Research brief:

The impacts of a PAYE reform on taxable earnings in Uganda[1]

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Summary

The paper uses administrative tax data from the Uganda Revenue Authority to examine the impacts of the 2012/13 reform, where taxes on individual earnings (collected using the pay-as-you-earn system, PAYE) were changed. In particular, we focus on top taxpayers (with earnings exceeding UGX 10 million a month) whose highest marginal tax rate increased from 30 to 40 per cent. The top group represents one per cent of income earners, and we compare their earnings developments before and after to reform to other taxpayers (our control group) in the top 10 per cent of taxpayers, whose marginal tax rate did not change. We find that the top group earnings declined by around 10 per cent in comparison to the control group earnings in the period after the reform. This reduction implies that while the additional tax bracket of 10 per cent led to increased tax revenues, the revenue increase would have been approximately 15 per cent greater had there not been a reduction in earnings among the top earners.

Background

Uganda reformed its personal income tax and the pay-as-you earn (tax on individual earnings withdrawn by the employers) tax system starting from the fiscal year 2012/13. The reform increased the lower threshold of the tax brackets, resulting in a reduction of the tax burden for low and middle income earners, and it also introduced a new tax bracket for people with earnings exceeding UGX 10 million a month, whose highest marginal tax rate increased from 30 to 40 per cent. The purpose of the reform was to allow relief for inflation for lower income groups and recoup revenues by increasing the tax rate on high-income groups.

Such a reform may induce behavioural responses among the taxpayers. They may choose to start working less or, if they own businesses, try obtaining compensation in other forms, such as capital income, instead. Such behavioural reactions are summarized in a concept known as The Elasticity of Taxable Income (ETI for short), which is defined to be the proportional change in taxable income (earnings in our case) when the retention rate (one minus the marginal tax rate)

[1] This research brief is based on a research paper by the same authors. The full paper is available from the authors upon request.

changes by one per cent. There is a large body of literature estimating ETI in economics literature, and it is summarized for instance by Saez et al. (2012)[2] for the case of developed countries.

Data and methods

This paper uses the universe of the administrative payroll tax data extracted from the information system of the Uganda Revenue Authority for the fiscal years 2010/11 to 2014/15. We seek to estimate the elasticity of taxable earnings for the top taxpayer group (the treatment group), whose marginal tax rate increased, using those below them in the earnings distribution as the control group (the rest of the taxpayers among top 10%). We use data from both before and after the reform and the so-called difference-in-difference method to study relative income changes between the groups. If we detect that the earnings of the treatment group whose tax burden increased decline relative to the earnings for the control group, this may be due to the tax reform or some other simultaneous trends that would have lowered earnings inequality in the country.

Results

We first summarize income trends for the treatment and control groups in the Figure below. The Figure suggests that while the income growth trends were fairly similar for the treated and the control group before the reform, the trends diverged after the reform: earnings fell for the top taxpayers who saw on increase in their marginal tax rate.

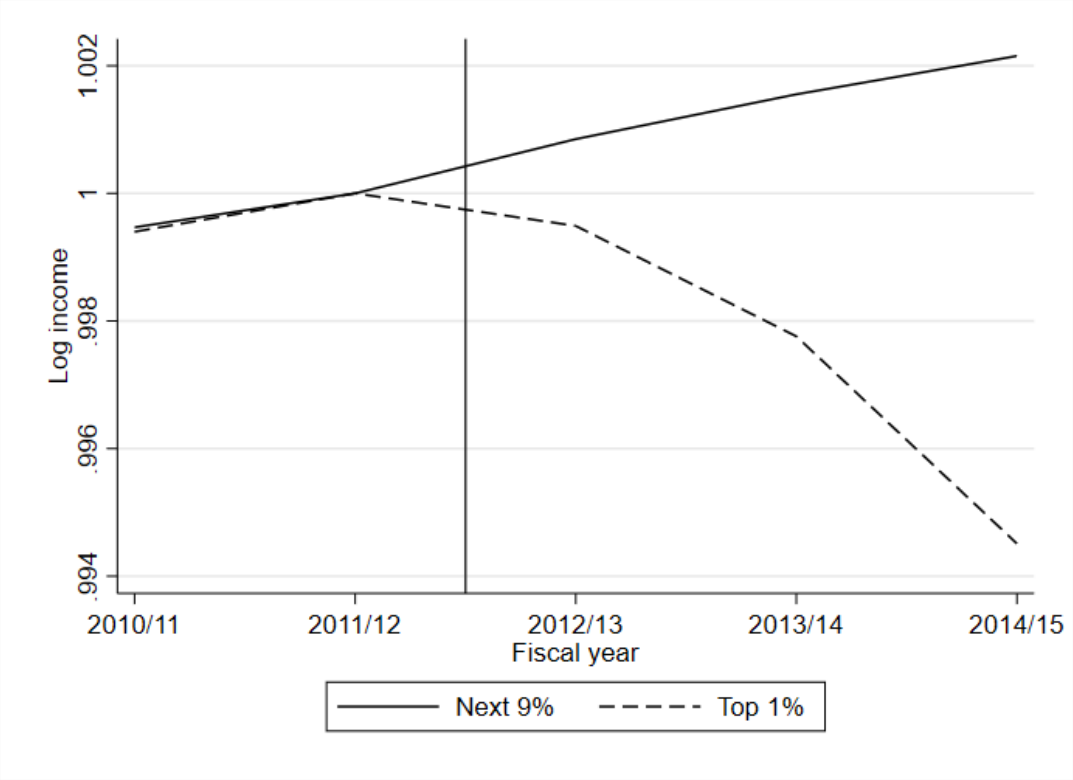
Actual difference-in-difference regressions, where we control for permanent differences between the groups and for common year and month effects, confirm the information from the figure. These results, which are reported in the Table below, suggest that according to the basic OLS regression (without weights), the drop in incomes for the treated group was around 7 per cent (Column 1). This corresponds with an elasticity equal to approximately 0.5, which is somewhat larger than corresponding estimates in the literature. When using income weights in the estimation, the estimate increases drastically (Column 2). However, further analysis shows that when one censors some outlier observations (top 1% of the treatment group), the elasticity estimates drop. This suggests that the very high elasticities are driven by few large outlier observations.

We have also examined the robustness of this result by splitting the treatment group into two halves and by focusing on the same set of taxpayers across the years. This analysis reveals that the response is greater for the upper half of the treatment group and that the elasticities decline when the same panel of taxpaying firms is used.

According to our calculations, the top taxpayers paid approximately UGX 400 billion in taxes a year. Without a decline in the earnings as reported by the employers of the top tax payers, this revenue impact would have been approximately 12 per cent greater. However, it is possible that not all of the income decline among the treatment group is due to the reform and that some of the income may have become taxable as capital income instead. Therefore, the estimates for the revenue implications of the top tax rate need to interpreted cautiously.

[2] Saez, E., Slemrod, J., & Giertz, S. H. (2012). The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review. *Journal of Economic Literature*, *50*(1), 3–50.

Figure. Mean earnings for treatment group (Top 1% taxpayers) and control group (Next 9%)



Notes: Incomes are normalized to one for both groups in 2011/12. The vertical line indicates the reform year.
Source: Authors' own calculations based URA PAYE administrative tax records.

Table. Difference-in-difference (DiD) regression results.

	Treated: Top 1%		*Treated: Top 1%, censored*	
	(1) Simple	(2) Weighted	(3) Simple	(4) Weighted
Basic:				
DiD estimate	-0.0743**	-0.319**	-0.0729**	-0.175***
	(0.0345)	(0.131)	(0.0344)	(0.0624)
Year and month dummies	Yes	Yes	Yes	Yes
R-squared	0.558	0.622	0.56	0.701
Implied elasticity	0.5201	2.233	0.5103	1.225

Notes: Columns (2) and (4) present weighted least squares estimates with income used as weights. In Columns (3) and (4), incomes exceeding the top 1% threshold among the treated group (that is, income above 0.01% of all income earners) are censored to the threshold value. Standard errors that are clustered at the firm level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: Authors' own calculations.