On the Political Economics of Tax Reforms

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Abstract

There is often a gap between the prescriptions of an "optimal" tax system and actual tax systems, some of which can be neither efficient economically nor efficient at redistributing income. With a focus on personal income taxes, this paper reviews the political economics literature on tax systems and reforms to see whether political mechanisms allow us to better understand why tax systems look the way they look. Finally, we exploit a database of reforms in labour taxation in the European Union to check the determinants of all reforms, on the one hand, and of targeted reforms, on the other hand. The results fit well with political economy theories and show that political variables carry more weight in triggering reforms than economic variables. This shed light on whether and how tax reforms are achievable. It also explains why many reforms that seem economically optimal fail to be implemented.

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Introduction

There is often a gap between the prescriptions of an "optimal" tax system and actual tax systems. A tentative explanation would be that different countries have varying degrees of aversion against inequality, which would explain why countries prefer to maintain a "non-optimal" tax system. Yet, there are recurrent cases in which the tax system is neither efficient economically nor efficient at redistributing income. The first goal of the present paper is to review the political economics literature on tax systems and reforms to see whether political mechanisms allow us to better understand why tax systems look the way they look. Throughout, our main focus is on the personal income tax (PIT). We then confront the predictions of the literature with observations and present econometric evidence that political economy forces are a strong predictor of tax reforms. Based on these theories and on available evidence, we draw some conclusions on politically-sustainable tax systems and on the feasibility of reform.

The structure of the paper is as follows. Section I very briefly reviews the classical theories on income tax. Optimal tax systems should aim at minimizing the "excess burden" from taxation – which calls for higher taxes on inelastic income sources - but taxation also has a role in enhancing income redistribution. A benevolent social planner thus faces a trade off. A weakness of these theories of taxation is that they abstract from two fundamental issues: first, the definition of the tax base itself; second, they overlook the definition of what is "personal income". When taxing different resources at different rates, taxpayers tend to play with these definitions in the way they organize their activity, which itself creates new types of distortions. This is reminiscent of the Lucas' critique. An oft-heard recommendation is then to broaden the tax base and to reduce the rates of taxation: this reduces the taxpayers' incentives to manipulate their activities, and thus distortions, while increasing horizontal equity. Despite the high expectations in favour of such a movement towards a broad-base/low-rate system, few countries are actually implementing reforms in this direction.

Section II reviews the political economy literature on income taxation and reform. A fact is that policymaking is not the feat of an abstract social planner. In democratic societies, policies are made by political parties who must win elections. Thus, political processes are likely to play a role in shaping tax systems. To understand these processes, we begin by reviewing the seminal literature on the political economy of taxation. The "median-voter" approach takes the hypothesis that political competition forces parties to pander to the voter

that divides the electorate in two equal parts. An interesting contribution of this literature is to show that the median voter is actually not interested in picking an optimal tax system. If she is self-serving, she will prefer sub-optimally high tax rates to tax the rich and redistribute to herself. These predictions are however not borne out by facts. A more elaborate setup are the probabilistic voting models which shed light on the incentive of parties to offer lower tax rates to the groups that are electorally mobile. Framed differently, equilibrium tax rates are not only lower for more elastic *income sources*, but also for the voters whose *electoral elasticity* is higher. In contrast to the Ramsey rule, one may observe inelastic income sources that benefit from low tax rates, only because of political competition. Next, considering an "anonymous" approach, where one can predict the Lorenz curve but not the identity of the beneficiaries, reveals that a fully egalitarian tax system is systematically beaten in a political competition game. This literature suggests that more intense political competition, under some conditions, induces parties to give up more efficiency in order to achieve better targetability.

Section 2.3 considers more widely the political economy of reforms: improving a tax system means starting from an existing situation, *the status quo*, and convincing politicians and voters to reform the system. This process creates uncertainty and losers and winners. The literature emphasizes several sources for a *status quo bias*. This bias means that voters will impose more conditions to move from a status quo *A* to a new tax system *B*, than to remain in *B* once the latter has initiated its existence. Thus, they oppose change as such. The government can tailor its reform strategy to try and circumvent this opposition. One strategy is to pursue *gradual reforms*, which amounts to splitting the reform in different chunks, to target a different group at a different time. In Section III, we provide econometric evidence that such reforms are more likely in proportional representation systems and when the ruling coalition has a strong lead. In some cases, the opposite strategy may be needed: if too many groups are able to block each single sub-reform, then the government may have to either rely on external constraints that make the reform unavoidable, or to group a suboptimally large range of reforms at once. Next, we review the incentives of the politicians when there is asymmetric information. Politicians may need to rely on strategies that hide some redistribution patterns, so as not to lose support from those who do not benefit from redistribution (i.e. suboptimal "sneaky" methods of redistribution). The politicians' incentives are typically affected by the rules of the game, defined by the country's institutions and constitution. One may for instance expect taxes to be lower in presidential and in majoritarian

systems than in parliamentary or in proportional representation systems. Direct democracy also leads to quite different outcomes, but a normative conclusion cannot be drawn from such differences: each system suffers from some type of distortion or generates its own information failures. Finally, we provide some concrete examples from Italy and the UK.

In Section III, we exploit data on labour tax reforms in the EU27 for the years 2000-2007. We check which political or economic conditions increase the probability of observing a reform. Surprisingly, the political variables appear to have more explanatory power than economic factors. High unemployment, for instance, is not conducive to more reforms. Instead, the size of the ruling coalition and the number of parties in it, do have a systematic impact on the probability of a reform.

Part I. Preliminaries

1.1. Classical theories on income tax

The normative analysis of taxation focuses on how the government should minimize the "excess burden" from taxation. In theory, a policy-maker can select any feasible allocation, and redistribute allocations via lump-sum transfers, so that the equilibrium market outcome leads to that allocation. This process is called decentralization and is an application of the second welfare theorem[1]. In practice, achieving any such allocation is impossible, if only because transfers are likely to be different across individuals. Thus, one needs to condition the transfer on "observables" (e.g. income), which the individual then has an incentive to manipulate. In this case, the transfer is no longer lump-sum. Any set of taxes and transfers thus generate economic distortions.

1.1.1 The trade-off between equity and efficiency

Economic distortions are typically expected to move the allocation of factors, goods and services away from an allocation that could be considered as economically "efficient". Yet, in the presence of externalities, such distortions can actually be used to improve upon inefficient allocations under laissez-faire. Taxes are also used to finance the supply of public goods that are under provided under laissez-faire.

Many tax systems are redistributive to serve an equity purpose, which has positive economic effects (e.g. reducing social unrest and criminality). In such systems, tax rates

should be zero or even negative at the bottom of the distribution. At the same time, however, pursuing equity purposes too far may reduce efficiency[2]. A strand of the literature on optimal taxation (Ramsey, 1927, Mirrlees, 1971, 1972, 1976) tried to address this trade-off between efficiency and equity: the initial thrust was to focus on efficiency, considering homogeneous agents. Then, income heterogeneity was included to also capture the redistributive effects of taxation. But a typical result was that tax levels would be very different across individuals, which is clearly not implementable for practical reasons.

1.1.2. The Ramsey Rule.

The *Ramsey Rule* (Ramsey, 1927) relates to the taxation of multiple tax bases: taxation should be heavier on less elastic bases. More precisely, if we abstract from cross-price effects, the ratio between two tax rates should be made equal to the inverse of the two price elasticities. This is known as the *inverse elasticity rule*. Importantly, this might imply a *regressive* overall tax rate: the goods with most inelastic demands (typically food, fuel, and housing) are comparatively more consumed by the poor. Balancing equity and efficiency will thus impose to partially move away from the inverse elasticity rule and constrain the system to tax at higher rates the goods that are disproportionately consumed by high-income earners.

Extending the logic of the Ramsey rule to personal income taxes (PIT), one may wish to tax different income sources at differential rates (see also Saez, 2001).[3] The elasticity of labour supply is likely to be higher when the worker has more opportunities outside the national labour force. We can easily identify two opposite reasons for high elasticity: either the worker can exit the labour market or emigrate at low cost. The former case may represent people with a wage close to the level of unemployment benefit, or the second wage earner in the household. The second case may represent high wage earners with lots of opportunities abroad: sports professionals, movie stars, plane pilots, managers, etc. Their high taxable income elasticity may call for lower income tax rates. This may provide an efficiency argument in favour of a hump-shaped tax rate as a function of income, which leans against equity principles and the actual progressivity of most actual tax systems.[4]

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[1] See Hindriks and Myles (2006), pp. 370-375.
[2] A tax system is said to be efficient if it minimizes the total excess burden of raising revenues.
[3] Saez (2001) shows that the Ramsey Rule can also be used to compute the optimal marginal tax rates in an optimal income tax scheme. However, his purpose is not to distinguish between different income sources. A noticeable feature of recent tax reforms has been the introduction of various forms of the so-called Dual Income Tax model, which taxes capital income of individuals at a separate (usually both flat and lower) tax rate.
[4] This conclusion also goes against Saez (2001) but rejoins the simulations in Mirrlees (1971).

1.2. Classical theories: application to the question: "Tax base broadening or incentives?"

A weakness of current theories on taxation is that they abstract from two fundamental issues: the definition of the tax base itself and the definition of what is "income". Typically, these models consider a distribution of individual productivities with people with highest productivity earning the highest income. But this approach does not distinguish capital from labour income, while we observe that they are generally taxed differently in many countries (e.g. DIT systems). Likewise, self-employed may be treated differently from employees, and other differences may appear between civil servants and private sector employees.

A second crucial issue appears as soon as we open the black box of "personal income": since it is composed of different sources, which are likely to have a different elasticity, we will have to conclude that tax rates should differ across sources. Yet, such differences themselves will pose a problem: they create new incentives to avoid taxes. Gruber (2005, p551) cites J.M. Keynes saying that "*The avoidance of taxes is the only pursuit that still carries any reward*". In other words, optimal taxation of different income sources may suffer from a Lucas' critique: the elasticity of the various income sources is itself a function of policy and tax rate differentials. A concrete case identified by de Mooij and Nicodème (2008), shows that the reduction in corporate taxes in Europe (possibly triggered by tax competition) induced many individuals to incorporate their business, in order to avoid taxes on labour. Thus, increasing the gap between two tax rates modified the individuals' behaviour, and therefore their income elasticity with respect to taxes.

More generally, consider a government that observes a high tax elasticity of some activity X. As a result, it decreases tax rates for incomes related to activity X. The issue is that, by creating this wedge between activity X and another activity Y, it induces a new type of substitution effect, and hence increases the tax elasticity of activity Y. In practice, efficiency may thus require to give up some of the elaboration in tax schedules that we took from the previous literature.[5] This brings in *tax neutrality*, which takes a view opposite to the Ramsey rule. According to this idea, all taxable activities should be treated equally, and thus taxed at the same effective marginal rate, independently of the income source (labour, capital). Similarly, different capital incomes should be taxed equally. An extreme version of tax neutrality is the pure flat tax proposed by Hall and Rabushka (1983, 1985).

Neutralizing tax systems is one of the major trends in the recent evolution of tax systems in European countries: *tax base broadening* and the *reduction of tax rate differentials* have been relatively common policies over the last years. Several countries have reduced the number of tax brackets for the personal income tax (for instance Belgium, Italy and the United Kingdom) and/or they are reducing taxes on labour, in particular Personal Income Taxes and social security contributions (e.g. the United Kingdom, Ireland, Netherlands, France). Meanwhile, there is a general tendency for countries to broaden the tax base, at least regarding the sources of capital income. There are indeed many advocates of a common and uniform treatment of all sources of capital incomes, and several governments embraced this goal.

Proponents of tax neutrality emphasize three main effects: the first one is **efficiency**. As just highlighted, the distortionary effects of taxation tend to be reduced, partly because the elasticities of the different income sources also get reduced. On the other hand, one should not forget the conclusions of the optimal tax literature: taxing different bases and different income levels at the very same rates may entail significant efficiency losses. The implementation of the tax neutrality principle may include a shift away from labour taxation. European countries recently performed many reforms in this direction, including the reduction of social security contributions in the UK, Ireland and the Netherlands, the increase of taxes on property in the UK and France, and an increase in environmental taxes.

The second argument is to promote **equity,** in the form of both vertical and horizontal equity. **Vertical equity** has in particular played a central role in recent tax reforms, being tightly related to the progressivity of the tax system: richer individuals have to be taxed more heavily. Focusing on the income tax, progressivity may be reached through several channels, which we will explain in a moment. Regarding **horizontal equity**, the main intuition is that a single and broad tax for any source of income, including labour and capital, should be preferred if the appropriate measure of the "ability to pay taxes" is comprehensive income (Simons, 1938). Then, individuals with equal ability to pay taxes (as measured by comprehensively defined incomes) should pay equal taxes regardless of the source of their income. This idea has never been implemented because of practical (measurement) and theoretical reasons (is it best to focus taxes on measurable income or on consumption?).[6] The issue of horizontal equity has often been neglected, based on the justification that it would

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[5] This is related to the argument by Alt et al. (2008) who insist on the need for governments to address tax systems in their entirety and avoid dealing with each tax rate separately.

become a minor problem once the income tax structure is simplified. In the next sections, we instead argue that there are strong political motivations behind the large diffusion of distortions away from the horizontal equity principle.

The third motivation is to reduce **complexity**. That is, increase the simplicity of the income tax structure, *e.g.* through a reduction in the number of brackets and in the number of exemptions and tax expenditures. From that viewpoint, some argue that comprehensive *flat rate* taxation is the most neutral and the least complex system.[7] In Estonia for instance, this motivation played an important role in the choice of a flat tax in 1994. More generally, decreasing the number of brackets may lower administration costs, and thus free revenue for other public goods. Finally, the presence of multiple brackets may induce some taxpayers to reduce their (measurable) income in order to be eligible for a lower tax rate (see Hettich and Winer, 1999).

To be more specific in the analysis of how these arguments can be applied, we introduce a simple formal representation of taxes on personal income.

First, define *total taxable income Y* as:

$$Y = \sum_i \alpha_i\, y_i$$

where *i* is the income source and α_i is the weight (or discount) given by the tax system to that source of income. Let $\alpha_i = 0$ if an income source is not considered in the tax base (this is common, for instance, for social security benefits). The *tax base* can thus be defined as the number of sources for which $\alpha_i > 0$. A *broadening of the tax base* is then a set of increases in the number of taxable income sources *i*: α_i is increased from zero to some[8] strictly positive value for these income sources. More generally, we can consider increases of α_i beyond their initial intermediate value.[9]

Then, define *(net) taxable income TI* as:

$$TI = Y - D$$

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[6] E.g. the Schanz-Haig-Simons definition of economic income includes consumption and changes in wealth.

[7] This was among the motivations behind Estonia's choice of a flat tax. Notice that even Estonia has some deductions, but also a ceiling on these deductions. We will discuss the role of political constraints on effective tax complexity.

[8] This will be important for the political economy process, which we analyze in the next section.

[9] α_i may remain strictly between 0 and 1 for income sources that are only partially taxed (for instance, $\alpha_i = 0.85$ for the income that the owner receives from renting a house in Italy, if this income is higher than the official value of the property). Note that α_i can theoretically be larger than unity.

where *D* is the deduction that the person can claim, based on observable characteristics, such as the possession of the house in which he/she lives, the poverty level, expenses for earning or maintaining income, etc.

Then, define the *tax payment* as:

$$TAX = \tau(TI) - C,$$

where τ is a function of taxable income, which includes the number of tax brackets and associated rates. In a *flat rate* tax system, there is a single tax bracket and thus the function $\tau(TI)$ reduces to a unique tax rate τ applied to the tax base *TI*. *C* stands for *tax credits*, which are typically associated with personal characteristics of the taxpayer, such as the number of children and/or other family charges, and with specific personal expenditures.

Finally, we have to consider additional income sources that are not necessarily taxed according to the personal income tax (e.g. some capital incomes, property taxes, etc.) but through specific taxes and taxes on consumption. For simplicity, we consider that these income sources are taxed linearly. Let us define these other sources of income and associated taxes as:

$$T^{other} = \tau^z \sum_i \beta_i z_i + \tau^c \sum_j \gamma_j c_j \, ,$$

where z_i are these other sources of income and c_j is consumption of good *j*. Taxes on these other sources are typically flat rates, and we have indicated with τ^z the tax rate on the other sources of income and with τ^c the tax rate on consumption.[10]

In this simple scheme, the arguments for tax neutrality can be reframed as follows:

1) Efficiency. Consumption taxes should be preferred to income taxes in order to limit intertemporal distortionary effects:[11] $\tau(Y) = \tau^z = 0$ and $\tau^c > 0$. When this is not possible and taxes on income are used, a broad base tax is preferred to reduce distortions among income sources, i.e. all sources of income should be included in the same tax base: $\sum_i \alpha_i y_i + \sum_i \beta_i z_i$. When this is not possible and different sources of income are taxed with

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[10] Notice however that a consumption tax does not necessarily have to be implemented by levying a VAT($\tau^c > 0$), since it can also be implemented indirectly by allowing savings to be deducted from the personal income tax base. We do not include this characterization in our simplified representation.

[11] The idea is that under progressive income taxation, revenues raised on one single occasion will push the taxpayer into higher marginal tax rates compared to a taxpayer that would earn the same amount over several periods. Note however that this argument is only valid if the consumption tax is proportional and the income tax progressive, two conditions that may not hold in practice.

different tax rates, the Ramsey rule recommends that $\tau_1 > \tau_2$ when tax base (1) is less elastic than tax base (2).

2) Vertical Equity. To achieve *vertical equity*, the tax system must be *progressive*. In our framework, the progressivity of the personal income tax must then be measured as the evolution of the *average tax rate*, as a function of total taxable income, *Y*. The personal income tax is progressive if the average tax rate is increasing in actual income, *i.e.* if:

$$\frac{d\left\{\dfrac{\tau\left(\sum \alpha_i \, y_i - D\right) - C}{Y}\right\}}{dY} > 0.$$

It is proportional if this average tax rate is constant, and regressive if it decreases with income. (Remarks that progressivity is equivalent to saying that the marginal tax rate is larger than the average tax rate).

It is straightforward to see that deductions *D,* tax credits *C*, and the different tax brackets are three alternative instruments to reach progressivity. They are typically used simultaneously, but their relative weight in actual tax systems differ across countries and, in presence of tax reforms, within the same country over time. In particular, notice that even a *flat rate* tax scheme may be progressive: deductions, allowances, and tax credits are still available to introduce progressivity. Notice also that while tax credits provide an equal reduction in the total tax payment for all taxpayers, the tax reduction provided by deductions actually depends on the marginal tax rate of the taxpayer. This means that, when the tax rate schedule features higher tax rates for higher income brackets, the reduction in total tax payment is higher for higher levels of income

The *progressivity of the overall tax system* depends on the evolution of *total tax payment* as a function of *total actual income*:

$$\left(TAX + T^{other}\right) / \left(\sum_i y_i + \sum_j z_j\right),$$

where total actual income, $\sum_i y_i + \sum_j z_j$, puts a weight 1 on all income sources, be them in the tax base (α_i or $\beta_j > 0$) or not (α_i or $\beta_j = 0$).

This *actual income* is generally not observable: it may include undeclared or illegal activities for instance. Yet, even if the individual only performs lawful activities, income

sources that lie outside the personal income tax base (because $\alpha_i = 0$) typically do not appear in tax forms. Yet, it is the tax base that the modeller would actually like to observe.

Interestingly, this approach may reveal that, even if the personal income tax is progressive, the overall tax system may turn out to be proportional, or even regressive, if some income sources are left out of the direct tax base, and are taxed according to a flat rate tax on what we have called "other income sources". Consider the case of capital income as an example: in many countries, it is not included in the base for the progressive personal income tax, but taxed separately, at a tax rate τ^{oy} which is much smaller than, say, labour income. If rich individuals benefit from much more capital income than the poor, then the overall tax system turns out to be regressive. Tax reforms may change the values of α and/or β for specific sources of incomes. We discuss these issues in section 2.4.

3) Horizontal Equity. To achieve horizontal equity, a broad tax base corresponding to "comprehensive" income should be preferred: $Y + \sum_i \beta_i z_i + \sum_j \gamma_j c_j$. In a life-time perspective, taxpayers with the same income in present value terms should be taxed equally. Horizontal equity and progressivity then become distinct goals, since progressive tax systems may violate horizontal equity when the overall lifetime is considered. On the political level, one might expect that this idea of taxing the comprehensive income would receive the support of taxpayers, who would perceive such a system as fair. In practice, however, horizontal equity may not be endorsed by political parties in equilibrium, because it goes against their incentive to take account of the effective political influence of different population groups (see section 2.2.2).

4) Complexity. As it is clear from our simplified representation, the complexity of the tax system depends on shape of the function $\tau(Y)$, *i.e.* on the number of tax rates and tax brackets, and on the number of deductions D and allowances A. It is not correct to say that a flat rate tax scheme (i.e. when $\tau(Y) = \tau Y$ with a unique τ for all levels of Y) is necessarily less complex than a scheme with several tax brackets, if the former is associated with more deductions and/or more allowances than the latter. There is a general trend in Europe towards reducing the number of brackets (e.g. Belgium, United Kingdom, or Italy). However, this need not imply less complexity, since the number of deductions, allowances, and exemptions, are typically increased at the same time. [12] Thus, the declared objective of many of these

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[12]See Slemrod (2005) on this point. For evidence on these trends in Europe see Bernardi and Profeta (2004). Notice also the link between tax progressivity and complexity.

reforms, mainly the simplification of the tax system, may fail to be reached. As we explain in the next section, political motivations may again be a crucial factor to explain these trends (Galli and Profeta, 2008).

Part II. Political Economy and Policy Strategy

2.1 Main questions and summary of the section

The optimal tax argument should be sufficient to explain the evolution of tax systems if policymakers behaved as social planners. Yet, in democratic societies, policies are made by political parties who want to win elections. Thus, the political process plays a crucial role in shaping the tax systems that we observe. This section summarizes the literature that studies how politicians tend to adapt to voter preferences in order to win the election, with a focus on the influence of these processes on the equilibrium tax system and on the feasibility of reforms. In this survey, we focus on theories based on the demands that originate in the electorate. This does capture the possibility of a change in the economic environment but overlooks a) the influence of an emblematic policymaker and b) the role of lobbies. The reason for the former is simply that no theory can predict the preferences of the policymaker, nor his charisma. The reasons for the latter are (i) that we are focusing on Personal Income Taxes, whereas lobbies are comparatively more active in corporate taxes, special exemptions, etc.; and (ii) Grossman and Helpman (2001) cover the topic already quite extensively.

2.2. The political economics of taxation

2.2.1. Can the median voter theorem explain tax systems?

The median voter approach assumes that voters are directly asked which tax rate they want, and that the median voter is the one eventually in control of policies.[13] This approach thus abstracts from the complex interactions between politicians and voters. The question is whether or not such a simplifying assumption prevents us from understanding what shapes tax systems. We will see that, even in the absence of information asymmetries or issues specific to the political game, voters themselves may develop an incentive to increase tax rates above

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[13] This is true only under some precise conditions. See Persson and Tabellini (2000, chp 2) for a review of some sufficiency conditions.

efficient levels. But we will also see that the simplifying assumptions of this approach make the model overly simplistic.

The political economics of taxation and redistribution was pioneered by Romer (1975), Roberts (1977) and Meltzer and Richard (1981). They consider a setup with one marginal tax rate, τ, and the equilibrium value of τ is determined through a direct election. Romer shows that majority voting needs not lead to a progressive tax schedule (which would produce a negative lump-sum value and a sufficiently large marginal tax rate). Roberts (1977) shows that this is true even when preferences are not single-peaked. Meltzer and Richard (1981) provide a *rational theory of the size of government*: they assume that tax revenue is redistributed lump-sum and uniformly to the population. Thus, from an efficiency standpoint, the optimal tax rate is zero. Now, let us see how each individual citizen perceives the problem. Let each citizen (indexed by *i*) be characterized by his taxable income $TI(i)$. The average of all taxable incomes is denoted TI_{avg}. The amount of benefits redistributed to any citizen is $b = \tau\, TI_{avg}$. This means that individual *i* receives a *net* transfer equal to:

$$\text{Net transfer} = b - \tau\ TI(i) = \tau \times (TI_{avg} - TI(i)).$$

In other words, the larger citizen *i*'s personal income, the lower his net transfer, and the net transfer is positive for any citizen with an income below the average income.

The voter thus has an incentive to support relatively high tax rates if his income is below the average. Absent tax distortions, all voters with an income below the average would vote for a 100% rate, whereas all voters above the average income would vote for a zero tax rate. Clearly, this overlooks the distortionary costs of taxation. Introducing these costs in the model yields that the lower is a voter's income, the higher is his preferred tax rate. Still, ideal tax rates always remain strictly below 100%. Clearly, only voters close or above the average income prefer the efficiency maximizing tax rate: zero.

Meltzer and Richard (1981) thus conclude that the more unequal is income distribution *among the voters*, the higher the tax rate (and the size of government) will be. Clearly, extending the franchise to poorer citizens and to women (initially less independent financially) can thus explain why the equilibrium tax rate increased continuously over time (Bertocchi, 2007).

Bringing the Meltzer-Richard model to the data

Can such a median voter theory of taxation actually explain equilibrium tax rates? Can it explain excessive distortions in actual tax systems? The brief answer is "not really". Yet, this model was and still is enormously influential. It is therefore interesting to dwell a bit more on the observed patterns of taxes. Meltzer and Richard (1983) tested and apparently validated their model based on the evolution of government size over the period 1938 to 1976 in the U.S. The main explanatory variable is TI_{median}/TI_{avg}, which is the ratio of the income of the median earner to that of the average earner, which is a summary for inequality. Yet, as emphasizes Mueller (2003, pp518-519), this contrasts with the finding of Tullock (1983), who "*pointed out* [that] *this ratio has been virtually constant since World War II, yet it 'explains' a significant fraction of the growth of government. Meltzer and Richard's test essentially amounts to regressing one long-run trend variable on another. Any other long-run trend variable might yield a similarly high correlation*".

The real test is thus to confront this theory to a panel of data that allows comparisons both over time and across countries. In this case, the model generally fails the test, as the effect of income inequality is often insignificant or takes the wrong sign (see e.g. Perotti 1993 and 1996, Bénabou 1996, Gouveia and Masia 1998, Bassett et al. 1999, Borck 2007). However, such tests do not look at actual redistribution patterns; they only focus on the size of government. In reality, redistribution patterns can be very elaborate. A large state and high taxes may actually generate little redistribution across income quantiles (see e.g. Le Grand 1982 or Esping-Andersen 1990). A direct way to look at the redistributive effects of tax systems is thus to compare *factor* and *disposable* incomes for different quantiles of the earning distribution. This has recently become possible thanks to the Luxembourg Income Survey (LIS). Milanovic (2000) performs a detailed study along these lines. He computes the *share gain* for each of the bottom five deciles (in the *factor* income distribution). These gains are defined as "*the difference between the share of a given decile in factor and disposable income. For example, if the bottom decile receives 2% of total factor income, while the same people receive 8% of total disposable income, the share gain is 6 percentage points.*" (p. 375). His summary table shows the typical redistribution patterns:

Table (1): Percentage income redistribution through tax and benefits, for different income deciles

	Average Gain	Std Dev	Maximum (country)	Minimum (country)
	(a) Redistribution (Sharegain) by decile for all countries (from factor to disposable income)[a]			
Bottom Decile	5.7	2.4	9.9 (Slovakia 92)	0.1 (Taiwan 81 and 86)

Second decile	4.0	2.1	9.0 (Belgium 85), 8.9 (W. Germany 84)[b]	0.1 (Taiwan 81 and 86)
Third decile	1.9	1.4	8.7 (Belgium 85), 5.1 (Sweden 92)	0.1 (Taiwan 81, 86, 91)
Fourth decile	0.7	0.6	2.8 (Sweden 95)	-0.3 (Italy 86)
Fifth decile	0.1	0.4	0.8 (Sweden 95)	-0.9 (Netherlands 94)
Bottom one-half	12.4	5.4	27.3 (Belgium 85), 23.5 (Poland 95)	0.3 (Taiwan 81)
(b) Redistribution (sharegain) by decile for established democracies (from factor to disposable income)[a]				
Bottom decile	5.8	2.0	9.7 (Luxembourg 85)	2.9 (Sweden 67)
Second decile	4.2	2.0	9.0 (Belgium 85), 8.9 (Germany 84)	1.2 (UK 69)
Third decile	1.9	1.4	8.7 (Belgium 85), 5.1 (Sweden 92)	0.2 (Germany 73)
Fourth decile	0.8	0.6	2.8 (Sweden 95)	-0.3 (Italy 86)
Fifth decile	0.1	0.4	0.8 (Sweden 95)	-0.9 (Netherlands 94)
Bottom one-half (deciles 1-5)	12.9	4.7	27.3 (Belgium 85), 22.5 (Sweden 92)	5.7 (Switzerland 82)

Source: Milanovic (2000), Table 2, p376

[a] deciles formed accordingly to household per capita factor income. The increase in the share shows the difference between the factor income share of people who are in the bottom (second, third, etc.) decile according to factor income and their share in disposable income. [b] data for Belgium 88 and 92 show zero or almost zero income for the bottom two deciles according to factor income. If these zeros are inaccurate redistribution may be overestimated. This is why a maximum redistribution country other than Belgium is shown as well.

A significant fraction of this redistribution is performed through pensions.[14] When pensions are *not* considered, a reduction of 1 percentage point in factor income is on average matched by (a) an increase in redistribution of about 0.7 percentage point when all the citizens with an income below the median are considered, and (b) an increase in redistribution of about 0.93 percentage point when the bottom quintile of the population is considered.

In other words, if the very poor lose one percentage point in factor income, their loss is almost *fully compensated* by an increase in transfers. In contrast, at the median of the distribution, compensation is less elastic. Yet, this merely establishes a correlation, and not a causal relationship: most of the variation in initial inequality is actually across countries, and not so much between years within countries.

A tighter test of the Meltzer-Richard hypothesis is thus to check whether the median's disposable income is indeed higher than his factor income: does he benefit from this overall redistribution scheme? Milanovic (2000) shows that the median typically *loses* from these transfers: the 5th and 6th deciles lose 3.6% and 10% on average respectively. Another test is whether the median's net transfer tends to increase when inequality increases; the difference with the previous test is between the level and the marginal effects. Milanovic (2000) shows

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[14] This partly biases the results: a rich individual who retires and benefits from a generous public pension will be perceived as receiving a large transfer. We thus focus on the results that leave pensions out.

that, statistically speaking, this benefit does increase. Yet, the coefficient of determination is $R^2=0.01$: the *economic* significance of this result is thus absent. Borck (2007, section 4) surveys other empirical evidence and shows that the evidence is broadly against the Meltzer-Richard hypothesis.

The main reason for this apparent failure of the Meltzer-Richard hypothesis lies in two of its main simplifying assumptions. Mathematical tractability imposed a reduction of the voting problem to a single dimension: one tax rate and a uniform redistribution to all the population. In reality, tax systems are non-linear and benefits are not uniform, which makes the problem fundamentally multidimensional. To address such problems, we need another set of theories. We review two of them below.

2.2.2. Probabilistic voting models: lower taxes for swing voters

The probabilistic voting model assumes that, when choosing for which party to vote, voters do not only consider economic variables such as the tax rate. Other dimensions matter, such as charisma, political mood, etc. The idea of the probabilistic voting models is to explicitly introduce these aspects in the model, as a random component. The implication is that parties can only maximize their *expected* number of votes (since the random component in only realized on election day), and not the actual number of votes as in standard models. Thus, parties can only compute the *probabilities* with which each group of voters may support their platform or that of their opponent (Lindbeck and Weibull 1987, Dixit and Londregan 1998). This apparently trivial modification of the model has an important consequence: here, a marginal change in policy leads to a smooth change in the number of expected votes. By contrast, with deterministic voting models, a marginal change in policy typically leads to discontinuous changes in vote support, which makes it impossible to study multidimensional policy spaces.

Thanks to this probabilistic voting approach, we can thus tackle complex problems, such as the joint determination of different net tax rates for different groups of voters.[15] Such a multidimensional problem, which had no solution in median voter models; often features a unique solution in probabilistic voting models (see Lindbeck and Weibull 1987 for conditions of equilibrium existence).

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[15] 'Net' means the difference between the taxes paid and the subsidies received, which may either be positive or negative.

Typical equilibrium patterns. The typical equilibrium features the two parties proposing the same platform.[16] This platform balances the opposing interests present in the electorate, and takes into account the political influence of each group. The tax structure that emerges from this approach is quite realistic, with those groups who are most mobile across parties being also the most favoured by the tax system (see Warksett, Winer and Hettich, 1998). In a nutshell, the *equilibrium (net) tax rates are **not** inversely proportional to the elasticity of the **income** source with respect to the tax rate* (as advocated by the Ramsey rule). *They are also influenced by the between-party **electoral** elasticity of each voting group. Electorally mobile voters pay lower taxes in equilibrium* (for more detail, see the formalization below).

As pointed out by Lindbeck and Weibull (1987), if those 'mobile' voters are the middle class, which is likely in a two-party system, then the structure of tax and public good provision will reproduce what Stigler (1970) termed *Director's Law*, after Aaron Director: the rich and the poor pay a relatively high tax and receive little public goods in exchange for it. The middle class gains benefits the most; this is also called an "ends against the middle" equilibrium (See Feld and Schnellenbach 2007 for a survey).

Formalization. Following Winer (2001), consider a society composed by H (groups of) voters: $h=1,...H$. Assume that the fiscal system consists in a government providing one public good G and choosing H proportional tax rates t_h, one for each voter, applied to the voter's tax base B_h. Each individual h solves his economic problem by maximizing his utility function, which depends positively on the public good G and negatively the his tax rate t_h. The maximization problem delivers the indirect utility function of the individual h: $v_h(t_h,G)$.

There are two candidates: the incumbent i and the opponent o. Before the election, the candidates simultaneously and non-cooperatively select their policy platforms: $(t_{1i},t_{2i},...t_{Hi},\ G_i)$ and $(t_{1o},t_{2o},...t_{Ho},\ G_o)$. Their goal is to maximize their expected number of votes. As explained above, platforms are chosen at a time when the election outcome is still uncertain: parties can only anticipate with which *probability* each voter will vote for each candidate. The probability that voter h votes for the incumbent is a function of the difference in the voter's indirect utility function under the incumbent's platform and that of the opposition:

$$\pi_h = f_h(v_{hi} - v_{ho})$$

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[16] See also Calvert (1985), Wittman (1983) and Roemer (2001) for models in which the politicians' ideology prevents platform convergence.

where v_{hi} is the indirect utility function of voter h under the policies implemented by the incumbent government i and v_{ho} is the indirect utility of voter h under the policies implemented by the opponent government o. The function f_h is a generic function of this difference, which may include an ideological term. The total *expected vote share* of the incumbent i can be written as:

$$EV_i = \sum_{h=1}^{H} \pi_h = \sum_{h=1}^{H} f_h(v_{hi} - v_{ho}),$$

and similarly for the opposition. These *EV* functions are common knowledge.

In the absence of administrative costs, the incumbent chooses the tax rates $t_1, t_2, \dots t_H$ and the level of public good G to maximize the expected total support, given the platform of the opposition and subject to the budget constraint:

$$G = \sum_{h=1}^{H} t_h B_h$$

where B_h is the tax base of voter $h=1\dots H$, which depends on t_h.

The first-order conditions are the following ($h=1,\dots H$):

$$\frac{(\partial f_h / \partial v_h) \times (\partial v_h / \partial t_h)}{B_h(1 + \varepsilon_h)} = \lambda \; ; \; \sum_{h=1}^{H} \frac{\partial f_h}{\partial v_h} \frac{\partial v_h}{\partial G} = \lambda$$

where $\varepsilon_h = \partial B_h / \partial t_h \times t_h / B_h$ is the income elasticity of base B_h with respect to t_h and λ is the Lagrange multiplier associated with the government budget constraint. These first order conditions make clear that the government chooses the tax rates that equalize across taxpayers the *marginal political cost* (or: reduction in expected votes) from raising an additional unit of money. For a given level of revenues the total political cost has to be minimized. As a result, the equilibrium tax structure can be very complex, with a different tax rate for any different individual (or group). Additionally, the government chooses the level of public good so that the marginal political benefit of spending an additional unit of money is equal to the marginal political cost λ.

It is a standard result that, since the two parties solve a symmetric problem, the equilibrium (when it exists) is also symmetric: the two parties choose identical policies. To understand this, let us assume that an equilibrium exists and define $\theta_h \equiv \partial f_h / \partial v_h \; \forall h=1,\dots H$ at

the Nash equilibrium. Then, the first order conditions for politically optimal equilibrium strategies can be written as follows:

$$\frac{\theta_h \times \partial v_h / \partial t_h}{B_h(1+\varepsilon_h)} = \lambda$$

This condition is the same as the one that is derived by maximizing the political support function $S=\sum\theta_h v_h$, subject to the government budget constraint, and it is thus consistent with Pareto efficiency. The weights θ_h represent the responsiveness of voting behaviour to a change in individual welfare, as perceived by the party, and thus they are a measure of the effective influence exerted by different voters on policy outcomes.

Note that if these weights θ_h were equal for all voters, the tax system would equalize the marginal efficiency cost of the tax for all individuals and minimize the excess burden of taxation. Yet, the political influence is typically distributed unequally. Formally, the various θ_h are different, which implies that it is optimal politically to impose a lower tax rate on the politically more influent voters (i.e. those with a higher θ_h) and thus impose them a smaller utility loss (i.e. a lower $\partial v_h/\partial t_h$), at the expense of a larger efficiency cost (i.e. higher $B_h(1+\varepsilon_h)$). Note that this means that parties trade off the support from different voters, even though Pareto-efficiency is achieved. As we already pointed out, this shows that political elements play their own role, on top of efficiency/equity considerations.

The function f implicitly represents the propensity of voters to move from one party to the other as the policy change. A policy implication arises: governments, who take preferences and ideology of the voters into account, may be willing to implement reforms that favour *swing voters*, *i.e.* the most "mobile" groups, which are ready to reward them with more votes when a policy proposal favours them. This is in line with a more general result of the political economy literature: reforms are implemented only if they are politically feasible and sustainable, *i.e.* if they enjoy enough support from the voters.

This simple framework delivers interesting predictions which may contribute to explain what we observe in tax design and reforms: the political success of a party depends on its ability to attract swing voters. This argument is particularly useful to explain some recent trends in tax policies: tax policies are often designed to please swing voters, who are almost indifferent between the opposite parties, *i.e.* the individuals are ideologically neutral. Their votes can be more easily influenced by an appropriate policy in their favour. Following this

reasoning, ideologically more neutral groups should pay lower (net) tax rates (see Profeta 2007 for an application to Italy). Comparative statics also suggest that (a) proposed policies will be more alluring to the swing voter groups that are larger in size (number of voters); and (b) proposed reforms will be highly similar for left- and right-wing parties, since they will result from a same set of first order conditions. Eyeball evidence confirms this prediction: many tax reforms have been similar under both left- and right-wing governments.

2.2.3. Colonel Blotto games: the efficiency-targetability trade-off

The focus of probabilistic voting games is on which groups will be preferred by the redistribution policy of the government. The approach pioneered by Myerson (1993) instead "anonymizes" the set of offers: the modeller loses the ability to learn which group receives which offer, at the benefit of becoming able to endogenize after-tax inequalities, and compare the features of these equilibria across institutional systems. Since the modelling approach is relatively technical, we shall skip these details here, and focus on the intuition behind the main results.[17]

Colonel Blotto games are a mathematical representation of how a colonel should allocate his troops across battlefields: scattering troops makes him moderately weak on all battlefields. Focusing his troops on fewer battlefields increases noticeably the chance of victory there, but also ensures that the enemy wins in the other battlefields. Myerson's extension of that model considers a number of political candidates who must allocate resources across voters. Offering a large (net) transfer to a voter means that she will vote for you with a very high probability. But the budget constraint means that you will have to transfer less to the other voters, who will start supporting your opponent(s). The typical equilibrium of such a game is in mixed strategy. This is why this approach is "anonymous": in equilibrium, a given percentile of the population will benefit from large transfers; another from low transfers, but one cannot ex ante identify which is which. The equilibrium is thus determined as a Lorenz curve that identifies the fraction of transfers received by each fraction of the population.

A striking result is that politicians will always make unequal offers. Indeed, imagine that there are two politicians. Each has a budget of 1. The first politician proposes a fully equalitarian offer, and splits this budget equally across all voters. The second politician can

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[17] See Myerson (1993), Lizzeri and Persico (2001, 2005) and Crutzen and Sahuguet (forthcoming) for more details.

then offer 0 to a fraction x of the population, and increase the transfer to $1/(1-x)$ to the remaining fraction of the population, with size $(1-x)$. These prefer the offer of the second politician. For $x \rightarrow 0$, almost all the population prefers the second politician: deviating from the equalitarian offer would provide an overwhelming majority to politician 2. Politician 1 can thus not make the equalitarian offer if she wants to have a chance to win the election.

Myerson (1993) compares the features of the equilibrium across electoral systems, and for a different number of candidates. In first-past-the-post systems (UK, US, for instance), the more candidates running, the more unequal is the policy. Other systems can produce more or less inequality. Lizzeri and Persico (2001, 2005) extend the model by letting politicians choose between a general public good, which has a high social value, and redistributing money, which has no social value. They show that proportional representation systems will be more efficient at producing the public good, and that increasing political competition (by increasing the number of candidates) will increase social waste in equilibrium: to win the election, the politician must rank first among his supporters. The fiercer is political competition, the higher are transfers, and the lower is the supply of public goods.

Crutzen and Sahuguet (2009) and Castanheira and Valenduc (2006) apply this type of game to tax systems. Crutzen and Sahuguet (2009)'s insightful analysis provides the first formalization of the political economic determinants of a tax system based on this type of games. They begin with a simple case: imagine that the government must decide about the tax rate τ, that taxes are distortionary, and that there is no public good. Clearly, the optimum is then not to tax: $\tau^*=0$. But, the political incentives underlined above induce politicians to nevertheless levy a tax, to finance socially wasteful transfers. The purpose is only to increase their political appeal: this perverse incentive makes the tax system become inefficient and unfair. The efficiency loss is shown to be hump-shaped in distortions: if distortionary effects are extremely large, high taxes would lose many votes, and only win a few. Thus, equilibrium taxes are low, which maintains distortions at a low level as well. With intermediate distortionary effects, equilibrium taxes will be high, and so will be distortions. Finally, with minimal distortionary effects, equilibrium taxes will be maximal, but distortions will be small again. In their general setup, they study the case in which politicians can choose *targetable taxes*. Targetable taxes avoid taxing an individual and then transfer benefits back to the same individual. They show that targetable taxes will always be used in equilibrium, regardless of the inefficiencies they create. In some cases, both targetable and non-targetable taxes are used in conjunction, to increase the amount of transfers.

Castanheira and Valenduc (2006) propose a case study of a few tax policies in Belgium that do not enhance either efficiency or equity. They show how the above arguments help explain such choices. For instance, Belgium grants special tax exemptions to small and medium enterprises, in principle to promote their activity and address some of their liquidity problems. Yet, the *Conseil Supérieur des Finances* concluded that these efficiency arguments are not actually valid for the targeted enterprises. In reality, these tax exemptions generate distortions that induce some individuals and independents to incorporate for tax avoidance reasons (see also De Mooij and Nicodème 2008), and may even create the perverse incentive to lower enterprise growth. Yet, the type of government coalitions observed across the years made SMEs a key political actor, which precisely induces the type of inefficiencies underlined by Lizzeri and Persico (2004, 2005) and Crutzen and Sahuguet (2009).

2.3. Reforms: how broad and how fast?

While the previous section describes the type of tax and redistribution systems that pre-electoral political interactions should produce in the long-run, this section focuses on the process of change from an existing system, the *status quo*, to another. The idea is the following: consider a politician who, after having been elected, decides to engineer a reform meant to improve, say, efficiency. This reform will affect the welfare of many different groups differently. Typically, some groups will be hurt and may oppose reform. Thus, "good" reforms may not easily be implementable. This section focuses on this implementation process in front of such political constraints.

Engineering good economic reforms is difficult. An issue in itself is to identify which policies may improve upon the existing situation. Since we focus on the political economy aspects of reform, we ignore this issue and assume that good reform plans are already on the table. The question is which political economic hurdles reform-minded policymakers will face, and how they may address them. We will see that building a sufficiently broad coalition of actors who support the reform may actually require modifying some aspects of the economically "ideal" reform plan. Oddly enough, economically inferior reforms may be more palatable politically.

A second question that arises is whether a politician actually has the incentive to press for economically superior reforms: some reforms might be politically suicidal. We will review the argument that crises can be necessary to trigger reform: the idea is that crises may increase the support for reform. This argument has been bitterly criticized, though. Finally,

while most of the literature focuses on the reform process itself, we wish to also relate it to the reasons why the status quo emerged in the first place.

2.3.1. The status quo bias

A representative-agent approach would advocate that any policy increasing efficiency (or some other goal: GDP, profits or aggregate welfare) should be implemented. According to this view, unless the politicians' incentives are somehow distorted, efficiency (or the other goal) should be close to its maximum at any point in time. Thus deviations from the optimum would only be due to distortions in the policy-making process. Such a 'Leviathan view' of policy inefficiencies leads to the conclusion that, to improve welfare, one must improve decision-making processes, e.g. by cutting down the power of politicians and of special interest groups.

This view is flawed. We begin this review by considering a direct-democracy approach to reform, where democracy suffers no distortion: a welfare-enhancing reform is on the table, and voters must decide whether to implement it or not. We will see that even such an efficient decision-making process suffers from a *status quo bias*. Pioneering this research, Fernandez and Rodrik (1991, p 1146) address the following question: "*Why do governments so often fail to adopt policies that economists consider to be efficiency-enhancing?* […] *The answer usually relies on* [the fact that] *the gainers from the status quo are taken to be politically 'strong' and the losers to be politically 'weak,' thereby preventing the adoption of reform*". Formally their theory emphasizes the individual uncertainty generated by reforms: by the very nature of the reform process, those who stand to lose from the reform are easily identifiable, whereas those who stand to gain face more uncertainty. This individual uncertainty generates a *double* hurdle for reforms: a reform must attract both *ex ante* and *ex post* majority support.

A numerical example can illustrate this point. Consider a population divided in two sectors: *L* is the sector (or group) that stands to *lose* from the reform. *G* is the sector that stands to *gain*. Ex ante, 54% of the population works in sector *L*. Thus, a majority of the population potentially stands to lose. Yet, the productivity gains in sector *G* imply that this sector will grow. Imagine that *ex post*, 64% of the population will be working in sector *G*. Therefore, a majority of the population (64%) will actually gain from the reform: those who are already present in sector *G* (46% of the population), and the additional 18% who will move from one sector to the other.

Figure (2): Gainers and losers from reform

Prior to reform		After reform
Sector L: 54%	36% would eventually lose from reform	**Sector L: 36%**
	18% would change sector and gain from reform	**Sector G: 64%**
Sector G: 46%	46% remain in sector *G* and gain from reform	

The issue is that each single individual in sector *L* is uncertain about *who* in *L* will move to *G*. Assume that the reform increases the payoff of anyone in sector *G* by 10, while decreasing the payoffs of anyone in sector *L* by 8. Thus, with probability 2/3[18], an individual initially in sector *L* loses 8 and, with probability 1/3, he or she gains 10. This implies that, from an *ex ante* standpoint, all *L*-sector workers are opposed to the reform, since they face a negative expected pay-off of –2. This ex ante constraint means that the reform is blocked by a majority: even a well-meaning politician faces the impossibility to pass the reform. Note the irony: after the reform is implemented, a majority of the population would actually be in sector *G* and support the reform (or oppose its reversal).

One may also imagine another reform, which would attract ex ante majority support, e.g. by giving strong compensation to those who remain in sector *L*, but which is rejected *ex post*, e.g. because the compensations are so high that the ones now in sector *G* prefer the initial situation. In that case, the reform would fail to maintain support *ex post*, and fail. Summing up, this political economy approach to reforms shows that proposed reforms must overcome the *status quo bias*, that is, obtain support from a majority both *ex ante* and *ex post*. By contrast, a purely economic approach would focus on aggregate gains.[19]

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[18] Calculated as 36/(36+18)

[19] Note that efficiency gains are a *necessary*, but not sufficient, condition to satisfying both the *ex ante* and the *ex post* constraint. In a different setup, the two concepts may be somehow unrelated: imagine that a majority of 50%+1 voter earn for sure a very small benefit, whereas 50%–1 voter lose for sure a very large amount: political constraints may be satisfied, even though efficiency would require blocking the reform. Thus, both the economic gains *and* the political constraints should be considered in any sound cost-benefit analysis.

To illustrate this, one can look at the analysis of Valenduc (2006), who studies the possibility of introducing a flat tax in Belgium. Under such reform, marginal rates would be decreased, but the tax base broadened. His analysis computes which rates would be achievable under a double scenario: First, budget neutrality. Second, in the absence of information about adaptation, the employment status and wage of each individual is assumed unchanged. This second assumption underlines the nature of the individual uncertainty faced by each citizen: one can easily compute what would happen to one's net income *all other things being equal*, but less easily grasp what would happen at the macroeconomic level. For instance, the new system might generate more employment, which would increase one's employment or wage prospects, reduce social welfare spending, and therefore lead to further tax rate cuts. From an ex ante basis, each voter will tend to perform the very same exercise as Valenduc (2006) and check whether future taxes paid would likely increase or decrease for a given income. His simulation results show that the *ex ante* constraint can definitely not be met in Belgium as net wage inequality would increase dramatically and only the top two deciles would really gain. Among socio-economic groups, some wage earners and self-employed people would gain, but unemployed, disabled, and retired people would lose a lot more. Thus, a flat tax reform would be politically unfeasible in Belgium.

2.3.2. Bundling and speed of reform

This *status quo bias* was an important concern at the time when transition countries initiated their reforms (see e.g. the books by Sturzenegger and Tommasi 1998 and by Roland 2000). The debate at the time was between advocates of a big bang strategy (such as Boycko, Shleifer and Vishny 1995) and advocates of gradualism (such as Roland 2000). The former argued that the fall of the Berlin wall offered a potentially narrow window of opportunity to implement reforms. Thus, all reforms had to be initiated immediately and governments should be fast on all fronts. The latter argued that many uncertainties were present and that circumventing oppositions required a piecemeal approach. Complementarities between different facets of the reform process may reinforce either type of argument.

The presence of aggregate uncertainty relates to the potential benefit of a reform: will it pay off or not? Aggregate uncertainty creates an *option value of learning*, which may have different implications. One possibility is that our understanding of the problems is improving over time. Independently of our actions, more information will come along. In that case, it may be optimal to defer an apparently profitable reform: future information may reveal that it

is actually bad. In this case, we should observe reforms that are implemented late, but vigorously and quickly.

Another possibility is that reforms must be experimented "at home" to learn how good they are. In this case, it might be optimal to have an extensive experimentation process. For instance, one may test the reform on specific sectors or areas, or to implement it gradually. Dewatripont and Roland (1995) propose a model in which a major reform can be split into two smaller reforms, but both must be carried out to fully grasp the benefits of the complete reform. Uncertainty surrounds these benefits, which can either be positive or negative. A big-bang strategy implements all reforms at once, and produces all benefits and costs immediately. The gradual strategy introduces only one of the smaller reforms in the first step. Once the outcome of that smaller reform is observed, the population decides whether to implement the second reform or to return to the status quo. The costs of reversal are increasing in the magnitude of the reforms already implemented. They show that the gradual strategy dominates if the first reform has a sufficiently high probability to reveal that the whole process should be stopped: this saves on reversal costs. Thanks to the option value of an early reversal, gradualism also facilitates social acceptance of the whole reform process, in particular if the second part of the reform is "politically difficult": under gradualism, this second reform is only implemented if one learns that its benefits are sufficiently high. Thus, some of the ex ante oppositions may be quelled by providing a possibility to block the entire process at the interim stage. Dewatripont and Roland (1995) also show that reformers should first implement the reforms that (i) have the highest expected payoffs, (ii) have the highest risk for given expected payoffs and (iii) have a high probability to reveal information about the value of the entire reform process: the first and second reform should be complementary.

This aspect of gradualism refers to the *speed* of reforms. Another issue is the (un)bundling of reforms in terms of the number of groups to take up at once. Dewatripont and Roland (1992) show that it may be fruitful to unbundle reforms that cannot overcome the status quo bias. The idea is simply to divide the reform in two steps that do not harm the same voters. The first step only targets a sufficiently narrow group of the population and has then the ex ante support of a majority. Once this first reform is passed, the group that was initially opposed, precisely because of this first step, will support the second step if it increases its own welfare.

Table (3): divide-and-rule tactics

	Reform 1	**Reform 2**	**Big bang**
Group 1 in *L*	+1	–3	–2
Group 2 in *L*	–3	+1	–2
Group 3, in *G*	+5	+5	+10

To illustrate this point, let us go back to the example we used to explain the status quo bias, and let us identify two subgroups in sector *L*. Remember that, from an ex ante basis, group *L* expects a loss of –2, because only some will win from the reform. These are the payoffs summarized in the "Big Bang" column of Table (3). The gradual strategy divides sector *L* in two subgroups and the reform in two steps; each of them only targets one of the two subgroups. Imagine for instance that, as illustrated in Table (3), Reform 1 gives +1 to Group 1, and concentrates the losses onto Group 2. Clearly, Group 1 supports this reform, which passes with the support of Groups 1 and 3. At the interim stage, when Reform 1 has passed, Group 2 prefers that Reform 2 be also implemented. This warrants the support of Groups 2 and 3 for the completion of the reform package. The watchful reader will remark that Groups 1 and 2 may wish to coalesce with one another and block both steps of the reform. This is correct: the policy-maker must indeed engineer a prisoner's dilemma situation to be successful: he must offer a sufficiently interesting short-run benefit to Group 1, to ensure that it prefers the reform to the blocking coalition.[20]

Martinelli and Tommasi (1997) object that often, reforms are an all-or-nothing process: gradual reforms might be impossible, whereas big bang reforms are feasible, even if only at some periods of history. They propose a model in which each group has veto power such that, by assumption, divide-and-rule tactics cannot work. Each small reform pleases two groups, and hurts one. Thus, every single reform would be vetoed. Yet, there also is a "grand reform" that corrects all distortions at once. In that case, it is the strategy of bundling many reforms together that becomes the only politically feasible strategy. Framed differently, in countries where many groups have veto power, reforms might be delayed until the time when distortions eventually hurt all groups, who then accept to vote the grand reform. In contrast,

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[20] Note that gradualism may mean that reform 2 is only implemented after several years. As we saw with Dewatripont and Roland (1995), information may also be revealed at the interim stage. In such cases, Group 1 may wish that the experimentation does take place if Group 2 is the guinea pig.

when the executive is sufficiently powerful to exploit divide-and-rule tactics à la Dewatripont and Roland (1992), the gradual strategy might allow an earlier start of the reform process.

There can thus not be a unique answer to a problem that proves complex. We can nevertheless draw a few clear-cut lessons: first, even though some reforms can be economically superior, they may prove politically unfeasible. In the process of building a coalition to make reforms politically feasible, policymaker may either defer some aspects of the reform or bundle it with others that are, a priori not necessarily related. For instance, a tax reform that temporarily increases inequality may require an increase in the social safety net (bundling) or may have to be introduced only progressively (e.g. a progressive increase in the tax rate of previously untaxed income sources). Secondly, reforms will be politically more sensitive if they generate a lot of inter-group redistribution compared to the size of expected efficiency gains (Rodrik, 1996). Developing this argument further, we believe that reforms are never as dichotomous as "do" or "do not". In reality, the possibilities to experiment, to delay or accelerate, to bundle or unbundle, mean that policymakers can always manipulate this "redistribution-to-efficiency gain" ratio. Sometimes, it may prove valuable to reduce efficiency gains if that reduces the redistributive effects more-than-proportionately.[21]

The issue is that the simple *possibility* of tailoring reforms to political constraints also comes at a cost: every group has an incentive to fight for a modified reform that saves it from bearing the cost of the reform. The more negotiable are the reform details, the higher is this incentive, and the more reforms end up being delayed (Alesina and Drazen 1991; Drazen 1998 for a survey). Thus, governments have sometimes to put themselves in a situation where burden shifting across groups is made impossible. This is why adding constraints on the reform process makes it easier sometimes to reform. Common examples are the reliance of national governments on international constraints, e.g. coming from the IMF or the European Commission, to justify that some measures are inescapable. According to the theory of Alesina and Drazen (1991), this is a well-justified strategy: this mutes each group's incentive to pursue the war of attrition at the source of reform delays. Another implication of their analysis is that reforms are more likely to take place when economic conditions worsen. Intriguingly, pressure groups may keep opposing the reform *even though they expect the situation to keep worsening* (Laban and Sturzenegger 1994). However, Rodrik (1996) criticizes this type of claim as *unfalsifiable*: if a reform takes place, it is meant to address

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[21] Castanheira, Galasso and colleagues (2006) provide cases studies for various sectors and countries.

some problem; is that a "crisis"? And if no reform takes places, does it mean that the crisis was "not deep enough"?

2.3.3. Policymaker incentives and policy distortions

In the above section, we focused on the hurdles faced by a pro-reform policymaker who behaves as a social planner. In such case, increasing or decreasing delegation to policymakers should not produce much of a difference in equilibrium outcomes. Yet, facts tend to prove the opposite: increasing the powers of voters, through referenda for instance, has a deep impact on the equilibrium tax structure and on the way public goods are financed. Three stylized facts related to direct democracy are that (1) *"public expenditures are lower where direct democratic instruments are available"* (Feld and Schnellenbach 2008, p19); (2) excludable public goods tend to be increasingly financed through *user charges* rather than *general taxes* (Feld and Matsusaka 2003). Finally, (3) redistribution is also affected: direct democracy is associated with lower levels of welfare spending, but without affecting inequality in the same way (Feld et al. 2007), which suggests that direct democracy leads to reforms that better target redistribution. Thus, the fact that policy is delegated to a policymaker does have an impact on equilibrium outcomes. There can be several reasons for this. One is that professional politicians have access to better information. Another is that they focus on a longer (or shorter) term than voters.[22] Yet another potential reason is that politicians have other incentives than to enhance the electorate's welfare. Let us review each of these in turn.

In a large population, voters should be "rationally ignorant" (Downs 1957): collecting information about each policy is very costly for a voter who has virtually no chance of affecting the election outcome. Caplan (2007) identified crucial dimensions of economic policy for which voters suffer from major biases in their beliefs. His conclusion is that such prejudices induce democracy to be diverted away from the best policies. This gives politicians perverted incentives. Populist positions, for instance, may receive wide support. More generally, politicians may wish avoid leaning against the winds of popular prejudices (see also Kessler 2005). Yet, the fact that voters are *individually* ill-informed or biased need not imply that they systematically make wrong decisions *collectively*. This self-correction mechanism of elections is known as the *Condorcet Jury Theorem* (Austen-Smith and Banks

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[22] Major reforms or even "legal revolutions" have been undertaken by "enlightened" politicians who acted despite opposition by voters, who eventually supported that policy when they realized that the leaders were right.

1996, Feddersen and Pesendorfer 1997, Piketty 2000, Castanheira 2003). On a related note, the voters' information is actually endogenous to the political system. Benz and Stutzer (2004), for instance, provide empirical evidence that, when given the power to influence policy directly, voters become politically more active and acquire more information. Conversely, professional politicians invest more in "competence" when they have more control over policy (Kessler 2005). Representative democracy *may therefore be based on a more informed decision process which takes future or present circumstances better into account*" (Kessler 2005, p28). Two related analyses, by Carrillo and Castanheira (2008) and by Castanheira, Crutzen and Sahuguet (2010), investigate a situation in which the policymaker must spend a costly effort to design good policies. They show that politicians develop better policies when voters have better information, but information may also trigger welfare-reducing actions on other dimensions: it reinforce party polarization, and political parties may reduce intraparty competition. Schultz (2008) studies the effect of increasing accountability by reducing term length. He shows that shorter office terms may induce the policymaker to manipulate information —and thereby voter beliefs— to increase support for his own pet projects.

The above describes the interplay between professional decision-makers and voters only insofar as information is concerned. The other issue is whether politicians actually strive to maximize aggregate welfare: they may pursue objectives that are disconnected from the electorate's needs or the institutional system may give them perverted incentives. The Leviathan view of government sustains the former idea: the fact that economic outcomes are different under direct and representative democracy is supposedly a proof that, when given autonomy, politicians divert resources to fulfil their own aims. This idea is however not falsifiable as such. Even the fact that the size of government is smaller under direct democracy may not reflect abuse by politicians; it may instead reveal differences in voter preferences, if they prefer both direct democracy *and* smaller governments in some areas, versus representative democracy *and* larger governments in other areas. Iversen and Soskice (2006) provide an explanation along these lines for the choice of electoral systems.

Coate and Morris (1995) consider a situation in which two types of policymakers coexist: those who maximize welfare, and the "captured" ones, who want to please some groups only. The issue is that none of them wants to be detected as "captured". Thus, whenever they wish to organise transfers to some groups, they will prefer less visible "sneaky" methods, even if those are highly distortive. Dewatripont and Seabright (2009) add

the idea that some politicians are also very productive, and all of them want to be detected as "productive". This gives another perverse incentive: to appear as hyperactive, and introduce many "visible" reforms even if they have negative social value.

Models of comparative politics such as Persson, Roland and Tabellini (1997, 1998, 2000, and 2003) or Diermeier and Feddersen (1998) disentangle some of these effects. Persson et al. (2000), for instance, postulate that politicians wish to divert rents for themselves. They study the effect of some institutions on the equilibrium level of rent diversion and of public good provision. Processes meant to improve accountability, such as the separations of powers present in presidential-congressional regimes, are shown to reduce rent diversion (a positive effect) but also to depress public good provision and redistribution below the optimum. Thus, according to their welfare-maximizing benchmark, institutions that further depress public good provision may reduce efficiency (see also the analysis by Lizzeri and Persico, 2004). This strongly contrasts with the "Leviathan approach". Empirical work such as Milesi-Ferretti et al. (2002) and Persson and Tabellini (2003) provide evidence supporting these comparative statics. Looking at the politicians' sensitivity to pressure groups, Horgos and Zimmermann (2008) claim that "*interest group activity significantly leads to a decline in the growth rate and a rise in the inflation rate*". Using data on Swiss cantons, Feld and Frey (2002) provide empirical evidence that tax compliance depends on the interaction between taxpayers and tax authorities. They hint that, the more developed are political participation rights, the better tax authorities treat taxpayers and the higher is "tax morale". Drazen and Limão (2008) have a provocative view on such distortions due to pressure group activity: they show that a well-meaning government *should* sometimes introduce inefficient policies. The mechanism is that, when more distortions are present, the pressure groups become dependent on government action to increase their profits. Thus, the government acquires increased bargaining power over these groups. In a nutshell: if the increase in bargaining power is sufficiently large compared to the loss in efficiency, the inefficient policy increases welfare.

This set of results shows that before making policy recommendations, one should understand the policymakers' incentives. It is suboptimal to impose economically efficient reforms if the institutional processes lead them to eventually reverse that reform. It is productive to propose big bang reforms only when distortions have reached sufficient levels and the reform is perceived as unavoidable (Alesina and Drazen 1991, Martinelli and Tommasi 1997). In the absence of a "crisis situation", political constraints may instead call

for subtler reforms either by avoiding an attack on all pressure groups at once or to introduce reforms gradually, to demonstrate the usefulness of the reform process (Dewatripont and Roland, 1992, 1995). Whichever the economic situation, the analyses of Coate and Morris (1995) and Dewatripont and Seabright (2009) suggest that the proposed reforms should be very visible as such, but make some transfers less than obvious: when political constraints and long-term equilibria are taken into account, the reform also becomes valuable to the political class.

A last question that arises is whether one actually needs a pro-reform government to implement reforms. Cukierman and Tommasi (1998) emphasize an important and subtle effect in that regard: the population expects pro-reform governments to push for reforms, and may thus not believe that the reform is necessary. In that case, the pro-reform government may fail to implement its reforms, due to a lack of popular support. In contrast, if a non-reform government is in power and ends up concluding that reform is necessary, it may face much less opposition, since the population will more easily trust that the reform is inescapable. This is probably the reason why there is little or no evidence that tax reforms are more likely to be implemented either by left-wing or by right-wing governments.

2.4 What is the political economy behind tax base broadening?

As noticed by Alt et al. (2008), many European countries have been reducing statutory income tax rates in the last decades, while broadening their tax base. As they detail, the UK marginal rates of statutory income tax have been cut substantially over the past 30 years. Yet, the share of taxes in GDP remained more or less constant. As they explain (p. 12) *"whilst statutory rates have been cut, thresholds and allowances have tended to rise in line with inflation, whilst earnings have risen more quickly, leading the number of higher rate tax-payers to grow from 674,000 in 1979-80 to 3.3 million in 2006-07 – this process is known as 'bracket creep' or 'fiscal drag'."* Many other countries followed a similar tax policy: since 1980, the US, Canada, Ireland, Japan, France, Germany and Italy, among others, have cut their statutory marginal rates. However the burden of income tax has fallen significantly only in Japan and Germany. In the other countries, the statutory rate cuts have been combined with measures of tax base broadening and/or fiscal drag to maintain the tax-to-GDP ratio constant.

How can we explain these government choices? We can think at them as a political strategy: income tax "cuts" are popular and easy to observe due to their transparency, while the overall tax burden is more difficult to measure, since it depends on income distribution

and many other less observable elements. The underlying process is thus closely related to the theories developed by Coate and Morris (1995) and by Dewatripont and Seabright (2009): it is politically very valuable to display action and be considered as the engineer of a tax rate cut. Yet, one may at the same time organize a hidden mechanism of redistribution through less visible mechanisms, here the fiscal drag. Accordingly, the political debate focused mainly on the reforms of the statutory *rates*, while actively ignoring the influence of *thresholds*, even though they are just as important in determining the actual tax burden.

Italy is another interesting case: the statutory tax rate and the thresholds of the personal income have been changed several times in the more recent years, responding to political pressures from the electorate. In 2002, the centre-right government proposed a reduction in the number of tax brackets from 5 to 2, while enlarging the tax base. This proposal has never been implemented. In 2004, the number of brackets was merely reduced from 5 to 4, and the top tax rate decreased from 45% to 43%. This reform was partially reversed in 2007, after the change of government. The new centre-left coalition reintroduced a 5-bracket system. Yet, it also left the top tax rate unchanged at 43%. These changes have been interpreted (see Profeta 2007, 2008) as the response of the government to attract the support of key voter groups towards the tax reform. In particular, the fact that the more radical reform has never been implemented, although proposed, suggests that this reform was simply not feasible politically. The fact that the left-of-centre coalition abstained from increasing the maximal tax rate back to 45% instead demonstrates the power of the status quo bias. The whole set of manipulations shows again that each decision-maker avoided reforms that had too transparent redistributive effects, which explains why marginal and parametric adjustments tend to prevail. It also supports the idea that the political opposition of rich individuals may be decisive to the failure of a reform.

Another element which may help explaining the observed trends is the choice between gradualist and big-bang reforms (see Section 2.3.2). Going back to the notation that we have introduced in section 1.2, define *total taxable income Y* as:

$$Y = \sum_i \alpha_i \, y_i$$

and other sources of income and their associated taxes as:

$$T^{other} = \tau^z \sum_i \beta_i z_i + \tau^c \sum_j \gamma_j c_j \, ,$$

where z_i are these other sources of income and c_j is consumption of good j.

In that setup, tax broadening may be reached by raising the coefficients α_i and/or β_j associated with specific sources of income. Suppose that a given increase of these coefficients is planned to reach the goal of tax broadening and/or some targets for the tax revenue. These changes may be done gradually or rapidly. Gradualism implies that changes are made sequentially, as opposed to contemporaneously, *i.e.* for all sources of incomes at once. The former strategy is typically more feasible on political grounds, as gradualism implies less opposition when increasing tax rates. The status quo bias is also more easily circumvented when changes are made slowly (see section 2.3.1). Too much gradualism may however lead to piece-wise and incoherent reforms. On the opposite, big bang and holistic reforms are easier when it is necessary to display major changes and to commit the government to reform, but at the cost of stiffening opposition, which may even block the reform. Examples of big bang tax reforms can be found in Sweden and the US. In most other European countries instead, gradualist and piecemeal reforms have been more common.

One such instance is the case of Italy where the tax rate on house rental income was increased to $\alpha_i = 85\%$. That is, the income earned by a landlord is only counted for a fraction of the amount actually earned, if, as it is typically the case, this amount is larger than the official value of the property (established by the real estate). Then, the discounted income is taxed at the regular statutory personal income tax rate. This means that the tax base associated with this specific source of income is broader than what would obtain if the property was taxed according to its official value. As the reader expects, the figure of $\alpha = 85\%$ represented a political compromise to avoid the opposition of rent owners. In exchange, they do not deduct the actual expenses on maintaining their properties. Notice that there is a more recent debate in Italy on the feasibility of shifting the taxation of this source of income to a flat rate tax of 20%, *i.e.* a tax rate smaller than the current bottom tax rate of the personal income tax schedule. In our notation this would imply assigning $\alpha=0$ (down from 0.85) for rental income and increasing β to 0.2 (up from 0). The feasibility of this proposal will eventually be determined by the political influence of rent owners, who would gain from this change, and the income needs of the government to address the unfolding financial crisis.

Bequest taxes in Italy are yet another interesting example. After a long debate, the bequest tax was abolished by the Berlusconi government. Then, after nearly five years, it was reintroduced first in a virtual form (by reference to another tax already in existence) in 2006 and then by formally re-introducing the earlier law (previously abolished) with minor changes. In 2007, the new Berlusconi government introduced a new inheritance tax, which

proves very generous to the taxpayers. In practice, only the largest Estates are now exposed to this tax, whereas small and medium Estates are not subject to bequest tax (in our notation, $\alpha=\beta=0$). In addition, if the Estate includes a business or a substantial shareholding in a company, they are not taxed if they are passed onto the children of the deceased, who carry on with the business or control of the company for at least 5 years. The rationale behind this "generous" legislation is to protect the family home at the death of the breadwinner and, since small/medium businesses are crucial for the Italian economy, to avoid the break up of viable businesses. The political arguments behind this choice are easy to understand: voters typically overestimate the impact of some taxes, such as bequest taxes. Thus, as predicted by the analyses of the previous section, cutting such taxes is a good strategy to gain large support among voters. Benefits in terms of political support may largely overcome the cost of a loss of revenue. This may also explain why a holistic approach (cancelling the tax rate on inheritance for almost all estates) rather than a gradualist one was chosen.[23]

Another important issue concerns transparency and information, which may play a crucial role in tax policy design and reforms. Voters are typically imperfectly informed, they are not expert of taxation and they do not have the information necessary to assess the effects of tax policies. As an example, Alt et al. (2008) report that politicians of all stripes are unwilling to extend VAT to children's clothing or food, for fear of people reactions, despite these measures may have a redistributive outcome.[24] Moreover, some taxes are more transparent than others: for instance, how much you pay in income taxes is less observable than how much you pay in VAT. As a consequence, politicians who do not want to disappoint voters averse to high taxes, will propose a tax system which tends to over-utilize less visible taxes (for instance taxes on income with respect to consumption). In particular, they will orientate towards taxes that are less visible to the decisive voters. This contributes explaining why politicians have tried to draw the debate and the attention of citizens more on the statutory tax cuts than on changes in the thresholds, whose effects are more difficult to be observed. Institutional reforms that improve transparency and public understanding would

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[23] Alt et al. (2008) provide another interesting example, though not related to the personal income tax. It concerns the evolution of the R&D tax credit in the UK. In 2001, the government enlarged and extended this tax credit from small to large firms. At the time of its introduction, the large firms did not lobby for its creation, even though they could expect to benefit from it. Yet, once the policy was in place, they lobbied actively to maintain and extend it. In other words, the favourable tax treatment guaranteed to a group in turn created a constituency for expanding that favourable treatment. This is another instance of the status quo bias.

[24] The Institute for Fiscal studies shows that getting rid of reduced VAT rates in the UK would raise about £23 billion. Using £12 billion of this revenue to increase means-tested benefit and tax credit rates by 15% would leave the poorest three deciles of the population better off (Crawford et al. 2008).

help avoid the excessive use by the government of tax policy instruments that are either ill-understood by voters, or less visible or less transparent to them.

Part III: The political economics of tax reforms: an empirical test

3.1. The data

In this section, we investigate the empirical determinants of tax reforms and assess some of the theories. To do so, we use a *LABREF*, a database managed by the European Commission and which collects reforms in labour markets that occurred in the Member States of the European Union. The database covers all current 27 Member States between 2000 and 2008[25]. Within this dataset, we focus on the reforms in labour taxation on three accounts: changes in personal income taxation, changes in social security contributions of employees and changes in social security contributions of employers. The database also allows identifying whether the change in legislation positively or negatively affects the rate and/or the base and whether the reform was targeted to taxpayers with specific characteristics, such as old workers, young workers, self-employed, families with children, high or low-income, etc. In the database, we identify 86 reforms of personal income taxation (among which 47 were targeted), 23 reforms of social security contributions of employees (among which 15 were targeted) and 53 reforms of social security contribution of employers (among which 33 were targeted). We codify these by creating a variable "reform" that takes the value 1 if a reform of one of these three types occurs in a specific country in a specific year and 0 otherwise. In the same vein, we create a variable "target" that takes the value 1 if a targeted reform of one of these three types occurs in a specific country in a specific year and 0 otherwise. Table (4) provides summary information on the 117 reforms, of which 77 were targeted.

Table (4): Reforms of labour income taxation in the European Union

Reforms	Total number	Of which, at least one of the reforms is targeted
PIT, SSCe, SSCr	9	7
PIT, SSCe	5	5
PIT, SSCr	15	10
SSCe, SSCr	6	0
PIT only	57	31
SSCe only	3	3
SSCr only	22	15
Total	**117**	**77**

Source: LABREF and own calculations

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[25] There is no information for reforms in social security contributions in Bulgaria between 2000 and 2002.

To assess the effects of political factors, we have collected indicators from the *Database of Political Institutions*, run by the World Bank (see Keefer, 2007). This database provides information on the political framework and the composition of executive and legislative institutions in most countries of the world between 1975 and 2006. To match these data with the data coming from *LABREF*, we have updated the database for our countries of interest with 2007 data. Next, we use information contained in the yearly *CIA Factbook* between 2000 and 2007, which also provides socio-economic information. Finally, we also use economic data provided in the *AMECO* database run by the European Commission.

3.2. Estimation technique

To investigate the determinants of the reform choices of governments we rely on the use of discrete choice modeling techniques and use the binary logit approach for this purpose. The choice of implementing a reform may be viewed as a maximization process done by the government and can be viewed as a variant of McFadden's random utility maximization model (see Long and Freese, 2006). This approach assumes that governments choose to reform or not depending on the impact on a latent (i.e. unobservable) variable y* (e.g. the expected political profit). Additionally, observed political and socio-economic characteristics are assumed to directly influence this latent variable. They enter the profit function of a given government *i* as follows:

$$y_i^* = X_i \beta + \varepsilon_i \qquad (1)$$

where the latent variable y* of government *i* depends on observed independent variables represented by X_i and a random component ε_i. The government will decide whether to reform of not (the observed decision y) based on the following measurement equation:

$$
\begin{aligned}
y_i &= 1 \quad if \quad y_i^* > 0 \\
y_i &= 0 \quad if \quad y_i^* \le 0
\end{aligned}
\qquad (2)
$$

Table (5) provides summary statistics on the main political variables and controls used in the subsequent empirical work to explain reform decisions. The mean value of *reform* – a dummy variable capturing the occurrence of a reform – is 0.542 and the mean value of *targeted* – a dummy variable capturing the occurrence of a targeted reform – is 0.356. Among the political controls, *execoalition* is the number of seats of majority of the governing

coalition in the parliament, which varies in our panel from 1 to 8, with a mean value of 2.7. A large number of coalition partners is expected to increase the number of reforms – albeit not necessarily their efficiency – because it increases political competition (Lizzeri and Persico, 2005). However, this process may depend on the respective power of each political party. To control for this, we include *herfgov*, a variable computed as the Herfindahl index of the share of each party in the number of seats of the majority coalition. A similar variable, *Herfopp*, is computed for the opposition. The decision to reform may also depend on the size of the majority of the ruling coalition and we therefore include *maj*, the proportion of seats of the majority whose mean value in our sample is 54.4%. Next, we add *parliamentterm* as a variable capturing the length of the legislative mandate and *parlyterm*, which is computed as the ratio of the number of years left in the current mandate on the length of the legislative mandate. *Left* and *right* are two dummy variables capturing the political wing of the ruling coalition, the default being a centrist government. Right-wing or left-wing governments may be willing to implement specific reforms. At the same time, as mentioned in section 2.3., Cukierman and Tommasi (1998) show that reforms may be easier with governments that are less-prone to reforms as pro-reform governments may fail to implement reforms because of distrust in the population about their necessity. Finally, *Govspec* is a dummy variable indicating whether a member of the ruling coalition has specific political (nationalist, regional, religious or rural) interest. Such party might be more eager to implement targeted reforms.

Next, we include socio-economic variables. *Pop65* represents the share of the population aged 65 or more. An ageing population could be an incentive for governments to reform – because of public finance constraints – but can also be an obstacle to reforms if this category prefers the status quo. *Ethnic* is the Herfindahl index of the various ethnicities composing society, with a value of one indicating a homogenous population. Heterogeneous populations might reflect heterogeneous preferences for reform which could increase political competition and hence the probability of a reform. Finally, we include economic control variables. *Outputgap* is the measure of the output gap of the economy, with a positive value indicating high growth. Alesina and Drazen (1991) hypothesise that reforms are more likely to happen during economic crises. *Complgovemp* capture the share of the compensation of labour of government employees in the economy and is hence a measure of the power of state officials. Finally, *lagirtlabor* is the lagged value of the implicit tax rate on labour. A high ITR on labour is expected to trigger reforms to decrease it.

Table (5): summary statistics

Variable	N# obs	Mean	Standard dev	Min	Max
Reform	216	.542	.499	0	1
Targeted	216	.356	.480	0	1
Lag reform	189	.529	.500	0	1
Lag targeted	189	.354	.480	0	1
Execoalition	216	2.708	1.341	1	8
Herfgov	216	.654	.258	.180	1
Herfopp	216	.506	.200	.213	1
Maj	216	.545	.076	.357	.732
Parlyterm	216	.405	.284	0	1
Parliamentterm	216	4.259	.439	4	5
Left	216	.361	.481	0	1
Right	216	.333	.472	0	1
Govspec	216	.194	.397	0	1
Pop65	216	15.187	2.054	11	20
Ethnic	216	.824	.175	.415	1
Outputgap	216	.308	2.488	-7.286	13.056
Complgovemp	216	11.075	2.509	6.844	18.025
Lagitrlabor	216	35.344	6.812	19.1	48.5

3.3 Empirical results

Table (6) provides the empirical results from a logistic regression on the probability for a reform in labour taxation to occur. Table (7) provides similar regressions for targeted reforms. In both tables, we start with regression (1) as our base case, which includes political variables only. *Execoalition*, the number of political parties in the ruling coalition enters in Table (6) with a coefficient of 0.352 that is significant at the 1% level. Alternatively, (unpublished) marginal effects indicate that increasing the number of political parties by one leads to an increase in the probability of reforming by 8.7%. This result seems to give in support for the prediction of Lizzeri and Persico (2005) that increased political competition leads to more reforms because of an increased need to seek political support. Next, the Herfindahl index of governmental parties enters positively and significantly at 1% level, indicating that more homogeneous governments (or governments with a dominant party) are more likely to reform. The marginal effect indicates that a one-percentage point increase in the index leads to an increase in the probability of a reform by 0.58%. We also control for the size of the majority in terms of parliamentary seats and also find a positive and significant effect at the 5% level. The marginal effect is substantial with a one-percentage point increase in the majority yielding an increase in the probability of a reform by 1.29%[26]. The length of the parliamentary term is also introduced as a control. Governments with longer terms may want to spread reforms over the term and practice gradualism. Alternatively, longer terms

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[26] Note that there is a possibility of quadratic effects. Adding the square of *maj* in regression (1) keeps the significance (at 10%) of both maj and its square, this latter entering with a negative sign. This significance disappears in other regressions.

may mean less political competition and hence a lower need for reform. The negative and strongly significant result could provide support for this latter hypothesis. Having a 5-year mandate instead of a 4-year mandate decreases the probability of reforming by 26.2%. However, the size of the result may also simply mean that the number of reform per term is more or less fixed and that governments with a 5-year term have simply a lower "reforms to years" ratio. Finally, both left-wing and right-wing governments are less likely to reform. In those cases, the presence of such government decreases the probability of a reform by 26 and 22% respectively. This provides support for the theory of Cukierman and Tommasi (1998) which predicts that governments that are seen as more pro-status-quo are more likely to succeed in reforming because their claims that a reform is necessary will be seen as more credible by voters. The basic model is quite successful in predicting reforms as its forecast is correct in about 64% of cases.

In regression (2), we add the Herfindahl index of the opposition, the ratio of the number of years left in the current mandate on the length of the legislative mandate and a dummy variable indicating whether a member of the ruling coalition has specific political interest as additional political variables. The first variable enters positively and significantly at the 1% level. Its marginal effect is similar to the one of the index for the government in this regression at 0.47% and 0.46% respectively. It provides additional support for the political competition theory. The other two additional variables are not significant albeit their sign is in line with the prediction that governments tend to implement reforms at the beginning of their mandate and that governments with specific interests are more likely to yield specific reforms. The other variables are not affected qualitatively and their marginal effects remain similar[27].

Regression (3) introduces economic variables as controls. A high implicit tax rate on labour in the previous period is an incentive to introduce a reform. Indeed, the variable enters positively and significantly at the 10% level. A large size of the public sector – as proxied by the compensation of government employees in GDP – is predicted to favour the status quo. The variable enters indeed the regression negatively but fails to be significant. Finally, the economic conditions are reflected in the output gap variable. The results infirm the prediction of Alesina and Drazen (1991) that reforms are more likely to happen during a crisis. Instead, the positive and significant coefficient for the output gap suggests that governments engage in pro-cyclical policies. The marginal effect indicates that a one-percentage point increase in the

output gap increases the probability of a reform by 3.4%[28]. To confirm this, we substitute in regression (4) the unemployment rate for the output gap. The negative and significant coefficient indicates that high unemployment is negatively correlated with the occurrence of reforms.

In regression (5), we substitute demographic controls for economic ones. We find that an ageing population is an incentive for reforms but that more homogenous populations have a positive but non-significant effect. Note however that entering those variables cause some of the core variables to be insignificant. This seems to be largely due to collinearity problems. Putting all variables together in regression (6) aggravates this problem further. Finally, we test for lagged effects in regression (7) and for the influence of reforms in other countries in regression (8). Both enter non-significant.

Next, Table (7) provides mirror regressions for targeted reforms. In regression (1), *Execoalition*, *Herfgov* and *Maj* enter the regression positive and significant with marginal effects close to their values in Table (6). The length of the term enters negatively but just fails to be significant at 10% level. Interestingly, left and right variables cease to be significant and this is confirmed in all regressions of table (7). This may be an indication that targeted reforms are not necessarily associated with a political colour but are used by all parties to win the support of specific groups of voters like in the Colonel Blotto Games. Regressions (2) to (8) display results that are qualitatively similar to regression (1). Several points are nevertheless worth noticing. First, economic variables do not seem to play a role. This is a strong indication that targeted variables might be of political nature instead of economic one. Second, the degree of majority seem to play a minor role, which shows again that - unlike general reforms that necessitate a broad political support - targeted reforms might be more political acts towards specific constituencies. This argument is strengthened by the lower role plaid by the Herfindahl index of the government in Table (7). Finally, the lag of the dependent variable enters positive and significant at the 5% level. The marginal effect indicates that having done a targeted reform in the previous period increases the probability of having a targeted reform in the current period by 17.7%. This seems to indicate that, unlike general reforms, targeted reforms are characterised by gradualism.

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[27] Note that those three additional variables are somewhat strongly correlated with some of the other ones and such collinearity is expected to decrease the significance of the results. It is therefore good news that the results are largely unaffected.

[28] An (unpublished) additional regression shows that there are no quadratic effects for the output gap, i.e. reforms do not occur in either very good or very bad economic situations.

Conclusions

Economic theory on optimal taxation provides many prescriptions on how to shape tax systems to reach economic efficiency by minimizing excess burden of taxation. Similarly, achieving fair tax systems also require specific designs for tax systems. Despite the economic case for such 'optimal' tax systems, actual ones are often shaped in a way that achieves neither efficiency nor fairness and recommended tax reforms are implemented in few countries only. It therefore of high policy interest to better understand the determinants of tax reforms. This paper is aiming to this goal.

A weakness of economic theories on tax efficiency and fairness is that they often abstract from both the definition of the tax base and the definition of income. In both cases, they encompass many aspects of diverse nature and are also somewhat subject to manipulation. Such gap between theory and practice may constitute a first bias. An important second bias is that policymaking is not the achievement of a benevolent social planner but is formulated by politicians and parties that also have an electoral objective. Several theories have been devised to explain their behaviour. The median-voter theory asserts that politicians will try to please the voter that divides the electorate in two equal parts as s/he is the one deciding upon the electoral results. The empirical literature has failed to validate this theory, maybe because it relies on too many simplifying assumptions. More elaborated models - such as the probabilistic voting models – predict that the equilibrium tax policy will not only be a function of the elasticity of the income sources but also of the electoral elasticity of voters. Such models explain many observed policy outcomes such as why fully equalitarian tax systems are not politically feasible, how the status quo bias hinders reforms and prescribes gradual reforms to circumvent it, or why broad-base and low-rate tax systems might not be politically sustainable as an equilibrium of such political 'games' modelled by the political economy literature.

Finally, we exploit a database of reforms in labour taxation in the European Union between 2000 and 2007 to check the determinants of all reforms, on the one hand, and of targeted reforms, on the other hand. The results fit well with political economy theories and show that political variables carry more weight in triggering reforms than economic explanatory variables. This shed light on whether and how tax reforms are achievable. It also explains why many reforms that seem economically optimal fail to be implemented.

Table (6): The impact of political variables on reforms.

Reform	(1) Base regression	(2) More polit. v.	(3) More econ. v.	(4) Unemp. rate	(5) Demographic v.	(6) All variables	(7) Lag depend v.	(8) Lag # reforms
execoalition	0.352*** (0.123)	0.414*** (0.131)	0.302** (0.152)	0.367** (0.153)	0.310** (0.142)	0.314** (0.157)	0.383*** (0.141)	0.406*** (0.139)
herfgov	2.347*** (0.828)	1.854** (0.879)	2.321** (0.966)	2.631*** (0.995)	0.532 (1.055)	1.124 (1.230)	1.735* (0.968)	1.867** (0.951)
maj	5.206** (2.571)	4.363* (2.567)	3.940 (2.755)	4.433 (2.720)	1.635 (2.813)	2.023 (2.965)	4.203 (2.809)	4.839* (2.841)
parliamentterm	-1.058*** (0.410)	-1.187*** (0.404)	-1.084** (0.461)	-1.313*** (0.493)	-0.688 (0.483)	-0.868* (0.517)	-1.058** (0.441)	-1.156*** (0.434)
left	-1.073** (0.421)	-0.997** (0.425)	-0.895** (0.448)	-1.077** (0.456)	-0.979** (0.447)	-0.841* (0.450)	-0.622 (0.462)	-0.771* (0.464)
right	-0.879** (0.389)	-1.165*** (0.420)	-0.838* (0.446)	-1.079** (0.450)	-1.240*** (0.423)	-0.893** (0.440)	-0.954** (0.449)	-1.050** (0.445)
herfopp		1.917** (0.919)	1.196 (0.943)	1.481 (0.931)	1.953** (0.902)	1.436 (0.947)	1.602 (0.979)	1.738* (0.986)
parlyterm		-0.274 (0.521)	-0.111 (0.528)	-0.174 (0.528)	-0.237 (0.531)	-0.143 (0.533)	0.017 (0.551)	-0.092 (0.555)
Govspec		0.370 (0.438)	0.646 (0.440)	0.619 (0.436)	0.404 (0.427)	0.515 (0.451)	0.206 (0.458)	0.173 (0.463)
outputgap			0.140** (0.066)			0.101 (0.068)		
complgovempl			-0.061 (0.068)	-0.068 (0.069)		-0.082 (0.074)		
lagitrlabor			0.052* (0.031)	0.045 (0.031)		0.016 (0.037)		
unemplr				-0.077* (0.045)				
pop65					0.255** (0.103)	0.198 (0.123)		
ethnic					0.762 (0.972)	0.792 (1.095)		
lagreform							0.345 (0.326)	
lagnumreform								-0.790 (1.151)
Constant	0.055 (1.776)	0.361 (1.820)	-0.947 (2.679)	0.411 (2.730)	-3.653 (2.468)	-2.294 (2.850)	-0.129 (1.968)	0.457 (2.046)
Observations	216	216	211	211	216	211	189	189
Pseudo R-squared	0.08	0.09	0.11	0.11	0.12	0.12	0.09	0.09
Goodness of fit	.639	.639	.701	.678	.667	.677	.672	.640

Estimation is by logit model. White (1980)'s heteroskedasticity-consistent standard errors are reported between brackets. The goodness of fit is the percentage of correct predictions (either fitted value of reform >0.5 and actual reform=1 or fitted value of reform=<0 and actual reform =0). Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table (7): The impact of Political variables on targeted reforms.

Targeted	(1) Base regression	(2) More polit. v.	(3) More econ. v.	(4) Unemp. rate	(5) Demographic v.	(6) All variables	(7) Lag dependent v.	(8) Lag # reforms
execoalition	0.347***	0.397***	0.329**	0.370**	0.326**	0.325**	0.339***	0.394***
	(0.122)	(0.128)	(0.146)	(0.153)	(0.135)	(0.148)	(0.131)	(0.135)
herfgov	2.139***	1.612*	1.958**	2.172**	0.503	1.153	1.316	1.306
	(0.830)	(0.895)	(0.989)	(1.009)	(1.060)	(1.290)	(0.895)	(0.975)
maj	3.972*	3.220	2.574	2.912	1.486	1.735	2.745	2.663
	(2.185)	(2.251)	(2.372)	(2.369)	(2.515)	(2.703)	(2.297)	(2.449)
parliamentterm	-0.659	-0.802*	-0.728	-0.890*	-0.525	-0.653	-0.646	-0.581
	(0.404)	(0.441)	(0.477)	(0.498)	(0.470)	(0.498)	(0.445)	(0.485)
left	0.025	0.104	0.022	-0.090	0.098	0.051	0.162	0.593
	(0.415)	(0.441)	(0.458)	(0.461)	(0.464)	(0.482)	(0.442)	(0.497)
right	0.220	-0.054	-0.059	-0.202	-0.127	-0.061	-0.058	0.116
	(0.420)	(0.453)	(0.490)	(0.491)	(0.449)	(0.486)	(0.449)	(0.502)
herfopp		2.030**	1.695*	1.852**	2.097**	1.798*	1.861**	1.705*
		(0.874)	(0.932)	(0.920)	(0.912)	(0.962)	(0.910)	(0.904)
parlyterm		-0.281	-0.217	-0.256	-0.284	-0.253	-0.140	0.019
		(0.538)	(0.535)	(0.543)	(0.534)	(0.536)	(0.544)	(0.558)
GOVSPEC		0.359	0.558	0.556	0.404	0.504	0.319	0.347
		(0.424)	(0.444)	(0.441)	(0.428)	(0.449)	(0.422)	(0.468)
outputgap			0.078			0.061		
			(0.061)			(0.067)		
complgovempl			-0.003	-0.011		-0.023		
			(0.068)	(0.068)		(0.071)		
lagitrlabor			0.037	0.033		0.022		
			(0.031)	(0.031)		(0.037)		
unemplr				-0.053				
				(0.043)				
pop65					0.152	0.083		
					(0.102)	(0.123)		
ethnic					1.086	0.951		
					(0.995)	(1.064)		
lagtargeted							0.765**	
							(0.334)	
lagnumtargeted								1.878
								(1.455)
Constant	-2.402	-2.111	-3.270	-2.288	-4.653**	-3.902	-2.394	-3.312
	(1.808)	(1.894)	(2.512)	(2.691)	(2.348)	(2.608)	(1.914)	(2.092)
Observations	216	216	211	211	216	211	216	189
Pseudo R-squared	0.05	0.07	0.08	0.08	0.09	0.09	0.09	0.08
Goodness of fit	.685	.695	.711	.701	.708	.730	.656	.688

Estimation is by logit model. White (1980)'s heteroskedasticity-consistent standard errors are reported between brackets. The goodness of fit is the percentage of correct predictions (either fitted value of reform >0.5 and actual reform=1 or fitted value of reform=<0 and actual reform =0). Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

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Appendix A. Variable definitions and data sources

Variable	Definition	Source
Reform	Dummy indicating the occurrence of a reform in labour taxation	LABREF (European Commission) and own calculations
Targeted	Dummy indicating the occurrence of a targeted reform in labour taxation	LABREF (European Commission) and own calculations
Execoalition	Number of parties in the governing coalition	CIA Factbooks and own calculations
Herfgov	Herfindahl index for the governing coalition (in % of seats)	DPI (World Bank)
Herfopp	Herfindahl index for the opposition (in % of seats)	DPI (World Bank)
Maj	Percentage of majority in seats	DPI (World Bank)
Right	Dummy indicating a right-wing government	DPI (World Bank)
Left	Dummy indicating a left-wing government	DPI (World Bank)
Parliamentterm	Length in years of the parliamentary term	DPI (World Bank)
Parlyterm	Number of years left in the current term divided by the length of the term	DPI (World Bank) and own calculations
Govspec	dummy variable indicating whether a member of the ruling coalition has specific political (nationalist, regional, religious or rural) interest	DPI (World Bank)
Pop65	Share of the total population aged 65 or more	CIA Factbooks
Ethnic	Herfindahl index of the various ethnic	CIA Factbooks and own calculations
Outputgap	Output gap of the economy (a positive index indicates GDP above potential GDP)	AMECO (European Commission)
Complgovempl	Compensation of employees of government in % GDP	AMECO (European Commission) and own calculations
Unemplr	Unemployment rate	AMECO (European Commission) and own calculations
Lagitrlabor	Lag of the Implicit tax rate on labour (computed as labour taxes collected on their own base)	Taxation Trends (European Commission)