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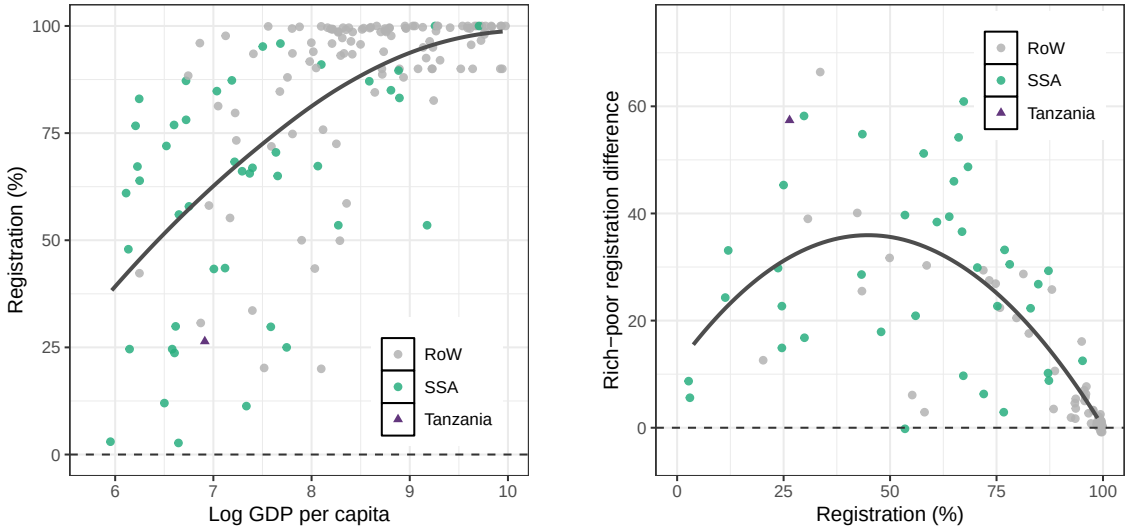
1 Main paper

1.1 Figures

Figure 1: Income, registration, and inequality



(a) Income and registration levels

(b) Registration levels and inequality

Sources: World Bank, UNICEF. *Registration* is the share of citizens possessing birth certificates. *Rich-poor registration difference* is the percentage point difference in the registration rate of highest income quintile citizens relative to lowest quintile.

1.2 Tables

Table 1: Effect of reform on registration

	(1)	(2)	(3)	(4)	(5)	(6)
Reform (β^{FS})	0.06***	0.05***	0.04***	0.05***	0.05***	0.03**
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
$Reform_{t+1}$				0.02	0.02	0.02
				(0.01)	(0.01)	(0.01)
$Reform_{t+2}$				-0.01	-0.01	-0.01
				(0.02)	(0.02)	(0.02)
$Reform_{t+3}$				-0.00	-0.00	-0.01
				(0.01)	(0.01)	(0.01)
$Reform_{t+4}$				-0.01	-0.01	-0.01
				(0.01)	(0.01)	(0.01)
$Reform_{t+5}$				0.00	0.00	-0.00
				(0.01)	(0.01)	(0.01)
Time trends	None	Region	District	None	Region	District
F-statistic	29.8	140.7	12.9	17.4	24.1	6.9
Outcome mean	0.13	0.13	0.13	0.13	0.13	0.13
Observations	193648	193648	193648	193648	193648	193648

DV: respondent has a birth certificate. Sample restricted to cohorts born within ten years of reform in treated or control districts.
Specifications estimated using OLS including district of birth and year of birth fixed effects and controls for gender. Exposure to reform is an indicator for being born after reform in a treated district. Standard errors clustered at the district of birth-level in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 2: Effects on access to the state

	I. Education			II. Social security		
	Pri. (1)	Sec. (2)	Uni. (3)	HI (4)	Priv. (5)	State (6)
Registered (β^{OLS})	0.11***	0.34***	0.10***	0.11***	0.12***	0.11***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
$\widehat{\text{Registered}}$ (β^{IV})	0.08	0.72***	0.17**	0.21	0.15*	0.18**
	(0.35)	(0.13)	(0.06)	(0.13)	(0.07)	(0.08)
	[0.83]	[0.00]	[0.01]	[0.17]	[0.07]	[0.04]
DV Mean	0.80	0.15	0.03	0.09	0.05	0.04
FS F-statistic	29.8	29.8	29.8	29.8	29.8	29.8
ρ(Wealth, DV)	0.12	0.42	0.29	0.17	0.33	0.26
Observations	193648	193648	193648	193648	193648	193648

DVs are all indicators. (1) has any primary education; (2) has any secondary education; (3) has any university education; (4) in a household accessing National Health Insurance Fund; (5) in a household accessing private pension; (6) in a household accessing state pension. Sample restricted to cohorts born within ten years of reform in treated or control districts. β^{OLS} estimated using Equation (1); β^{IV} estimated using Equation (3). All specifications include district of birth and year of birth fixed effects and controls for gender. Standard errors clustered at the district of birth-level in parentheses; bootstrapped p-values in square brackets. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 3: Effects on exposure to taxation

	All	Fees	Local	Central
	(1)	(2)	(3)	(4)
Registered (β^{OLS})	0.18***	-0.00	0.05**	0.18***
	(0.03)	(0.02)	(0.02)	(0.04)
$\widehat{\text{Registered}}$ (β^{IV})	0.47*	0.20	0.02	0.45*
	(0.28)	(0.22)	(0.21)	(0.28)
	[0.10]	[0.62]	[0.91]	[0.08]
DV Mean	0.19	0.05	0.05	0.13
FS F-statistic	17.5	17.5	17.5	17.5
ρ(Wealth, DV)	0.36	0.04	0.28	0.42
Observations	1571	1571	1571	1571

DVs are all indicators. (1) in a household which has paid any tax in the last year; (2) in a household which paid fees in the last year; (3) in a household which paid local taxes in the last year; (4) in a household which paid taxes to the central government in the last year. Sample restricted to cohorts born within ten years of reform in treated or control districts.
β^{OLS} estimated using Equation (1); β^{IV} estimated using Equation (3). All specifications include district of birth and year of birth fixed effects and controls for gender. Standard errors clustered at the district of birth-level in parentheses; bootstrapped p-values in square brackets. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 4: Heterogeneity in compliance with reforms

		I. Taxation				II. Local public goods		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Reform	0.060***	0.053***	0.054***	0.054***	0.056***	0.062***	0.051***	0.059***
	(0.011)	(0.006)	(0.005)	(0.007)	(0.006)	(0.018)	(0.005)	(0.012)
Reform × Share paying tax		-0.011**			-0.013***			
		(0.005)			(0.003)			
Reform × Tax per capita			-0.028*		-0.022**			
			(0.015)		(0.009)			
Reform × $(\tau^{\text{Max}} - \tau^{\text{Min}})$				-0.008**	-0.002			
				(0.004)	(0.003)			
Reform × Primary schools						0.022		0.020
						(0.028)		(0.020)
Reform × Secondary school							0.016***	0.016***
							(0.004)	(0.004)
Outcome mean	0.13	0.13	0.13	0.14	0.14	0.13	0.13	0.13
Observations	193648	193648	193648	160588	160588	193648	193648	193648

DV: respondent has a birth certificate. Panel I examines heterogeneity using local measures of taxation; Panel II using local measures of public goods. Sample restricted to cohorts born within ten years of reform in treated or control districts. District-level measures of tax levels from Jensen and Mkama (1968); tax incidence from Lee (1965); local public goods from administrative data. Regressions control for interaction of *Reform* with standardized district income per capita and population density. All specifications estimated using OLS including district of birth and year of birth fixed effects and control for gender. SEs clustered at the district of birth-level in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 5: Complier characteristics

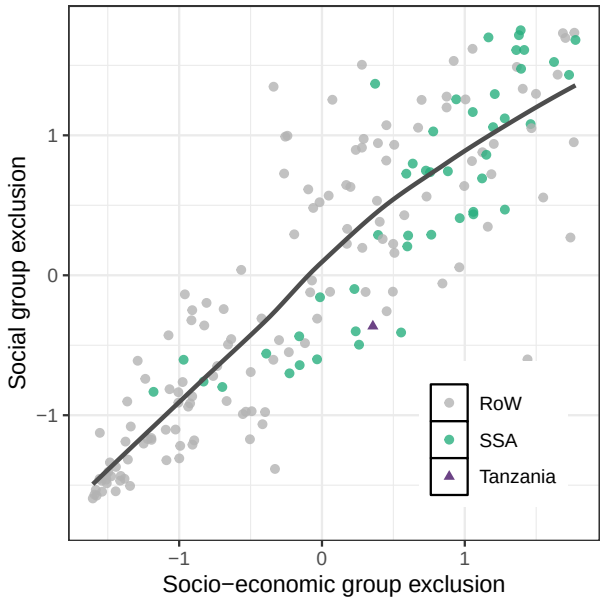
Variable	Sample mean (1)	Complier mean (2)	Ratio (3)
Male	0.47	0.50	1.06
Parent has primary education	0.60	0.67	1.13
Parent has secondary education	0.09	0.17	2.02
Parent has university education	0.02	0.08	3.54

Table computes covariate means for baseline NPS sample (column 1) and compliers (column 2). Column (3) is column (2) divided by column (1).

2 Appendix

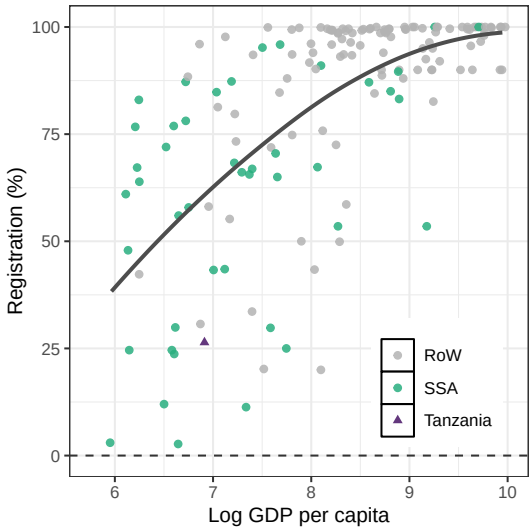
2.1 Figures

Figure A1: Exclusion from public resources based on economic versus social status

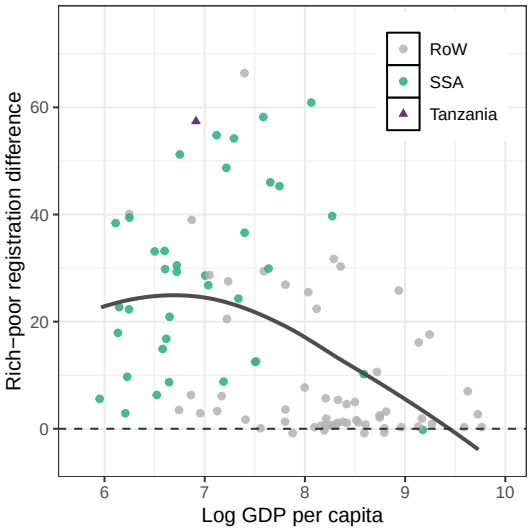


Source: V-DEM v.12 dataset. Figure plots the average country-level extent of exclusion from public resources based on socioeconomic group status against exclusion from public resources based on social group status. Variables are standardized and averaged across the period 1960-2015. "ROW" refers to rest-of-world; "SSA" refers to sub-Saharan Africa.

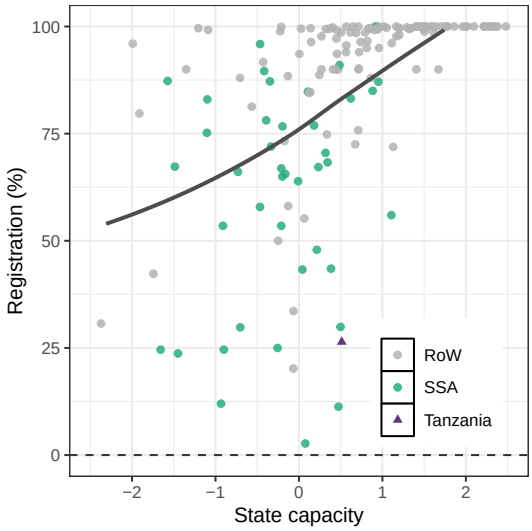
Figure A2: Income, registration, and inequality (supplementary)



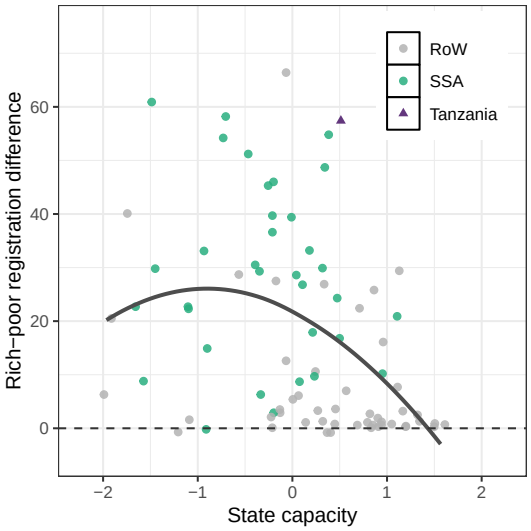
(a) Income and registration rates



(b) Income and registration inequality



(c) Hanson and Sigman (2021) measure of state capacity and registration rates



(d) Hanson and Sigman (2021) measure of state capacity and registration inequality

Sources: World Bank, UNICEF, Hanson and Sigman (2021). "ROW" refers to rest-of-world; "SSA" refers to sub-Saharan Africa.

Figure A3: Measure of Tanzania's state capacity over time

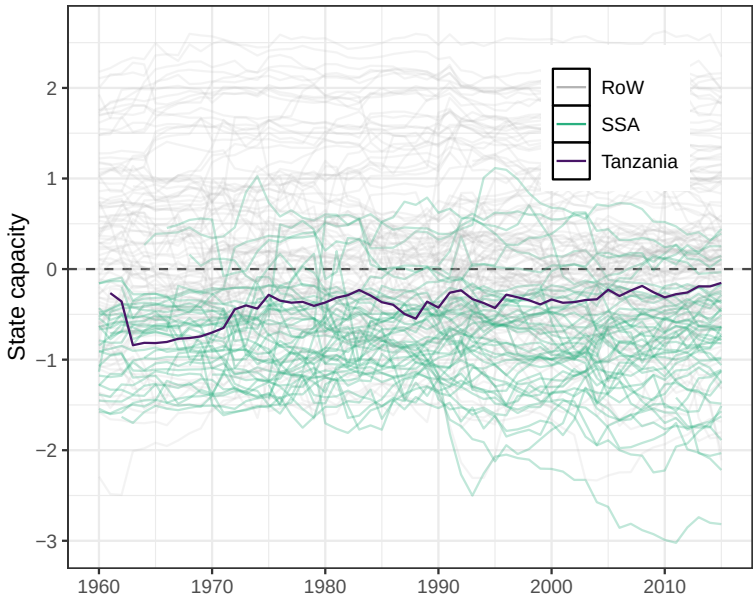


Figure plots the Hanson and Sigman (2021) measure of state capacity at the annual level (standardized within year). Tanzania gains independence in 1961. "ROW" refers to rest-of-world; "SSA" refers to sub-Saharan Africa.

Figure A4: Introduction of civil registries across sub-Saharan Africa

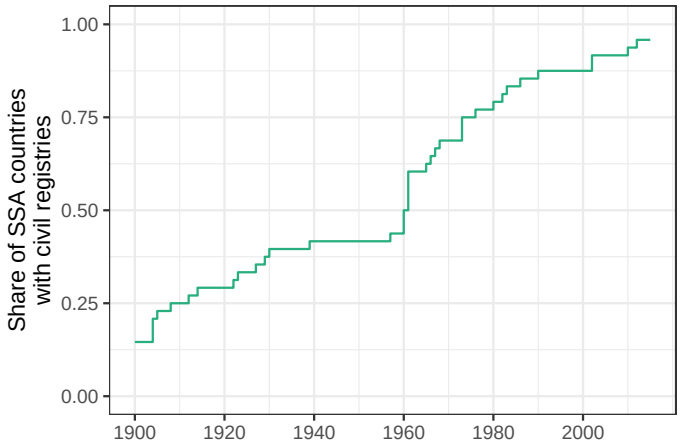


Figure plots the share of countries in sub-Saharan Africa with civil registration authorities over time.
Source: World Bank ID4D initiative.

Figure A5: Spatial distribution of treated and control districts

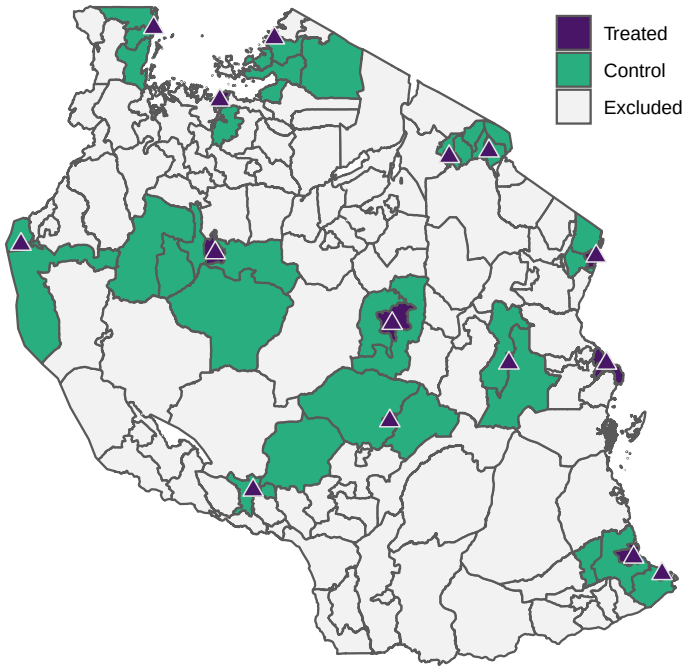
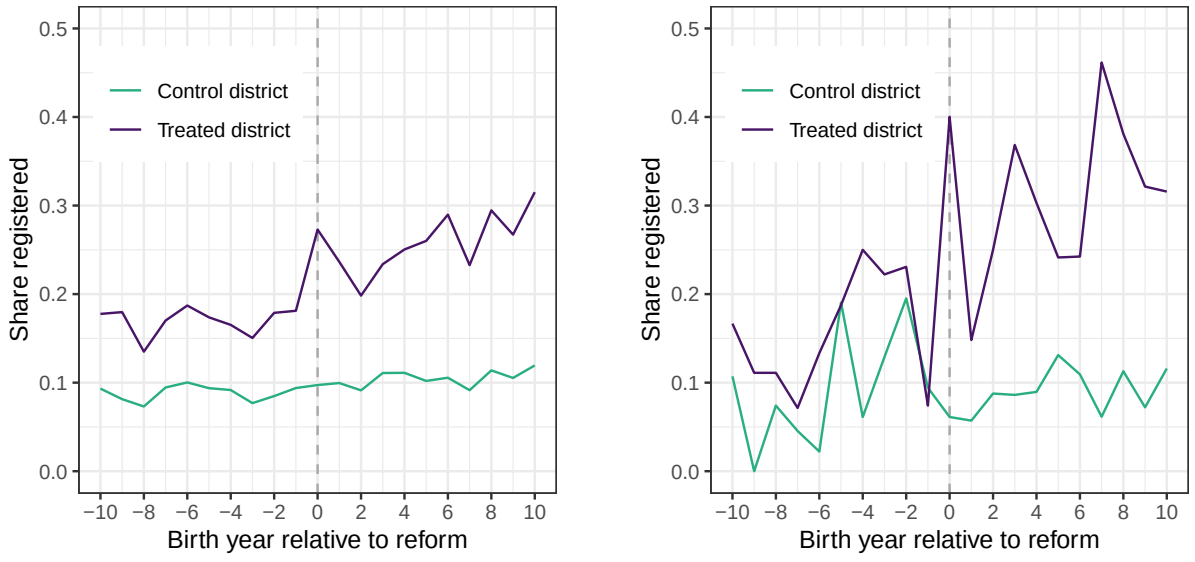


Figure plots the spatial distribution of treated (purple) and control (green) districts used in the baseline analysis. District boundaries as defined in 2012 Population and Housing Census.

Figure A6: Trends in registration rates



(a) Census

(b) National Panel Survey

Figures display the average share of registered individuals across treated and control districts over time. Panel (a) uses the baseline Census sample; Panel (b) uses the baseline National Panel Survey sample.

Figure A7: Estimates of first stage while excluding districts

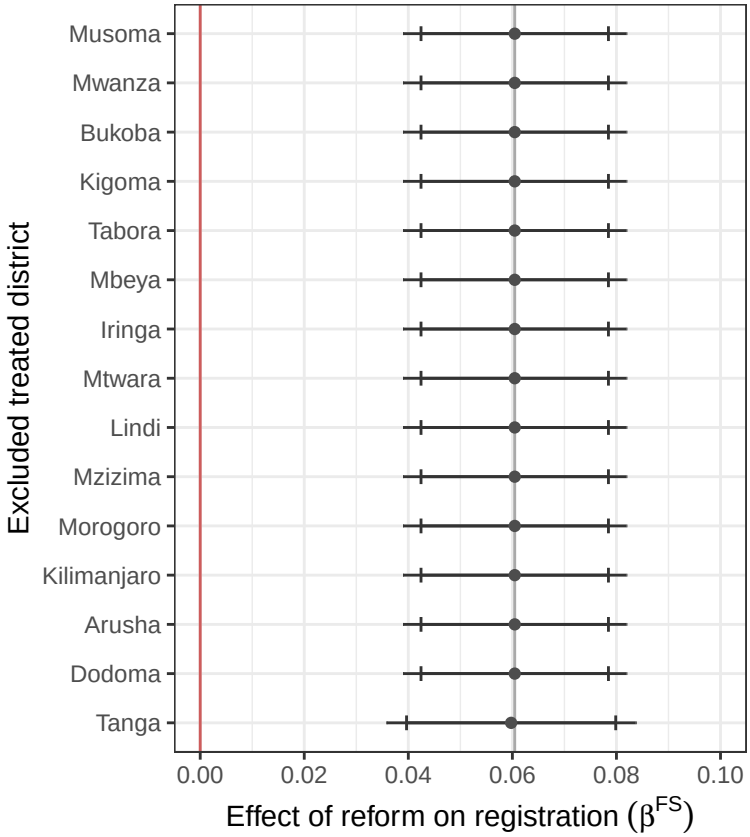
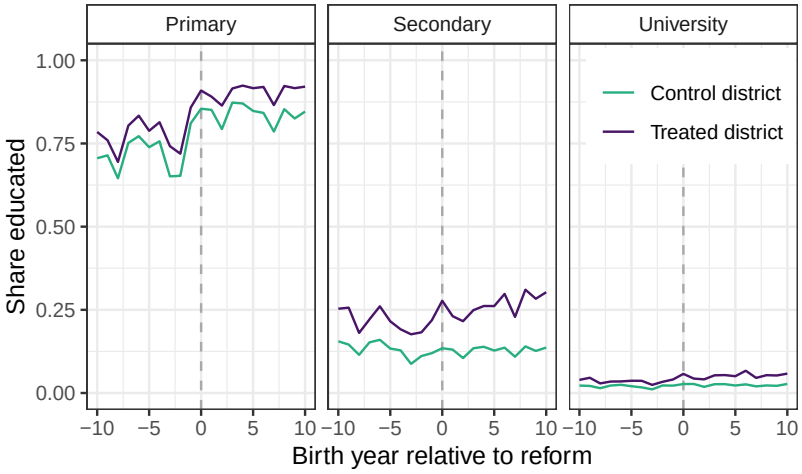
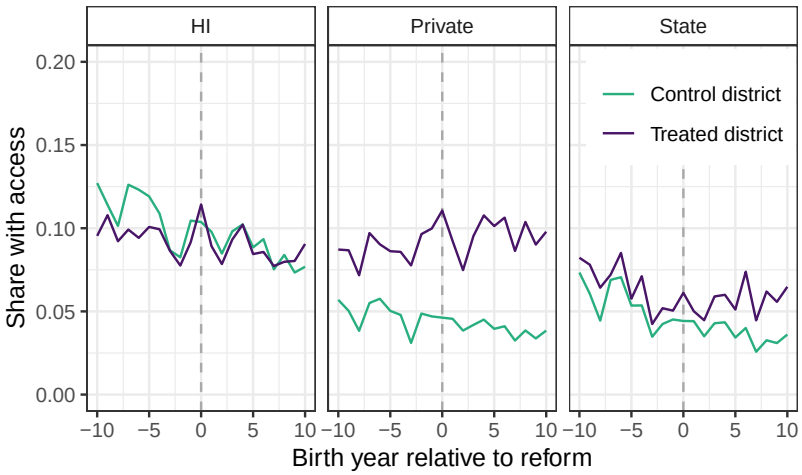


Figure estimates the first stage coefficient (β^{FS}) using Equation (2) while excluding a given treated district. Vertical gray line provides the overall first stage coefficient from column 1 of Table 1. 90% and 95% confidence intervals plotted.

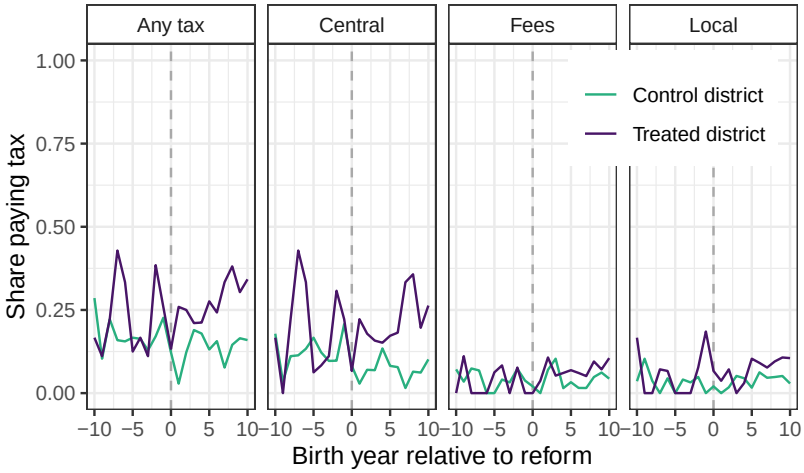
Figure A8: Trends in outcome variables



(a) Trends in education access



(b) Trends in social security access



(c) Trends in tax payment

Figure displays the average value of variables measuring access to education (Panel A, Table 2); access to social security (Panel B, Table 2); and tax payment (Table 3) across treated and control districts over time using the baseline census and NPS samples.

Figure A9: Effects on education access by grade

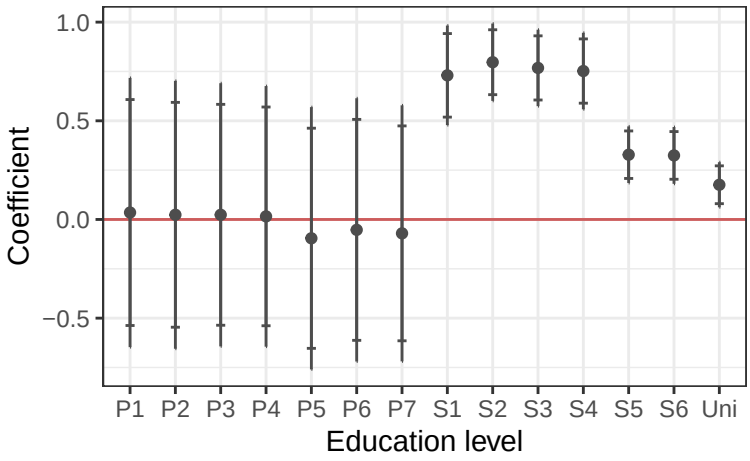


Figure estimates treatment effects (β^{IV}) on having completed a given grade of education using Equation (3). Primary education runs from P1 to P7; Secondary education runs from S1 to S4 ('Ordinary level') or to S6 ('Advanced level'). 90% and 95% confidence intervals plotted.

Figure A10: Expansion of compulsory registration across districts over time

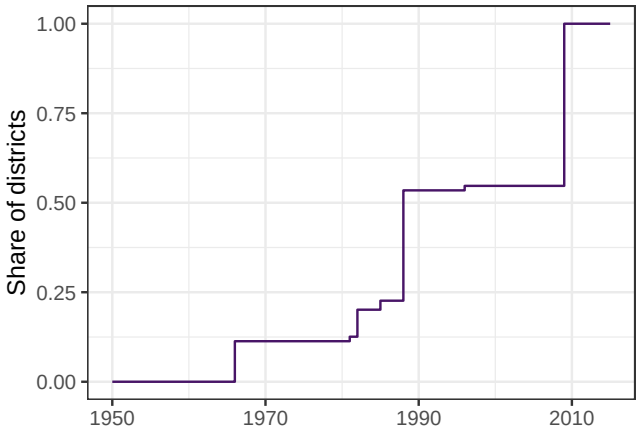


Figure displays the cumulative share of districts targeted by a compulsory registration order by year.
Source: Tanzania National Archives.

Figure A11: Relevant legislation during reform period

Figure displays the share of relevant legislation being passed in a given year.
Source: Southern African Legal Information Institute.

2.2 Tables

Table A1: Descriptive statistics (Census)

	Both		Treated		Control	
	Mean	SD	Mean	SD	Mean	SD
A. Sample characteristics						
Age	44.06	5.73	43.35	5.57	44.27	5.76
Male	0.48	0.50	0.48	0.50	0.47	0.50
Tanzanian citizen	0.99	0.08	0.99	0.10	0.99	0.07
Father alive	0.38	0.49	0.40	0.49	0.38	0.48
Mother alive	0.61	0.49	0.61	0.49	0.61	0.49
B. First stage variables						
Registered	0.13	0.33	0.23	0.42	0.10	0.30
Born in treated district	0.23	0.42	1.00	0.00	0.00	0.00
Born after reform	0.15	0.36	0.68	0.47	0.00	0.00
Reform	0.15	0.36	0.68	0.47	0.00	0.00
C. Outcome variables						
Education: Primary	0.80	0.40	0.86	0.35	0.79	0.41
Education: Secondary	0.15	0.36	0.24	0.43	0.12	0.33
Education: University	0.03	0.16	0.05	0.21	0.02	0.15
National Health Insurance Fund	0.09	0.29	0.09	0.28	0.09	0.29
Private pension	0.05	0.22	0.09	0.29	0.04	0.20
State pension	0.04	0.21	0.06	0.23	0.04	0.20
Observations	193648		44124		149524	

Data source is the 2012 National Population and Housing Census. Sample restricted to cohorts born within ten years of reform in either treated or control districts.

Table A2: Descriptive statistics (NPS)

	Both		Treated		Control	
	Mean	SD	Mean	SD	Mean	SD
A. Sample characteristics						
Age	44.51	6.07	43.43	5.89	45.01	6.08
Male	0.47	0.50	0.47	0.50	0.47	0.50
Parent has primary education	0.60	0.49	0.70	0.46	0.55	0.50
Parent has secondary education	0.09	0.28	0.16	0.37	0.05	0.22
Parent has university education	0.02	0.15	0.05	0.21	0.01	0.11
B. First stage variables						
Registered	0.15	0.35	0.27	0.44	0.09	0.29
Born in treated district	0.32	0.47	1.00	0.00	0.00	0.00
Born after reform	0.23	0.42	0.72	0.45	0.00	0.00
Reform	0.23	0.42	0.72	0.45	0.00	0.00
Paid any tax	0.19	0.39	0.27	0.44	0.15	0.36
Paid fees	0.05	0.21	0.06	0.23	0.04	0.20
Paid local tax	0.05	0.21	0.07	0.26	0.04	0.18
Paid central tax	0.13	0.34	0.22	0.41	0.09	0.29
Observations	1571		498		1073	

Data source is National Panel Survey (2010, 2014). Sample restricted to cohorts born within ten years of reform in either treated or control districts.

Table A4: First stage (robustness)

	+/- 5 cohorts			All cohorts		
A. Varying included cohorts	(1)	(2)	(3)	(4)	(5)	(6)
Reform	0.05***	0.05***	0.06***	0.15***	0.15***	0.05**
	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.02)
Time trends	None	Region	District	None	Region	District
Outcome mean	0.12	0.12	0.12	0.20	0.20	0.20
Observations	102836	102836	102836	1327672	1327672	1327672
	-Reform year			**-Heaped ages**		
B. Excluding birth years	(1)	(2)	(3)	(4)	(5)	(6)
Reform	0.06***	0.05***	0.03**	0.06***	0.05***	0.04***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Time trends	None	Region	District	None	Region	District
Outcome mean	0.13	0.13	0.13	0.13	0.13	0.13
Observations	187300	187300	187300	170292	170292	170292
	District-level			**Individual-level**		
C. Control variables	(1)	(2)	(3)	(4)	(5)	(6)
Reform	0.06***	0.06***	0.05***	0.05***	0.05***	0.04***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Time trends	None	Region	District	None	Region	District
Outcome mean	0.13	0.13	0.13	0.13	0.13	0.13
Observations	193648	193648	193648	193648	193648	193648
	Urban			**Unrestricted**		
D. Changing control districts	(1)	(2)	(3)	(4)	(5)	(6)
Reform	0.05***	0.05***	0.03**	0.06***	0.06***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Time trends	None	Region	District	None	Region	District
Outcome mean	0.13	0.13	0.13	0.08	0.08	0.08
Observations	118829	118829	118829	619982	619982	619982
	2012 district FEs			**District-cohort clustering**		
E. Varying estimation	(1)	(2)	(3)	(4)	(5)	(6)
Reform	0.06***	0.05***	0.04***	0.06***	0.05***	0.04***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Time trends	None	Region	District	None	Region	District
Outcome mean	0.13	0.13	0.13	0.13	0.13	0.13
Observations	193648	193648	193648	193648	193648	193648
	+/- 10 cohorts			**All cohorts**		
F. National Panel Survey dataset	(1)	(2)	(3)	(4)	(5)	(6)
Reform (β^{FS})	0.13***	0.10***	0.14**	0.17***	0.17***	0.14***
	(0.03)	(0.03)	(0.05)	(0.03)	(0.02)	(0.04)
Time trends	None	Region	District	None	Region	District
Outcome mean	0.15	0.15	0.15	0.25	0.25	0.25
Observations	1571	1571	1571	11692	11692	11692

DV: respondent has a birth certificate. Panel A: sample restricted to cohorts born within 5 year of reform, or no restriction. Panel B: excluding individuals born in reform year, or those who report their age rounded to five years. Panel C: interacting vector of district-level controls with post-reform year indicator, or linearly adding additional individual-level controls. Panel D: redefining the set of control districts to comprise other districts classified as urban in 1967 census (Table A5), or all other districts in the country. Panel E: using district of birth fixed effects based on modern administrative units, or clustering at pre-reform district $\times$ cohort level; Panel F: replicating the baseline first stage using the NPS sample while varying included cohorts.

Specifications estimated using OLS including district of birth and year of birth fixed effects and controls for gender. Exposure to reform is an indicator for being born after reform in a treated district. Standard errors clustered at the district of birth-level in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table A6: First stage (Alternative estimation)

A. Regression discontinuity	(1)	(2)	(3)	(4)	(5)	(6)
Born after reform	0.08***	0.05***	0.04***	0.03**	0.01	0.00
	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Bandwidth	2	5	10	15	20	30
Outcome mean	0.20	0.21	0.23	0.25	0.28	0.35
Observations	10827	22689	44124	72740	106205	190696
B. Household fixed effects	(1)	(2)	(3)	(4)	(5)	(6)
Reform	0.04**	0.04***	0.04***	0.06***	0.07***	0.10***
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)
Bandwidth	2	5	10	15	20	30
Outcome mean	0.12	0.12	0.12	0.13	0.14	0.19
Observations	5419	25417	78027	155313	252715	543094

Outcome variable is whether respondent has a birth certificate. Panel A: estimated using a local linear regression in the set of treated districts. Coefficient represents the change in registration probability among cohorts just after, versus just before, the reform. Panel B: Equation (2) estimated using household-level fixed effects.

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors clustered at the district of birth-level in parentheses.

Table A7: Placebo outcomes

	Male	Tanzanian	Father alive	Mother alive
	(1)	(2)	(3)	(4)
Reform	0.00	-0.00	-0.00	-0.00
	(0.01)	(0.00)	(0.01)	(0.01)
Outcome mean	0.48	0.99	0.38	0.61
Observations	193648	193648	193648	193648

Table uses individual-level characteristics as dependent variables in Equation (1). DVs: (1) individual is male; (2) individual is Tanzanian; (3) individual's father is alive; (4) individual's mother is alive.

Specifications estimated using OLS including district of birth and year of birth fixed effects. Exposure to reform is an indicator for being born after reform in a treated district. Standard errors clustered at the district of birth-level in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table A8: Effects on literacy

	Any (1)	Kisw. (2)	Eng. (3)
Registered (β^{OLS})	0.12***	0.11***	0.35***
	(0.02)	(0.02)	(0.01)
$\widehat{\text{Registered}}$ (β^{IV})	0.04	0.06	0.58***
	(0.31)	(0.31)	(0.13)
	[0.90]	[0.87]	[0.00]
DV Mean	0.79	0.79	0.16
FS F-statistic	29.79	29.79	29.79
ρ(Wealth, DV)	0.13	0.13	0.41
Observations	193648	193648	193648

DVs are all indicators. (1) individual is literate in any language; (2) individual is literate in Kiswahili; (3) individual is literate in English.

β^{OLS} estimated using Equation (1); β^{IV} estimated using Equation (3). All specifications include district of birth and year of birth fixed effects and controls for gender. Standard errors clustered at the district of birth-level in parentheses; bootstrapped p-values in square brackets. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table A9: Effects on access to social security

			Private		State			
	Any	HI	NSSF	PPF	PSPF	GEPF	LAPF	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Registered (β^{OLS})	0.23***	0.11***	0.09***	0.03***	0.09***	0.01***	0.02***	0.01***
	(0.02)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
$\widehat{\text{Registered}}$ (β^{IV})	0.33*	0.21	0.18***	-0.04	0.12*	0.03**	0.03	0.01
	(0.18)	(0.13)	(0.05)	(0.04)	(0.06)	(0.01)	(0.02)	(0.03)
	[0.10]	[0.17]	[0.00]	[0.36]	[0.08]	[0.03]	[0.12]	[0.61]
DV Mean	0.16	0.09	0.04	0.01	0.03	0.00	0.01	0.02
FS F-statistic	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8
ρ(Wealth, DV)	0.32	0.17	0.28	0.19	0.23	0.07	0.12	0.02
Observations	193648	193648	193648	193648	193648	193648	193648	193648

DVs are all indicators. (1) individual in a household with access to any social security fund; (2) individual in a household with access to National Health Insurance Fund (NHIF); (3) individual in a household with access to National Social Security Fund (NSSF); (4) individual in a household with access to Parastatal Pension Fund (PPF); (5) individual in a household with access to Public Service Pension Fund (PSPF); (6) individual in a household with access to Government Employees Provident Fund (GEPF); (7) individual in a household with access to Local Authorities Pension Fund (LAPF); (8) individual in a household with access to any other social security fund.

β^{OLS} estimated using Equation (1); β^{IV} estimated using Equation (3). All specifications include district of birth and year of birth fixed effects and controls for gender. Standard errors clustered at the district of birth-level in parentheses; bootstrapped p-values in square brackets. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table A10: Effects on exposure to taxation (all cohorts)

	All	Fees	Local	Central
	(1)	(2)	(3)	(4)
Registered (β^{OLS})	0.12***	0.00	0.03***	0.12***
	(0.02)	(0.01)	(0.01)	(0.01)
$\widehat{\text{Registered}}$ (β^{IV})	0.36**	0.10	0.12	0.32**
	(0.14)	(0.10)	(0.10)	(0.16)
	[0.02]	[0.50]	[0.30]	[0.04]
DV Mean	0.18	0.05	0.04	0.11
FS F-statistic	43.6	43.6	43.6	43.6
ρ(Wealth, DV)	0.29	0.03	0.23	0.33
Observations	11692	11692	11692	11692

DVs are all indicators. (1) individual in a household which has paid any tax in the last year; (2) individual in a household which has paid any fees to the government in the last year; (3) individual in a household which has paid local taxes in the last year; (4) individual in a household which has paid taxes to the central government in the last year. Sample restricted to all adults born in either treated or control districts.
β^{OLS} estimated using Equation (1); β^{IV} estimated using Equation (3). All specifications include district of birth and year of birth fixed effects and controls for gender. Standard errors clustered at the district of birth-level in parentheses; bootstrapped p-values in square brackets.
* p < 0.1, ** p < 0.05, *** p < 0.01.

Table A11: Comparison of registration reform effects

	Pooled	'66	'80s	'09
	(1)	(2)	(3)	(4)
Reform	0.16***	0.06***	-0.01***	0.01***
	(0.01)	(0.01)	(0.01)	(0.00)
Reform × '80s	-0.17***			
	(0.02)			
Reform × '09	-0.17***			
	(0.02)			
Outcome mean	0.13	0.08	0.15	0.14
Observations	4188733	619982	1673553	1788643

Table estimates the effects of the '66 reform, '80s reforms, and '09 reform on registration as discussed in Appendix A.2. Column (1) estimates using the complete census sample and tests for differences between the effects of later reforms compared to '66. Columns (2) to (4) separately estimate effects of each reform, restricting each sample to cohorts born close to reform year. All specifications are estimated using OLS and include district of birth and year of birth fixed effects and control for gender. * p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors clustered at the district of birth-level in parentheses.