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Changing social preferences and optimal redistributive taxation

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We examine a dynamic model of optimal nonlinear taxation of labour income and savings, in which there are two political parties: left-wing and right-wing. The parties differ only in their redistributive preferences, with the left-wing party having a stronger preference for redistribution. Our analysis explicitly considers the possibility that society's preference for redistribution may change, as reflected in its future voting behaviour. The incumbent government respects the possibility that society's preference may change, and sets taxes to maximize expected social welfare. Our main result is that an incumbent left-wing (resp. right-wing) government will implement a regressive (resp. progressive) savings tax policy. The incumbent government implements this policy not out of self interest, but to accommodate the redistributive goals of the opposing party.

JEL classifications: H21, H24.

1. Introduction

This paper is motivated by the following observations: an incumbent government may choose to set taxes based only on its own preference for redistribution, since it has after-all been elected and in that sense its preference for redistribution is supported by society. Therefore, the incumbent government might argue, with some justification, that it has a mandate to implement its preferred policies. However, tax policies implemented

today will affect outcomes in the future, and it is possible that society's preference for redistribution may change, i.e., the incumbent government might not be re-elected. Accordingly, one could argue that when setting taxes the incumbent government should take into account the possibility that society's preference may change. We believe this latter approach is consistent with the notion of optimal taxation, which is *normative* in nature in that it is concerned with how the government *should* set taxes. In particular, the optimal tax literature typically assumes that the government should implement the tax system that is most preferred by society (i.e., that which maximizes social welfare). This implies that if society's preferences change, the tax system should correspondingly change as well. Our aim is to investigate optimal taxation when the incumbent government respects the possibility that society's preference for redistribution may change.

Our paper is also motivated by the observation that previous studies have not considered how an incumbent government, who recognizes that it may not be in power in the future, should set policies to maximize social welfare (without trying to influence its re-election chances). Instead, the political-economy literature has focused mostly on the *positive* question of how the incumbent may set policies to undermine future opposing governments. For example, Persson and Svensson (1989) and Alesina and Tabellini (1990) find that governments may use public debt strategically to bind the hands of future governments. Similarly, Aghion and Bolton (1990) show how an incumbent government can set policy to raise its chances of re-election. Such policy setting may be optimal from the government's own point of view, but it is not necessarily optimal from society's point of view. A key distinction between our paper and the aforementioned literature is that the incumbent government in our model sets policies to accommodate (rather than undermine) the opposing party's preferences, reflecting the possibility that the opposition may be in power in the future. As a result, while the incumbent government's behaviour is strategic in both settings, there exists an importance difference in terms of the underlying policy objective. In addition, the relationship between our paper and that by Zoutman, et al. (2016) is interesting, since the aim of their paper is in some sense the reverse of ours. Zoutman, et al. (2016) start with the proposed tax policies announced by the major political parties in the Netherlands, and then use

these proposals to infer the redistributive preferences of each political party. However, as their focus is not on policy recommendations, their analysis remains more positive than normative.

We consider a dynamic model in which there are two political parties, left-wing and right-wing, that are distinguished only by their preferences for redistribution from high-skill to low-skill individuals. The left-wing party has a stronger preference for redistribution than the right-wing party. The model economy has two periods, which can be interpreted as representing the 'present' versus the 'future'. In period 1 there is some probability that the incumbent government (which is either the left-wing or right-wing party) will be re-elected in period 2. In our model, this is equivalent to there being some probability that society's preference for redistribution may change. In period 1, the incumbent government implements optimal nonlinear (Mirrlees 1971 style) taxation on labour income and savings, while in period 2 the elected government implements optimal nonlinear taxation on labour income. As period 2 is the last period, there are no savings undertaken in that period. Our assumption that the government can implement fully-general nonlinear taxation reflects the normative nature of taxation in our model.[1]

Our main result is that an incumbent left-wing government should implement a regressive savings taxation policy, in that low-skill individuals face a positive marginal tax rate on their savings, whereas high-skill individuals face a negative marginal tax rate. An incumbent right-wing government should do the opposite, i.e., it implements progressive savings taxation: low-skill individuals face a negative marginal savings tax rate, while that for high-skill individuals is positive.[2] The intuition, explained in further detail below, follows from each government type's desire to shift the individuals' consumption between periods, in response to the possibility that it may not be in power

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[1] By contrast, positive analyses of taxation often consider restrictions on the tax instruments that the government can implement, say due to political constraints.

[2] It should be kept in mind that using the terms 'regressive' and 'progressive' to describe the pattern of marginal tax rates is somewhat loose language, because such pattern does not necessarily align with the direction of redistribution. Nevertheless, we use the regressive/progressive terminology for convenience and because similar terminology has been used in the literature on nonlinear capital taxation (e.g., Farhi, et al. 2012).

3

in period 2. Importantly, however, this consumption shifting is not undertaken by the incumbent government out of self interest; it is done to accommodate the redistributive goals of the opposing party. Indeed, in the absence of such accommodation, the Atkinson and Stiglitz (1976) result that savings should not be taxed alongside nonlinear income taxation would apply.

There is a literature that examines optimal taxation when individuals have different preferences (e.g., Diamond and Spinnewijn 2011, Golosov, et al. 2013, and Krause 2014), and when the government's preferences differ from those of individuals (e.g., Racionero 2001, Blomquist and Micheletto 2006, and O'Donoghue and Rabin 2006). But to the best of our knowledge, this paper is the first to consider the possibility that society's preference for redistribution may change over time. The literature on the comparative statics of optimal nonlinear income taxes (e.g., Weymark 1987 and Simula 2010) has examined the effects of changing the weights in the social welfare function, but their models are static so there are no savings. Our paper is also related to the extensive literature on the optimal taxation of capital/savings (which we discuss in Section 5). The canonical result is that capital should not be taxed. Our paper, however, contributes to the literature which identifies exceptions to that rule, by providing a new rationale for taxing/subsidizing savings. More recently, Scheuer and Wolitzky (2016) examine sustainable capital taxation, in that a tax policy is sustainable if it garners sufficient support in the future to prevent a reform. Their focus is therefore on the ability of the government to commit, with policy designed to deter the gathering of popular support for reform.

The remainder of the paper is organized as follows. Section 2 presents the main features of our model, while Section 3 describes how optimal taxation is implemented. Section 4 presents our results, while Section 5 discusses our results in the context of the literature on tax theory versus tax practice. Section 6 concludes, and some mathematical details regarding the derivation of optimal marginal tax rates are contained in an appendix.

2. Preliminaries

There is a unit measure of individuals, with a proportion $\phi \in (0,1)$ being high-skill workers and $(1 - \phi)$ being low-skill workers. Type 1 individuals are low-skill and type 2 individuals are high-skill, with w_1 and w_2 $(0 < w_1 < w_2)$ denoting the wages of low-skill and high-skill individuals respectively. There are two political parties, left-wing (denoted L) and right-wing (denoted R), who differ only in their preference for redistribution from high-skill to low-skill individuals, with the left-wing party having a stronger preference. The economy lasts for two periods, which can be thought of as the 'present' versus the 'future'.[3] In period 1 there is an incumbent government, which is either the left-wing or right-wing party. The probability that the incumbent government, party i $(i = L$ or $R)$, is re-elected in period 2 is $p_i \in (0,1)$, implying that $(1 - p_i)$ is the probability that the opposing party is elected. This probability is completely exogenous, i.e., the incumbent government cannot affect its chances of re-election.

While the assumption that the incumbent government cannot affect its re-election probability makes the analysis easier, we hasten to stress that we do not make the assumption for that reason. The key feature of our paper is that the analysis is purely normative. That is, the incumbent government respects the possibility that society's preferences may change (i.e., it may not be re-elected), and takes this into account by setting taxes to maximize expected social welfare. Accordingly, even if the incumbent government could affect its re-election chances, it should not take action to increase (or for that matter decrease) its re-election probability. The assumption that the re-election probability is exogenous is consistent with our normative approach, in which we seek to determine how the government should set taxes. Alternatively, if the aim were to explain how governments actually set taxes (positive economics), then attempts by the incumbent government to influence its re-election probability would become directly relevant.

All individuals have the same preferences, which can be represented by the utility

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[3] As a practical matter, assuming a finite time horizon is convenient because it will be seen that the optimal tax problem is most readily solved by backward induction.

function:

$$u(c^1_{ki}) - v(l^1_{ki}) + \delta \left[u(c^2_{kj}) - v(l^2_{kj}) \right] \tag{2.1}$$

where c^1_{ki} and l^1_{ki} are, respectively, type k's ($k = 1$ or 2) consumption and labour in period 1 when party i ($i = L$ or R) is in government. Analogously, c^2_{kj} and l^2_{kj} are type k's consumption and labour in period 2 when party j ($j = L$ or R) is in government. The function $u(\cdot)$ is increasing and strictly concave, $v(\cdot)$ is increasing and strictly convex, and $\delta \in (0, 1]$ is the individuals' discount factor. Individuals may save in period 1, denoted s^1_{ki}, which raises their consumption in period 2 by $(1 + r)s^1_{ki}$, where $r > 0$ is the market interest rate. For future reference, we use m^t_{ki} to denote type k's post-tax income in period t when party i is in government, and y^t_{ki} to denote type k's pre-tax income in period t when party i is in government (where $y^t_{ki} = w_k l^t_{ki}$).

3. Optimal Taxation

As our model is dynamic, the question arises as to whether the incumbent government can implement what Gaube (2007) calls 'long-term' versus 'short-term' taxation. If the incumbent government announces its tax systems for periods 1 and 2, and if re-elected in period 2 it simply implements the tax system it promised in period 1, then the incumbent government can commit to long-term taxation. On the other hand, if the incumbent government is re-elected and it implements a tax system in period 2 independent of any announcements made in period 1, then it is using short-term taxation. That is, the re-elected government sets taxes in period 2 in the same manner as the opposing party will if it is elected. Since long-term or short-term taxation may be practised, we examine both systems. Under both systems we assume full commitment by the government, in the sense that the government in period 2 does not take advantage of skill-type information revealed in period 1 nor re-optimize the savings tax. This is because, to the extent possible, we want the government in period 2 to implement taxation under the same constraints as the government in period 1, so that our results are driven only by the possibility of a change in society's redistributive preferences.

3.1   Long-term Taxation

As the optimal tax problem is solved by backward induction, we first describe the nature of optimal taxation in period 2. Suppose party i ($i = L$ or R) was in government in period 1, but the opposing party $j \neq i$ ($j = L$ or R) is in government in period 2. It implements optimal nonlinear labour income taxation by choosing tax treatments $\langle m_{1j}^2, y_{1j}^2 \rangle$ and $\langle m_{2j}^2, y_{2j}^2 \rangle$ for the low-skill and high-skill individuals, respectively, to maximize:

$$\pi_j(1-\phi)\left\{u(m_{1j}^2 + (1+r)s_{1i}^1) - v\left(\frac{y_{1j}^2}{w_1}\right)\right\} + (1-\pi_j)\phi\left\{u(m_{2j}^2 + (1+r)s_{2i}^1) - v\left(\frac{y_{2j}^2}{w_2}\right)\right\}$$
$$(3.1)$$

subject to:

$$(1 - \phi)\left[y_{1j}^2 - m_{1j}^2\right] + \phi\left[y_{2j}^2 - m_{2j}^2\right] + (1+r)s_i^1 \geq 0 \qquad (3.2)$$

$$u(m_{2j}^2 + (1+r)s_{2i}^1) - v\left(\frac{y_{2j}^2}{w_2}\right) \geq u(m_{1j}^2 + (1+r)s_{2i}^1) - v\left(\frac{y_{1j}^2}{w_2}\right) \qquad (3.3)$$

where equation (3.1) is a *weighted* utilitarian social welfare function, with $\pi_j \in (0,1)$ representing the weight that party j places on the welfare of low-skill individuals. It is assumed that $\pi_L > \pi_R$, to capture the assumption that the left-wing party has a stronger preference for redistribution than the right-wing party. Note that $c_{kj}^2 = m_{kj}^2 + (1+r)s_{ki}^1$, i.e., type k's second-period consumption equals their second-period post-tax income plus the return on savings undertaken in period 1 when party i was in government. Equation (3.2) is the government's budget constraint, where s_i^1 denotes savings by the government in period 1. For simplicity we assume that the government's revenue requirement is zero, so taxation is implemented only for redistributive purposes.[4] Equation (3.3) is the high-skill type's incentive-compatibility constraint.[5] At this point an interesting issue arises regarding the information available to the government in period 2. Based on the individuals' responses to taxation in period 1, the government in period 2 can

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[4]While it may be more realistic to assume that a left-wing government has a higher revenue requirement than a right-wing government, we would like to compare their tax policies on the same basis. Accordingly, we assume that both parties have the same revenue requirement, and for simplicity this revenue requirement is set to zero.

[5]Although we assume that a left-wing government has a stronger preference for redistribution than a right-wing government, both still seek to redistribute from the high-skill to the low-skill. Accordingly, under both governments high-skill individuals may want to mimic low-skill individuals, but not vice versa. Therefore, only the high-skill type's incentive-compatibility constraint will be binding. This is what Stiglitz (1982) calls the 'normal' case and what Guesnerie (1995) calls 'redistributive equilibria'.

distinguish high-skill from low-skill individuals, and therefore could use (first-best) personalized lump-sum taxes and transfers. However, as mentioned earlier, we assume full commitment by the government. Accordingly, the government in period 2 implements nonlinear income taxation, rather than exploit skill-type information revealed in period 1 to implement first-best taxation in the second period.[6]

The solution to the second-period optimal tax problem yields functions for the choice variables, $m_{1j}^2(\pi_j, \phi, r, s_{1i}^1, w_1, s_{2i}^1, w_2, s_i^1)$, $y_{1j}^2(\cdot)$, $m_{2j}^2(\cdot)$, and $y_{2j}^2(\cdot)$, as well as the value function $W_j^2(\cdot)$ which represents the level of social welfare attainable in period 2 when party j is in government.

In period 1 the incumbent government, party i, can by assumption implement long-term taxation. It therefore chooses long-term tax treatments, $\langle m_{1i}^1, s_{1i}^1, y_{1i}^1, m_{1i}^2, y_{1i}^2 \rangle$ and $\langle m_{2i}^1, s_{2i}^1, y_{2i}^1, m_{2i}^2, y_{2i}^2 \rangle$, and its own savings s_i^1 to maximize:

$$
\pi_i(1-\phi)\left\{ u(m_{1i}^1 - s_{1i}^1) - v\left(\frac{y_{1i}^1}{w_1}\right) \right\} + (1-\pi_i)\phi\left\{ u(m_{2i}^1 - s_{2i}^1) - v\left(\frac{y_{2i}^1}{w_2}\right) \right\} + (1-p_i)\delta W_j^2(\cdot)
$$

$$
+ \; p_i\delta\left[\pi_i(1-\phi)\left\{ u(m_{1i}^2 + (1+r)s_{1i}^1) - v\left(\frac{y_{1i}^2}{w_1}\right) \right\} + (1-\pi_i)\phi\left\{ u(m_{2i}^2 + (1+r)s_{2i}^1) - v\left(\frac{y_{2i}^2}{w_2}\right) \right\} \right]
$$

(3.4)

subject to:

$$
(1-\phi)\left[y_{1i}^1 - m_{1i}^1\right] + \phi\left[y_{2i}^1 - m_{2i}^1\right] - s_i^1 \geq 0 \tag{3.5}
$$

$$
(1-\phi)\left[y_{1i}^2 - m_{1i}^2\right] + \phi\left[y_{2i}^2 - m_{2i}^2\right] + (1+r)s_i^1 \geq 0 \tag{3.6}
$$

$$
u(m_{2i}^1 - s_{2i}^1) - v\left(\frac{y_{2i}^1}{w_2}\right) + p_i\delta\left\{ u(m_{2i}^2 + (1+r)s_{2i}^1) - v\left(\frac{y_{2i}^2}{w_2}\right) \right\} + (1-p_i)\delta V_{2j}^2(\cdot) \geq
$$

$$
u(m_{1i}^1 - s_{1i}^1) - v\left(\frac{y_{1i}^1}{w_2}\right) + p_i\delta\left\{ u(m_{1i}^2 + (1+r)s_{1i}^1) - v\left(\frac{y_{1i}^2}{w_2}\right) \right\} + (1-p_i)\delta \widehat{V}_{2j}^2(\cdot) \tag{3.7}
$$

where equation (3.4) is a weighted utilitarian social welfare function, with $c_{1i}^1 = m_{1i}^1 - s_{1i}^1$ and $c_{2i}^1 = m_{2i}^1 - s_{2i}^1$. The incumbent government considers the (exogenous) probability that it will be re-elected, and can therefore implement its planned tax system in period

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[6]Papers that relax the commitment assumption include Apps and Rees (2006), Brett and Weymark (2008a), Krause (2009), Guo and Krause (2011, 2013, 2014, 2015a, 2015b), and Berliant and Ledyard (2014), among others.

2; but also the probability that the opposing party will be elected in period 2, and social welfare will be W_j^2. Equations (3.5) and (3.6) are, respectively, the incumbent government's first- and second-period budget constraints. Equation (3.7) is the high-skill type's incentive-compatibility constraint, where:

$$V_{2j}^2(\cdot) = u(m_{2j}^2(\cdot) + (1+r)s_{2i}^1) - v\left(\frac{y_{2j}^2(\cdot)}{w_2}\right) \tag{3.8}$$

$$\widehat{V}_{2j}^2(\cdot) = u(m_{1j}^2(\cdot) + (1+r)s_{1i}^1) - v\left(\frac{y_{1j}^2(\cdot)}{w_2}\right) \tag{3.9}$$

for $i \neq j$. In order for a high-skill individual to be willing to choose tax treatment $\langle m_{2i}^1, s_{2i}^1, y_{2i}^1, m_{2i}^2, y_{2i}^2 \rangle$ rather than $\langle m_{1i}^1, s_{1i}^1, y_{1i}^1, m_{1i}^2, y_{1i}^2 \rangle$, their expected utility from choosing the former must be greater than or equal to their expected utility from choosing the latter. Notice that if a high-skill individual does pretend to be low-skill by choosing $\langle m_{1i}^1, s_{1i}^1, y_{1i}^1, m_{1i}^2, y_{1i}^2 \rangle$ in period 1, they must also choose the low-skill type's tax treatment in period 2 even if there is a change in government (cf. equation 3.9). This is because the government in period 2 will know what choices the individuals made in period 1. Therefore, all individuals must choose the same type's tax treatment in period 2 as they did in period 1. To assume otherwise would effectively allow individuals to 'switch type' in the eyes of the government, and would also enable a range of mimicking strategies that would complicate the analysis without yielding much in additional insight.

3.2   Short-term Taxation

If the incumbent government can only implement short-term taxation, then the government in period 2, whether it be the re-elected incumbent or the opposing party, will solve program $(3.1) - (3.3)$ in period 2. In period 1 the incumbent government, party i, implements optimal nonlinear taxation on labour income and savings. It chooses tax treatments, $\langle m_{1i}^1, s_{1i}^1, y_{1i}^1 \rangle$ and $\langle m_{2i}^1, s_{2i}^1, y_{2i}^1 \rangle$, and its savings s_i^1 to maximize:

$$\pi_i(1-\phi)\left\{u(m_{1i}^1 - s_{1i}^1) - v\left(\frac{y_{1i}^1}{w_1}\right)\right\} + (1-\pi_i)\phi\left\{u(m_{2i}^1 - s_{2i}^1) - v\left(\frac{y_{2i}^1}{w_2}\right)\right\} + p_i\delta W_i^2(\cdot) + (1-p_i)\delta W_j^2(\cdot) \tag{3.10}$$

subject to:

$$(1 - \phi)\left[y_{1i}^1 - m_{1i}^1\right] + \phi\left[y_{2i}^1 - m_{2i}^1\right] - s_i^1 \geq 0 \tag{3.11}$$

$$u(m_{2i}^1 - s_{2i}^1) - v\left(\frac{y_{2i}^1}{w_2}\right) + p_i\delta V_{2i}^2(\cdot) + (1-p_i)\delta V_{2j}^2(\cdot) \geq u(m_{1i}^1 - s_{1i}^1) - v\left(\frac{y_{1i}^1}{w_2}\right) + p_i\delta \widehat{V}_{2i}^2(\cdot) + (1-p_i)\delta \widehat{V}_{2j}^2(\cdot) \tag{3.12}$$

where equation (3.10) is a weighted utilitarian social welfare function. The incumbent government considers the (exogenous) probability that it will be re-elected, and therefore can achieve a level of social welfare equal to W_i^2 in period 2, but also the probability that the opposing party will be elected in period 2, and social welfare will be W_j^2. Equation (3.11) is the incumbent government's budget constraint, and equation (3.12) is the high-skill type's incentive-compatibility constraint, where:

$$V_{2i}^2(\cdot) = u(m_{2i}^2(\cdot) + (1+r)s_{2i}^1) - v\left(\frac{y_{2i}^2(\cdot)}{w_2}\right) \tag{3.13}$$

$$\widehat{V}_{2i}^2(\cdot) = u(m_{1i}^2(\cdot) + (1+r)s_{1i}^1) - v\left(\frac{y_{1i}^2(\cdot)}{w_2}\right) \tag{3.14}$$

In order for a high-skill individual to be willing to choose tax treatment $\langle m_{2i}^1, s_{2i}^1, y_{2i}^1 \rangle$ rather than $\langle m_{1i}^1, s_{1i}^1, y_{1i}^1 \rangle$, the utility obtained in period 1 from choosing $\langle m_{2i}^1, s_{2i}^1, y_{2i}^1 \rangle$ plus the utility they can then expect in period 2, $p_i\delta V_{2i}^2 + (1-p_i)\delta V_{2j}^2$, must be greater than or equal to their expected utility from pretending to be low-skill.

4. Results

It is shown in the Appendix that the formula for the low-skill type's marginal tax rate applicable to savings $(MTRS_{1i}^1)$ under long-term taxation is:

$$MTRS_{1i}^1 = \frac{(\pi_i - \pi_j)(1 - p_i)u'(m_{1j}^2 + (1+r)s_{1i}^1)}{\pi_i\left[p_i u'(m_{1i}^2 + (1+r)s_{1i}^1) + (1-p_i)u'(m_{1j}^2 + (1+r)s_{1i}^1)\right]}$$

$$- \frac{\theta_i^1\left[u'(m_{1i}^1 - s_{1i}^1) - p_i\delta(1+r)u'(m_{1i}^2 + (1+r)s_{1i}^1) + (1-p_i)\delta\left(\frac{\partial V_{2j}^2(\cdot)}{\partial s_{1i}^1} - \frac{\partial \widehat{V}_{2j}^2(\cdot)}{\partial s_{1i}^1}\right)\right]}{\pi_i(1-\phi)\delta(1+r)\left[p_i u'(m_{1i}^2 + (1+r)s_{1i}^1) + (1-p_i)u'(m_{1j}^2 + (1+r)s_{1i}^1)\right]} \tag{4.1}$$

10

where $\theta_i^1 > 0$ is the multiplier on the incentive-compatibility constraint, equation (3.7). The first-term in equation (4.1) can be interpreted as the redistributive effect, and the second-term as the incentive effect. Likewise, the formula for the high-skill type's marginal tax rate applicable to savings $(MTRS_{2i}^1)$ under long-term taxation is:

$$MTRS_{2i}^1 = \frac{(\pi_j - \pi_i)(1 - p_i)u'(m_{2j}^2 + (1+r)s_{2i}^1)}{(1 - \pi_i)\left[p_i u'(m_{2i}^2 + (1+r)s_{2i}^1) + (1 - p_i)u'(m_{2j}^2 + (1+r)s_{2i}^1)\right]}$$

$$+ \frac{\theta_i^1 \left[u'(m_{2i}^1 - s_{2i}^1) - p_i\delta(1+r)u'(m_{2i}^2 + (1+r)s_{2i}^1) - (1 - p_i)\delta\left(\frac{\partial V_{2j}^2(\cdot)}{\partial s_{2i}^1} - \frac{\partial \widehat{V}_{2j}^2(\cdot)}{\partial s_{2i}^1}\right)\right]}{(1 - \pi_i)\phi\delta(1+r)\left[p_i u'(m_{2i}^2 + (1+r)s_{2i}^1) + (1 - p_i)u'(m_{2j}^2 + (1+r)s_{2i}^1)\right]}$$

$$- \frac{\theta_j^2(1 - p_i)\left[u'(m_{2j}^2 + (1+r)s_{2i}^1) - u'(m_{1j}^2 + (1+r)s_{2i}^1)\right]}{(1 - \pi_i)\phi\left[p_i u'(m_{2i}^2 + (1+r)s_{2i}^1) + (1 - p_i)u'(m_{2j}^2 + (1+r)s_{2i}^1)\right]} \qquad (4.2)$$

where $\theta_j^2 > 0$ is the multiplier on the incentive-compatibility constraint, equation (3.3). The first-term in equation (4.2) is the redistributive effect, while the second- and third-terms are the incentive effects.[7]

To interpret these formulas, consider first redistributive taxation in a static setting. In a first-best static setting, low-skill individuals receive more utility and more consumption under a left-wing government than under a right-wing government.[8] In a second-best (incentive-compatible) static setting, however, low-skill individuals receive more utility but *less* consumption under a left-wing government than under a right-wing government (discussed further below). Therefore, absence any incentive effects, in a dynamic setting an incumbent left-wing government that knows there is some chance it will not be re-elected will want to bring forward consumption by low-skill individuals and delay consumption by high-skill individuals. This would immediately imply that an incumbent left-wing government will want to tax (resp. subsidize) the savings of low-skill (resp. high-skill) individuals at the margin. (The reverse argument holds for an incumbent right-wing government.) These motives are represented by the first terms

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[7]As shown in the Appendix, the formulas for the marginal tax rates applicable to savings under short-term taxation are very similar to those under long-term taxation, and their interpretations are identical.

[8]By comparison, recall that under pure utilitarianism, first-best taxation gives all types the same level of consumption, but lower-skill individuals obtain more utility due to less labour supply.

in equations (4.1) and (4.2). However, such consumption shifting potentially creates incentive problems, which are represented by the remaining terms in equations (4.1) and (4.2). It can be seen that these terms depend upon the comparative statics of a second-best optimal nonlinear income tax system. The literature on the comparative statics of optimal nonlinear income taxes has found that analytical results are obtainable only when the utility function is quasi-linear, and even then only with respect to certain parameters.[9] Accordingly, we do not attempt to derive analytical solutions, but instead use numerical methods to obtain our results. To this end, we assume that the utility function takes the form:

$$u(c_{ki}^t) - v(l_{ki}^t) = \frac{(c_{ki}^t)^{1-\sigma}}{1-\sigma} - \frac{(l_{ki}^t)^{1+\gamma}}{1+\gamma} \tag{4.3}$$

where $\sigma > 0$ is the individuals' coefficient of relative risk aversion, and $1/\gamma > 0$ is the individuals' labour supply elasticity. Based on Chetty (2006), we postulate that $\sigma = 1$ which implies that $u(c_{ki}^t) = \ln(c_{ki}^t)$. While empirical estimates of the labour supply elasticity can vary considerably, based on Chetty, et al. (2011) we set $\gamma = 2$ which implies a labour supply elasticity of 0.5.

Across countries, approximately one-third of persons aged 25-64 years have attained tertiary level education (OECD, 2014). We assume that tertiary educated individuals are high-skill and the remainder are low-skill, i.e., $\phi = 1/3$. We normalize the low-skill type's wage to unity and set the high-skill type's wage equal to 1.6, which is based on an estimated college wage premium of 60 % (see Fang 2006 and Goldin and Katz 2007). Since there is no direct observation on the welfare weights, our benchmark parameterization arbitrarily sets $\pi_L = 0.52$ and $\pi_R = 0.48$, so that the left-wing party is slightly more redistributive than pure utilitarianism, while the right-wing party is slightly less. In addition, the probability that the incumbent government is re-elected is arbitrarily set at 0.5. We assume an annual market interest rate of 4 %, which is in line with standard practice, but we take each period to be four years in length (which is roughly the length of a term in government). Therefore, $1 + r = 1.17$. Finally, we assume that

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[9]See, for example, Weymark (1987), Brett and Weymark (2008b, 2011), and Simula (2010).

the individuals' discount factor, δ, is equal to $1/(1+r)$. The baseline parameter values are presented in Table 1.

Before proceeding to our results, in Table 2 we confirm that under pure utilitarianism ($\pi_L = \pi_R = 0.5$) the optimal marginal tax rate applicable to type k's savings (denoted $MTRS_k^1$) is zero. This result follows from Atkinson and Stiglitz (1976), who show that commodity taxation is redundant alongside nonlinear income taxation if labour is separable from consumption in the utility function and all individuals have the same preferences. We also obtain the standard results on the optimal marginal tax rate applicable to type k's labour income in period t, denoted as $MTRL_k^t$ — the optimal marginal tax rate applicable to the high-skill type's labour income is zero, while that for low-skill individuals is positive.

4.1   Baseline Results

Tables 3 and 4 report the baseline results for long-term taxation and short-term taxation, respectively. As it turns out, the results are qualitatively the same in both cases. Specifically, the optimal marginal tax rates applicable to the labour income of type k individuals in period t under a i-wing government (denoted $MTRL_{ki}^t$) are standard. That is, the optimal marginal tax rate applicable to the high-skill type's labour income is always zero, while that for low-skill individuals is always positive. What is more interesting are the optimal tax treatments of savings (denoted $MTRS_{ki}^1$), which we summarize as follows:

Result 1 *If the incumbent party is left-wing, the low-skill individuals' optimal marginal tax rate on savings is positive ($MTRS_{1L}^1 > 0$) while that for high-skill individuals is negative ($MTRS_{2L}^1 < 0$). If the incumbent party is right-wing, the low-skill individuals' optimal marginal tax rate on savings is negative ($MTRS_{1R}^1 < 0$) while that for high-skill individuals is positive ($MTRS_{2R}^1 > 0$).*

In sum, an incumbent left-wing government should set taxes to discourage savings by low-skill individuals and subsidize savings by high-skill individuals, while an incumbent right-wing government should do the opposite. The intuition underlying Result 1 follows from an important but somewhat overlooked feature of redistributive taxation, in that it redistributes utility, not income. As a left-wing government seeks to redistribute more

utility than a right-wing government, high-skill individuals have a stronger incentive to mimic under left-wing governments. This is why low-skill individuals receive less consumption, and face a higher marginal labour income tax rate, under a left-wing government than under a right-wing government. To understand how this feature of redistributive taxation helps explain Result 1, suppose the incumbent government is right-wing. An incumbent right-wing government knows there is some probability that the left-wing party will be in power in period 2, and that the left-wing party will need to increase the difference in the post-tax incomes of high-skill and low-skill individuals to deter mimicking. By encouraging savings by low-skill individuals and discouraging savings by high-skill individuals, the incumbent right-wing government is helping the left-wing party in period 2, because the latter can raise the difference in the two type's post-tax incomes without there being a corresponding increase in consumption discrepancy. The cost of this savings tax policy is increased utility inequality in period 1, due to lower consumption by low-skill individuals and higher consumption by high-skill individuals. But since the incumbent government is right-wing, it is more willing to tolerate this rise in inequality. A reverse argument applies if the incumbent government is left-wing. An incumbent left-wing government knows there is some probability that the right-wing party will be elected in period 2. As the right-wing party redistributes less, it has a lower need to differentiate the two type's post-tax incomes. It is therefore in a better position to inherit lower savings by low-skill individuals and higher savings by high-skill individuals. Moreover, this savings pattern implies more consumption by low-skill individuals and less consumption by high-skill individuals in period 1, which is more preferable under a left-wing government because it reduces utility inequality.

4.2   Comparative Statics

Figures $1-3$ show how the optimal marginal tax rates applicable to savings change in response to changes in the parameters that are specific to our model: the social welfare weights π_i and the probability that the incumbent government is re-elected p_i. The effects of changes in these parameters are explored, whilst holding all other parameters at their baseline levels. As the results for long-term and short-term taxation are qualitatively the same, we present only the long-term taxation results. The main

findings are summarized as follows:

Result 2 *If the incumbent party is left-wing, $\partial MTRS^1_{1L}/\partial \pi_L > 0$ and $\partial MTRS^1_{2L}/\partial \pi_L < 0$. If the incumbent party is right-wing, $\partial MTRS^1_{1R}/\partial \pi_L < 0$ and $\partial MTRS^1_{2R}/\partial \pi_L > 0$.*

Result 3 *If the incumbent party is left-wing, $\partial MTRS^1_{1L}/\partial \pi_R < 0$ and $\partial MTRS^1_{2L}/\partial \pi_R > 0$. If the incumbent party is right-wing, $\partial MTRS^1_{1R}/\partial \pi_R > 0$ and $\partial MTRS^1_{2R}/\partial \pi_R < 0$.*

Result 4 *If the incumbent party is left-wing, $\partial MTRS^1_{1L}/\partial p_L < 0$ and $\partial MTRS^1_{2L}/\partial p_L > 0$. If the incumbent party is right-wing, $\partial MTRS^1_{1R}/\partial p_R > 0$ and $\partial MTRS^1_{2R}/\partial p_R < 0$.*

The intuition underlying Results $2-4$ is straightforward and follows that underlying Result 1. An increase in π_L implies, *ceteris paribus*, a greater difference in the redistributive preferences of left-wing and right-wing governments. Therefore, the differences in the optimal marginal tax rates applicable to the low-skill and high-skill types' savings are increased. Analogously, an increase in π_R reduces the difference in the two partys' redistributive preferences; hence the differences in the optimal marginal tax rates on savings are reduced. An increase in the probability that the incumbent government is re-elected reduces the differences in the optimal marginal tax rates applicable to savings. If the incumbent government is more likely to be re-elected, it has less need to implement marginal savings taxation/subsidization to accommodate the redistributive goals of the opposition. In the limit, if the probability of re-election was certain, then the Atkinson-Stiglitz result that savings should not be taxed would apply.

5. Discussion: Theory versus Practice of Taxation

We have shown that implementation of optimal nonlinear taxation by a left-wing (resp. right-wing) government includes regressive (resp. progressive) savings taxation. It is interesting to contrast this policy recommendation with both the theory and practice of savings/capital taxation. In their review article on tax policy, Mankiw, et al. (2009) note that the zero taxation of capital is a benchmark result and a prominent policy recommendation. In particular, they highlight four key papers. First, the Diamond and Mirrlees (1971) production efficiency theorem implies that intermediate goods should not be taxed. To the extent that capital is an intermediate input in the production process,

the Diamond-Mirrlees result implies that capital should be exempt from taxation.[10] Second, an implication of Atkinson and Stiglitz's (1976) analysis is that savings should not be taxed (as discussed earlier). Third, there are the often-cited works of Chamley (1986) and Judd (1985), who conclude that the optimal long-run tax rate on capital is zero within an optimal growth model. The models used and assumptions made in these papers are quite distinct, thus contributing to the apparent robustness of the "zero capital tax" policy recommendation.

In practice, capital is subject to significant taxation. Mankiw, et al. (2009) report corporate income tax rates averaging around 30 % in developed countries. These rates have fallen sharply since the 1980s, but are still significant. At the individual level, taxation of dividend income differs substantially by country, but overall it remains significant, averaging near 20 % in OECD countries.

Given the above-mentioned gap between theory and practice, the question arises as to whether theory is missing something or whether actual practice is simply suboptimal. In their article on linking basic research to policy recommendations, Diamond and Saez (2011) argue strongly in favour of capital taxation. Their argument rests on the observation that the assumptions driving the benchmark zero capital tax result are not empirically relevant. In particular, they highlight that the Chamley-Judd model assumes that individuals make rational savings decisions consistently over a very long time horizon. Such behaviour is unsupported by empirical evidence. Likewise, the Atkinson-Stiglitz result no longer holds if there is a positive correlation between skills and savings propensity, which appears to be the case in reality.[11] Since our paper recommends non-zero savings taxation, it contributes to the literature that identifies exceptions to the baseline zero capital tax result (see, e.g., Conesa, et al. 2009 and the references cited therein). However, we cannot claim (nor can the related literature) that actual practice closely follows our policy recommendation. Table 5 shows corporate

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[10]It is worth noting that Diamond and Saez (2011) disagree with this common interpretation of the Diamond-Mirrlees result, stating that it does not imply that the capital income of households should not be taxed.

[11]Diamond and Saez (2011) also argue in favour of capital taxation on the basis that: (i) it can be difficult to distinguish between capital income and labour income, (ii) many individuals face borrowing constraints, and (iii) uncertainty over future earnings.

taxation as a share of total tax revenues under left-wing and right-wing governments in three countries: the United States, the United Kingdom, and Australia.[12] This tax-share statistic is an indication of the emphasis placed on corporate versus other types of taxation. Corporate income represents the return to capital and is predominately earned by the rich. Therefore, loosely speaking, left-wing governments should be less inclined to tax corporate income than right-wing governments if their objective is long-term social welfare maximization. However, Table 5 shows that no clear pattern has emerged. The corporate tax share is, on average, higher under left-wing governments in the U.S., lower under left-wing governments in the U.K. (thus qualitatively consistent with the theoretical predictions of our analysis), and there is no difference under left-wing and right-wing governments in Australia. One may wonder why actual practice differs in these countries. Perhaps political ideology plays a greater role in policy setting in the U.S. than in the U.K., as compared to economic and social motives. Specifically, the Republican Party in the U.S. seeks to distinguish itself from the Democrats as the 'low-tax and pro-business' alternative; and actual practice in the U.S. appears to be consistent with these differing ideologies.

A similar discrepancy between recommended policy and actual practice arises regarding labour income taxation. Theory suggests that a decreasing pattern of marginal labour tax rates may be optimal and consistent with redistribution (Mankiw, et al. 2009). Indeed, the workhorse Mirrlees (1971) model of optimal nonlinear income taxation implies that the highest-skill worker should face a zero marginal tax rate.[13] In practice, marginal tax rates are increasing in income, with top rates averaging around 40 %.[14] There again appears to be a large gap between theory and practice. Diamond and Saez (2011), however, recommend that very high earnings should be subject to rising marginal tax rates. First, they emphasize that the zero marginal tax rate at the

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[12]These countries are chosen as examples since their political systems have typically been dominated by two parties that can loosely be described as left-wing and right-wing. These are the Democrats and Republicans in the U.S., the Labour Party and Conservatives in the U.K., and the Labor Party and Liberal Party in Australia.

[13]The top marginal tax rate may even be negative, if wages are endogenous. See Stiglitz (1982).

[14]In the U.K., for example, no tax is payable on the first £11,000. Income from £11,001−£43,000 is taxed at 20 %, and income from £43,001−£150,000 is taxed at 40 %. All income above £150,000 is taxed at 45 %.

top result applies only to the highest-skill worker, suggesting that it is of little practical relevance. Second, the pattern of optimal marginal tax rates is sensitive to the skill distribution. If skills follow a Pareto distribution at the top, then high-earners should face increasing marginal tax rates. Diamond and Saez (2011) argue that the Pareto distribution better fits the data, as opposed to the log-normal distribution postulated by Mankiw, et al. (2009). Nevertheless, there still appears to be a gap between theory and practice away from the top of the skill distribution. For example, Diamond (1998) and Saez (2001) find that optimal marginal tax rates may follow a U-shaped pattern, being high at both the top and bottom of the skill distribution, but relatively low in the middle. Based on U.S. data, Saez (2001) shows that marginal tax rates should decrease in income up to $75,000 per annum, before increasing up to $200,000; and then remaining constant thereafter. However, if one moves beyond stated marginal tax rates to incorporate the effects of other policies (such as welfare programs), theory and practice become much closer.

6. Summary and Conclusion

Research on tax policy from a normative perspective is ultimately concerned with making recommendations as to how the government should set taxes. It is generally thought that the government should implement the tax system that is most preferred by the society. This corresponds to choosing the tax system that maximizes social welfare, assuming that the social welfare function represents the society's preferences. As tax policies implemented in the present can affect outcomes in the future, and society's preferences may change, it follows that the incumbent government should take the possibility of such change into consideration when setting taxes.

In this paper, we have examined the case in which society's preference for redistribution may change. The incumbent government chooses the tax system that maximizes expected social welfare, thereby explicitly respecting the possibility that society's preference may change. Our main result is that an incumbent left-wing government should implement a regressive savings tax policy, while an incumbent right-wing government

should do the opposite. The corresponding non-zero marginal tax rates on savings exist only to accommodate the different redistributive goals of the opposing party. If there was no chance that the opposing party may be elected — or equivalently no chance that society's redistributive preference may change — the Atkinson and Stiglitz (1976) result that savings should not be taxed alongside nonlinear income taxation would apply.

Finally, it seems reasonable to think that actual policy setting by an incumbent government reflects both self-interest and social welfare objectives. In future research, it would be interesting to explore an extension of our model which incorporates some self-interested behaviour (as in Persson and Svensson 1989 and Alesina and Tabellini 1990), and see whether such an extension can better explain the stylized facts shown in Table 5.

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Appendix

Marginal Tax Rates

In order to derive expressions for the marginal tax rates, we first describe how individuals would behave in the absence of taxation. Individual k would choose c_k^1, s_k^1, l_k^1, c_k^2, and l_k^2 to maximize:

$$u(c_k^1) - v(l_k^1) + \delta \left[u(c_k^2) - v(l_k^2) \right] \tag{A.1}$$

subject to:

$$c_k^1 + s_k^1 \leq w_k l_k^1 \tag{A.2}$$

$$c_k^2 \leq (1+r)s_k^1 + w_k l_k^2 \tag{A.3}$$

The solution to program $(A.1) - (A.3)$ yields the marginal conditions:

$$\frac{v'(l_k^t)}{u'(c_k^t)w_k} = 1 \text{ (for } t = 1, 2) \quad \text{and} \quad \frac{u'(c_k^1)}{\delta(1+r)u'(c_k^2)} = 1 \tag{A.4}$$

In the presence of taxation, the marginal conditions in equation (A.4) may not hold. The marginal distortions may be interpreted as implicit marginal tax rates. That is:

$$MTRL_k^t := 1 - \frac{v'(l_k^t)}{u'(c_k^t)w_k} \quad \text{and} \quad MTRS_k^1 := 1 - \frac{u'(c_k^1)}{\delta(1+r)u'(c_k^2)} \tag{A.5}$$

where $MTRL_k^t$ denotes the marginal tax rate on labour faced by type k individuals in period t, and $MTRS_k^1$ denotes the marginal tax rate on savings faced by type k individuals in period 1. However, since the government in each period may be left-wing or right-wing, and it is not known in period 1 which party will be in power in period 2, the expressions for the marginal tax rates become:

$$MTRL_{ki}^t := 1 - \frac{v'(l_{ki}^t)}{u'(c_{ki}^t)w_k} \quad \text{and} \quad MTRS_{ki}^1 := 1 - \frac{u'(c_{ki}^1)}{\delta(1+r)E(u'(c_k^2))} \tag{A.6}$$

where $E(u'(c_k^2)) = p_i u'(c_{ki}^2) + (1 - p_i)u'(c_{kj}^2)$ is type k's expected marginal utility of consumption in period 2.

Marginal Savings Tax Rate Formulas under Long-term Taxation

To derive equations (4.1) and (4.2), the first-order conditions for program $(3.4) - (3.7)$ on s_{1i}^1 and s_{2i}^1 are, respectively:

$$-\pi_i(1-\phi)u'(m_{1i}^1 - s_{1i}^1) + p_i\pi_i(1-\phi)\delta(1+r)u'(m_{1i}^2 + (1+r)s_{1i}^1) + (1-p_i)\delta\frac{\partial W_j^2(\cdot)}{\partial s_{1i}^1}$$

$$+ \theta_i^1\left[u'(m_{1i}^1 - s_{1i}^1) - p_i\delta(1+r)u'(m_{1i}^2 + (1+r)s_{1i}^1) + (1-p_i)\delta\left(\frac{\partial V_{2j}^2(\cdot)}{\partial s_{1i}^1} - \frac{\partial \widehat{V}_{2j}^2(\cdot)}{\partial s_{1i}^1}\right)\right] = 0$$
$$\text{(A.7)}$$

$$-(1-\pi_i)\phi u'(m_{2i}^1 - s_{2i}^1) + p_i(1-\pi_i)\phi\delta(1+r)u'(m_{2i}^2 + (1+r)s_{2i}^1) + (1-p_i)\delta\frac{\partial W_j^2(\cdot)}{\partial s_{2i}^1}$$

$$- \theta_i^1\left[u'(m_{2i}^1 - s_{2i}^1) - p_i\delta(1+r)u'(m_{2i}^2 + (1+r)s_{2i}^1) - (1-p_i)\delta\left(\frac{\partial V_{2j}^2(\cdot)}{\partial s_{2i}^1} - \frac{\partial \widehat{V}_{2j}^2(\cdot)}{\partial s_{2i}^1}\right)\right] = 0$$
$$\text{(A.8)}$$

where $\theta_i^1 > 0$ is the multiplier on equation (3.7). By the Envelope Theorem:

$$\frac{\partial W_j^2(\cdot)}{\partial s_{1i}^1} = \pi_j(1-\phi)u'(m_{1j}^2 + (1+r)s_{1i}^1)(1+r) \qquad \text{(A.9)}$$

$$\frac{\partial W_j^2(\cdot)}{\partial s_{2i}^1} = (1-\pi_j)\phi u'(m_{2j}^2 + (1+r)s_{2i}^1)(1+r) + \theta_j^2(1+r)\left[u'(m_{2j}^2 + (1+r)s_{2i}^1) - u'(m_{1j}^2 + (1+r)s_{2i}^1)\right]$$
$$\text{(A.10)}$$

where $\theta_j^2 > 0$ is the multiplier on equation (3.3). Using equation (A.6), equations $(A.7) - (A.10)$ can be manipulated to yield equations (4.1) and (4.2).

Marginal Savings Tax Rate Formulas under Short-term Taxation

The formula for the low-skill type's marginal tax rate applicable to savings under short-term taxation is:

$$MTRS_{1i}^1 = \frac{(\pi_i - \pi_j)(1 - p_i)u'(m_{1j}^2 + (1+r)s_{1i}^1)}{\pi_i\left[p_iu'(m_{1i}^2 + (1+r)s_{1i}^1) + (1-p_i)u'(m_{1j}^2 + (1+r)s_{1i}^1)\right]}$$

$$- \frac{\theta_i^1\left[u'(m_{1i}^1 - s_{1i}^1) + p_i\delta\left(\frac{\partial V_{2i}^2(\cdot)}{\partial s_{1i}^1} - \frac{\partial \widehat{V}_{2i}^2(\cdot)}{\partial s_{1i}^1}\right) + (1-p_i)\delta\left(\frac{\partial V_{2j}^2(\cdot)}{\partial s_{1i}^1} - \frac{\partial \widehat{V}_{2j}^2(\cdot)}{\partial s_{1i}^1}\right)\right]}{\pi_i(1-\phi)\delta(1+r)\left[p_iu'(m_{1i}^2 + (1+r)s_{1i}^1) + (1-p_i)u'(m_{1j}^2 + (1+r)s_{1i}^1)\right]} \qquad \text{(A.11)}$$

while that for the high-skill type is:

$$MTRS_{2i}^1 = \frac{(\pi_j - \pi_i)(1 - p_i)u'(m_{2j}^2 + (1+r)s_{2i}^1)}{(1 - \pi_i)\left[p_i u'(m_{2i}^2 + (1+r)s_{2i}^1) + (1 - p_i)u'(m_{2j}^2 + (1+r)s_{2i}^1)\right]}$$

$$+ \frac{\theta_i^1\left[u'(m_{2i}^1 - s_{2i}^1) - p_i\delta\left(\frac{\partial V_{2i}^2(\cdot)}{\partial s_{1i}^1} - \frac{\partial \widehat{V}_{2i}^2(\cdot)}{\partial s_{1i}^1}\right) - (1 - p_i)\delta\left(\frac{\partial V_{2j}^2(\cdot)}{\partial s_{2i}^1} - \frac{\partial \widehat{V}_{2j}^2(\cdot)}{\partial s_{2i}^1}\right)\right]}{(1 - \pi_i)\phi\delta(1+r)\left[p_i u'(m_{2i}^2 + (1+r)s_{2i}^1) + (1 - p_i)u'(m_{2j}^2 + (1+r)s_{2i}^1)\right]}$$

$$- \frac{\theta_i^2 p_i\left[u'(m_{2i}^2 + (1+r)s_{2i}^1) - u'(m_{1i}^2 + (1+r)s_{2i}^1)\right]}{(1 - \pi_i)\phi\left[p_i u'(m_{2i}^2 + (1+r)s_{2i}^1) + (1 - p_i)u'(m_{2j}^2 + (1+r)s_{2i}^1)\right]}$$

$$- \frac{\theta_j^2(1 - p_i)\left[u'(m_{2j}^2 + (1+r)s_{2i}^1) - u'(m_{1j}^2 + (1+r)s_{2i}^1)\right]}{(1 - \pi_i)\phi\left[p_i u'(m_{2i}^2 + (1+r)s_{2i}^1) + (1 - p_i)u'(m_{2j}^2 + (1+r)s_{2i}^1)\right]} \tag{A.12}$$

where $\theta_i^2 > 0$ is the multiplier on equation (3.3) when the incumbent government is re-elected.

TABLE 1

Baseline Parameter Values

π_L	0.520	σ	1.000	w_1	1.000
π_R	0.480	γ	2.000	w_2	1.600
p_i	0.500	$1 + r$	1.170		
φ	0.333	δ	0.855		

TABLE 2

Pure Utilitarianism ($\pi_L = \pi_R = 0.5$)

Long-term Taxation		Short-term Taxation	
Period 1		*Period 1*	
$MTRS_1^1$	0.000	$MTRS_1^1$	0.000
$MTRS_2^1$	0.000	$MTRS_2^1$	0.000
$MTRL_1^1$	0.087	$MTRL_1^1$	0.087
$MTRL_2^1$	0.000	$MTRL_2^1$	0.000
Period 2		*Period 2*	
$MTRL_1^2$	0.087	$MTRL_1^2$	0.087
$MTRL_2^2$	0.000	$MTRL_2^2$	0.000

TABLE 3

Baseline Results: Long-term Taxation

Left-Wing Incumbent		Right-Wing Incumbent	
Period 1: Left-Wing		*Period 1: Right-Wing*	
$MTRS^1_{1L}$	0.043	$MTRS^1_{1R}$	−0.044
$MTRS^1_{2L}$	−0.032	$MTRS^1_{2R}$	0.034
$MTRL^1_{1L}$	0.096	$MTRL^1_{1R}$	0.078
$MTRL^1_{2L}$	0.000	$MTRL^1_{2R}$	0.000
Period 2: Left-Wing		*Period 2: Left-Wing*	
$MTRL^2_{1L}$	0.096	$MTRL^2_{1L}$	0.083
$MTRL^2_{2L}$	0.000	$MTRL^2_{2L}$	0.000
Period 2: Right-Wing		*Period 2: Right-Wing*	
$MTRL^2_{1R}$	0.089	$MTRL^2_{1R}$	0.078
$MTRL^2_{2R}$	0.000	$MTRL^2_{2R}$	0.000

TABLE 4

Baseline Results: Short-term Taxation

Left-Wing Incumbent		Right-Wing Incumbent	
Period 1: Left-Wing		*Period 1: Right-Wing*	
$MTRS^1_{1L}$	0.042	$MTRS^1_{1R}$	−0.046
$MTRS^1_{2L}$	−0.033	$MTRS^1_{2R}$	0.033
$MTRL^1_{1L}$	0.096	$MTRL^1_{1R}$	0.078
$MTRL^1_{2L}$	0.000	$MTRL^1_{2R}$	0.000
Period 2: Left-Wing		*Period 2: Left-Wing*	
$MTRL^2_{1L}$	0.113	$MTRL^2_{1L}$	0.099
$MTRL^2_{2L}$	0.000	$MTRL^2_{2L}$	0.000
Period 2: Right-Wing		*Period 2: Right-Wing*	
$MTRL^2_{1R}$	0.075	$MTRL^2_{1R}$	0.057
$MTRL^2_{2R}$	0.000	$MTRL^2_{2R}$	0.000

FIGURE 1

Long-term Taxation: effects of changing π_L

Left-Wing Incumbent   *Right-Wing Incumbent*
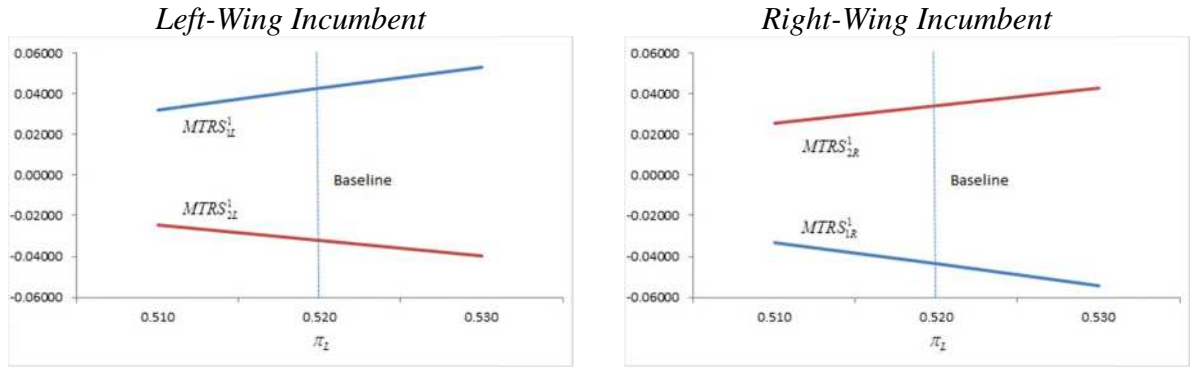
FIGURE 2

Long-term Taxation: effects of changing π_R

Left-Wing Incumbent   *Right-Wing Incumbent*
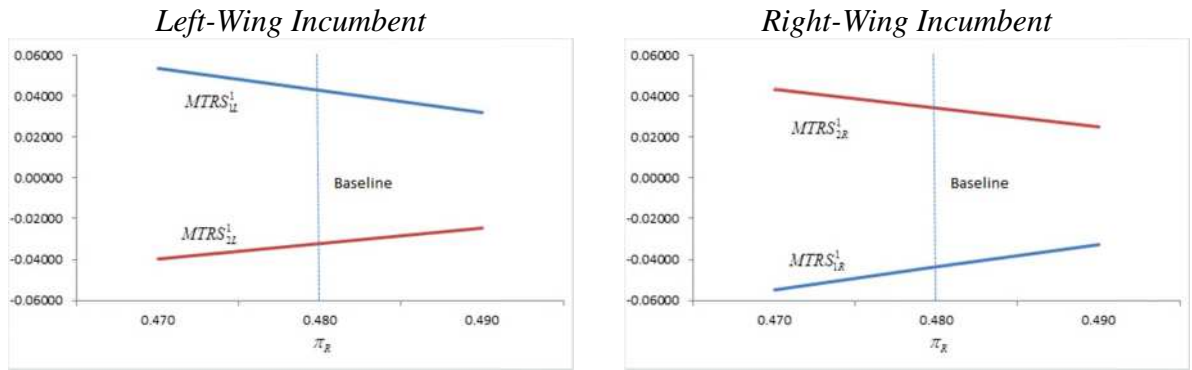
FIGURE 3

Long-term Taxation: effects of changing p_L and p_R

Left-Wing Incumbent   *Right-Wing Incumbent*
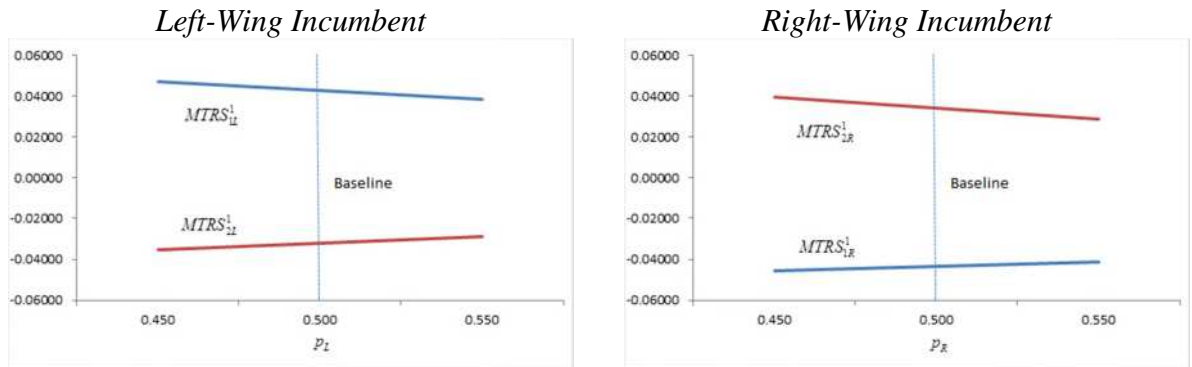
TABLE 5

Corporate Taxation as a Share of Total Tax Revenues under Left-wing and Right-wing Governments[*]

United States

Year	1965-68	1968-76	1976-80	1980-92	1992-2000	2000-08	2008-15
Government	*L*	*R*	*L*	*R*	*L*	*R*	*L*
Corporate tax share (%)	16.3	12.3	11.5	8.0	8.6	8.3	7.6

Average *L*　11.0　　　Average *R*　9.5

United Kingdom

Year	1965-70	1970-74	1974-79	1979-97	1997-2010	2010-15
Government	*L*	*R*	*L*	*R*	*L*	*R*
Corporate tax share (%)	6.6	8.2	6.9	9.5	9.4	8.0

Average *L*　7.6　　　Average *R*　8.6

Australia

Year	1965-69	1969-75	1975-83	1983-90	1990-93	1993-96	1996-98	1998-2001	2001-07	2007-13	2013-14
Government	*R*	*L*	*R*	*L*	*R*	*L*	*R*	*L*	*R*	*L*	*R*
Corporate tax share (%)	15.4	15.0	11.1	10.6	13.9	14.2	14.7	16.3	18.6	19.7	17.4

Average *L*　15.2　　　Average *R*　15.2

[*] Source: OECD (2016).