Response to Reviewer 1

"Democracy and Taxation'' by Balamatsias Pavlos (Discussion Paper No. 2017-100 November 22, 2017)

I would like to thank the reviewer for his careful reading comments and suggestions. I understand that the reviewer's main concerns are about the theoretical elaboration, empirical designs and about the structure and writing of the paper. Here I try to respond to these issues and explain the changes we have made to the paper.

Important issues.

1. The author does not justify the research significance in the introduction. Explain the reality or contribute the existing economic theories, or both?

I dealt with this problem in the Introduction. I now explain that this paper tries to examine the two-way causal relationship between taxation and democracy. The reason for this is that many authors either deal with the fact that taxation causes democratization or choose to study how democracy affects taxes. In this paper I will instead examine if these two variables both affect and are affected by each other.

I also add to the existing theories about what determines democracy in a country. In the past, authors either treat democracy as an exogenous variable only affected by domestic conditions in a country, or by democracy in neighbouring countries only. But I use an estimation strategy based on regional waves of democratization which is a technique never used before in order to examine how democracy is affected in a country.

2. What is the literature gap? The author has not clarified it in the introduction or literature review. In fact, it should be done in the introduction. The gap should not only be clarified but also refined; otherwise, your contribution cannot be worth consideration for publication.

I clarify in the introduction that this paper adds to the existing literature of the relationship between taxation and democracy by being the first to examine the possibility that there exists a two-way causal relationship between these variables. Furthermore, this paper examines how regional waves of democratization affect a country's political regime and consequently, tax revenues. The following excerpt is taken from the introduction of the revised paper:

Despite the considerable attention that the link between taxation and democracy has received in the economics literature, authors have so far focused only on how taxation influences a country's political system, following the well-known hypothesis that "taxation causes democratization" (Bates and Lien (1985), Baskaran (2014)) or on the way in which democracy affects tax rates and tax revenues (Acemoglu and Robinson (2000, 2005)). However, none of these authors has dealt with the possibility that taxation and democracy have a two-way causal relationship, where one variable influences the other and is in turn influenced by it; to the best of my knowledge, this possible two-way causality between democracy and taxation has not been the research subject of any other author in the past as well. It is this gap in the literature that I try to cover with this paper; more specifically I will alter my analysis from that of other authors by analyzing this possible two-way causality and trying to find how it influences tax policies.

In addition to examining the two-way causal relationship between democracy and taxation, this paper will also be contributing to existing theories about the determinants of democracy in a country. In the past authors (HelliIll (1994), Rodrik (1998) Persson and Tabellini (2006), Aidt and Jensen (2009), Mutascu(2011)) have always treated a country's political system as an exogenous variable, affected by domestic civil and political liberties and economic conditions, or only influenced by the regime of neighboring countries, (Persson and Tabellini (2009)). But I will alter the estimation strategy from that of previous authors by using the methodology of regional waves of democratization seen in Acemoglu, Naidu, Restpero and Robinson (2014) based on the theory of Huntington (1991). This approach differs from the ones mentioned before because I do not treat democracy as an exogenous index or as a variable affected only by democracy in neighbouring countries; instead, I examine how the political system in countries in the same geographical area can create regional waves of demand for or of discontent with a political system. I then use these regional democratization waves to examine how they affect democracy and consequently taxation in a country, using a 2SLS model.

3. This paper does not provide a decent basis for the later investigation. Specifically, Section 2.3 explains the determinants of taxation, but the author needs to focus on the points instead of the details. For one thing, the author provides a thin analysis for the effect of democratization on taxation (the 1st paragraph of Section 2.3); for another, (s)he spends too much effort on the explanation for the control variables (all remaining paragraphs of Section 2.3). This puts the cart before the horse. Moreover, this section makes points with reference to scholars one by one, this is unacceptable. (S)he needs to use its own ideas to justify the predictions for later investigations.

I reorganized and shortened the literature review. The revised literature now focuses on how taxation affects democracy and how democracy affects taxation in order to explain the existence of a two-way causal relationship between these two variables. I also review papers about what types of tax revenues democracies tend to collect. Finally, I only make brief references on how some other economic variables affect taxation in a democracy in order to explain why I will employ them as control variables in my regression.

4. I really cannot understand the relationship between the variable of interest, Dct, and the variables for institutional variations. The author mentions how these variables are measured; but (s)he also mentioned that "we document the institutional variations which this democracy measure captures and which are used to define a country's political system as democratic or autocratic." What is the relationship between Dct and the other institutional variables? In fact, I cannot find the institutional variables in later results. (S)he may use institutional variables to define Dct, but (S)he also mentions that Dct is a dummy. I am confused by that.

This methodology is the same as the one used by Acemoglu et al. (2014) and the explanation we give in this paper is similar. The institutional variations are used by Polity IV and Freedom House; countries receive a score in each one of these categories, which is then used to define countries as democratic or autocratic. We then use the definition of democracy or autocracy given by Polity IV and Freedom House, in order to define a country as a democracy or autocracy using our dummy variable Dct.

5. The author needs to lag all independent variables one period. The author needs to carefully check it not only for the results (i.e., tables) but also for the equations and not only for the 1st-stage estimations but also for the 2nd-stage estimations

I lagged all variables one period. The new equations are the following:

$$Taxrevenue_{ct} = \alpha_o + \beta_1 Democracy_{ct-1} + \beta_{it} Controls_{ct-1} + \gamma_c + \delta_t + \varepsilon_{ct}$$

$$Democracy_{ct-1} = \phi_j Z_{ct-1} + u_{ct-1}$$

6. Standard errors are clustered at which level, a geographical region or not?

Standards errors are now simply robust in the new estimations.

7. The author explains why the jack-knifed average of democracy is related to the variable of interest. This is expected, however, the author does not realize that the jack-knifed average of democracy also has a direct effect on taxation; namely, the IV is imperfectly exogenous. The author has two options. First, to use a series of robustness tests and falsification tests to show the imperfect exogeneity is not a big issue for this paper; the second is to apply the plausible exogentiy theory (Conley et al., 2012). For example, Acemoglu et al. (2014) uses a formal analysis to justify the IV has no direct effect on their dependent variable (GDP per capita); by contrast, the author just follow Acemoglu et al. (2014) to use the IV but without the consideration of exclusion restriction.

I solve this problem by following Baum (2008) and simply adding the instrumental variable (Z_{ct-1}) in the OLS and Fixed effects (F.E.) regressions and check the results. The findings show us that imperfect exogeneity is not a very important issue because Z_{ct-1} is not statistically significant in the OLS estimations and it only positively affects direct taxation in the fixed effects estimation at a 10% level with a very small coefficient of 0.025.

Baum, C. (2008, July). Using instrumental variables techniques in economics and finance. In *German Stata Users' Group Meetings*. Stata Users Group.

8. The author does not realize that the control variables may also be endogenous; I recommend to carefully add control variables. Otherwise, there will be a bad-control issue (Angrist and Pischke, 2008). If one particular control variable really needs to be controlled, we can manipulate the measures of the variable to

avoid or lessen the endogeneity issue. For example, a dummy tends to be less endogenous than a continuous variable.

In order to limit the issue of bad control, I used the method of Angrist and Pischke (2008) and added three dummy variables: socialist transition, election years and whether the sample countries are major oil exporters. I also removed two continuous variables *Investment* and *Elderly*

9. The author does not need to explain all findings; (s)he only need to explain the counter-intuitive results despite the ones for the variable of interest. Above all, we cannot ensure that the findings related to control variables are really credible.