The Determinants of the Complexity and Progressivity of Personal Income Tax Systems: A Cross-Country Empirical Analysis*

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Abstract

This paper provides an empirical analysis of the determinants of the complexity and progressivity of personal income tax systems using a unique dataset drawn from 251 countries for the years 1980-2009. We measure complexity by the number of tax brackets and progressivity first by the difference between minimum and maximum tax rates, and secondly, as a supplementary measure, by the difference between the highest and lowest bracket limits. We provide preliminary results on the explanatory power of a wide range of economic and political variables. In a time fixed effects regression we find significant impacts of unemployment and inflation rates, average wage levels, and female labour force participation, while both right or left wing political orientation have a negative impact on the tax system's complexity and progressivity.

JEL-classification: H0; H25; C33

Keywords: Labor taxation; Piecewise linear taxes; Count data models; Panel data methods

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1 Introduction

Tax progressivity and the complexity of the income tax system have always been topics of interest for the academic community and have formed part of the political agenda of policymakers for a long time period. This interest has been largely motivated by income inequality considerations or the effects of the tax structure on labour supply. Accordingly, the optimal degree of progressivity or the design of optimal piecewise linear tax systems has already received vast attention in the theoretical literature. However, there is surprisingly little empirical work on how different macroeconomic factors shape the structure of tax systems. Providing a deeper understanding of the parameters behind a country's personal income tax schedule is important in the light of the ongoing debate on increasing income divergence on the one hand and on the attempts to simplify tax systems by introducing flat taxes on the other hand, as well as due to the effect of these taxes on economic growth and the importance of these kind of taxes for raising government revenue. The goal of taxation as seen by economists is to raise a given amount of revenue with the smallest possible distortion to incentives and economic efficiency, while taking into account the fairness or equity of the distribution of tax burdens across households. Issues such as the complexity or transparency of the tax system, the costs of administration and compliance, and the possibilities and incentives it gives for costly evasion and avoidance are also acknowledged to be important, but not usually incorporated into formal models of optimal taxation, tending rather to be addressed in the context of the design of specific taxes to be implemented in practice, such as a VAT. The modern theory of optimal income taxation stems essentially from two papers, Mirrlees (1971) and Sheshinski (1972). The first of these places no a priori restrictions on the form of the tax structure. It can be any (continuous) function of income, and its shape is determined by three underlying relations: a social welfare function, which expresses the preferences of the taxing authority or "social planner" over distributions of wellbeing across households; the relationship summarizing the elasticity of a worker's labour supply with respect to the marginal tax rate at each

point in the income distribution; and the distribution of innate skills or productivities of all individuals in the economy. In contrast, Sheshinski's approach imposes a very specific, simple structure. Each worker receives a given undifferentiated lump sum, and pays the same marginal tax rate. Thus net tax paid is a linear function of gross income. The optimal marginal tax rate is very simply and elegantly characterized. It will be smaller, the larger the average (compensated) labour supply elasticity across the entire population, which is a measure of the degree to which the tax distorts labour supply decisions. It is larger, the greater the covariance across the population between the marginal social benefit of income to a worker and her gross income. This is a measure of the equity effect of a tax. The tax on income is intended to redistribute social welfare, and it is a more powerful instrument for doing so the stronger the relationship between income and its marginal social value. The level of abstraction of these optimal tax models is such that they cannot and do not claim to provide blueprints for an actual tax system. Rather, their purpose is to improve our understanding by clarifying and making precise the central idea of the trade off between equity and efficiency that lies at the root of the optimal tax problem. To use taxation to improve the income distribution bears a cost in terms of the distortion of economic incentives and decisions, and the problem is to find the optimal balance between the two. Nevertheless, it has to be noted that income tax systems in practice correspond to neither of the two models. In virtually all countries of the world, tax systems are piecewise linear. That is, gross income is divided up into brackets and a tax rate is set for each bracket.[5] Typically, the higher the tax bracket the higher the tax rate. It should be noted however that in addition to this formal system there is often a social benefit system which makes payments to households that are then withdrawn at specific rates as income increases, and these can have important effects on the structure of effective marginal tax rates. The anal-

[5] An apparently "flat rate tax" system, with a tax rate not varying with income, is actually a two-bracket piecewise linear system if it has an initial "tax exempt" income range, so that the tax rate in the first bracket is zero.

ysis of optimal piecewise linear taxation [6] also provides a simple characterization of the optimal tax rates, as well as of the optimal bracket limits or "kink points". [7] Take the simplest case, in which there are just two brackets. Given the bracket limit, the optimal tax rate in the upper bracket is determined by essentially the same elements as in the linear tax model just described: the average of the effects of the tax rate on labour supply at the margin, and the strength of the relationship between gross income and the marginal social utility of income, except that these are calculated for only the sub-population of households whose incomes fall within this bracket. The same applies to the lower bracket tax rate, with one interesting difference. This tax rate is essentially a lump sum, non-distortionary tax on the households in the upper bracket, since it is applied intra-marginally to the first x units of their income, where x is the bracket limit. This effect will tend to make this tax rate higher than would be implied by the first two elements alone. In a system with $n > 2$ brackets, this effect will also apply to the tax rates in all brackets below the n'th. Only in the top bracket is this effect absent.[8] The optimal bracket limit also has an interesting intuition. Households with incomes just at this bracket limit will typically be constrained, in the sense that they would like to work more if the resulting income would be taxed at the lower bracket rate, but not if it would be taxed at the higher bracket rate. [9] Therefore a small increase in the bracket limit would make these households better off as well as bringing in more tax revenue from the increased labour supply. The cost of this however is the loss of tax revenue from all households in the higher bracket(s), since they will be paying less tax on part of their income, and may be considered less socially deserving of this windfall gain.

[6] Inaugurated by Sheshinski (1989). See also Sadka (1976), Slemrod et al (1994), Apps, Long and Rees (2011) and Apps and Rees (2012).

[7] So called because a consumer/worker's budget constraint in the gross income-consumption plane will have kinks at the income values at which the marginal tax rates change.

[8] This is analogous to the famous "no distortion at the top" result in the Mirrlees optimal tax model. However, in the present model the top tax rate could still be high if the equity and deadweight loss effects are respectively strong and weak.

[9] This assumes of course that rates are increasing across brackets.

The optimal bracket limit finds the optimal trade off between these effects. The aim of this paper is to analyse empirically the determinants of the structure of piecewise linear tax systems across a unique panel dataset of 251 countries over the period 1980-2009. We focus on the determinants of progressivity and complexity of tax systems and of how they have changed over time. With the available data we are not able to test empirically whether actual tax systems are close to being optimal in the sense just defined. In any case, the optimal tax models exclude important considerations, such as complexity, transparency, and administrative and compliance costs, that must be relevant to the design of real tax systems. We might also expect political economy considerations to play a part: few economists really believe that governments actually conform to the fiction of the omniscient benevolent social planner, even though that is a useful construct in normative analysis. However, our approach and interpretation of results will be informed both by the normative theory and by the wider political economy literature.

The paper is structured as follows. The next Section provides an overview of the data, while Section three introduces the econometric approach used. Section 4 summarizes the empirical results and Section 5 concludes.

—Figure 1 here—

2 Data

2.1 Data on income taxation, country group and time trends

In this study, we employ three different dependent variables, namely the number of kinks, as a measure of the complexity of the tax system, the difference between maximum and minimum tax rates and the difference between the values of income at the highest and lowest kinks, both as measures of progressivity. The number of kinks can be interpreted a measure of the tax system's complexity not only for

the reason that more brackets may make the tax system look more complex to taxpayers and increase administration costs, but also because the larger the number of brackets, the narrower the brackets, and so, ex ante, the harder it is for a taxpayer to predict what her tax rate will in fact be, if there's some uncertainty about her final income. That is important because the incentive effects of taxation, present in all the normative models, depend on taxpayers knowing what their marginal tax rate is. Fewer tax brackets hence imply wider brackets and accordingly greater certainty about an individual's marginal tax rate.

Figure 1 depicts the evolution of the number of kinks, the minimum tax rate and the maximum tax rate between 1980 and 2009 and 1992 to 2009 respectively. All the graphs present the development of these variables during the different time spans in worldwide countries grouped by income category. The country classification is undertaken according to the level of PPP per capita GDP in 2009. Given that some countries such as the new countries of the Russian Federation for instance, are represented only from 1992 onwards in our data set, we choose to depict these graphs for two distinct samples. The first is based on a smaller number of countries which are represented over the whole time period and for which we were able to find corresponding PPPGD/capita data, namely 189 economies, whereas the second column of graphs depicts the evolution for the aforementioned variables for 214 economies. Looking at the number of kinks, we can see that up to 1987/1988, the different countries' tax systems were characterized by a similar number of kinks namely on average around 7, whereas starting with the second half of the eighties, the trends started to diverge. High income economies, depicted by the lowest solid line in Figure 1a, started to sharply simplify their tax systems and introduced reductions in the number of kinks which declined to an average of slightly below 3. This marked decline by approximately 57 per cent contrasted the low decline in low income economies where the number of kinks still amounted to almost 5 on average in 2009. Middle-high income economies and middle income economies also followed policies of reducing the complexity of their tax systems, and the average number of kinks oscillating around 4 in the time period 1992-2009. A stark diverging pic-

ture emerges from the evolution of minimum vs. maximum tax rates respectively. Accordingly, whereas maximum tax rates recorded a drastic decline, as Figures 1c and 1f show, minimum tax rates decreased only slightly in high and middle-high income economies and even increased in middle and low income economies. The highest maximum tax rates and the lowest minimum tax rates are encountered in low income economies, whereas the lowest maximum tax rate and the highest minimum tax rate are met in high income economies, suggesting a larger progressivity of the tax system in low income economies. The sharpest decline in the top income tax rate was recorded in high income and low income economies where the top income tax rate declined by 32 per cent and 24 per cent respectively between 1980 and 2009. As Figure 1f shows, the decline was less pronounced during the last 17 years in our sample. Whereas the difference between the maximum tax rates in low income and high income economies seemed to be rather stable during the considered time framework, this does not seem to apply to the evolution of minimum tax rates as depicted in Figures 1b and 1e. These pictures show a convergence in the lowest tax rates from a level of around 2.9 percent in low income economies in 1980 to 4.4 per cent in 2009 compared to 6.4 per cent in high income economies in 1980 and 5.5 per cent in 2009.

After having got a first impression on the evolution of our main variables of interest, we now turn to the empirical analysis to analyse the determinants behind these variables both within a country during the respective time span as well as across countries.

We assemble data on the personal income tax schedules, as well as employer and employee social security contributions to construct a unique panel data set for 251 countries for the time period 1980-2009. We collect data on the top and the lowest marginal personal income tax rate, on the minimum and the maximum tax bracket as well as on the number of kinks of each country's tax schedule. Besides these detailed provisions of the income tax code, we calculate marginal and average effective tax rates including the social security contributions for an individual earning

the average wage or five times the average wage of an economy. Beyond payroll taxes, we account for specific provisions of the respective national tax codes such as personal tax credits, tax allowances, other country-specific formulae and local (subnational) taxes.[10]

This comprehensive panel data set was constructed from various sources such as publications from international organizations, individual countries' tax laws, and data from international accounting firms. The most important references count the *PricewaterhouseCoopers' Individual Taxes: Worldwide Summaries* for various years, *OECD Taxing Wages* data sets for several years, , *PKF International's Worldwide Tax Guide*, the *International Labour Organization's LABORSTA* database for data on annual gross wages and the *Social Security Observatory's Social Security Programs Throughout the World* for social security legislation in addition to a myriad of individual countries' sources.

2.2 Data on control variables

Several covariates which could explain the progressivity (number of kinks) of a country's tax systems are derived from the World Bank's World Development Indicators 2010. In particular, we employ the following economic variables and data in our regressions: a country's population $Population_i$; unemployment rates ($Unemployment_i$), inflation ($Inflation_i$), male and female labour force participation rate ($MaleLabPart_i$) and ($FemLabPart_i$), the dependency ratio ($Dependrat_i$) defined as sum of the shares of population above 64 years old and below 14 years old in the overall population, and a variable determining a country's degree of openness ($Open_i$), measured as the sum of exports and imports divided by GDP. Furthermore, we consider a measure

[10]Peter, Buttrick, and Duncan (2010) calculate the tax liability for pre-tax incomes equivalent to one, two, three and four times a country's GDP per capita. However, we believe gross wages reflect more accurately the actual income tax base. In addition, the measures constructed by Peter, Buttrick, and Duncan (2010) do not include social security contributions and other provisions which we consider as essential for inference of the true effective tax burden on labor.

of income inequality before taxes, namely the gini index $Gini_i$, reported by WIDER (The World Institute for Development Research). In addition, we consider information on average gross wages per employee in U.S. dollars, $Wage_i$, from the United Nations' labor statistics database, LABORSTA as well as two variables capturing the level of employee- and employer social security contributions, $EmployeeSocSec_i$ and $EmployerSocSec_i$ respectively, gathered from the *Social Security Observatory's Social Security Programs Throughout the World* . Furthermore, we use the ratio of the population with secondary education in country i ($SecEdu_i$) based on data from Lutz, Goujon, and Sanderson (2007). Given that not only economic factors but also political determinants influence a country's tax system, we employ two variables to capture this dimension as well. First, we use two indicator variable on the country's political orientation from the World Banks's Database on political orientation reflecting the party's political orientation with respect to economic policy. The first indicator ($RightPolOrient_i$) takes the value 1 for parties defined as Christian democratic, conservative or right-wing. The second indicator ($LeftPolOrient_i$) takes the value 1 for social democratic, socialist, left-wing or communist parties and zero otherwise. [11] Second, we use a variable taken from the POLITY IV database ($PolitStab_i$) which captures the degree of political stability by measuring the number of years since the most recent regime change or the end of transition period defined by the lack of stable political institutions. Third, we employ a variable taken from Freedom House ($Polright_i$) that indicates the extent to which individuals are allowed to freely participate in the political process, such as voting for distinct alternatives in legitimate elections, join political parties, compete for public office. The variable is coded from one to seven, where 7 represents no freedom. Finally, we employ an indicator variable ($Unitary/Fed_i$) capturing whether the economy has a unitary (in which case the variable takes the value 1) or federalistic structure, from

[11] The original variable takes three values, namely 1, 2 and 3, and this is why we replace this ordered variable by two indicators in our regressions. 1 represents a 'right' political party orientation, 2 for a 'center' political orientation and '3' for a left political orientation. 2 represents accordingly parties that advocate strengthening private enterprises in a social-liberal context.

Norris - Democracy Time Series Dataset.

2.3 Descriptive statistics

Table 1 reports the summary statistics of our three dependent variables, $Nbkinks_{it}$, $TaxDiff_{it}$ and $KinkDiff_{it}$ as well as for the covariates employed. Accordingly, the maximum number of kinks reached 33 in countries such as El Salvador (between 1980 and 1985), or Spain (1985-1987). The minimum of zero occurs for countries having either flat taxes or zero income tax rates. On average, countries' tax systems have 5.1 kinks and the standard deviation is around 5. Regarding the difference between the top and the lowest income tax rate, here the maximum of 85 percentage points is reached in countries such as Eritrea or Ethiopia in the eighties. The mean difference amounts to 31 percentage points. Regarding our third dependent variable $KinkDiff_{it}$, this is measured as the difference in the log maximum and minimum kink, both expressed in USD PPP. The employer and employee social security contributions range from 0% to 51% and from 0% to 32% with mean values of 13.2% and 5.4% respectively. The highest unemployment rate is recorded in Kosovo with 39.3%. The dependency ratio ranges between 28.2% and 50.8% with an average of 37%.

3 Empirical strategy and estimation results

We aim at estimating the determinants of the particular characteristics of income tax systems by use of panel data methods using the following two regression equations

$$Y_{it} = \alpha + \beta \mathbf{X_{it}} + \boldsymbol{\lambda}_T \mathbf{h}_T + \epsilon_{it}, \tag{1}$$

$$Y_{it} = \alpha + \beta \mathbf{X_{it}} + \boldsymbol{\delta}_N \mathbf{h}_N + \boldsymbol{\lambda}_T \mathbf{h}_T + \epsilon_{it}, \tag{2}$$

where Y_{it} denotes either the number of kinks, the difference between the top and the minimum income tax rates, the log of the difference between the maximum and minimum kink [12] in country i in year t. The $1 \times K$ vector $\mathbf{X_{it}}$ refers to the covariates we control for such as gross wages $Wage_{it}$, population,$Population_{it}$,unemployment rates ($Unemployment_{it}$), inflation ($Inflation_{it}$), male and female labour force participation rate ($MaleLabPart_{it}$) and ($FemLabPart_{it}$), the dependency ratio ($Dependrat_{it}$), the gini index $Gini_{it}$, degree of openness ($Open_{it}$), employee- and employer social security contributions, $EmployeeSocSec_i$ and $EmployerSocSec_{it}$ respectively, secondary education ratio ($SecEdu_{it}$), political orientation, ($RightPolOrient_{it}$), ($LeftPolOrient_{it}$) political stability ($PolitStab_{it}$), political rights ($Polright_{it}$) or federalistic structure, ($Unitary/Fed_{it}$). Finally, ϵ_{it} denotes an error term. The difference between the two equations considers just the fact that in the second one, we include both country and time fixed effects, whereas the first one just absorbs time-specific effects. Hence, the $1 \times N$ and $1 \times T$ vectors of unknown parameters $\boldsymbol{\delta}_N$ and $\boldsymbol{\lambda}_T$, respectively, represent constants applying to the specific dimension and capture all possibly relevant time-invariant country effects or time-specific common effects (such as common business cycle shocks). This allows us to infer from the cross-sectional dimension the effects of different control variables for the first set of regressions. Since the number of kinks is a count data variable, we consider for these regressions count data models such as the poisson model to consider the discrete nature of the data.

As explained above, we hypothesize ceteris paribus a xx effect of our variables of interest,

We rationalize the effects of these additional controls in the following way: higher average gross wages $Wage_i$ should have a positive effect on the complexity and the progressivity of the tax system if we assume a non-linear relationship between this income measure and income inequality. Regarding the coefficient on $Gini_i$, our mea-

[12]The minimum and maximum kink are first transformed into USD PPP to get comparable amounts between countries.

sure of gross income inequality, the prediction from economic theory and the one derived from political considerations, may have opposing implications as explained in the Introduction. The same applies for our measure of openness. On the one hand, as explained by Bakija and Shapiro (2000), if governments cannot tax individuals on a worldwide basis, an increase in openness raises the cost of progressivity because openness has a positive impact on the elasticity of taxed activities. Hence, if governments react to this, we should expect a negative effect on progressivity. On the other hand, globalization may increase also the benefits of government [13] such that the effect on progressivity is indeterminate. Concerning a country's political orientation, even though a first prior could be that left wing governments tend to favor a more redistributive policy and hence a higher progressivity and complexity of the tax system, there is no conclusive econometric evidence supporting this idea. [14] A further political variable, namely the extent of political rights $Polright_i$, reflects the degree of democracy in the political process. Following the median voter hypothesis, when increased inequality leads to a rise in average income relative to the income of the median voter, the decisive voter will prefer a higher tax progressivity (Meltzer and Richard, 1981). Given that voting rights are directly tied to political rights and political freedom, the coefficient on this variable of interest should be positive.

From Table 2, we can see that higher wages imply a higher number of kinks, as well as a larger difference between the top and the lowest income tax and the maximum and minimum kink. all results are significant at the 1% level. Hence, these regressions which also control for time fixed effects, suggest that countries which have higher wages also have more complex and more progressive tax systems. The effects of employer vs. employee social security contributions have opposite effects

[13] See for instance Rodrik (1998) who finds a positive relationship between openness and the size of the government.

[14] See for instance Alt and Lassen (2006) or Potrafke (2011). Potrafke (2011) uses data on OECD countries between 1970 and 2006 and finds that government ideology hardly influenced budgetary affairs during the last years. Alt and Lassen (2006) findings imply that left-wing governments tend to have smaller deficits than right-wing governments.

on the number of kinks. Whereas higher employer contributions have a positive effect on the number of kinks, the opposite holds true for employee contributions. The latter also have a significant negative impact on the difference between kinks. Countries which are characterised by higher unemployment rates and levels of secondary education ratios, seem to have less progressive tax systems insofar as the coefficient on these variables is negative and significant at the 1% level both for the difference in tax rates as well as for the difference in kinks. On the contrary, larger countries in terms of population and more open countries in terms of the share of exports and imports in GDP, display more complex and increasingly progressive tax systems as the coefficients on the variables $Open_i$ and $Population_i$ is positive and highly significant in columns 1-3 in Table 2. In addition, countries with higher income inequality display, as expected, tax systems with higher number of kinks.Both countries ruled by right or left wing political parties have tax systems with lower number of kinks and less progressivity which implies that countries with a 'centre' political orientation that advocate strengthening private enterprises in a social-liberal context have more complex and more progressive tax systems. Finally, the results in Table 2 also suggest that a higher male and female labour force participation have a highly significant negative impact on the number of kinks and the top-minimum tax rate difference.

If we now turn to Table 2, where the regressions also include country fixed effects, almost all previously mentioned results fade away, because they are captured by the time-invariant country effects. Hence, only the unemployment rate and the inflation rate has a positive and significant effect on the number of kinks (both coefficients being significant at the 1% level). As opposed to this, higher employee social security contributions and an increased female labour force participation reduce the income tax base measured as the difference between the maximum and minimum kink.

—Table 2 here—

4 Conclusion

-to be added-

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Table 1: Summary Statistics

	Mean	Stddev	Median	Max	Min	NbObs
	(1)	(2)	(3)	(4)	(5)	(6)
Nbkinks	5.141	4.935	4.000	33.000	.000	1,328
TaxDiff	.313	.171	.300	.850	.000	1,328
KinkDiff	1.984	1.467	1.910	7.012	.000	1,328
Wage	8.602	1.432	8.671	10.965	-2.813	1,328
EmployerSocSec	.132	.109	.121	.512	.000	1,328
EmployeeSocSec	.054	.052	.047	.320	.000	1,328
Unemployment	9.105	5.663	7.930	39.280	.025	1,328
SecEdu	.407	.049	.420	.467	.314	1,328
Population	16.395	1.484	16.136	20.983	13.409	1,328
Dependratio	.370	.051	.354	.508	.282	1,328
Gini	41.992	10.336	40.250	76.950	22.020	1,328
Inflation	52.676	465.816	6.558	12338.660	-23.479	1,328
RightPolOrient	.465	.499	.000	1.000	.000	1,328
LeftPolOrient	.427	.495	.000	1.000	.000	1,328
Polright	2.257	1.655	2.000	7.000	1.000	1,328
Unitary/Fed	.621	.485	1.000	1.000	.000	1,328
PolStability	33.319	36.455	19.000	195.000	.000	1,328
Open	.700	.350	.644	2.857	.138	1,328
FemLabPart	47.277	11.478	47.800	88.900	11.200	1,328
MaleLabPart	74.124	7.327	74.300	92.600	51.000	1,328

Table 2: Determinants of Number of Kinks, Difference Between Minimum and Top Income Tax, Difference Between Minimum and Maximum Kink

	Nb.kinks	TaxDiff	KinkDiff
	(1)	(2)	(3)
Wage	.055	.017	.102
	(.016)***	(.003)***	(.033)***
EmployerSocSec	.711	-.041	.468
	(.211)***	(.041)	(.354)
EmployeeSocSec	-.848	.140	-2.738
	(.333)**	(.078)*	(.615)***
Unemployment	.006	-.003	-.030
	(.005)	(.0009)***	(.007)***
SecEdu	-6.779	-1.485	-6.150
	(.840)***	(.207)***	(1.898)***
Population	.206	.058	.424
	(.019)***	(.004)***	(.037)***
Dependratio	-.173	-.127	.649
	(.697)	(.137)	(1.338)
Gini	.015	.0008	.007
	(.002)***	(.0005)	(.005)
Inflation	.00006	1.00e-05	.00007
	(.00002)**	(4.88e-06)***	(.00006)
RightPolOrient	-.376	-.010	-.477
	(.070)***	(.011)	(.114)***
LeftPolOrient	-.249	.020	-.413
	(.070)***	(.011)*	(.114)***
Polright	.024	.005	.119
	(.015)	(.003)	(.033)***
Unitary/Fed	-.116	.009	-.112
	(.044)***	(.011)	(.078)
PolStability	-.002	-.0006	-.004
	(.0007)***	(.0001)***	(.001)***
Open	.236	.097	.768
	(.084)***	(.015)***	(.133)***
FemLabPart	-.012	-.002	-.039
	(.002)***	(.0004)***	(.004)***
MaleLabPart	-.015	-.003	-.007
	(.003)***	(.0007)***	(.006)
cons	1.594	.148	-1.297
	(.666)**	(.144)	(1.311)
Nb. obs.	1373	1373	1328
R^2	.64	.345	.33

Notes: ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively. Year dummies are included. Robust standard errors are computed. The first column reports the results for a poisson estimation whereas columns two and three use an OLS regression.

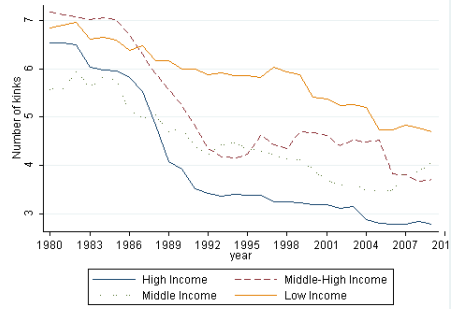
Table 3: Fixed Effects Regression

	Nb.kinks	TaxDiff	KinkDiff
	(1)	(2)	(3)
Wage	.064	.0003	.081
	(.033)*	(.007)	(.069)
EmployerSocSec	1.188	.173	1.871
	(.929)	(.144)	(1.393)
EmployeeSocSec	-1.071	.041	-2.964
	(.799)	(.120)	(1.187)**
Unemployment	.034	.002	-.020
	(.012)***	(.002)	(.019)
Population	1.263	-.208	-.029
	(.797)	(.138)	(1.861)
Dependratio	4.131	-.246	2.133
	(2.820)	(.521)	(5.799)
Inflation	.00007	1.00e-05	.00009
	(.00002)***	(3.07e-06)***	(.00007)
RightPolOrient	-.123	.005	-.165
	(.105)	(.019)	(.157)
LeftPolOrient	-.072	.013	-.109
	(.106)	(.019)	(.153)
Polright	-.021	-.012	.035
	(.054)	(.006)*	(.085)
PolStability	.004	-.001	-.007
	(.004)	(.001)	(.009)
Open	.190	-.0009	-.590
	(.216)	(.050)	(.447)
Femlabpart	-.005	-.0005	-.048
	(.011)	(.002)	(.022)**
Malelabpart	.0007	.003	.002
	(.020)	(.002)	(.021)
Const.		3.743	4.328
		(2.294)	(30.733)
Nb. obs.	1311	1373	1328
R^2	.344	.319	.214

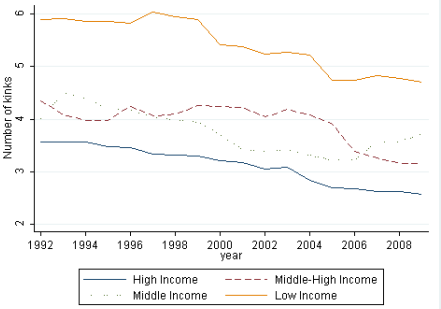
Notes: ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively. Country and Year Fixed Effects Included. Robust standard errors are computed. The first column reports the results for a poisson estimation. *Gini*, *SecEduRatio* and *UnitFed* excluded because they are constant within groups.

Figure 1: Number of kinks, Minimum Tax, Maximum Tax Across Time in Different Countries

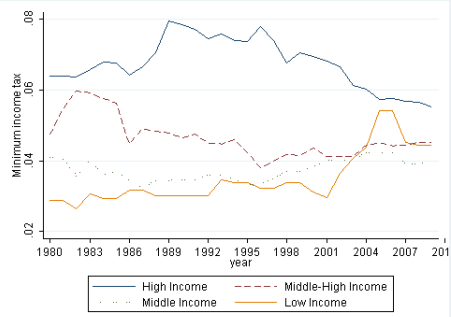
(a) Number of Kinks 1980-2009



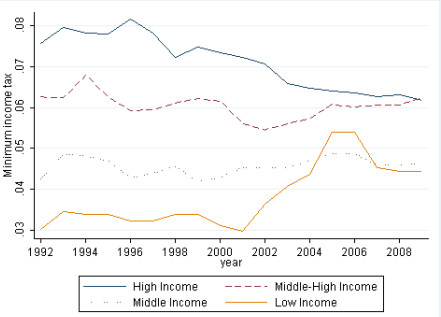
(d) Number of Kinks 1992-2009



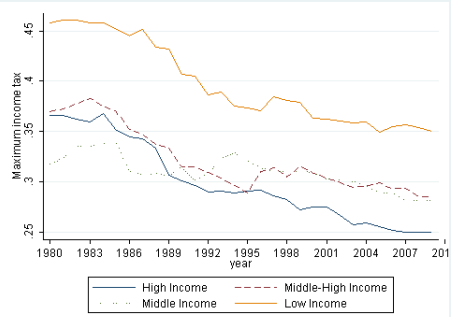
(b) Minimum Tax 1980-2009



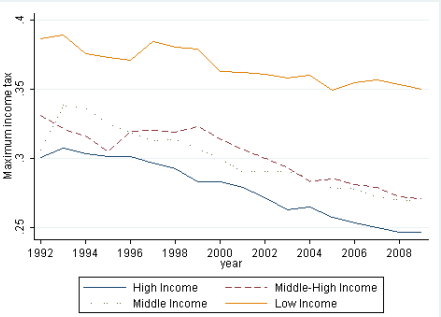
(e) Minimum Tax 1992-2009



(c) Maximum Tax 1980-2009



(f) Maximum Tax 1992-2009



Notes: The left column graphs are based only on those countries which are represented over the whole time period in the dataset whereas the right column graphs are depicted for a larger number of countries which are present for the time period 1992-2009 in our sample. We classify countries according to PPP GDP per capita in 2009. High income economies, middle-high income economies and middle income economies count 53,53 and 54 countries respectively whereas the category of low income economies comprises 34 countries.