On the political economy of the income-tax threshold[*]

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Abstract

This paper develops a conceptual framework to analyze the political forces affecting the income-tax threshold in a non-linear tax system. Firstly, we study how reforms affecting marginal tax rates and the income-tax threshold can be politically feasible. Our main theoretical results show the relationship between the types of reforms affecting the income-tax threshold and the identity of the decisive voters who make them politically feasible. In particular, we prove that the individual with median income is not necessarily decisive. Secondly, we highlight a mechanism (called "*décote*") used by French politicians to effectively control the number of households with positive income tax liability and show how it interacts with reforms of the statutory tax rates.

Keywords: Political Competition; Tax Reforms; Income-tax threshold.
JEL classification: C72; D72; D78; H6.

1 Introduction

Within a political economy framework, we study reforms of non-linear income tax systems with a focus on the income-tax threshold,[1] that is, the income starting from which individuals have a positive income-tax liability. The income-tax threshold determines the proportion of the population paying the income tax. Starting from a given status quo, we characterize reforms that affect this threshold and that are politically feasible, in the sense that they make a majority of taxpayers better-off. We introduce a conceptual framework that can be used to analyze whether reforms changing the number of households with positive tax liability hold a chance in the political process. This framework sheds a new light on the close attention paid to the income-tax threshold by French politicians and guides our empirical analysis of French tax reforms for the period 2002-2015.

Through the fact that the income-tax threshold determines the relative number of taxpayers in a population, it holds an important place in the public sphere and can be the object of much public debate. The run-up to the 2012 US presidential elections provides a good example of this, when the Republican candidate, Mitt Romney, stated that "There are 47 percent of the people who will vote for the president [Mr. Obama] no matter what. [...] These are people who pay no income tax. Forty-seven percent of Americans pay no income tax."[2] Or again, when reading the French press, one may notice that it is an issue that is raised every year.[3]

But the income-tax threshold can also be an objective carefully set by politicians or by the government. In the United Kingdom, George Osborne, Chancellor of the Exchequer from 2010-2016, states that his goal "is a tax system where the lowest paid are lifted out of tax altogether, while the tax revenues we get from the richest increase." (Budget statement - March 2012). The French government budgetary report of 2016 states that one of its objectives is to exempt 50% of the population from paying the income tax with the rationales of increasing purchasing power of "poorer households" and of making the schedule more progressive (see *Projet de Loi Finances, 2016* page 49).

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[1]The income-tax threshold is sometimes also referred to as the tax exemption threshold.

[2]This is true for the federal income tax: in 2011, 46.4% of tax units in the United States did not pay any federal income tax, see Tax Policy Center results available at http://www.taxpolicycenter.org/model-estimates/tax-units-zero-or-negative-tax-liability/baseline-distribution-tax-units-no-tax.

[3]See, in the past three years examples of titles such as

"Qui paie encore l'impôt sur le revenu en France ?", Le Figaro, 15/10/2015.

"De moins en moins de Français paient l'impôt sur le revenu", Le Figaro 13/04/2016.

"Près de 6 Français sur 10 ne paient plus d'impôt sur le revenu", Les Echos 18/07/2017.

(http://www.lefigaro.fr/economie/le-scan-eco/decryptage/2015/10/04/29002-20151004ARTFIG00050-qui-paie-encore-l-impot-sur-le-revenu-en-france.php, as viewed on January 26, 2018, http://www.lefigaro.fr/economie/le-scan-eco/dessous-chiffres/2016/04/13/29006-20160413ARTFIG00012-impot-sur-le-revenu-en-france-moins-d-un-foyer-sur-deux-est-imposable.php, as viewed on January 26, 2018 and https://www.lesechos.fr/18/07/2017/lesechos.fr/030452872864_pres-de-6-francais-sur-10-ne-paient-plus-d-impot-sur-le-revenu.htm, as viewed on January 26, 2018.)

And indeed, the proportion of the income-tax paying population has remained surprisingly stable in many western countries in the past thirty years. In France for instance the percentage of French tax units paying the income tax has been around 50% since 1986 (see Figure 1). In the United Kingdom, this share has been between 55 and 65 percent since 1990 (see Miller and Roantree (2017)).

We provide a framework to understand the political impediments of tax reforms affecting the income-tax threshold in a non-linear income tax schedule. In order to do so we build on the framework of Bierbrauer and Boyer (2017), where non-linear tax schedules are dependent on the previous status quo: in order to reform a tax schedule, the legislator needs sufficient support from the voters. Voters, when deciding whether or not to support a reform, compare their indirect utility before and after the reform. In this setup, they show that the political feasibility of reforms that satisfy some monotonicity property[4] can be assessed by looking at whether the median income individual would support such a reform.

We also consider monotonic reforms of the tax system but our focus is on the income-tax threshold. The reforms we consider involve both a change of marginal tax rates in certain brackets and the use of a parameter to control the number of taxpayers. In practice, this parameter can be thought of as the personal allowance (in the United Kingdom), the standard deduction and personal exemption (in the United States), or the "*décote*" mechanism (in France). In order to meaningfully analyze reforms affecting the income-tax threshold, we introduce a potential extra cost that is incurred by individuals who initially did not owe any income tax and owe a positive income tax after the reform. This psychological cost is akin to phenomena whereby individuals' reactions are dependent on the zero reference point (see, for example, Shampanier, Mazar and Ariely (2007)). Similar attitudes have been widely documented in the context of taxation (see, for example, Rees-Jones (2017), Kirchler (2007)).

Our main theoretical results show the relationship between the types of reforms affecting the income-tax threshold and the identity of the decisive voters who make them politically feasible.

In a first set of results we find that the median income is the decisive individual for the political feasibility of reforms in two main instances. Firstly, when the median income individual is below the income-tax threshold before and after a reform. In this case, as long as the revenue generated by the reform is positive, the number of non-taxpayers

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[4]A reform is monotonic if the change is either larger or smaller the higher the incomes. Bierbrauer and Boyer (2017) documents that a large majority of income tax reforms in OECD countries since 2000 are (strictly) monotonic and they also show that this is the case for a longer time horizon for France, Germany, the United Kingdom, and the United States.

is sufficiently large to support the reform: this can be thought of as a tyranny of the majority formed by non-taxpayers. Secondly when reforms push taxpayers out of the income tax (thus raising the income-tax threshold). We show the surprising fact that the median type being a taxpayer does not necessarily trigger an opposition to tax reforms that decrease the number of taxpayers. This is a new force that may explain why we observe low shares of income tax payers.

Our second set of results considers the political feasibility of reforms that are not supported by the median income. For example, a reform that increases the number of taxpayers below the median type and raises marginal tax rates for all taxpayers might leave the median type out of the supporting coalition if she incurs too large a disutility cost. As a second example, a reform that decreases marginal tax rates for all taxpayers and lowers the income tax threshold becomes politically feasible when there exists a coalition between low and high income individuals against middle income individuals.

In the second part of the paper we show how French politicians use a mechanism, the "*décote*" to effectively control the number of households with positive income tax liability, and how it interacts with reforms of the statutory rates. In particular, we first show how politicians effectively adjusted the income-tax threshold over time and over diverse presidencies. Our analysis of the relationship between the share of households with positive income tax liability and the choice of the "*décote*" provides evidence in favor of the political mechanisms highlighted in our theory.

Figure 1: Proportion of tax units paying the income tax in France since 1915
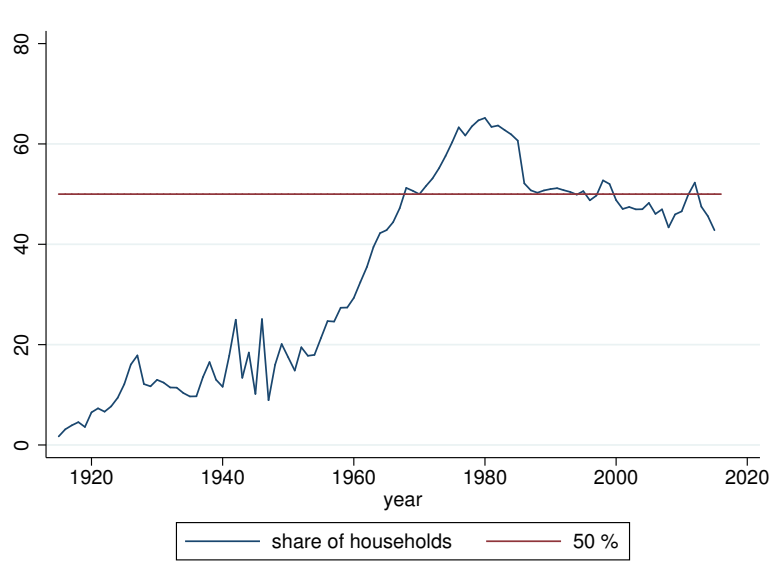
Sources: André and Guillot (2014) and *Cahiers Statistiques Direction Générale des Finances Publiques* since 2014.

The rest of this paper proceeds as follows. Section 2 discusses related literature.

Section 3 presents the formal framework. Section 4 shows that the mechanisms identified in our theoretical framework can be applied to real-world reforms affecting the income-tax threshold. Specifically, we describe the mechanism used by French politicians to effectively control the number of households with positive income tax liability, and its interaction with reforms of the statutory rates. The last section contains concluding remarks. All proofs are in the Appendix.

2 Related literature

Our analysis is constructed within the optimal income taxation framework developed by Mirrlees (1971). We use the tax perturbation method when analyzing reforms of the tax system (see the heuristic approach in Piketty (1997) and Saez (2001); and recently the more formal approaches in Golosov, Tsyvinski and Werquin (2014), Jacquet and Lehmann (2016), or Gerritsen (2016)).

The decision-making process, however, does not rely on the maximization of a social welfare function, but is embedded in a political economy framework: we look at reforms through the lens of political feasibility.[5] A reform takes place if it is supported by a majority of voters. In this respect, it is important to bear in mind Roberts' intuition for such a decision rule: "[if] political parties make choices so as to maximize the likelihood of being elected then it is possible to view the chosen options as being determined, albeit indirectly, by a voting process. The point is not whether choices in the public domain are made through a voting mechanism but whether choice procedures mirror some voting mechanism." Two of the founding articles in this literature, Roberts (1977) and Meltzer and Richard (1981), rely on lump-sum redistribution of tax proceeds, an assumption we do not challenge in our framework. Both consider linear tax schedules. Roberts (1977) shows a median voter theorem when individuals' incomes are ranked according to their ability and independently of the tax schedule, and Meltzer and Richard (1981) find that the lower the median income with respect to the mean income, the higher the rate of taxation. In their model, the extension of the franchise is accompanied by a larger size of government. This result is partly confirmed by Acemoglu, Naidu, Restrepo and Robinson (2015) in a recent survey examining the empirical relevance of these conclusions.

Bierbrauer and Boyer (2017) develop a framework to study the political feasibility of non-linear reforms of non-linear tax schedules.[6] The focus on the conditions under which

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[5]Saez and Stantcheva (2016) study generalized welfare functions with weights that need not be consistent with the maximization of a utilitarian social welfare function. The generalized weights may as well reflect alternative, non-utilitarian value judgments or political economy forces.

[6]Bierbrauer and Boyer (2017) generalizes results by Rothstein (1990; 1991) and Gans and Smart (1996).

a status quo tax policy admits reforms that are politically feasible distinguishes their work from papers that explicitly analyze political competition as a strategic game and then characterize equilibrium tax policies.[7] The non-linearity of the tax schedule provides us with a novel tool to consider the income-tax threshold. Contrary to linear taxation, it is now possible that some individuals have no tax liability (independently from the revenue generated by taxation), and some have positive tax liability.

A classical idea in public finance is that the theory of optimal taxation should be complemented by a theory of tax reforms with a focus on incremental changes that apply to a given status quo, see Feldstein (1976), Weymark (1981), or Guesnerie (1995) that contains an analysis of tax reforms that emphasizes political economy forces formalized as a requirement of coalition-proofness. Our approach contributes to this earlier literature by combining results from social choice theory on the applicability of median voter theorems with the perturbation approach to the analysis of non-linear tax systems.

The income-tax threshold has, to our knowledge, been considered through two perspectives. On the one hand, as a salient kink point generating bunching (thus also providing the means to estimating the elasticity of taxable income for low income earners): see Saez (2010) and Lardeux (2017).
On the other hand, as a factor varying through time and reflecting State capacity. Besley and Persson (2009; 2010; 2011; 2014) extensively study the role of State capacity in raising taxes (see also Aidt and Jensen (2009), on the introduction of income tax in Europe, North America, Japan and Oceania). Jensen (2016) studies the evolution of the income-tax threshold in developed and developing countries. He shows that as employment share rose in countries (or states), third-party reporting helped lower this threshold.

We consider the political economy of tax reforms affecting this exemption threshold, and show that frictions might appear, that create some form of inertia around it. Our framework applies to developed countries, where third party reporting and administrative hassles are not as big hurdles to tax collection as in many developing countries, and where the share of employees has been relatively stable in the past decades. We introduce the

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[7]Examples include Acemoglu, Golosov and Tsyvinski (2008; 2010) who relate dynamic problems of optimal taxation to problems of political agency as in Barro (1973) and Ferejohn (1986); Farhi, Sleet, Werning and Yeltekin (2012) and Scheuer and Wolitzky (2016) who study optimal capital taxation subject to the constraints from probabilistic voting as in Lindbeck and Weibull (1987); Battaglini and Coate (2008) who study optimal taxation and debt financing in a federal system using the model of legislative bargaining due to Baron and Ferejohn (1989); Röell (2012) and Brett and Weymark (2017; 2016) who characterize the non-linear income tax schedule that the median voter would pick if she could dictate tax policy; Bierbrauer and Boyer (2016) who study Downsian competition with a policy space that includes non-linear tax schedules and possibilities for pork-barrel spending as in Myerson (1993). Ilzetzki (2015) studies reforms of the commodity tax system using a model of special interests politics.

possibility for individuals to incur a psychological cost when their tax liability under the reform becomes positive when it was not so previously. The consideration of psychological phenomena influencing the behavior of individuals has recently been introduced in the taxation literature. Rees-Jones (2017), for example, finds evidence of loss aversion among taxpayers, who, in the United States, optimize much more when they want to avoid owing extra taxes to the IRS.

We take the cost we describe to be positive and do not take into account identity and group belonging effects which might cause this cost to be negative in the event that it might make voters feel like they "belong to the group who pays a tax on income" (see Shayo (2009)). Indeed, in this context, given that it is only one kind of tax (albeit the most salient one) that they are not paying, these effects might not be relevant.

3 Theoretical framework

There is a continuum of individuals of measure 1. Individuals are confronted with a predetermined income tax schedule T_0 that assigns a tax payment $T_0(y)$ to every level of pre-tax income $y \in \mathbb{R}_+$. Under the initial tax system, individuals receive a lump-sum transfer equal to $c_0 \geq 0$. We assume that T_0 is differentiable everywhere, so that marginal tax rates are well-defined for all levels of income.

We define the income-tax threshold $y_0^E \in \mathbb{R}_+$ to be such that

$$T_0(y) \begin{cases} = 0 & \text{for} \quad y \leq y_0^E \\ > 0 & \text{for} \quad y > y_0^E \end{cases}$$
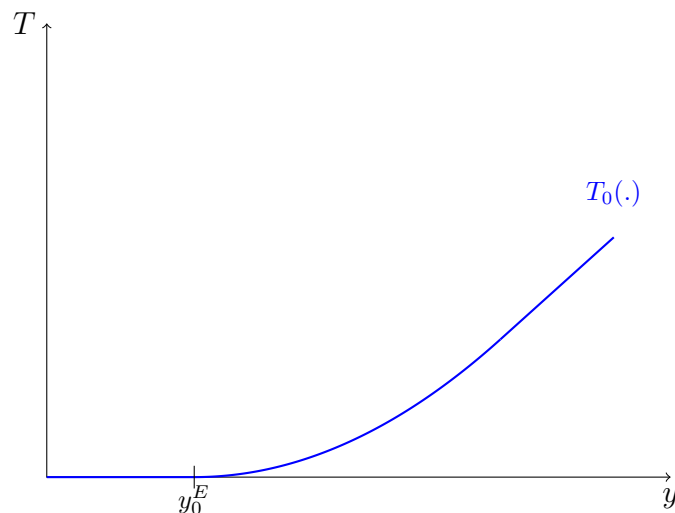

Figure 2: Status quo schedule

Threshold reforms.   A reform induces a new tax schedule T_1 that is derived from T_0 so that, for any level of pre-tax income y, $T_1(y) = T_0(y) + \tau\, h(y)$, where $\tau > 0$ is a scalar, used as a scaling factor, and h is a differentiable function (that may be weakly positive or negative). The new income-tax threshold y_1^E is such that

$$T_1(y) \begin{cases} = 0 & \text{for} \quad y \leq y_1^E \\ > 0 & \text{for} \quad y > y_1^E \end{cases}$$

We represent a reform by the triplet $\left(\tau, h, y_1^E\right)$. We focus on reforms that are incentive compatible, i.e., for which $y - T_1(y)$ is non-decreasing. The reform induces a change in tax revenue denoted by $\Delta^R(\tau, h)$, that is redistributed lump-sum in the population (so it is added to c_0 for each individual).

Preferences.   Individuals have a utility function u that is increasing in private goods consumption, or after-tax income, c, and decreasing in earnings or pre-tax income y. Utility also depends on a measure of the individual's productive ability ω. The set of possible abilities is denoted by $\Omega = [\underline{\omega}, \overline{\omega}]$ and is a compact subset of $\mathbb{R}_+$. We assume that the individuals who start paying taxes on their income after the reform – i.e. under T_1 – and who were not paying any taxes under T_0 incur an extra utility cost.[8] Our preferred interpretation of this cost is grounded in the psychology literature. The disutility of starting to pay taxes could also be thought of as a hassle cost (see Aghion, Akcigit, Lequien and Stantcheva (2017)) or, simply, a monetary compliance cost when the utility function is quasi-linear. This cost is indexed by a parameter χ that is distributed in the population. Costs belong to the compact subset of $\mathbb{R}_+$, $\mathcal{X} = [\underline{\chi}, \overline{\chi}]$. We refer to the couple (ω, χ) as the individual's type. It is not observable by the government. The utility that an individuals with type (ω, χ) derives from c and y is denoted by $U(c, y, \omega, \chi)$. The distribution of types in the population is represented by a joint cumulative distribution function $F(\omega, \chi)$ with joint density $f(\omega, \chi)$. We also introduce cumulative distribution functions $G(\omega)$, $H(\chi)$ and density functions $g(\omega)$, $h(\chi)$ for ω and χ respectively.

Under the status quo, the utility function of individual (ω, χ) is such that

$$U(c, y, \omega, \chi) = u\left(c_0 + y - T_0(y), y, \omega\right).$$

In the case of a reform, the utility function of individual (ω, χ) is of the form

$$U(c, y, \omega, \chi) = u\left(c_0 + e + y - T_0(y) - \tau h(y), y, \omega\right) - \chi \tau h(y) \mathbb{1}\mathcal{N}.$$

where $\mathbb{1}\{\cdot\}$ is the indicator function and $\mathcal{N}$ is the event "individual (ω, χ)'s income y under T_0 was such that they were not paying taxes and if they chose the same income y

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[8]This formulation is in line with the literature incorporating an extensive margin of labor supply decision in an optimal income tax setup (see, Saez (2002), Choné and Laroque (2010), or Jacquet, Lehmann and Van der Linden (2013)).

8

under T_1, they would now be paying taxes".

The specification of the cost we adopt is such that the total utility cost reflects the intensity of the "treatment" to the reform, i.e. χ is multiplied by the amount of tax the individual starts to pay.

Spence-Mirrlees single crossing property. We assume that $-\frac{u_y(c,y,\omega)}{u_c(c,y,\omega)}$, the marginal rate of substitution between labour and consumption is decreasing in the individual's skills, i.e. for any pair (c, y) and any ω, ω' with $\omega' > \omega$,

$$-\frac{u_y(c, y, \omega')}{u_c(c, y, \omega')} \leq -\frac{u_y(c, y, \omega)}{u_c(c, y, \omega)} \,.$$

We assume that leisure is a non-inferior good. If individuals experience an increase in an exogenous source of income e, they do not become more eager to work. Formally, this means that $-\frac{u_y(c+e,y,\omega)}{u_c(c+e,y,\omega)}$ is non-decreasing in e.

We also assume that an individual's marginal utility $u_c(c, y, \omega)$ is both non-increasing in c and non-increasing in ω, i.e. $u_{cc}(c, y, \omega) \leq 0$ and $u_{c\omega}(c, y, \omega) \leq 0$.

Notations. To describe the implications of reforms for measures of revenue, welfare and political support it proves useful to introduce the following optimization problems. If the status quo T_0 is maintained, individual (ω, χ) chooses y so as to maximize

$$u\left(c_0 + y - T_0(y), y, \omega\right).$$

We assume that this optimization problem has, for each ω, a unique solution that we denote by $y^*(0, 0, \omega, \chi)$. It is constant across χ's for a given ω. Thus, we may also write $y^*(0, 0, \omega, \chi) = \tilde{y}^0(\omega)$. The corresponding indirect utility function is denoted by $V(0, 0, \omega, \chi)$ (and is also constant across χ's for a given ω). We write $\tilde{u}_c^0(\omega)$ for the marginal utility of consumption that a type (ω, χ)-individual realizes in this case. If a reform (τ, h) is carried out, individual (ω, χ) chooses y so as to maximize

$$u\left(c_0 + e + y - T_0(y) - \tau h(y), y, \omega\right) - \chi \tau h(y) \mathbb{1}\left\{ \begin{array}{l} \tau h(\tilde{y}^0(\omega)) > 0 \\ T_0(\tilde{y}^0(\omega)) = 0 \end{array} \right\},$$

where e is a source of income that is exogenous from the individual's perspective. We assume that this optimization problem has, for each type (ω, χ), a unique solution that we denote by $y^*(e, \tau, \omega, \chi)$ (or also $\tilde{y}^1(\omega, \chi)$). The corresponding indirect utility function is denoted by $V(e, \tau, \omega, \chi)$. We write $\tilde{u}_c^1(\omega, \chi)$ for the marginal utility of consumption that a type (ω, χ)-individual realizes after the reform.

Armed with this notation we can express the reform-induced change in tax revenue as

$$\Delta^R(\tau, h) = \int_{\underline{\omega}}^{\overline{\omega}} \int_{\underline{\chi}}^{\overline{\chi}} \{T_1(y^*(\Delta^R(\tau, h), \tau, \omega, \chi)) - T_0(y^*(0, 0, \omega, \chi))\} f(\omega, \chi) \, d\omega \, d\chi \,.$$

The reform-induced change in indirect utility for a type ω individual is given by

$$\Delta^V(\omega, \chi \mid \tau, h) := V(\Delta^R(\tau, h), \tau, \omega, \chi) - V(0, 0, \omega, \chi) .$$

Political support for reforms. Political support for the reform is measured by the mass of individuals who are made better-off if the initial tax schedule T_0 is replaced by T_1 (we consider individuals have equal weights in the decision-making process),

$$S(\tau, h) := \int_{\underline{\omega}}^{\overline{\omega}} \int_{\underline{\chi}}^{\overline{\chi}} \mathbb{1}\{\Delta^V(\omega, \chi \mid \tau, h) > 0\} f(\omega, \chi) \, d\omega \, d\chi .$$

A reform (τ, h) is said to be supported by a majority of the population if $S(\tau, h) \geq \frac{1}{2}$.

3.1 Political economy of the income-tax threshold

Notations. We start by assuming that there is no bunching under T_0, so that we can write $\tilde{y}^0(\omega)$ and its inverse $\tilde{\omega}^0(y)$.[9] We write ω_0^E for the type corresponding to y_0^E under the status quo. Let ω^M be the median of the distribution of skills. We write $y^{0M} := \tilde{y}^0(\omega^M)$, and refer to this individual as the median income individual or the median type. Finally, we write $\omega_1^E := \tilde{\omega}^0(y_1^E)$ for the type corresponding to y_1^E under the status quo.

Monotonic reforms. A tax reform (τ, h, y_1^E) is said to be monotonic if $T_1(.) - T_0(.) = \tau\, h(.)$, or more simply, $h(.)$ is monotonic over $\mathbb{R}_+$. Given a cross-section distribution of incomes, we say that a reform is piece-wise monotonic if h is a monotonic function for incomes above (or below) some given income. In our empirical application we check that the reforms studied satisfy these monotonicity properties.

Small reforms. As typically done in the literature we consider small reforms, i.e. reforms such that τ is close to zero. An individual (ω, χ) benefits from a small reform (τ, h) if $\Delta^V(\omega, \chi \mid \tau, h) > 0$. At the first order, this is equivalent to

$$\tau \Delta_\tau^V(\omega, \chi \mid 0, h) > 0,$$

where

$$\Delta_\tau^V(\omega, \chi \mid \tau, h) := \frac{d}{d\tau} V(\Delta^R(\tau, h), \tau, \omega, \chi).$$

We first present the benchmark case where there are no costs of becoming a taxpayer.

Proposition 1 *Suppose that $\mathcal{X} = \{0\}$. Let h be a monotonic function. The following statements are equivalent:*

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[9]Allowing individuals to bunch under the status quo would not change our results, see Bierbrauer and Boyer (2017).

1. *The median skill individuals ω^M benefit from a small reform.*

2. *There is a majority of voters who benefit from a small reform.*

The proof of Proposition 1 follows from Bierbrauer and Boyer (2017, Theorem 1).

The first step is to find, for all individual types, the value of interest, $\Delta_\tau^V(\omega \mid 0, h)$, which is

$$\Delta_\tau^V(\omega \mid 0, h) = \left(\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega).$$

Intuitively, if entering the income tax does not generate extra disutility, the trade-off for the voter is between her extra tax liability that may have to increase (or decrease) versus the revenue generated by the reform. Hence, a voter may be willing to support a reform that increases her taxes if the amount that will be redistributed to her is greater than this extra payment.

Moreover, Mirrlees' single crossing property implies that $\tilde{y}^0(.)$ is increasing in individuals' abilities ω. Hence, if a reform is supported by an individual of type $\hat{\omega}$, then, if it is increasing, all types below $\hat{\omega}$ will support it as well, and if it is decreasing, all types above $\hat{\omega}$ will support it as well. That is, the ranking of incomes due to the single crossing property translates into a ranking of benefits from the reform according to the individuals' types ω. This is the mechanism that gives rise to the median voter result.

In such an environment, the position of the individuals with respect to the income-tax threshold does not matter when evaluating the benefit of the reform.

From now onward, suppose that there is a $\chi > 0$. Then for all $(\omega, \chi) \in \Omega \times \mathcal{X}$,

$$\Delta_\tau^V(\omega, \chi \mid 0, h) = \left(\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega) - \chi h(\tilde{y}^0(\omega))\mathbb{1}\left\{\begin{array}{l} \tau h(\tilde{y}^0(\omega)) > 0 \\ T_0(\tilde{y}^0(\omega)) = 0 \end{array}\right\}.$$

3.1.1 Income-tax threshold reforms and median voter results

It should be harder for the legislator to get voters who become taxpayers after a reform to support the said reform. The following proposition describes the reforms for which the legislator can do without their support and is articulated around the position of y_1^E with respect to the initial income-tax threshold y_0^E and the initial income of the individuals with median type y^{0M}.

Proposition 2 *Let $y_1^E \geq min\{y_0^E, y^{0M}\}$. Suppose h is monotonic from $max\{y_0^E, y_1^E\}$ onward. A reform (τ, h, y_1^E) is supported by a majority of the population if and only if the median skill individuals ω^M benefit from it.*

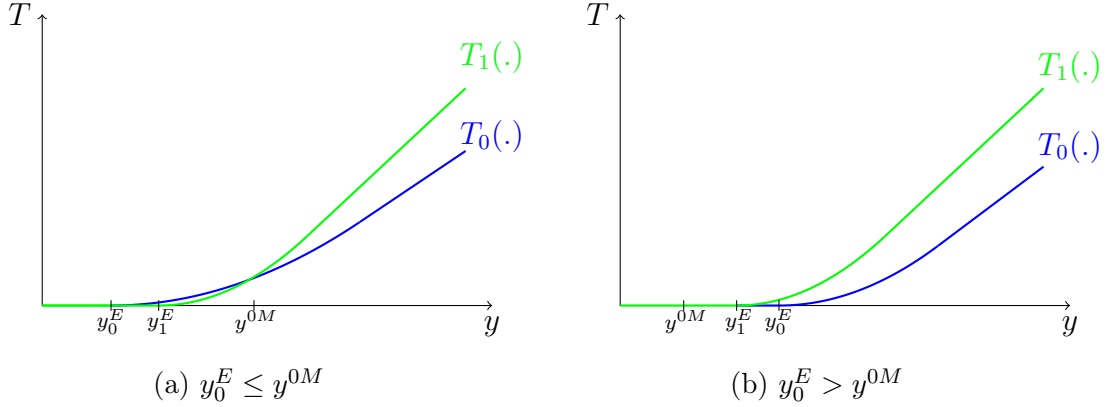(a) $y_0^E \leq y^{0M}$ (b) $y_0^E > y^{0M}$

Figure 3: $y_1^E \geq min\{y_0^E, y^{0M}\}$

Proposition 2 identifies a class of reforms (τ, h, y_1^E) for which the median voter is the decisive type. The intuition is as follows.

If $y_0^E > y^{0M}$, then $y^{0M} \leq y_1^E \leq y_0^E$ means that the reform either lowers the threshold above the median income individual or leaves it as is. If $y_1^E > y_0^E$, it might even raise the threshold. As long as the revenue generated is positive, the reform is politically feasible. In our majority rule context, the fact that in the case where the threshold is lowered, some individuals may incur an extra psychological cost not does matter to the legislator, as a majority of voters supports the reform anyway.

If $y_0^E < y^{0M}$, then $y_0^E \leq y_1^E$ means that the reform either leaves the income tax threshold as is, or raises it. No-one incurs a cost of entering the tax schedule, the ranking of benefits still depends on the ranking of types, and it is the net benefit of the median voter that is taken into account.

Proposition 2 presents threshold reforms that almost everywhere monotonic and for which the political feasibility hinges on the median voter. First, for reforms that raise the income-tax threshold, thus lifting taxpayers out of the income tax, the decisive voter is the median type, see Figure 2 (left panel). If marginal tax rates are raised for taxpayers above the median type, it is possible that the median voter's extra tax burden is null and that the revenue raised is positive. In this case, the median type will support the reform. Hence, her being a taxpayer does not necessarily trigger an opposition for a decrease of the number of taxpayers sharing the total tax burden. This is a force that may explain why we observe low shares of income taxpayers.

Second, the political feasibility of a reform such that the median income is below the income-tax threshold before and after a reform, is governed by the median income individual's consent, see Figure 2 (right panel). Interestingly, this result does not depend on the intensity of the disutility cost incurred by the individuals who become taxpayers because enough voters remain below the new tax threshold. This case can be described as the tyranny of the majority: poor individuals support tax increases borne by richer

12

individuals as soon as they increase revenue.

3.1.2 Income-tax threshold reforms and non-median voter results

A reform that lowers the income tax threshold below the median type might increase tax rates or might decrease tax rates for the tax paying population. We show that these reforms may meet with more frictions. In particular, they tamper with the ranking of beneficiaries according to their initial income (or equivalently, their ability). We present the following results by separating the reforms that increase or decrease the marginal tax rates.

Reforms increasing marginal tax rates. The fact that some individuals may face an extra cost of entering the income tax schedule might now have an impact on the identity of the decisive voter, which we formalize in the following proposition, where tax rates are increased for all status quo tax paying individuals.

Proposition 3 *Let $y_1^E < min\{y_0^E, y^{0M}\}$. Suppose that h is non-decreasing. A reform (τ, h, y_1^E) is supported by a majority of the population if and only if the individuals in $[0, \omega_1^E]$ benefit from it and there exists an α in $[0, G(\omega_0^E) - G(\omega_1^E)]$ such that*

α individuals in $(\omega_1^E, \omega_0^E]$ benefit from it

and either $\alpha + G(\omega_1^E) \geq \frac{1}{2}$ or the individuals with skill $\hat{\omega}_\alpha \geq \omega_0^E$ such that $G(\omega_1^E) + [G(\hat{\omega}_\alpha) - G(\omega_0^E)] + \alpha = \frac{1}{2}$, benefit from it.
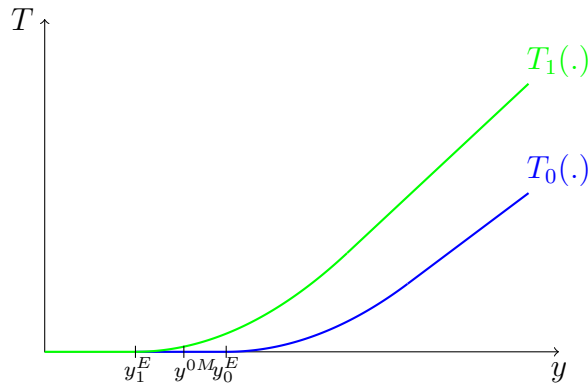

Figure 4: $y_1^E < min\{y_0^E, y^{0M}\}$

Proposition 3 looks at reforms that monotonically increase marginal tax rates. It finds that the extra cost individuals would pay by crossing (at equal income) the income tax threshold eliminates the monotonicity in ranking the beneficiaries from a reform according to their type ω. Now, the political feasibility of such a reform might require compensating some individuals above the median, which, since h is non-decreasing may be more demanding than compensating the median income individual (remember that the trade-off

is between $\Delta^R(\tau, h)$ and $h(\tilde{y}^0(\omega)))$.

Reforms that raise the number of taxpayers below the median type and raise marginal tax rates for all taxpayers (see Figure 4) imply that the median type is not necessarily the type with the highest burden from the tax increase in the first half of the population: individuals below the median who become taxpayers suffer, on top of their tax liability, an extra disutility cost. A supporting coalition for such reforms thus needs to gather the support of the non-taxpayers (the individuals in $[0, \omega_1^E]$), the individuals who start paying taxes and have a low χ and, if necessary, individuals who were already taxpayers. In particular, the median type might be left out of the coalition if she was not a taxpayer and incurs a large disutility cost.

Reforms decreasing marginal tax rates. In the following proposition, we characterize the conditions for which a reform that lowers the income tax threshold while lowering tax rates for the status quo tax-paying population is politically feasible. In this case, the main factor that might contradict the median voter result is the fact that the reform cannot be monotonous everywhere anymore.

Proposition 4 *Let $y_1^E < min\{y_0^E, y^{0M}\}$. Suppose that h is non-increasing from y_0^E onward.*

> **I. The median type is not a taxpayer under the status quo.** *Suppose that $y_0^E \geq y^{0M}$. A reform (τ, h, y_1^E) is supported by a majority of the population if and only if the individuals in $[0, \omega_1^E]$ benefit from it and there exists an α in $[0, G(\omega_0^E) - G(\omega_1^E)]$ such that*
> *α individuals in $(\omega_1^E, \omega_0^E]$ benefit from it*
> *and either $\alpha + G(\omega_1^E) \geq \frac{1}{2}$ or the individuals with skill $\hat{\omega}_\alpha \geq \omega_0^E$ such that $G(\omega_1^E) + [1 - G(\hat{\omega}_\alpha)] + \alpha = \frac{1}{2}$, benefit from it.*

> **II. The median type is a taxpayer under the status quo.** *Suppose that $y_0^E < y^{0M}$.*

> (a) *When $\Delta_\tau^R(0, h) > 0$, a reform (τ, h, y_1^E) is supported by a majority of the population if and only if there exists an α in $[0, G(\omega_0^E) - G(\omega_1^E)]$ such that:*
> *α individuals in $(\omega_1^E, \omega_0^E]$ benefit from it*
> *and the individuals with skill $\hat{\omega}_\alpha \geq \omega_0^E$ such that $G(\omega_1^E) + [1 - G(\hat{\omega}_\alpha)] + \alpha = \frac{1}{2}$, benefit from it.*

> (b) *When $\Delta_\tau^R(0, h) \leq 0$, a reform (τ, h, y_1^E) is supported by a majority of the population if and only if the median skill individuals ω^M benefit from it.*
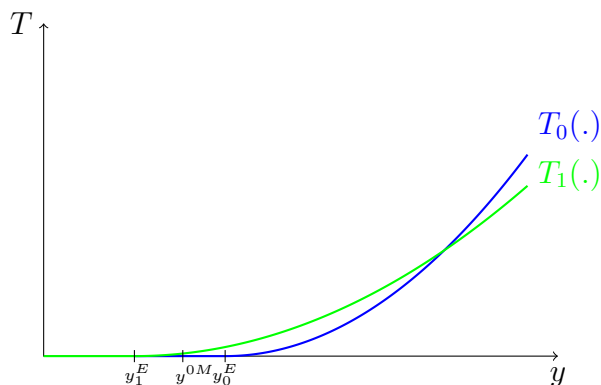
Figure 5: $y_1^E < min\{y_0^E, y^{0M}\}$

Part I of Proposition 4 shows that now, for example, a reform that has positive revenue and where the lower skilled individuals who still do not pay taxes and the higher skilled individuals who pay lower taxes constitute half of the voters would be politically feasible. This suggests that lowering the income-tax threshold may be politically feasible with a coalition between the poorer and the richer part of the population against the middle class. (This result is reminiscent the "ends against the middle" phenomenon in Epple and Romano (1996)).

In Part II (a) of Proposition 4, the revenue generated by the reform is positive and the coalition supporting the reform has the same composition than in Part I. This is true even if the median type is a taxpayer under the status quo, which enriches the cases where the median type is not in the supporting coalition. However, when the revenue generated by the reform is negative as in Part II (b) of Proposition 4, the median type regains her position as a decisive voter. Intuitively, the reform favors disproportionately individuals with higher income. Hence, when the median voter benefits from it, a winning coalition will be gathered.

4   Empirical application: France

In France the income-tax threshold is controlled by the décote-mechanism.

Institutional details.   The décote-mechanism was introduced in France in 1981, with the aim of reducing taxes for lower income individuals. One reason that was stated was to enhance their purchasing power.

It aims to set back to zero the income tax owed by households below a certain threshold and to decrease that of some households above. This enables to keep the income tax schedule progressive as it is, while not losing the revenue that would be mechanically (i.e., not taking behavioral responses into account) lost if the effective tax threshold was

defined as the statutory one.

For example, in year 2017 for 2016 incomes, for a single individuals with no children, the statutory income tax schedule is as reported in Table 1.[10]

Table 1: Statutory marginal tax rates and brackets

Lower threshold	Marginal tax rate
0 €	0.0%
9710 €	14%
26,818 €	30%
71,898 €	41%
152,260 €	45%

Source: Institut des Politiques Publiques.

Now the décote-mechanism has two parameters:[11] a threshold S and a rate $\alpha > 1$. Individuals calculate the income tax T they owe with Table 1 and then calculate $T' = \alpha T - S$. If this is below zero, then they owe a zero income tax. If it is above zero, then they owe $min\{T, T'\}$.

In 2017, $S = 1165$ and $\alpha = 7/4$. This implies that the effective income tax threshold is at 14,465 €, and that the income tax is reduced for incomes until 20,805 € (and that between 14,465 € and 20,805 €, the marginal tax rate is multiplied by α).

For a single taxpayer with no children this then induces the marginal tax rates and brackets in Table 2.

Table 2: Marginal tax rates and brackets with the décote-mechanism

| Lower threshold	Marginal tax rate
0 €	0.00%
14,465 €	24.5%
20,805 €	14.0%
26,818 €	30.0%
71,898 €	41.0%
152,260 €	45.0%

Source: Institut des Politiques Publiques.

Below is an illustration of the effect of the décote-mechanism on the statutory income tax schedule for year 2017.

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[10]The complete table for the period 2002-2014 is in Appendix B.

[11]The complete table for the period 2002-2014 is in Appendix B.

Figure 6: Income tax schedule 2017 with and without the décote-mechanism
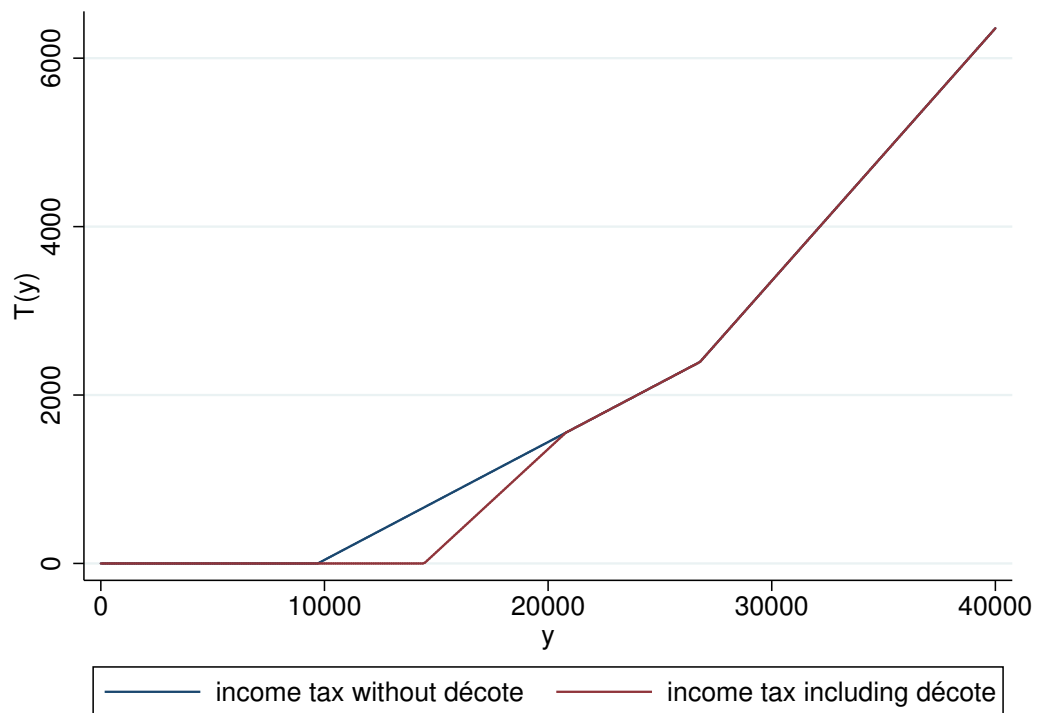
The following figures (for years 2003, 2006, 2010 and 2012) show how the mass of individuals and taxpayers is located with respect to the income-tax threshold.[12]
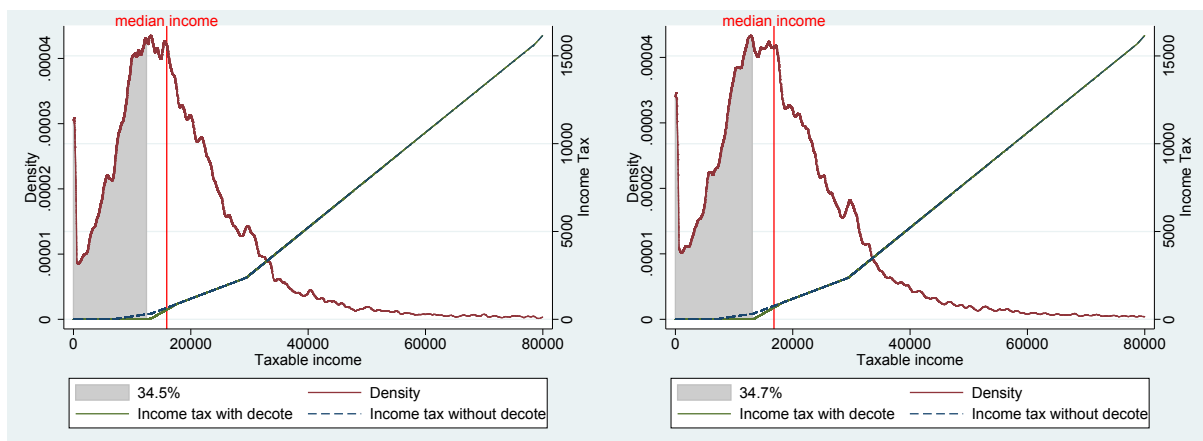
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[12]The rest of the years may be found in the appendix

Figure 7: Tax schedules 2004-2013 with and without the décote-mechanism and distribution of taxable incomes
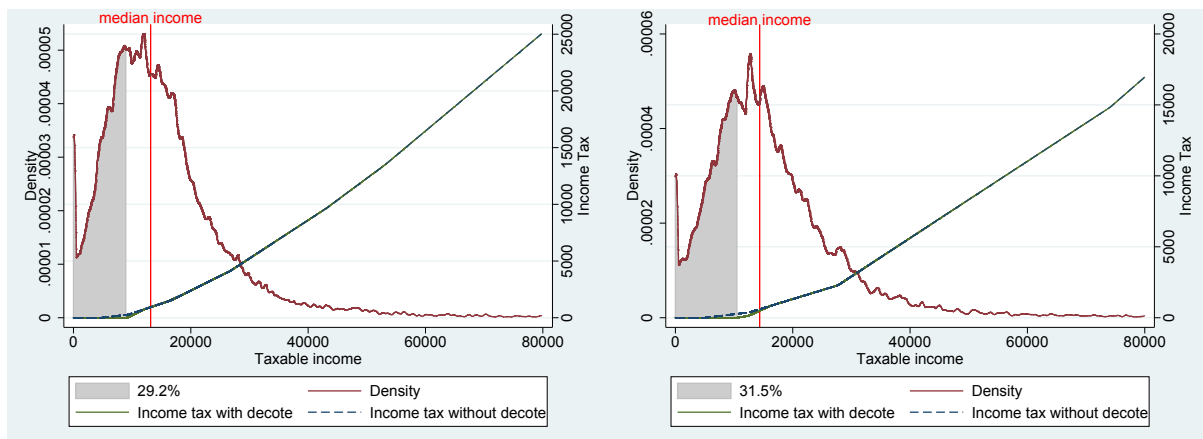
(a) Incomes 2003

(b) Incomes 2006

(c) Incomes 2010

(d) Incomes 2012

Source: Authors' own calculations using the *Enquêtes Revenus Fiscaux et Sociaux* (ERFS) 2002-2014
These figures show the distribution of taxable incomes for a representative sample of the French population using a kernel density estimate (purple line). They are combined with the tax schedules faced by the individuals the following year. The tax schedules are shown with and without the décote-mechanism (respectively the green line and the dashed blue line). The area in gray represents the percentage of the population with no tax liability. The red line represents the median type's income.

In the time period between 2002 and 2015, France was governed by both left and right wing governments. From 2002 to 2010, the income tax was lowered every year (with more or less important decreases: the most important ones took place in 2003, 2004 and 2007). In 2011 and 2013, reforms increasing tax liability for richer individuals took place. Throughout this period, however, as can be seen in the figures constituting Figure 7 the décote-mechanism was always adjusted so as to lift a considerable percentage of the

population from out of the income tax, and the distance between the income-tax threshold and the median has been decreasing. This is in line with the results of Proposition 2: reforms that increase or decrease marginal tax rates for taxpayers may be carried out, but it is politically easier for the legislator to do so if they do not move the income-tax threshold by much or they raise it.

5 Concluding remarks

This paper develops a conceptual framework to study the political forces affecting the income-tax threshold in a non-linear tax system. First, we show how reforms affecting the income tax threshold can be politically feasible. Second, we present evidence showing how French politicians use the décote-mechanism to effectively control the number of households with positive income taxes and how it interacts with reforms of the statutory rates.

Appendix

A   Proofs

Proof of Proposition 1.   If $\mathcal{X} = \{0\}$, then Δ^V does not depend on χ, and we have:

$$\Delta_\tau^V(\omega \mid 0, h) = \left(\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega).$$

Indeed, if h does not introduce any kink in the new schedule, the optimal revenue may be characterized by a first-order condition. Then, by the envelope theorem

$$\frac{d}{d\tau}V(\Delta^R(\tau, h), \tau, \omega) = \left((\Delta_\tau^R(\tau, h) - h(y^*(\Delta^R(\tau, h), \tau, \omega)))\right)\tilde{u}_c^1(\omega).$$

So that when τ goes to 0, $\Delta_\tau^V(\omega \mid 0, h) = \left(\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega)$.
If h introduces an upward jump at some point of T_1', then individuals might bunch at some point y^B. For these individuals,

$$\frac{d}{d\tau}V(\Delta^R(\tau, h), \tau, \omega) = \frac{d}{d\tau}u(c_0 + \Delta^R(\tau, h) + y^B - T_0(y^B) - \tau h(y^B), y^B, \omega)$$

$$\frac{d}{d\tau}V(\Delta^R(\tau, h), \tau, \omega) = \left((\Delta_\tau^R(\tau, h) - h(y^B))u_c(c_0 + \Delta^R(\tau, h) + y^B - T_0(y^B) - \tau h(y^B), y^B, \omega\right)$$

Since there is no bunching under the status quo, at $\tau = 0$, this is only valid for $\tilde{\omega}^0(y^B)$.

Without loss of generality, suppose that h is non-decreasing and $\tau > 0$.
Now, if the median voter benefits from the reform, then $\Delta_\tau^V(\omega^M \mid 0, h) > 0$.
So $\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega^M)) > 0$,

which implies that $\Delta_\tau^R(0,h) - h(\tilde{y}^0(\omega)) > 0$ for all $\omega \leq \omega^M$ since h is non-decreasing and $\tilde{y}^0$ is increasing.

Now, if the median voter does not benefits from the reform, then $\Delta_\tau^V(\omega^M \mid 0, h) \leq 0$

So $\Delta_\tau^R(0,h) - h(\tilde{y}^0(\omega^M)) \leq 0$,

which implies that $\Delta_\tau^R(0,h) - h(\tilde{y}^0(\omega)) \leq 0$ for all $\omega \geq \omega^M$ since h is non-decreasing and $\tilde{y}^0$ is increasing.

Reminder: $\tilde{y}^0(.)$ is decreasing.

By definition, $\tilde{y}^0(.)$ satisfies the following (first and second order) conditions:

- (FOC): $(1 - T_0'(y))u_c + u_y = 0$

- (SOC): $B := -T''_0(y)u_c + (1 - T_0'(y))^2 u_{cc} + 2(1 - T_0'(y))u_{cy} + u_{yy} < 0$

By differentiating (FOC) with respect to ω, we get, for all $\omega \in \Omega$:

$$
\begin{aligned}
\tilde{y}^0(\omega) \times B &= (1 - T_0'(\tilde{y}^0(\omega)))\tilde{u}_{c\omega}^0(\omega) + \tilde{u}_{y\omega}^0(\omega) \\
&= -\frac{\tilde{u}_y^0(\omega)}{\tilde{u}_c^0(\omega)}\tilde{u}_{c\omega}^0(\omega) + \tilde{u}_{y\omega}^0(\omega) \leq 0 \\
&\leq 0 \qquad \text{by the Mirrlees single crossing property.}
\end{aligned}
$$

So from (SOC), $\tilde{y}^0(\omega) \geq 0$ for all ω.

Proof of Proposition 2. $\tau > 0$. Suppose h is non-decreasing and $y_1^E \geq min(y_0^E, y^{0M})$.

Either $y_0^E \leq y^{0M}$ or $y_0^E > y^{0M}$.

If $y_0^E \leq y^{0M}$ then $y_1^E \geq y_0^E$.

$y_1^E \geq y_0^E$, so $\forall (\omega, \chi) \in \Omega \times \mathcal{X}$,

$$
\Delta_\tau^V(\omega, \chi \mid 0, h) = \left(\Delta_\tau^R(0,h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega)
$$

So as in the proof of Proposition 1, if the median voter benefits from the reform, all the individuals with skills between $\underline{\omega}$ and ω^M benefit from it.

If the median voter does not benefit from the reform, none of the individuals with skills above ω^M benefit from it.

If $y_0^E > y^{0M}$ then $y_1^E \geq y^{0M}$.

Now, for all individuals with $\omega \leq \omega^M$, $\Delta_\tau^V(\omega, \chi \mid 0, h) = \Delta_\tau^R(0,h)\tilde{u}_c^0(\omega)$,

so if the median voter benefits from the reform then $\Delta_\tau^R(0,h) > 0$ and all individuals with $\omega \leq \omega^M$ benefit from the reform.

If the median voter does not benefit from the reform, then $\Delta_\tau^R(0,h) \leq 0$ and no-one in the population benefits from the reform.

Proof of Proposition 3. $\tau > 0$. Suppose h is non-decreasing and $y_1^E < min\{y_0^E, y^{0M}\}$.

Now, individuals may be separated into three categories:

- $\forall \omega \in [\underline{\omega}, \omega_1^E], \Delta_\tau^V(\omega, \chi \mid 0, h) = \Delta_\tau^R(0, h)\tilde{u}_c^0(\omega)$

- $\forall \omega \in (\omega_1^E, \omega_0^E], \Delta_\tau^V(\omega, \chi \mid 0, h) = \left(\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega) - \chi h(\tilde{y}^0(\omega))$

- $\forall \omega \in (\omega_0^E, \overline{\omega}], \Delta_\tau^V(\omega, \chi \mid 0, h) = \left(\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega)$

Sufficient condition.

Suppose a proportion $\alpha \in [0, G(\omega_0^E) - G(\omega_1^E)]$ of individuals in $(\omega_1^E, \omega_0^E]$ benefit from the reform.

If $\alpha + G(\omega_1^E) \geq \frac{1}{2}$, then the reform is politically feasible.

If not, and if the individuals with skill $\hat{\omega}_\alpha \geq \omega_0^E$, such that $G(\omega_1^E) + [G(\hat{\omega}_\alpha) - G(\omega_0^E)] + \alpha = \frac{1}{2}$ benefit from it, then so do the individuals with skills in $(\omega_0^E, \hat{\omega}_\alpha]$.

Indeed, $\forall \omega \in (\omega_0^E, \overline{\omega}], \Delta_\tau^V(\omega, \chi \mid 0, h) = \left(\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega)$.

So if $\hat{\omega}_\alpha$ benefits from the reform, then $\Delta_\tau^R(0, h) > h(\tilde{y}^0(\hat{\omega}_\alpha))$.

So since $h(\tilde{y}^0(.))$ is non-decreasing, $\forall \omega \in (\omega_0^E, \hat{\omega}_\alpha], \Delta_\tau^R(0, h) > h(\tilde{y}^0(\omega))$.

So all individuals with skills in $[\underline{\omega}, \omega_1^E]$ and all individuals with skills in $[\omega_0^E, \hat{\omega}_\alpha]$ benefit from the reform.

Hence, a proportion $G(\omega_1^E) + [G(\hat{\omega}_\alpha) - G(\omega_0^E)] + \alpha = \frac{1}{2}$ of the population benefits from the reform.

Necessary condition.

Suppose that for all $\alpha \in [0, G(\omega_0^E) - G(\omega_1^E)]$, $\alpha + G(\omega_1^E) < \frac{1}{2}$ and the individuals with skill $\hat{\omega}_\alpha \geq \omega_0^E$, such that $G(\omega_1^E) + [G(\hat{\omega}_\alpha) - G(\omega_0^E)] + \alpha = \frac{1}{2}$ do not benefit from the reform.

Suppose that there exists an $\omega > \hat{\omega}_\alpha$ such that $\Delta_\tau^V(\omega, \chi \mid 0, h) > 0$.

Then, since $h(\tilde{y}^0(.))$ is non-decreasing, $\Delta_\tau^V(\hat{\omega}_\alpha, \chi \mid 0, h) > 0$, which is a contradiction.

Hence, the reform is supported by strictly less than $G(\omega_1^E) + [G(\hat{\omega}_\alpha) - G(\omega_0^E)] + \alpha = \frac{1}{2}$ of the population.

Proof of Proposition 4. $\tau > 0$. Suppose h is non-increasing and $y_1^E < min\{y_0^E, y^{0M}\}$. Individuals may be separated into three categories:

- $\forall \omega \in [\underline{\omega}, \omega_1^E], \Delta_\tau^V(\omega, \chi \mid 0, h) = \Delta_\tau^R(0, h)\tilde{u}_c^0(\omega)$

- $\forall \omega \in (\omega_1^E, \omega_0^E], \Delta_\tau^V(\omega, \chi \mid 0, h) = \left(\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega) - \chi h(\tilde{y}^0(\omega))$

- $\forall \omega \in (\omega_0^E, \overline{\omega}], \Delta_\tau^V(\omega, \chi \mid 0, h) = \left(\Delta_\tau^R(0, h) - h(\tilde{y}^0(\omega))\right)\tilde{u}_c^0(\omega)$

If $y_0^E \geq y^{0M}$ (i.e., the median type is not a taxpayer under the status quo), then the proof is very similar to that of Proposition 3. (Except that now, if the reform benefits some $\hat{\omega} \geq \omega_0^E$, then it benefits all $\omega \geq \hat{\omega}$.)

If $y_0^E < y^{0M}$, then either we are in a case where the revenue generated is positive, and the prrof goes as above.

Or else, the revenue generated is negative. In this case, it is not possible to form a

coalition with the lower skilled individuals, as they do not benefit from the reform: for them, $\Delta_\tau^V(\omega, \chi \mid 0, h) = \Delta_\tau^R(0, h)\tilde{u}_c^0(\omega) < 0$. In this case, the individuals who start paying the income tax, i.e., for whom $\omega \in (\omega_1^E, \omega_0^E]$, have a h positive, so that their change in indirect utility cannot be positive. Hence, for it to be politically feasible, such a reform must be supported by individuals in $(\omega_0^E, \overline{\omega}]$. The median type individual belongs to this group. In the same spirit as in the proof of Proposition 1, the reform is politically feasible if and only if the median type individual benefits from it.

B   Data

Table 3: French income tax schedule 2002-2015

Year		Bracket thresholds (in euros)							Marginal tax rates (%)						
Tax	Income	Th1	Th2	Th3	Th4	Th5	Th6	Th7	Th1	Th2	Th3	Th4	Th5	Th6	Th7
2015	2014	0	9,690	26,764	71,754	151,956			0	14	30	41	45		
2014	2013	0	6,011	11,991	26,631	71,397	151,200		0	5.5	14	30	41	45	
2013	2012	0	5,963	11,896	26,420	70,830	150,000		0	5.5	14	30	41	45	
2012	2011	0	5,963	11,896	26,420	70,830			0	5.5	14	30	41		
2011	2010	0	5,963	11,896	26,420	70,830			0	5.5	14	30	41		
2010	2009	0	5,875	11,720	26,030	69,783			0	5.5	14	30	40		
2009	2008	0	5,852	11,673	25,926	69,505			0	5.5	14	30	40		
2008	2007	0	5,687	11,344	25,195	67,546			0	5.5	14	30	40		
2007	2006	0	5,614	11,198	24,872	66,679			0	5.5	14	30	40		
2006	2005	0	4,412	8,677	15,274	24,731	40,241	49,624	0	6.83	19.14	28.26	37.38	42.62	48.09
2005	2004	0	4,334	8,524	15,004	24,294	39,529	48,747	0	6.83	19.14	28.26	37.38	42.62	48.09
2004	2003	0	4,262	8,382	14,753	23,888	38,868	47,932	0	6.83	19.14	28.26	37.38	42.62	48.09
2003	2002	0	4,191	8,242	14,506	23,489	38,218	47,131	0	7.05	19.74	29.14	38.54	43.94	49.58

Note: Th stands for Threshold.

Source: Institut des Politiques Publiques.

Table 4: '*Décote*" parameters 2002-2015

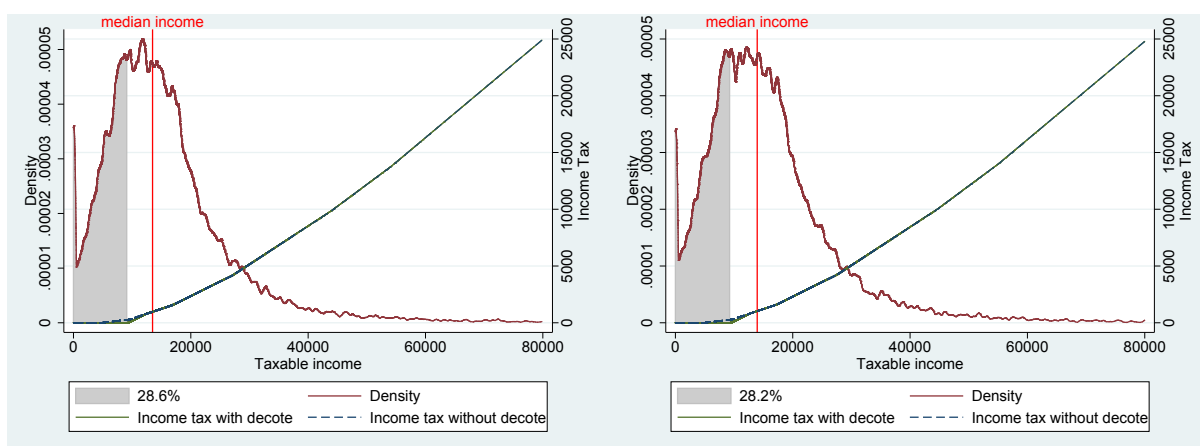| Income year	S		α
	Singles	Couples	
2015	1165	1870	7/4
2014	1135	1920	2
2013	508		3/2
2012	480		3/2
2011	439		3/2
2010	439		3/2
2009	433		3/2
2008	431		3/2
2007	419		3/2
2006	414		3/2
2005	407		3/2
2004	400		3/2
2003	393		3/2
2003	386		3/2

Source: Institut des Politiques Publiques.

Figure 8: Tax schedules 2003-2008 with and without "décote" and distribution of taxable incomes
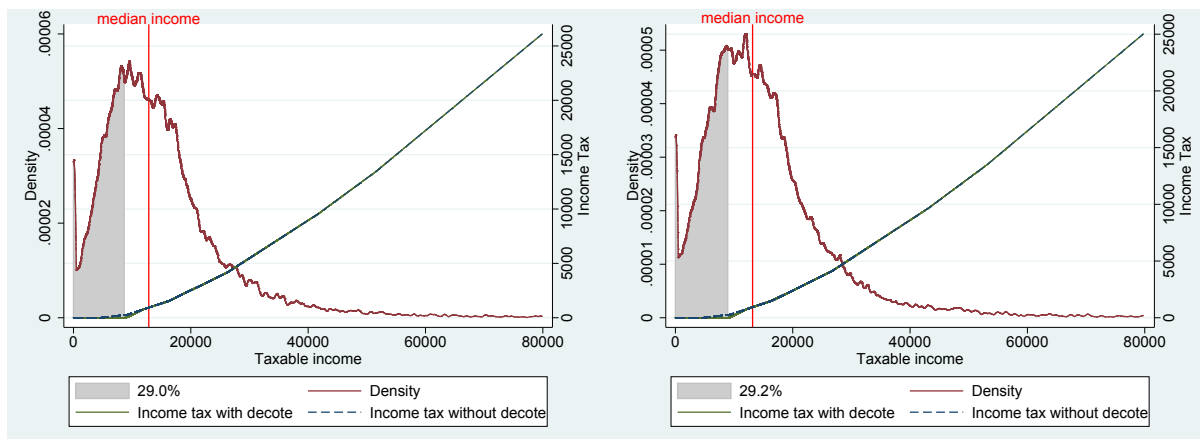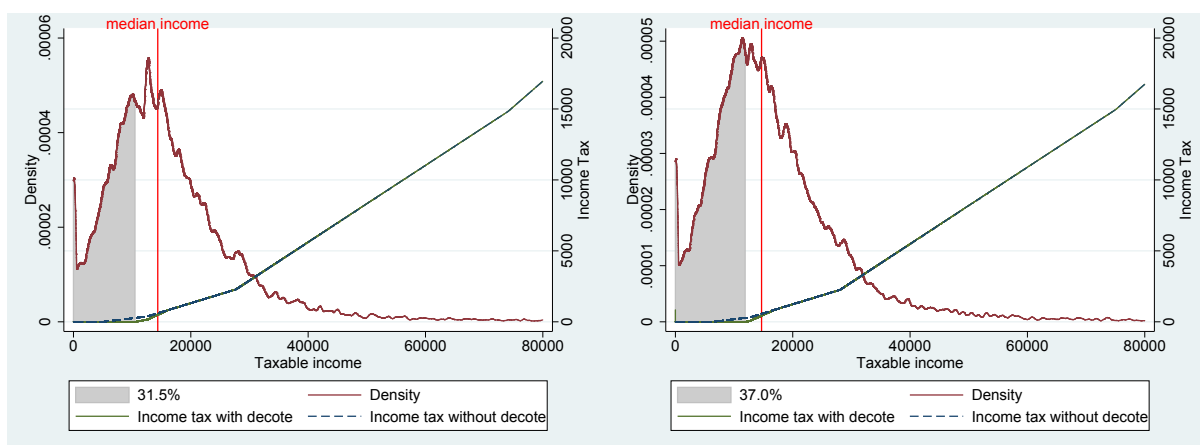

(a) Incomes 2002
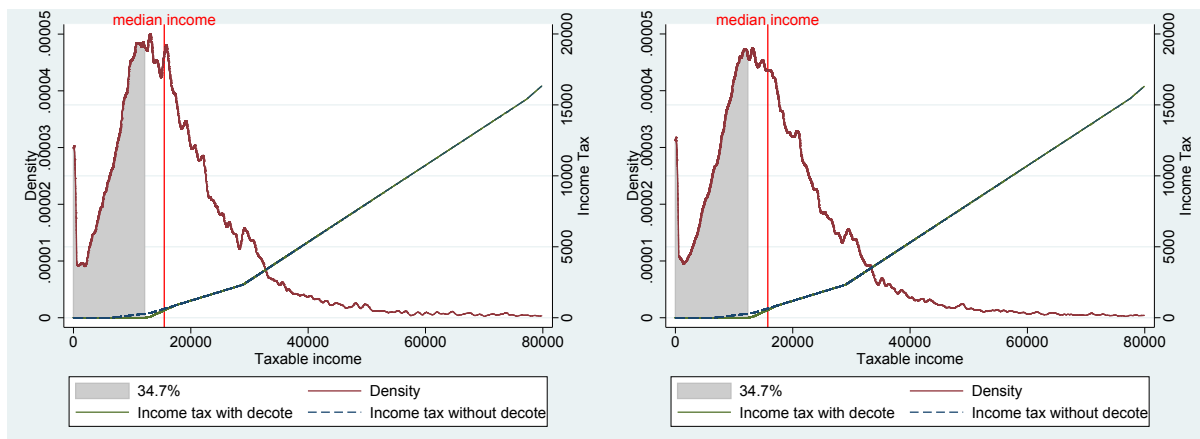
(b) Incomes 2003

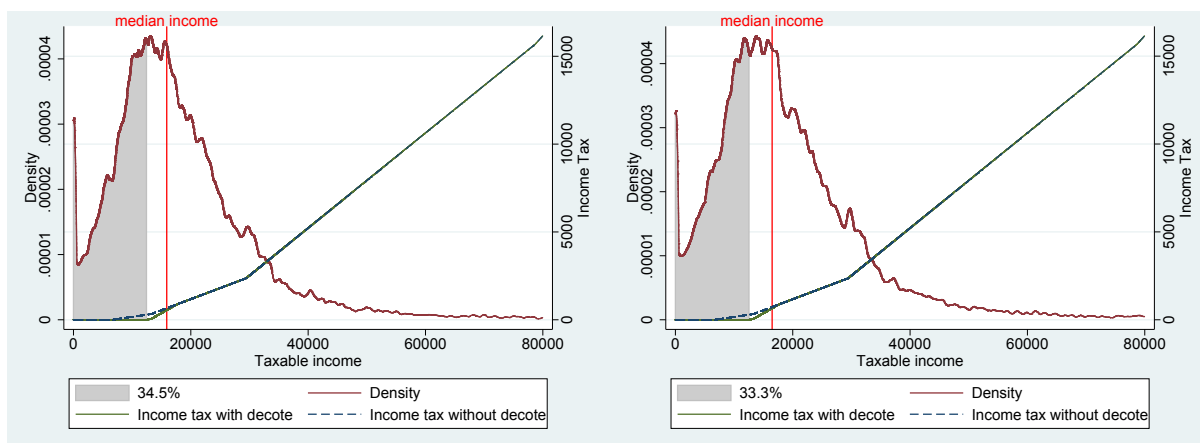(c) Incomes 2004

(d) Incomes 2005

(e) Incomes 2006

(f) Incomes 2007

Figure 9: Tax schedules 2009-2014 with and without "décote" and distribution of taxable incomes
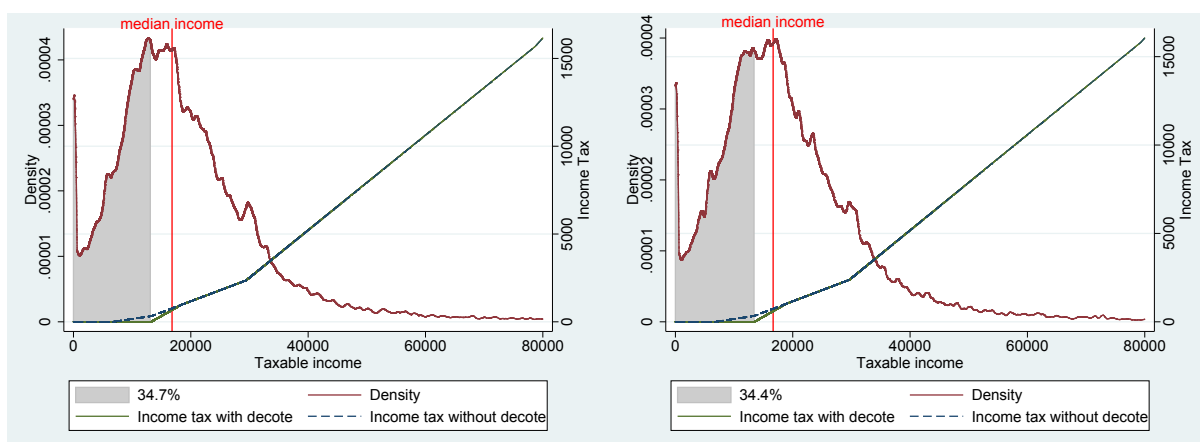

(a) Incomes 2008
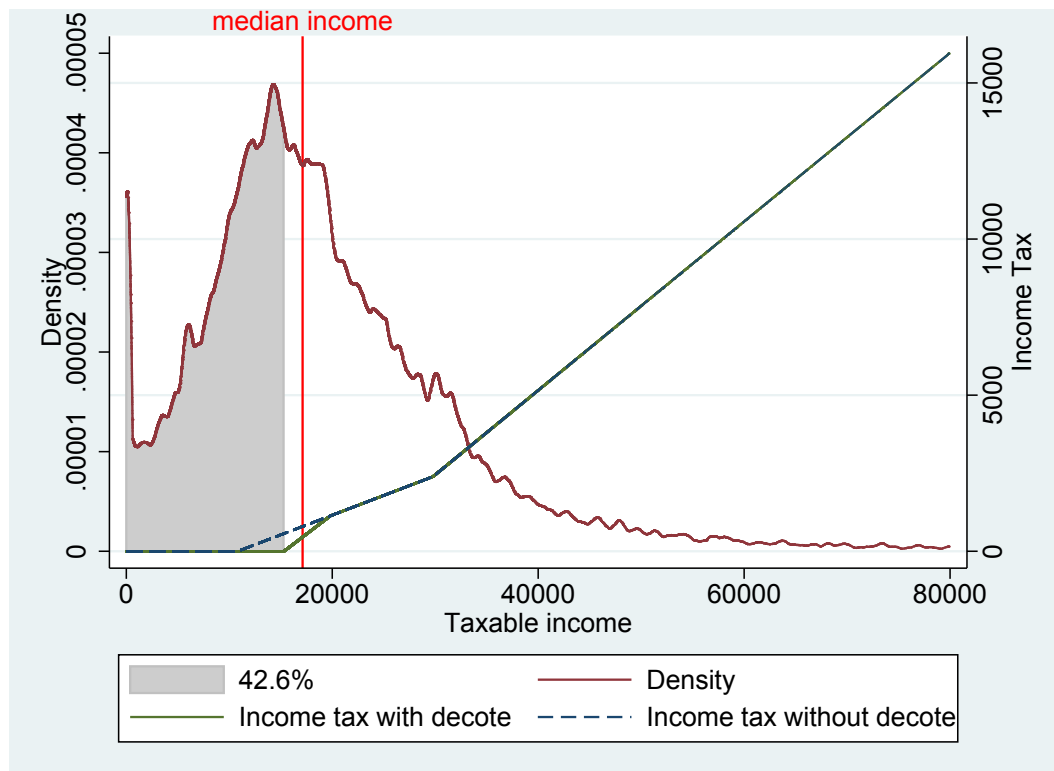
(b) Incomes 2009

(c) Incomes 2010

(d) Incomes 2011

(e) Incomes 2012

(f) Incomes 2013

Figure 10: Income tax schedule 2015 with and without "décote" and distribution of taxable incomes

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