA} - y_{iB}) \tag{6}$$

where the negative sign attached to the second term reflects the central government's avoidance of regional income disparity in the sense that a higher level of regional income inequality reduces the central government's utility; the parameter, $\lambda_i \geqslant 0$, attached to the aggregate outputs F_i, measures the government's preference for economic development relative to regional equality. Thus, the higher the value of λ_i, the more the central government is concerned about economic development vis-à-vis regional equality.

The problem of each central government is to choose its capital tax rate t_i so as to maximize its objective function (6), subject to its budget constraint (5) and the resident's income determination rules specified in (4). The first order conditions (FOCs) gives,

$$\frac{\partial W_i}{\partial t_i} = 2K_i - \frac{t_i}{\beta} - \frac{\lambda_i}{\beta}(\rho + t_i) = 0 \tag{7}$$

Using equations (3) and (7), we can obtain country i's optimal tax rate as a function of its preferences over economic development and regional equality,

$$t_i^* = \frac{-\lambda_i \rho + 2\alpha - 2\rho}{3 + \lambda_i} \tag{8}$$

Equation (8) presents the property that $\frac{\partial t_i^*}{\lambda_i} < 0$, which immediately gives the following result.

Proposition 1 *Countries with a higher preference for economic development in relative to regional equality λ_i tend to select a lower level of capital income tax rate t_i^*.*

The intuition of this result is straightforward and practically meaningful. It clearly indicates that for countries emphasizing more on economic development, selecting a lower rate of capital income tax would be optimal as it increases marginal product of capital and results in attracting more mobile capital for economic development. Equally importantly, this

theoretical exercise conveys a clear message that the asymmetry of government preferences does contribute to a source of generating asymmetric responses of tax policy across countries. In the subsequent sections, we resort to the data from OECD countries for empirical evidence.

3 Empirical Methodology and Data

Our main empirical strategy is to test the theoretical prediction that is explicitly summarized in Proposition 1, using a panel data set of 28 OECD countries over the period 1990-2007. This selection of country sample and observation period is based on the data availability of our main variables of interest including corporate income tax rates and the measurement of government preferences, which is discussed with more details in subsection 3.3.

3.1 Specification

In order to be consistent with the tax competition theory, our empirical model builds on a dynamic spatial lag specification in the most general form that has been widely employed in the previous empirical research on tax competition (e.g. Devereux et al., 2008; Jacobs et al., 2010; Klemm and Van Parys, 2012; Liu and Martinez-Vazquez, 2013).

$$\tau_{it} = a\tau_{it-1} + b\tau_{-it} + \beta_1 P_{it} + \mathbf{X}_{it}\gamma_1 + \eta_i + tt_t + \varepsilon_{it} \tag{9}$$

where the dependent variable τ_{it} is the corporate income tax rate of country i in year t; P_{it} is our measure of government preferences for economic development relative to regional equality of country i in year t; τ_{it-1} is a one period time-lagged dependent variable, which is included to account for the high degree of persistence in tax policies; τ_{-it} denotes the weighted average of all other countries j's corporate income tax rates in year t, i.e. $\tau_{-it} = \sum_{j \neq i} w_{ij}\tau_{jt}$, which is introduced to capture the spatial dependence and so the tax competition pattern underlined by the theory. Following the standard practice of the spatial econometrics literature, we rely on geographic criteria to define the exogenously weights as the inverse of distance between

the countries (d_{ij}) and they are normalized so that the summation of all weights equal to 1, i.e. $w_{ij} = \frac{d_{ij}}{\sum_j d_{ij}}$; η_i is country-specific fixed effects capturing the unobserved heterogeneity across countries that are constant over time, while tt_t is a linear time trend.[12]

As control variables, $\mathbf{X}_{it}$ includes a set of factors that influence tax rate based on existing theoretical and empirical literature. This leads to the inclusion of real GDP per capita, openness, government consumption, unemployment rate, urban population share, proportion of young population, and proportion of old population, election and party affiliation. Real GDP per capita serves as a measure of income; higher incomes are generally related to stronger demand for public services, which may ultimately affect a country's tax policies. Openness, which is calculated as the ratio of total trades (import plus export) to GDP, aims to capture the exposure of a country to trade and competition for capital. Government consumption as a percentage of GDP is included to account for the revenue need of the government. Unemployment rate is used to measure the impact of the business cycle on tax setting behavior of governments. A series of demographic characteristics including urban population share, proportions of young and old population serve to characterize a country's special needs for public policies. Finally, drawing on Devereux et al. (2008) and Foucault et al. (2008), we also include election and party affiliation to capture the potential effects of political factors. Election is a dummy variable for an election year, which takes the value 1 for each presidential election year of the country and 0 otherwise; partisan affiliation is a dummy variable that takes the value 1 if the party of government is to the left of centre and 0 otherwise. Finally, all control variables, excepting the dummy variables, are lagged by one period to avoid any endogeneity bias.

3.2 Estimation

In order to estimate specification (9) unbiasedly and efficiently, two critical endogeneity issues have to be addressed. First, the lagged dependent variable is endogenous since it is

[12]See the subsequent subsection for a discussion on the reason to include time trend instead of time dummies in the specification.

correlated with the country fixed effects in the composite error term ($\eta_i + \varepsilon_{it}$), which yields biased and inconsistent results if OLS or fixed effect estimators are applied (Nickell, 1981). Second, tax policies of the competitors enter contemporaneously, so that the competitors' tax decisions are endogenous and correlated with the error term (ε_{it}). OLS yields a biased estimate of parameter ρ (Anselin, 1988).[13]

To circumvent all these problems, we employ the system GMM estimator developed by Blundell and Bond (1998), that has been used quite often in the recent studies on tax competition with dynamic features (Foucault et al., 2008; Ghinamo et al., 2010; Klemm and Van Parys, 2012). This estimator combines the moment conditions from both the first-differenced equation of the estimating equation and the estimating equation in levels, and then estimates the parameters by GMM.[14] In addition, following the standard spatial econometrics literature (Kelejian and Robinson, 1993; Kelejian and Prucha, 1998), we also use the competitors' weighted government preferences, weighted real GDP per capita, weighted openness, weighted government consumption, weighted unemployment rate, weighted urban population share, weighted proportion of young population, and weighted proportion of old population as extra exogenous instruments for the spatial lag variable (τ_{-it}) in specification (9).[15]

The overall validity of the instruments used in the regressions as well as the serial correlation in the residuals are evaluated by the Sargan test (or overidentifying restriction test) and the Arellano and Bond (1991) test respectively. The former statistic tests the null hypothesis that the instruments are not correlated with the residuals, while the latter tests the presence of auto-correlation in the residuals.[16] Both statistics are necessary to confirm the validity of

[13]This second endogeneity is a typical issue in the spatial econometrics literature. Two conventional approaches for getting consistent estimates of the spatial parameter are suggested in the literature. The first approach is to use instrumental variables (Anselin, 1988). An alternative approach is to rely on the maximum likelihood (See Brueckner, 2003, for more discussion). Although both approaches yield consistent estimate of spatial parameter, the latter method is generally challenging in computation.

[14]In dealing with the endogenous variables, the system GMM estimator uses lagged levels to instrument the endogenous differences and lagged first differences to instrument levels.

[15]The weights are constructed in the same way as the ones we discussed previously.

[16]Given the structure of the first-differences equation in the system GMM estimator, the first order correlation in the residuals is usually expected, but the second order correlation in the residuals should be

the instruments used.

Ideally, one would also include time dummies in the specification to prevent the most likely form of cross-state correlation, contemporaneous correlation. However, it generates two problems in my context. Due to the large amount of instruments created by the system GMM estimator together with the external instruments, adding time dummies may weaken the Sargan test and overfit the endogenous variable (Roodman, 2009a,b). Additionally, Devereux et al. (2008) and Klemm and Van Parys (2012) point out that the inclusion of time dummies in a model with spatial lag variables results in a possible multicollinearity issue among the spatial lag variables and the time dummies,[17] which makes it hard to identify the true impact of each variable. Therefore, following the suggestion by Devereux et al. (2008) and Klemm and Van Parys (2012), we add a linear time trend variable that captures common trend for all states, instead of using time dummies.

3.3 Variables and Data

The data we use in this paper covers 28 OECD countries over the period 1990-2007. In this subsection, we explain our dataset in further detail, with a special focus on the measurements of our dependent variables and government preferences.

To begin with, the corporate income tax rate of country i in year t (τ_{it}) is measured by both the statutory corporate income tax rate (SCIT) and the effective average tax rate (EATR). The former measure, defined as the top statutory tax rate including local profit taxes, is conceptually in line with the tax tool discussed in the standard tax competition models of Zodrow and Mieszkowski (1986) and Wilson (1986) and one that has also been used in some of the recent empirical studies of tax competition (e.g. Devereux et al., 2008; Klemm and Van Parys, 2012). However, due to the complexity and variety of tax exemptions, deductions and credits existing in the tax system, it is generally believed that the information

avoided for a valid specification.

[17]The reason here is that the inclusion of time dummies is equivalent to adding the average value of the dependent variable in each year, which by its nature is highly correlated with the spatial lag variables.

derived from the SCIT is not sufficient to reflect the actual tax burden of capital, and so tax competition should not only be driven by statutory tax rate but also by tax base adjustments. In view of this, the concept of EATR, as proposed by Devereux and Griffith (1998) and Devereux and Griffith (2003), is claimed to be a better measure for analyzing the impact of taxation on investment behavior. Because this measure, based on forward-looking concepts, calculates the effective tax burden for hypothetical further investment projects over the assumed life of the project using the statutory features of the tax regimes, which include the statutory tax rate, capital allowances, the treatment of foreign source income and others (Commission, 2001).[18] Since it is in principle the relevant rate for analyzing discrete location choices of investment, this measure has become widely used in recent empirical studies of tax competition and in many other studies that related to foreign investment location (e.g. Devereux et al., 2002; Lahrèche-Révil, 2005; Winner, 2005; Loretz, 2008; Ivanyna, 2010). Thus, we use the EATR as our primary measure of capital income tax rates and use the SCIT as an alternative for robustness checks. Data on both the SCIT and the EATR are provided by Loretz (2008), who updated and extended the version of the Devereux et al. (2002) dataset to include more countries and years.[19]

The measurement of our key variable of interest, government preferences P_{it}, turns out to be a much more challenging task in this paper since it is not directly observable. Theoretical model solves this issue in a simple way by restricting government preferences to two important dimensions: economic development and regional equality. In order to be consistent with this assumption, it is ideally to come up with an appropriate proxy that is able to reflect governments' relatively attitude toward both dimensions at the same time. As a main proxy we utilize interview data on "public perception of income equality" taken from both the *European Values Survey* (EVS) the *World Values Survey* (WVS) to achieve this goal.[20]

[18]See Devereux and Griffith (1998) and Devereux and Griffith (2003) for a detailed discussion of the methodology.

[19]See Devereux et al. (2002) and Loretz (2008) for more information.

[20]Both the EVS and the WVS are cross-country projects that aim to collect comparative survey data on social values and belief system. Their samples are based on representative national samples of at least 1000 individuals in each country. Because of their comprehensivity in providing social and economic beliefs, they

More specifically, we measure government preferences for economic development relative to regional equality by using respondents' answers to the following survey question that contains two conflicting statements from both the EVS and the WVS: "incomes should be made more equal" and "we need large income differences as incentives". As it self explains, the first statement asks for respondents' opinions on income inequality, while the second statement approximately emphasizes on their views of using income inequality as incentive for economic development. It is therefore the merit of the survey question in capturing both dimensions of our interest that makes it an arguably good proxy for government preferences. The answers are coded 1 to 10, with 1 indicating complete agreement with the first statement and so favoring regional equality, and 10 representing complete agreement with the second statement and so favoring economic development. Other numbers in between reflect the respondent's belief on the relative importance of the two issues. Since this survey question is included in various waves of both the EVS and the WVS with exactly the same coding for answers,[21] and given the observation that both surveys cover quite different sets of country sample, we thereby integrate all available waves of the two surveys together in order to make our sample size as large as possible.[22] Finally, the final value for government preferences in each country for each year is calculated from the following two steps of aggregation. First, we recode the answer values on a scale 0 to 1, and take the mean national value of all individual respondents in the same country as a proxy for government preferences in that country for the period covered in that particular wave. Next, basing on different waves covered in the same decade (i.e. 1990-1999; 2000-2007) we calculate each country the average value of government preferences over a decade, and then employ this average value as the values for each year in that decade. The reasons for doing so is to maximize the number of observations,

have become widely used sources in recent empirical literature on examining the impacts of public belief on government policies and economic outcomes (Fong, 2001; Guiso et al., 2003; Alesina and Angeletos, 2005b,a; Alesina and Ferrara, 2005; Strieborny, 2013)

[21]There are five waves of the WVS in total including 1981-1984, 1990-1993, 1994-1999, 1999-2004, and 2005-2007; and four waves of the EVS in total including 1981-1984, 1990-1993, 1999-2001, and 2008-2010.

[22]The five waves WVS data-set together with detailed instructions on how to integrate it with EVS data-set is available online at $http://www.wvsevsdb.com/wvs/WVSIntegratedEVSWVS.jsp?Idioma=I$.

which otherwise would be reduced substantially due to the data limitations. Particularly, not all the countries where the survey has been carried out have consistently participated in every wave and the existence of year gaps between different waves creates discontinuity for the available observation period. Both factors render impossibility to have annual data from the surveys directly. Even though our method results in no variation of government preferences for each country in the same decade, practically, it should be of less concern, as the answers to the survey question are likely to be determined mostly by deeper cultural convictions or belief system of the society, which on the other hand are not likely to change dramatically over a relatively short period of time.

Data for all other variables are derived from the *World Development Indicators*, with the exception of information on election year and partisan affiliation, which in turn are collected from the *Database of Political Institutions*. Summary statistics of all the variables are given in Table 1.

4 Results

We now turn to the discussion of our empirical results. Specification (9) is estimated by the system GMM method explained above, along with robust and finite sample corrected standard errors. The Sargan test and the Arellano and Bond (1991) test are reported at the bottom of each table, indicating the validity of the instruments used.

4.1 Main Results

Based on both measures of corporate income tax rates (i.e. EATR and SCIT), Table 2 reports the main results from estimations controlling and not for the time trend. For all four regressions, we find a negative and statistically significant coefficient for the measure of government preferences in line with Proposition 1 that countries focusing more on economic development tend to choose a lower level of corporate income tax rate. The magnitudes

of the coefficients, varying a bit across the definitions of corporate income tax rates and model specifications, range from -0.14 to -0.23, which implies that a one standard deviation increase in government preferences toward economic development will be associated with a reduction in the country's EATR (SCIT) of around 0.12 (0.19) percent of a standard deviation. Turning to the effects of country interactions in the setting of tax policies, a positive and significant effect from the competitors' weighted tax rates provides evidence on the existence of tax competition among OECD countries, which in turn is the starting point of our analysis. It is also noted that the magnitudes of the coefficients of the weighed tax rates become slightly larger when the primary EATR is used as dependent variable and the time trend is controlled for, which may reflect the fact that the EATR is a more relevant measure for the analysis of tax competition. In addition, all four coefficients of weighed tax rates are smaller than one, which ensures the stationarity of the spatial lag model.

For the other control variables, the lagged dependent variable has a positive and significant coefficient, indicating high persistence of the tax policies. Openness is negatively associated with tax rates, confirming the fact that higher exposure of a country to trade and competition for capital tends to reduce tax rates. Government consumption has a negative and significant coefficient, suggesting that with higher demand for revenues, a lower tax rate is chosen in order to attract more tax base. The share of urban population and unemployment rate are both found to be positively associated with tax rates selected by the governments, while left wring parties tend to have lower tax rates—particularly on statutory tax rates. Despite their potential roles in affecting tax rates, the rest of the control variables are generally not statistically significant in our estimations.

4.2 Robustness

In order to test for the robustness of the main results, we conduct sensitivity analysis along two dimensions. First, we employ an alternative survey question from the EVS and the WVS to measure government preferences. More specifically, we use a closely related question on

"the public beliefs regarding the fairness of income inequality in a society" taken from the same survey as an alternative proxy. A number of studies have revealed that the public beliefs about the causes of income may affect demand and preferences for redistribution policy. For instance, the more the public perceives wealth and success as the outcome of luck rather than individual talent and hard work, the more public support for governmental provision of social equity can be expected. The previous well-known literature, Alesina et al. (2001) and Alesina and Angeletos (2005b) provide some cross-sectional empirical evidence supporting this conjecture; they show that a stronger belief in luck as the main determinant of success is associated with a higher level of redistribution policy (i.e. the share of social spending in GDP).[23] Following these studies, we look at the same survey question from the EVS and the WVS asking: "In the long run, hard work usually brings a better life. Or hard work does not generally bring success; it's more a matter of luck and connections." The answers are coded 1 to 10, with 10 indicating the strongest belief in luck. It is expected that government preferences for income equality are stronger in countries where the mean belief that luck determines success is higher. Lastly, we follow the exact same method specified in subsection 3.3 to aggregate the values from individual level to country level. It is also noted that in order to make it consistent with our primary measure of government preferences, we rescale this alternative measure to take values from 0 to 1 with larger values indicating weaker belief in luck as a determinant of success and so favoring more for economic development policy.

The second method we use as a robustness check is to restrict our estimations to a sub-sample, which only contains EU-15 countries. The rationale here is that while the differences in the relative social beliefs and cultures between these countries are smaller, they are geographically closed to each other, which may imply different extents of tax competition among these countries and so different equilibrium outcomes.

Tables 3 and 4 report the estimation results for the alternative measures of government

[23] Fong (2001) and Alesina and Ferrara (2005) find a similar pattern using the 1998 Gallup Poll Social Audit Survey and the General Social Survey respectively for the case of United States.

preferences and the EU-15 subsample, respectively. As shown, all results are consistent with our main results obtained above. Furthermore, Table 3 indicates that the effect of government preferences is also comparable in size with this alternative definition. The coefficients of the weighted EATRs in Table 4 suggest that strategic interactions indeed tend to be stronger in the EU-15 countries, and the effect of government preferences also becomes larger in this group of countries. Overall, we find robust evidence to support our main finding that countries with higher preferences for pursuing economic development tend to select lower level of corporate income tax rates.

5 Concluding Remarks

This paper seeks to provide a novel explanation on the cross-country differences in tax rates, both theoretically and empirically. We attribute partially the source of this heterogeneity to the role of government preferences, which are largely simplified in this paper to two important dimensions: economic development and regional equality. Following the general setups of the theoretical tax competition literature, we show that as a way to attract more capital for economic development, countries with a higher preference for economic development in relative to regional equality tend to select a lower level of capital income tax rate—a result that is logically in line with the intuition. By using a sample of OECD countries over the time period 1990-2007, we find supportive evidence for this theoretical prediction, and the results are shown to be robust across alternative definitions of corporate income tax rates and government preferences, and across alternative country sample. In addition, we also provide strong evidence of tax competition pattern among OECD countries, which serves as the basis for our analysis.

Although there has been some literature on exploring the reasons for the asymmetric tax policy responses under the context of tax competition, it is hoped that our study will shed some additional light on this point by highlighting the significance of government preferences.

For further research in this regard, it would be interesting to see whether our results still hold with some other possible measures of government preferences, and also whether the results are robust to other sample sets that may extend to include some developing countries.

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Table 1: Summary Statistics

Variable	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
EATR	675	0.273	0.084	0.050	0.488
SCIT	735	0.366	0.107	0.100	0.650
P_{it} (primary)	480	0.567	0.071	0.363	0.733
P_{it} (alternative)	432	0.540	0.064	0.394	0.665
GDP per capita	789	9.630	0.693	7.864	10.940
Openness	786	0.739	0.436	0.160	3.200
Government consumption	788	0.186	0.045	0.080	0.300
Unemployment rate	701	0.074	0.041	0.020	0.240
Urban population	810	0.728	0.115	0.430	0.970
Young population	810	0.208	0.052	0.140	0.440
Old population	810	0.130	0.034	0.040	0.210
Election	788	0.047	0.212	0	1
Partisan affiliation	735	0.416	0.493	0	1

Source: Author's calculations

Table 2: Government Preferences and Tax Competition: Main Results

	τ=EATR		τ=SCIT	
	(1)	(2)	(3)	(4)
τ_{it-1}	0.677***	0.687***	0.617***	0.615***
	(9.191)	(8.254)	(7.254)	(7.060)
τ_{-it}	0.371***	0.404***	0.397***	0.383**
	(3.832)	(2.599)	(3.356)	(2.337)
P_{it} (primary)	-0.140**	-0.137**	-0.224***	-0.225***
	(-2.414)	(-2.309)	(-2.662)	(-2.664)
GDP per capita $t-1$	0.004	0.005	0.002	0.002
	(0.889)	(0.890)	(0.309)	(0.310)
Openness $t-1$	-0.014*	-0.014*	-0.023**	-0.023**
	(-1.917)	(-1.920)	(-2.404)	(-2.374)
Government consumption $t-1$	-0.508***	-0.492***	-0.718***	-0.724***
	(-4.141)	(-3.559)	(-4.478)	(-4.345)
Unemployment rate $t-1$	0.205*	0.210*	0.430***	0.430***
	(1.836)	(1.841)	(3.230)	(3.221)
Urban population $t-1$	0.104***	0.100***	0.142***	0.144***
	(3.123)	(2.621)	(3.375)	(3.235)
Young population $t-1$	-0.220	-0.198	-0.109	-0.115
	(-1.109)	(-0.915)	(-0.477)	(-0.492)
Old population $t-1$	0.243	0.250	0.656*	0.655*
	(0.851)	(0.865)	(1.882)	(1.876)
Election	0.016	0.016	0.016	0.016
	(1.025)	(1.037)	(0.792)	(0.797)
Partisan affiliation	-0.017*	-0.017*	-0.035***	-0.035***
	(-1.825)	(-1.830)	(-2.928)	(-2.924)
Constant	0.052	0.029	0.062	0.071
	(0.861)	(0.271)	(0.820)	(0.655)
Country fixed effects	Yes	Yes	Yes	Yes
Time trend	No	Yes	No	Yes
Observations	416	416	430	430
Number of countries	28	28	28	28
AR(1) (p-value)	0.000	0.000	0.000	0.000
AR(2) (p-value)	0.428	0.410	0.850	0.851
Sargan test (p-value)	0.304	0.292	0.433	0.387

Notes: Robust t-statistics in parentheses. Time period is 1990-2007. Models are estimated by system GMM estimator. ***, **, * denotes significance at the 1, 5, and 10% level, respectively.

Table 3: Government Preferences and Tax Competition: Alternative Measure of Government Preferences

	τ=EATR		τ=SCIT	
	(1)	(2)	(3)	(4)
τ_{it-1}	0.694***	0.706***	0.707***	0.649***
	(8.024)	(7.925)	(8.615)	(7.428)
τ_{-it}	0.319***	0.639***	0.125*	0.559**
	(3.359)	(3.031)	(1.650)	(2.217)
P_{it} (alternative)	-0.133	-0.179*	-0.207*	-0.275**
	(-1.495)	(-1.879)	(-1.702)	(-2.184)
GDP per capita $t-1$	0.008	0.010*	0.008	0.007
	(1.530)	(1.762)	(1.259)	(1.118)
Openness $t-1$	-0.019	-0.035	-0.061**	-0.091***
	(-0.974)	(-1.570)	(-2.470)	(-3.082)
Government consumption $t-1$	-0.480***	-0.360**	-0.386***	-0.301**
	(-3.603)	(-2.343)	(-2.923)	(-2.169)
Unemployment rate $t-1$	0.016	0.027	0.084	0.080
	(0.168)	(0.276)	(0.602)	(0.576)
Urban population $t-1$	0.102**	0.105**	0.072	0.084*
	(2.273)	(2.280)	(1.446)	(1.698)
Young population $t-1$	-0.187	-0.051	-0.065	0.044
	(-0.972)	(-0.241)	(-0.288)	(0.190)
Old population $t-1$	0.089	0.069	0.127	0.215
	(0.326)	(0.246)	(0.386)	(0.652)
Election	0.004	0.004	0.026	0.025
	(0.858)	(0.787)	(1.401)	(1.372)
Partisan affiliation	0.001	-0.001	0.003	-0.000
	(0.270)	(-0.245)	(0.325)	(-0.015)
Constant	0.040	-0.116	0.132	-0.045
	(0.445)	(-0.890)	(1.095)	(-0.293)
Country fixed effects	Yes	Yes	Yes	Yes
Time trend	No	Yes	No	Yes
Observations	369	369	383	383
Number of countries	27	27	27	27
AR(1) (p-value)	0.000	0.000	0.000	0.000
AR(2) (p-value)	0.623	0.543	0.951	0.932
Sargan test (p-value)	0.135	0.254	0.134	0.152

Notes: Robust t-statistics in parentheses. Time period is 1990-2007. Models are estimated by system GMM estimator. ***, **, * denotes significance at the 1, 5, and 10% level, respectively.

Table 4: Government Preferences and Tax Competition: EU-15 Countries Sample

	τ=EATR		τ=SCIT	
	(1)	(2)	(3)	(4)
τ_{it-1}	0.652***	0.630***	0.738***	0.745***
	(6.692)	(5.733)	(8.974)	(8.237)
τ_{-it}	0.508***	0.460**	0.351**	0.373*
	(2.839)	(2.167)	(2.244)	(1.953)
P_{it} (primary)	-0.209***	-0.241**	-0.183**	-0.169*
	(-3.138)	(-2.427)	(-2.469)	(-1.658)
GDP per capita $t-1$	-0.013	-0.013	-0.024*	-0.025*
	(-1.178)	(-1.163)	(-1.740)	(-1.744)
Openness $t-1$	0.007	0.011	0.013	0.011
	(0.560)	(0.702)	(0.943)	(0.632)
Government consumption $t-1$	-0.114	-0.131	-0.083	-0.077
	(-1.065)	(-1.151)	(-0.595)	(-0.546)
Unemployment rate $t-1$	0.046	0.053	-0.037	-0.039
	(0.500)	(0.569)	(-0.333)	(-0.348)
Urban population $t-1$	0.137***	0.149***	0.171***	0.165***
	(2.966)	(2.769)	(3.374)	(2.791)
Young population $t-1$	-0.848***	-0.949**	-0.959***	-0.907**
	(-2.642)	(-2.384)	(-2.835)	(-2.138)
Old population $t-1$	-0.578*	-0.625*	-0.825**	-0.793**
	(-1.732)	(-1.785)	(-2.246)	(-1.983)
Election	-0.021	-0.021	-0.004	-0.005
	(-1.319)	(-1.325)	(-0.179)	(-0.202)
Partisan affiliation	0.000	0.001	0.013	0.012
	(0.047)	(0.186)	(1.525)	(1.295)
Constant	0.357**	0.416**	0.482***	0.453**
	(2.269)	(1.984)	(2.733)	(1.982)
Country fixed effects	Yes	Yes	Yes	Yes
Time trend	No	Yes	No	Yes
Observations	224	224	224	224
Number of countries	14	14	14	14
AR(1) (p-value)	0.000	0.000	0.000	0.000
AR(2) (p-value)	0.325	0.332	0.502	0.498
Sargan test (p-value)	0.805	0.757	0.419	0.387

Notes: Robust t-statistics in parentheses. Time period is 1990-2007. Models are estimated by system GMM estimator. ***, **, * denotes significance at the 1, 5, and 10% level, respectively.