Prison Labor: The Price of Prisons and the Lasting Effects of Incarceration

Belinda Archibong (Barnard College, Columbia University) and Nonso Obikili (United Nations)

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Colonial infrastructure and economic development in Africa: Who built the railroad? (+ missionary schools etc)



Figure: African forced labor (and prison labor) was essential to infrastructure construction in Europe's African colonies

Rising incarceration rates around the world have reignited debates around prison labor

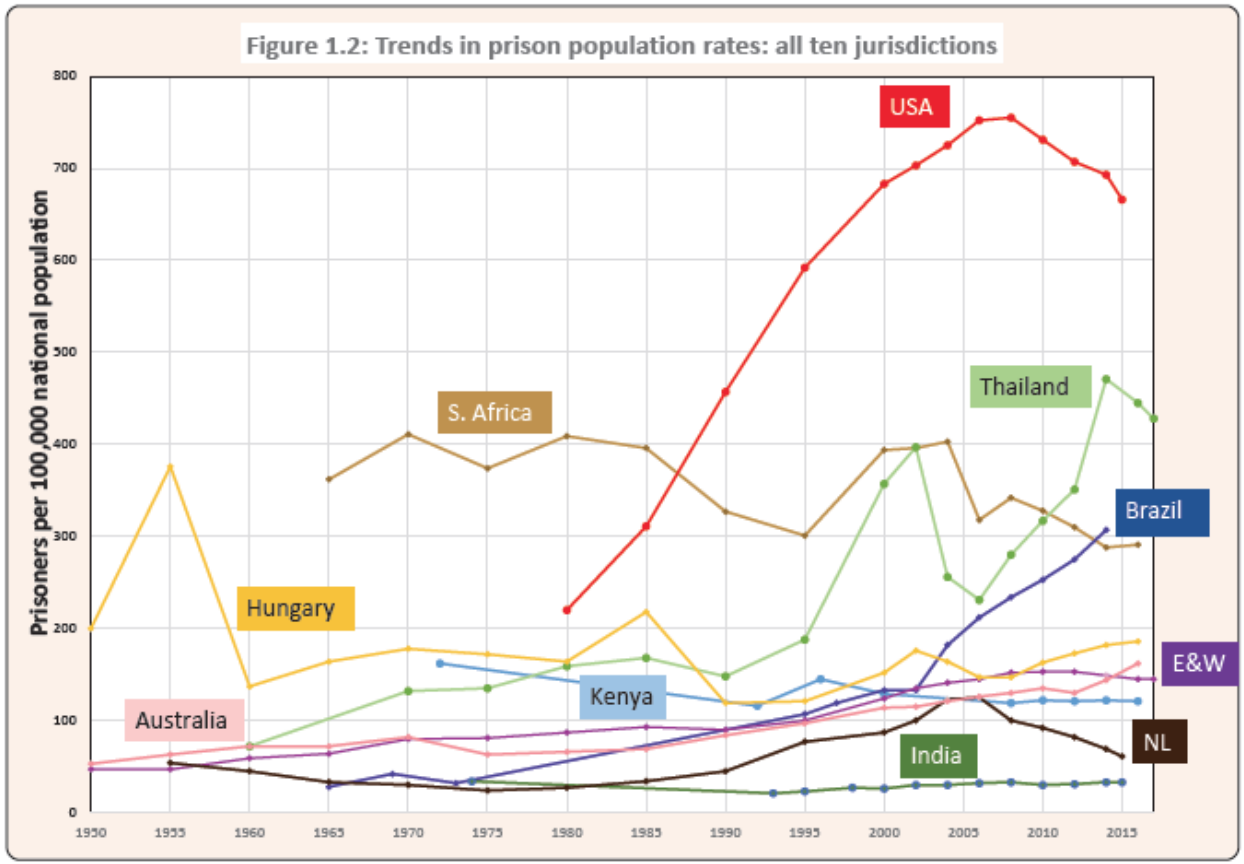


Figure: Incarceration rates globally, 1950-2015. Source: Institute for Criminal Policy Research

What are the effects on incarceration when prisoners are viewed and used as a source of labor to serve economic interests?



Figure: Many governments around the world use and/or are advocating for the use of prison labor

And what are the potential implications for views of state legitimacy when an institution of state justice, like prisons, is used to serve economic/extrajudicial interests?



Figure: Protests against police brutality around the world and lowered trust in police

Key Questions: Evidence from prisons in colonial and postcolonial Nigeria

- Answer questions using evidence from colonial Nigeria (1920-1959) where prison labor was a feature of state policy and finance (first estimates)
- We examine the dynamics of incarceration, how it responded to economic shocks, and some long-term consequences (65 years of archival data on prisons)
- We answer 3 specific questions:
  - Q1: How important was prison labor for colonial public finance/public works construction and maintenance?

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  - Q2: How did incarceration rates respond to economic shocks when prison labor was an important part of state public finance?
    - Q2a: Falsification test: do we see the same relationship when prisoners are not being viewed and used as source of labor (evidence from postcolonial (post 1960) Nigeria, 1971-1995)

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  - Q3: What are there long-term effects of this prison labor system on perceptions of state legitimacy? Trust in legal institutions like police? When institutions of justice are used to serve economic or extrajudicial interests?

Why is colonial Nigeria an informative region to study these questions?

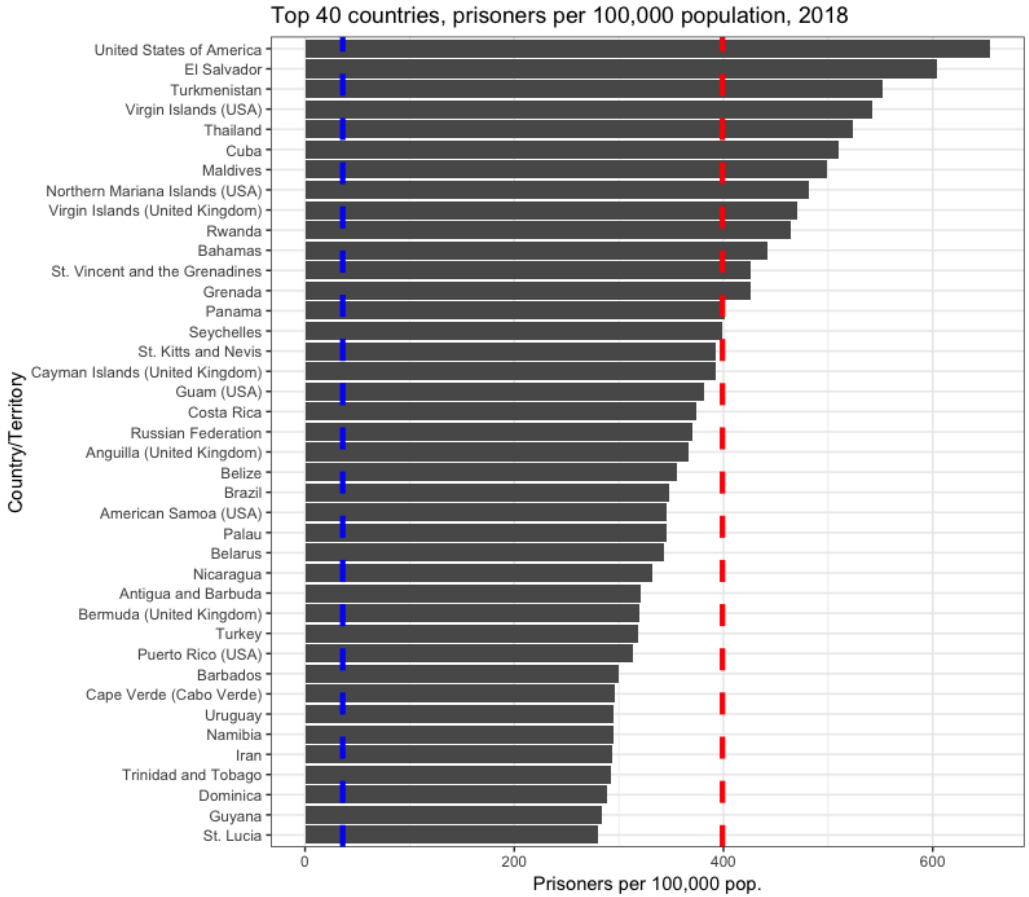


Figure: Top 40 countries/territories for incarceration rates, 2018 with Nigeria incarceration rates in red (year 1940) and blue (year 2018). Source: WPB

Preview of Results

- Q1: Prison labor is economically valuable to colonial regime. All able-bodied sentenced prisoners must work, unpaid labor:
  - Gross value of prison labor $>>$ 0 between 1920-1959 . Net value (all maintenance costs) $>>$ 0 $\approx$ 60% years
  - Significant share of colonial public works expenditures- 40-249% gross (mean 101%). Net: average 5%, max 42%. Govt departments like Public Works, railroad significantly use prison labor



Figure: African laborers on a railroad c. 1930, Source: Alexander Keese, CEAUP, Porto

Preview of Results

- Q2: Incarceration rates are procyclical during colonial period. Effect is reversed in postcolonial period:
  - Positive economic shocks increase incarceration rates and the use of prison labor in colonial era
  - Positive effect specific to short-term (ST) ($<$ 6mos) incarceration only. No effect for long-term (LT) ($>$ 2yr) incarceration.
  - Moderate positive rainfall shock that inc. agric. prod. increase ST rates by 12% (mean is 135)
  - Effect is reversed in postcolonial period: extreme negative rainfall shocks, like droughts, inc. incarceration (21% rel. to mean of 105)
  - 1% inc in export prices for major cash crop in producing regions $->$ 2% increase in ST incarceration rel. to mean
  - Inc. demand for unpaid labor for construction and maintenance of public works $->$ intensify exports of agric. comm. during pos. shocks
  - Robustness tests: using changes in sentencing (sentence switching) and exploiting distance to railroads

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- Q3: Respondents from areas with high rates of colonial imprisonment report lower trust in legal institutions like police today, no effect on interpersonal trust

A History of Forced Labor

- Prison labor was a small part of a larger regime of domestic forced labor in colonial Africa
- European colonial revenue imperative and labor shortage question
- Answer: Construct public works infrastructure using coercive labor regimes. Examples:
  - Labor ordinances, labor taxes, Masters and Servants Ordinances, vagrancy laws, labor registration, pass laws, Native Authority Ordinances, etc
  - E.g. Road ordinance of 1894, "Chiefs' Bye-Laws and Road Maintenance" 1912
  - Consequences of not participating: fines, prison

Prison labor across British colonial Africa and Africans disproportionately issued prison as punishment

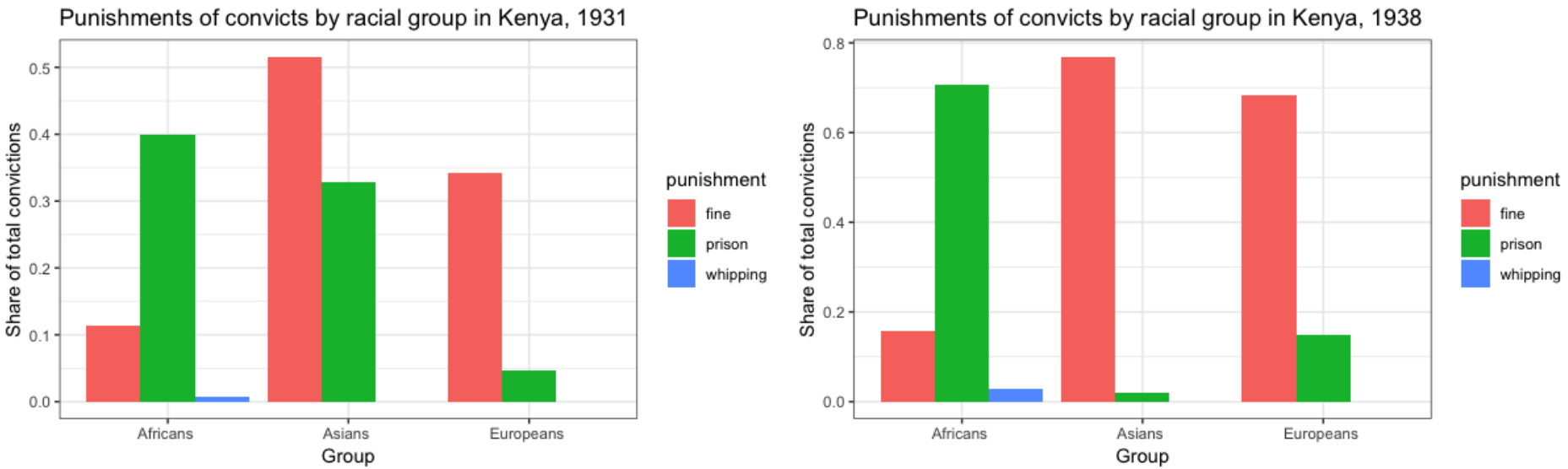


Figure: Punishments issued by race in colonial Kenya

Prison labor in British colonial Nigeria

- Nigeria colony from 1914-1960. Colonial prisons (and Native Admin. prisons)
- Colonial prisons: Mostly short-term prisoners: Convict prisons/LT- $> 2yrs$; Provincial/MT ($2 > y > .5$); Divisional/ST ($y <= .5$/ or 6 months)
- Goals- punish crimes/control African pop., cheap labor (unpaid, all prisoners work, hired out to govt. only)
- Similar crimes $\neq$ similar punishment

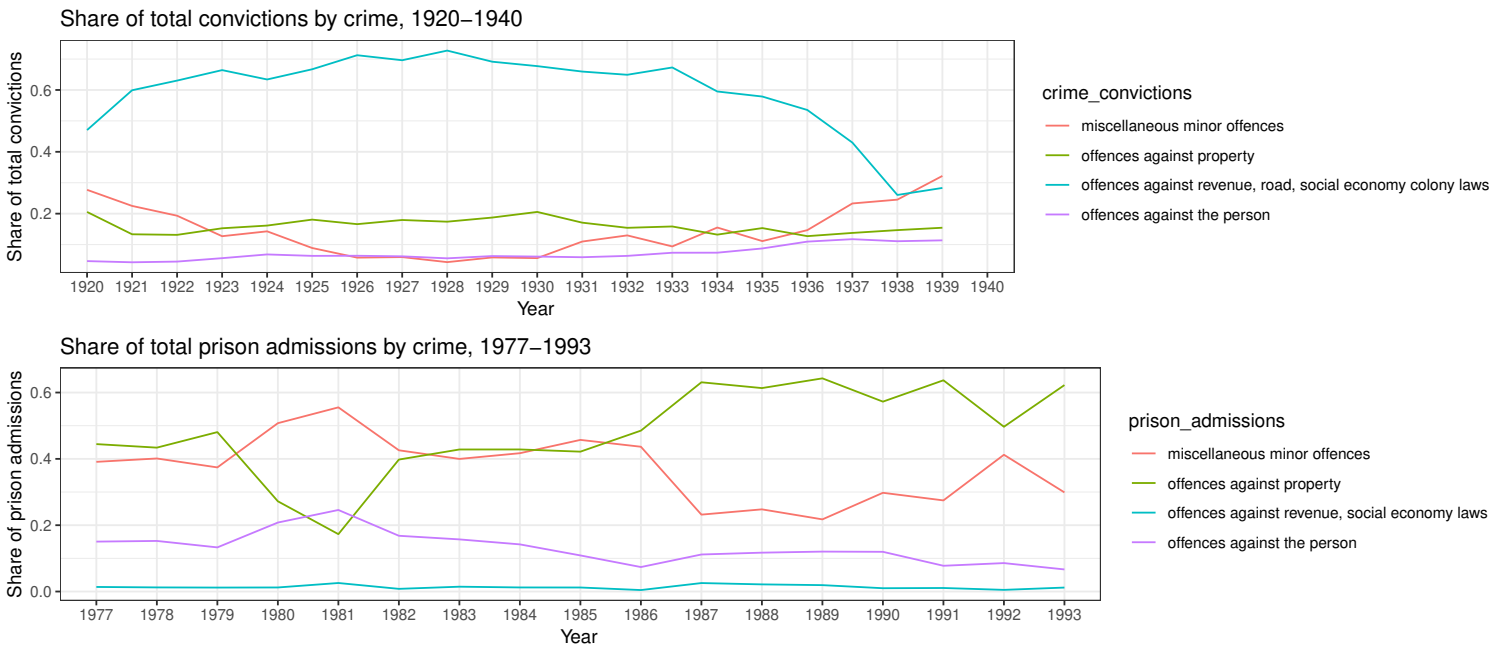


Figure: Share of total convictions in colonial courts and share of total prison admissions in postcolonial period by crime in Nigeria, 1920-1993.

Prison labor in British colonial Nigeria

- North/South differences in Native Admin (>North) vs colonial (>South) Prisons
- Unpaid prison labor hired out to govt. depts only- public works department (PWD), Railways and Harbors, Police, Public Health, Education top consumers. Types HL and LL (73-91% in South):
  - Unskilled hard labor (HL): "coaling ship, grass-cutting, painting and refuse disposal" etc
  - Skilled hard labor: "basket-weaving, brick-making, carpentry, clerical work, cooking, laundering, mat-making, masonry and tailoring" etc
  - Light labor (LL): cell-cleaning, lamp-trimming, sweeping" etc
- In Nigeria- quarries in Abeokuta province, coalfields in Enugu, industries in Lagos, Eastern railway from Port-Harcourt in Enugu province all use large gangs of prison labor etc- much of coal mining and railroad construction in SE Nigeria
- LT prisoners- trade like carpentry, basket making (uniforms etc) for cash returns
- Change in tax structure of postcolonial economy $->$ prison labor no longer a major feature of state public finance

Change in composition of tax revenue in Nigeria, 1930-1980

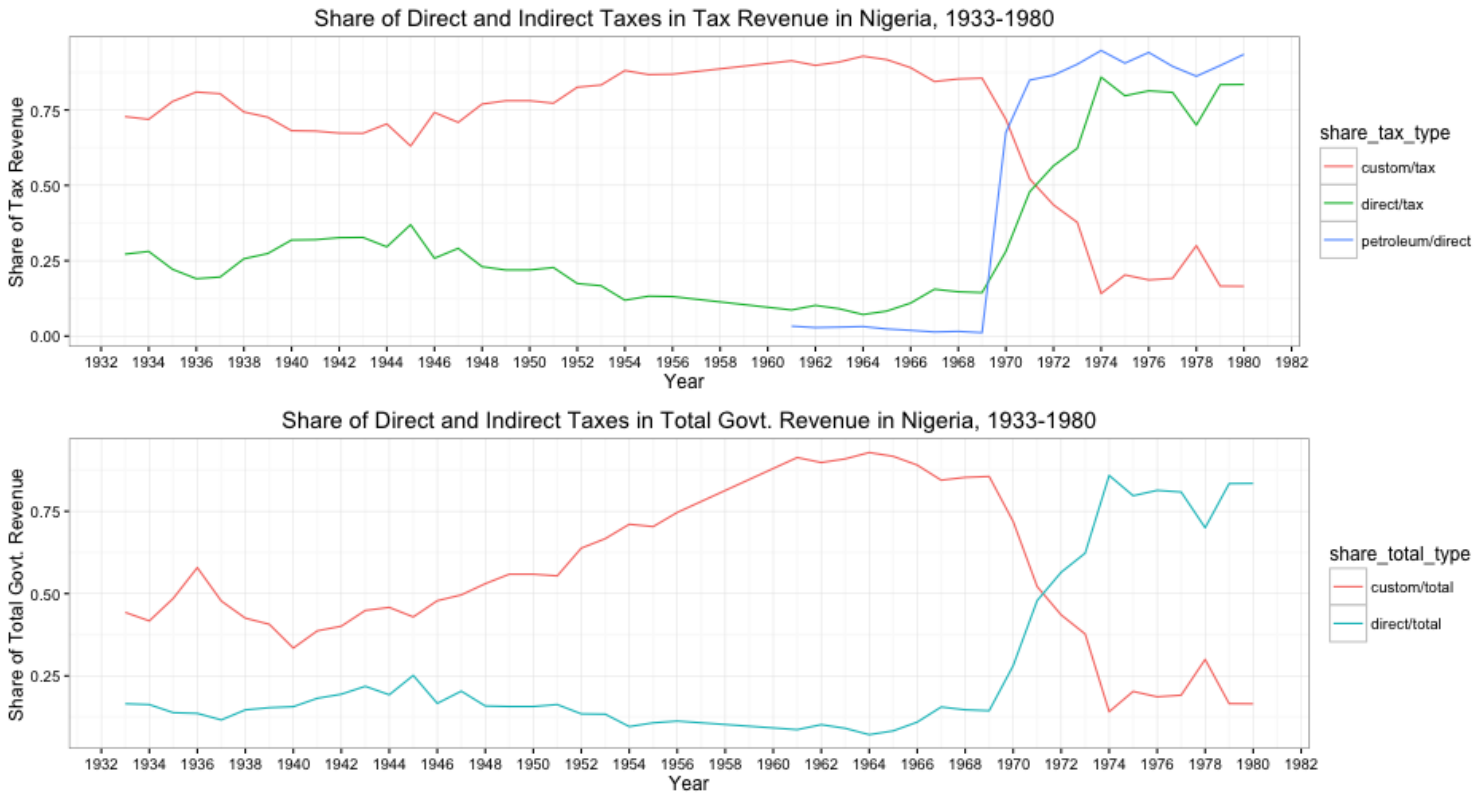


Figure: Composition of Tax Revenue in Nigeria, 1930-1980

Qualitative accounts: Addressing labor shortages with prison labor in British colonial Nigeria

- E.g.: 1920s "many of the inmates in Owerri prison in South-Eastern Nigeria were young men who had resisted compulsory labor, only to be imprisoned and employed in chains as prison labor" (Ekechi, 1989)
- Similar to US convict labor use over industrial period, e.g. Western North Carolina Railroad from 1855 to 1894 in the US (Fogel, 1995; Browne, 2007; Ayers, 1984; Myers, 1991)
- 1911 Gov of NN: "The value (calculated at 2/3 of the market rate) of prisoners' labor in connection with public works, which would otherwise have had to be paid for in cash was 3,878 pounds. If calculated at the ordinary market rates the value of the prisoners' useful labor would have exceeded the entire cost of the Prison Department" (Abiodun, 2017; Salau, 2015)
- Sometimes explicit: response to 1923 wage labor request of British sanitary inspector: 'the officials asked the prison department to find ways to either increase the prison population or recruit convicts from outstation prisons to complete the tasks." (NAI, CSO 26/2 09591 Vol.1 'Lieutenant Governor Southern Province to Resident Calabar Province: Memorandum on Prison labor' 23rd April 1923)
- Beverley in the 1916 Annual Report on Prisons lists 2 main reasons for creating categories of prisons according to prison sentence as (a) to place 'special prisons' in "townships which are on good lines of communication and afford the most suitable description of penal labour." and (b) "the ensuring, as far as possible, of an automatic and constant supply of prisoners to each class of prisons. At the end of the year, the system appeared to be working well; the prison population was evenly distributed, and nowhere was there shortage of convict labour."

Q1: Historical Data

- British colonial Blue Books and Annual Report on Prisons, Nigeria, 1920-1959, District/Province level
  - Prison data
  - Wages
  - Public works expenditure
  - Railroad (colonial only)
- A note on Native Administration prisons: Lower bound estimates

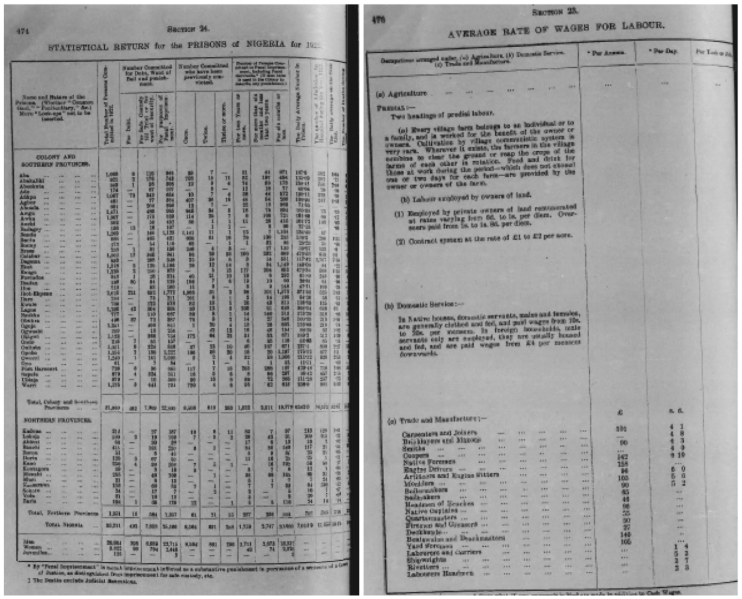


Figure: Example of archival data on prisons and wages from the British Blue Books (1922)

Colonial prisons, regions and railroad network in Nigeria

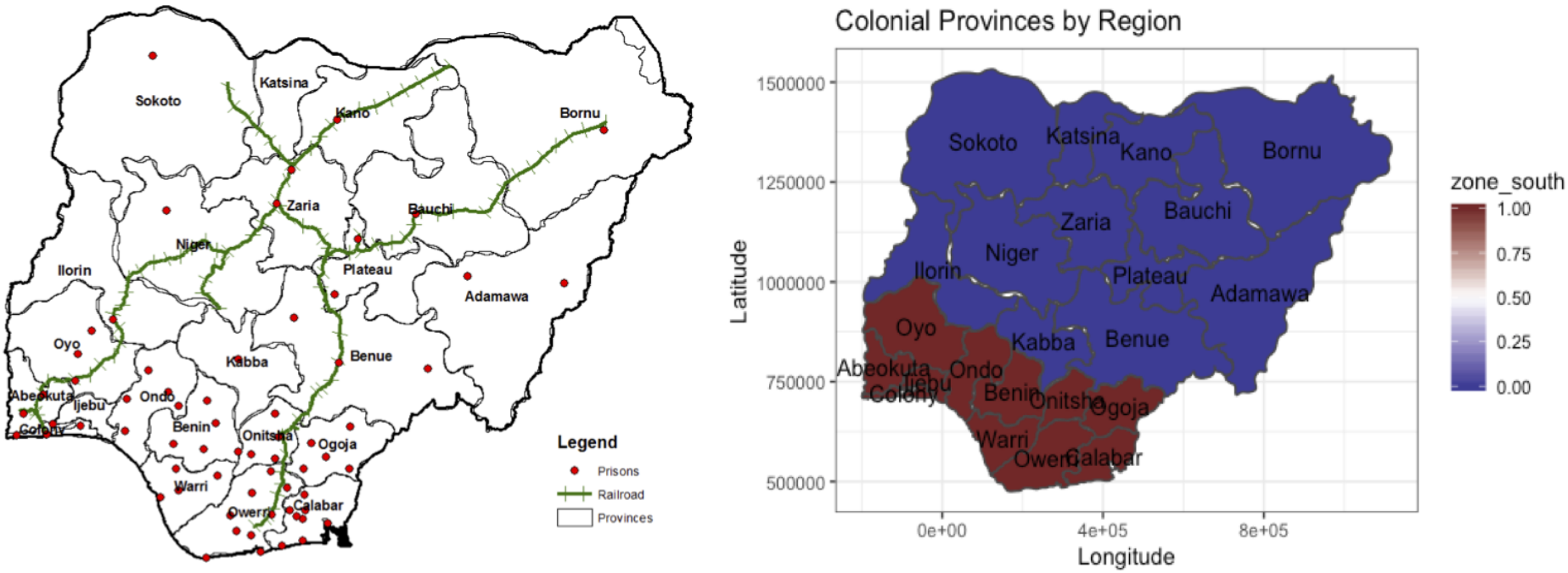


Figure: Nigeria provinces with colonial prison locations and railroad network shown (left) and regions (right)

Q1: How important was prison labor for colonial public finance/public works construction and maintenance?

$$\text{Value of prison labor}_t = \text{Annual wages}_t \times \sum_{n=1}^{N} \text{Prisoners}_{nt} \quad (1)$$

- $Prisoners_{nt}$ is the daily average number of people in prisons over n days in the year from archival records
- Implied labor costs = Value of prison labor [lower bound estimate]
- Gross value of prison labor and net value of prison labor (less food (35%) and total prison maintenance costs (most expansive))
- Relative value of prison labor = Value of prison labor / Public works expenditure
- Robustness checks: Compare with colonial estimates of value of prison labor

Wages, prisoner costs and daily average number in prisons in colonial Nigeria, 1920-1959

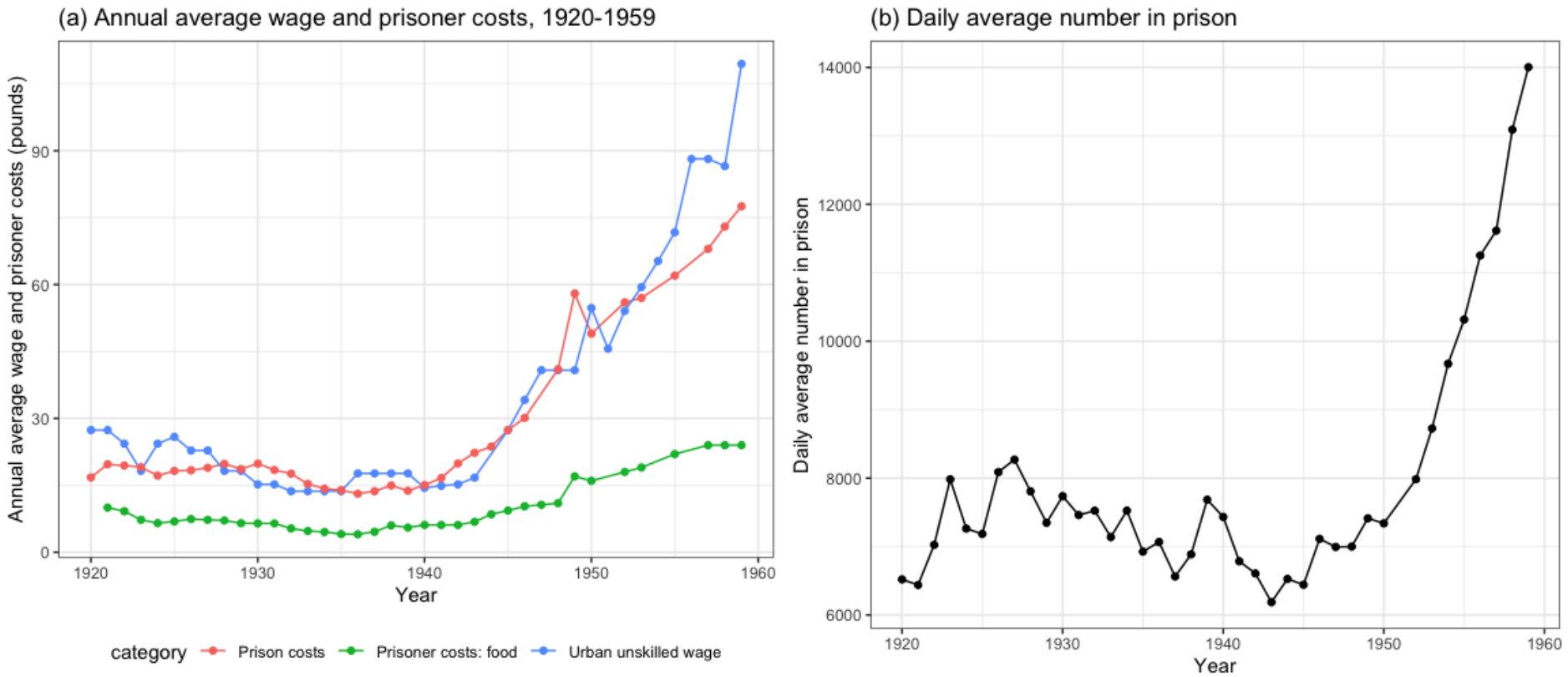


Figure: Wages, prisoner costs and daily average number in prisons in colonial Nigeria, 1920-1959

Summary of results on value of prison labor in colonial Nigeria

- Prison labor is economically valuable to colonial regime. Significant share public works expenditure- gross value is 40-249% (mean 101%) of public works expenditure in colonial Nigeria [lower bound]
- Net value, accounting for most expansive costs of prisoner upkeep up to 42% (mean 5%), $>> 0 \approx 60\%$ years
- Colonial estimates: Prisoners' labor valued bet 60-80% below market rate over 1919-1925 (confirms historical lit trends). Underestimate value of prison labor to keep costs of administration for their peer departments low while attempting to balance their budgets

Q2: Data on Incarceration Rates and Economic Shocks

- Incarceration data:
  - British colonial Blue Books- Nigeria, 1920-1938, District/Province level:
  - Prison data: number of newly admitted prisoners per 100,000 pop., ST, LT (Falsification tests on sentence)
  - Nigeria Annual Abstract of Statistics, 1971-1995, District/State level:
  - Prison data: prisoners per 100,000 pop.
- Economic shocks data:
  - Rainfall z-scores, weather stations, Blue Books, 1920-1938
  - Rainfall z-scores, NASA MERRA-2, 1980-1995
  - Export price on major cash crop exports (cocoa, palm oil and groundnuts), Wageningen University African Commodity Trade Database (ACTD)
  - Land suitability and colonial crop production data from the Global Agro-Ecological Zones (GAEZ) and Blue Books

Average incarceration rate falls by ≈ 40% Between the colonial (1920-1938) and postcolonial (1971-1995) periods

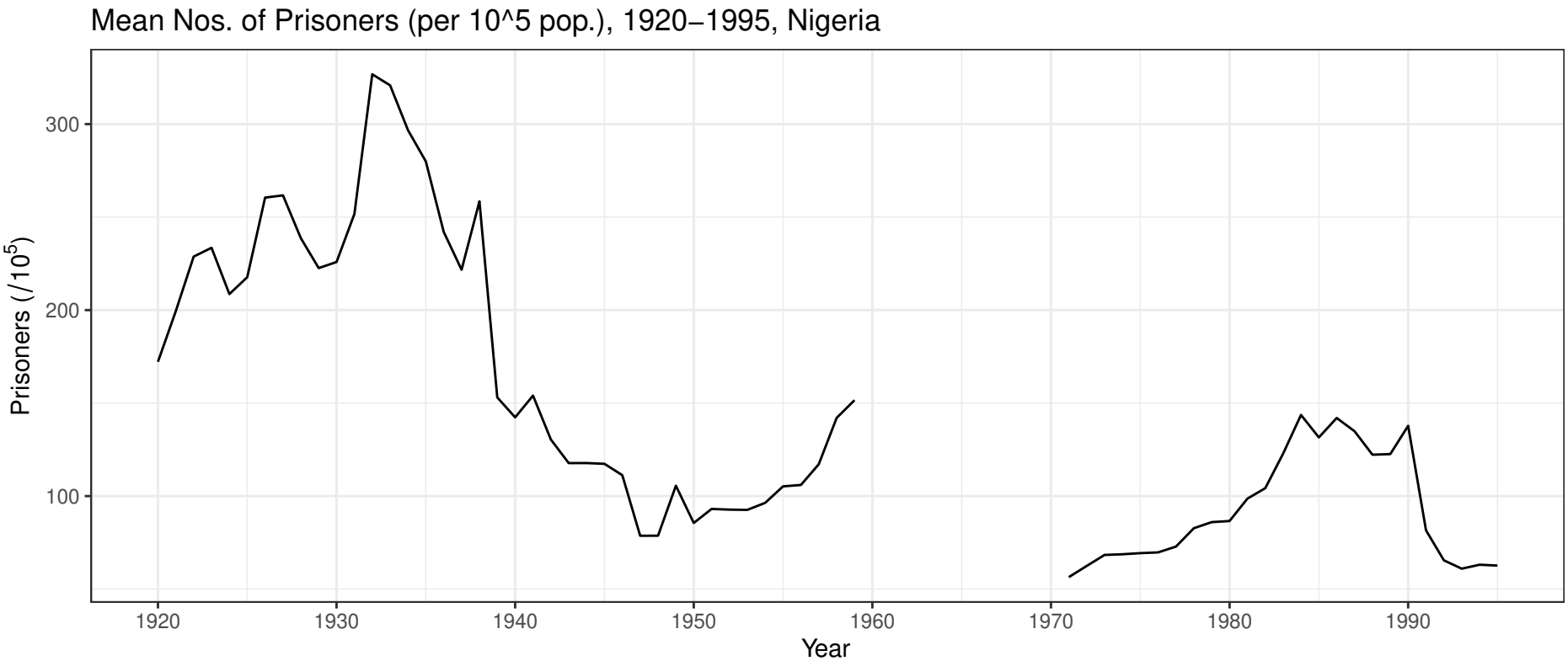


Figure: Mean number of prisoners per 100,000 population, 1920-1995

Spatial distribution of incarceration rates in colonial and postcolonial Nigeria

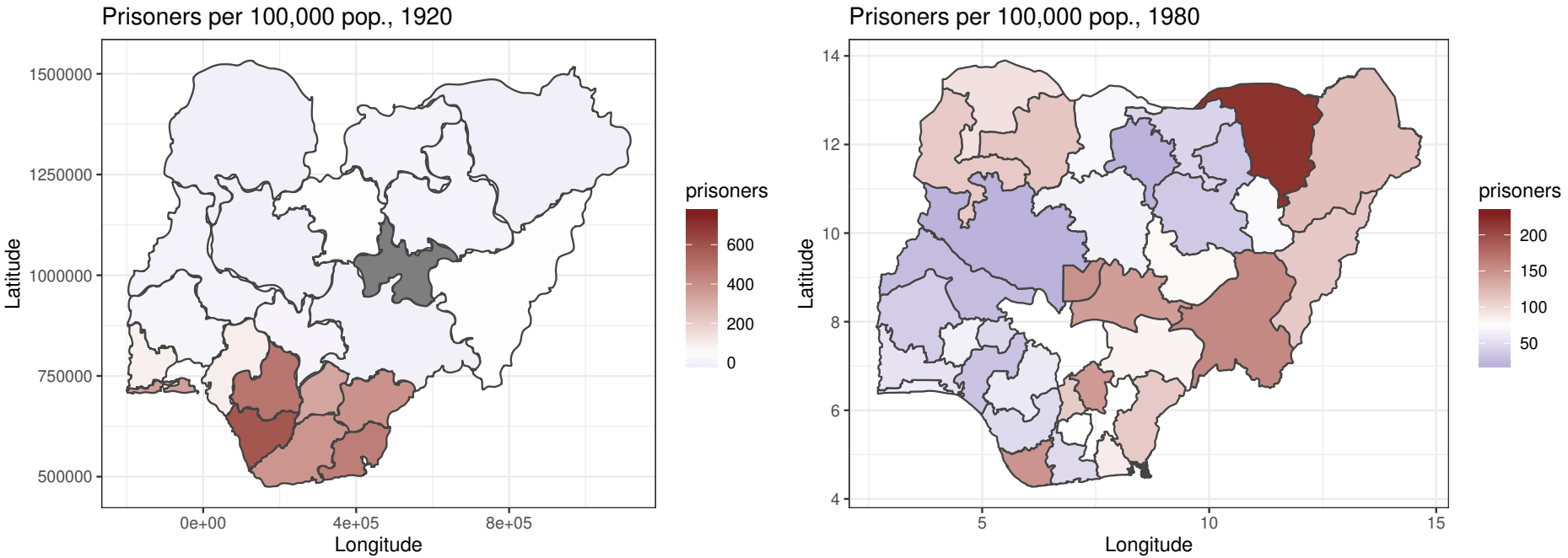


Figure: Prison populations in colonial (1920) and postcolonial (1980) Nigeria

Spatial distribution of cash crop production in colonial Nigeria (North vs South)

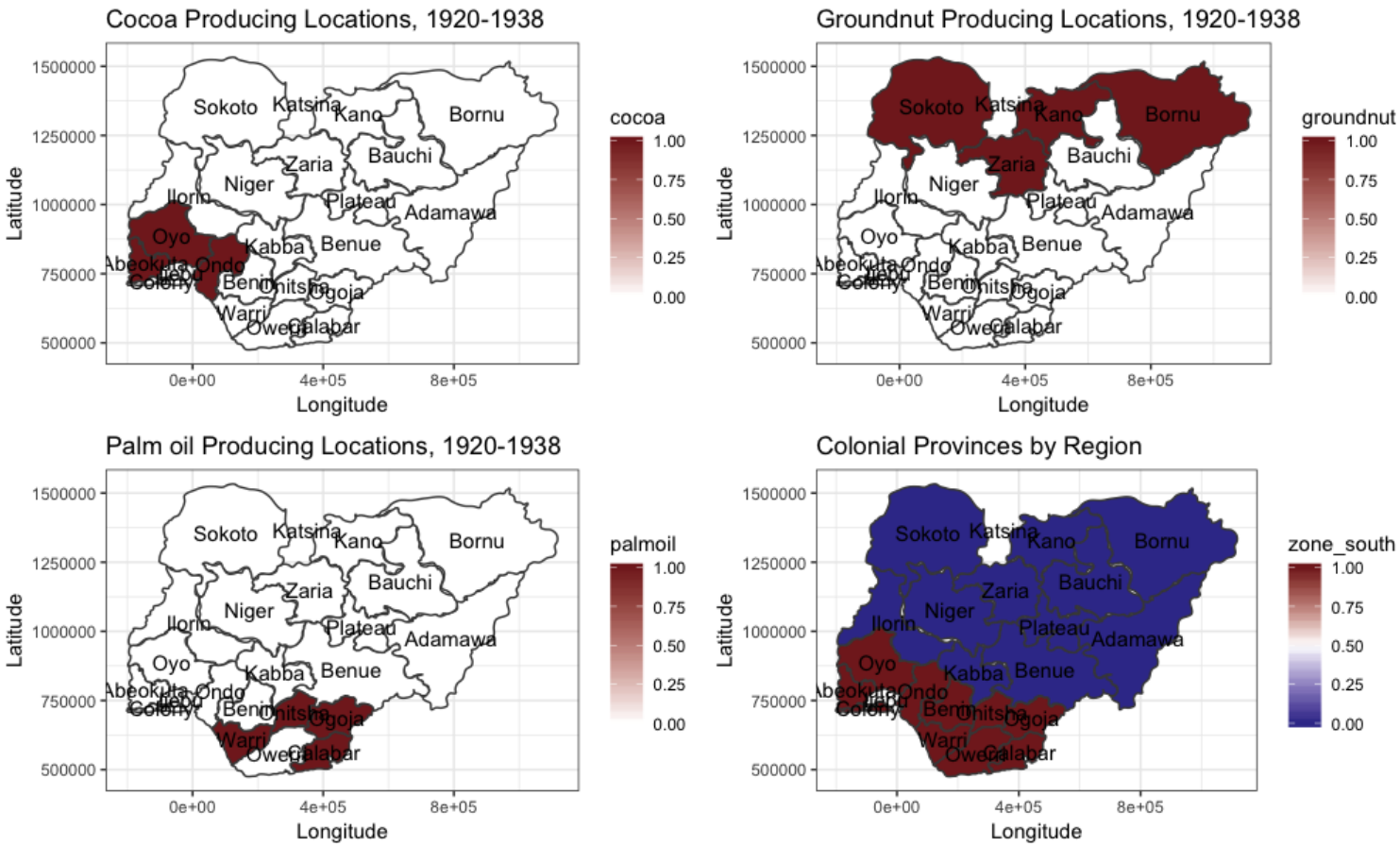
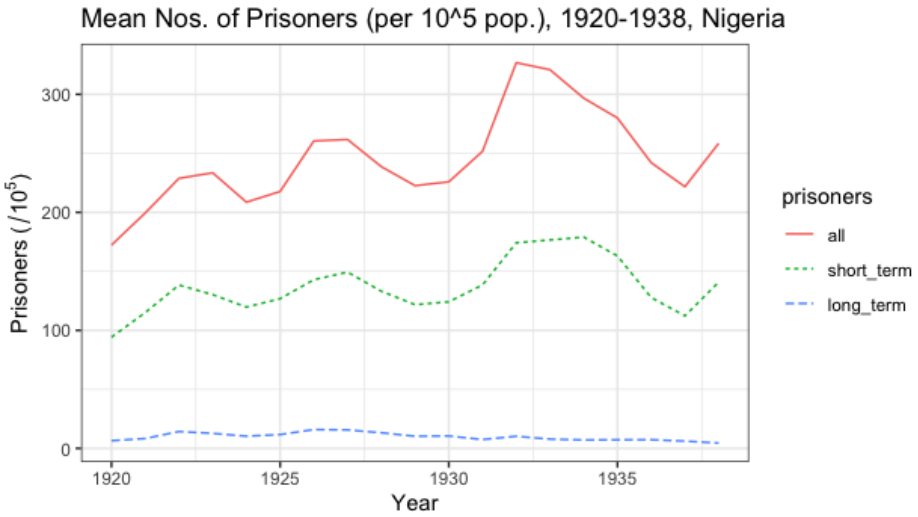
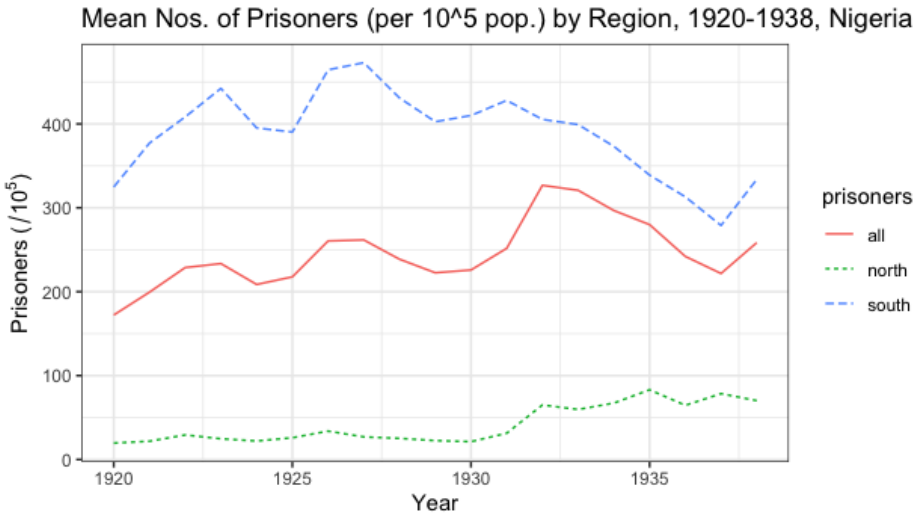
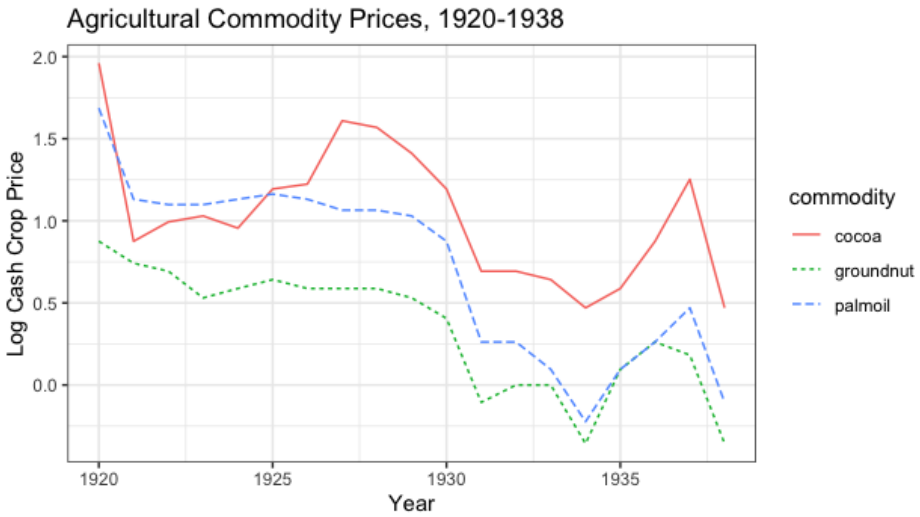


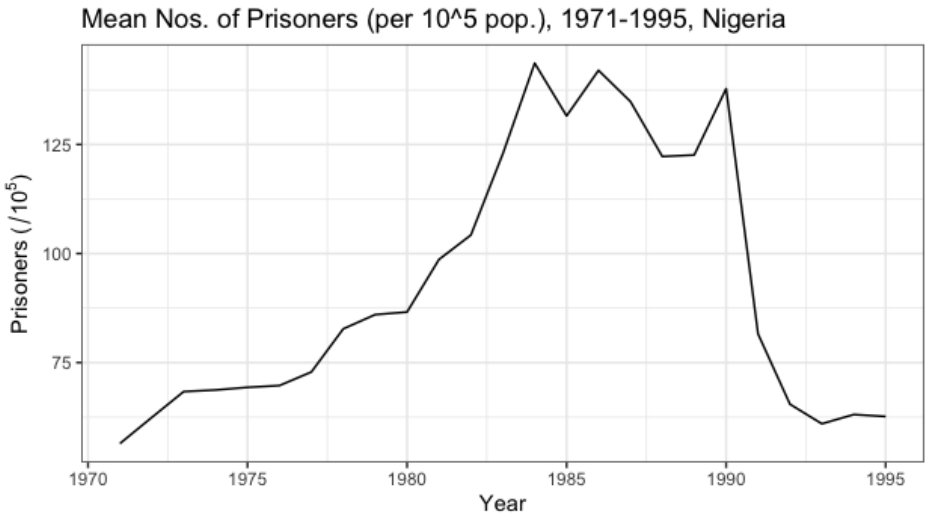
Figure: Agricultural commodity production in colonial Nigeria

Prisoners and agricultural commodity prices in Nigeria, 1920-1995

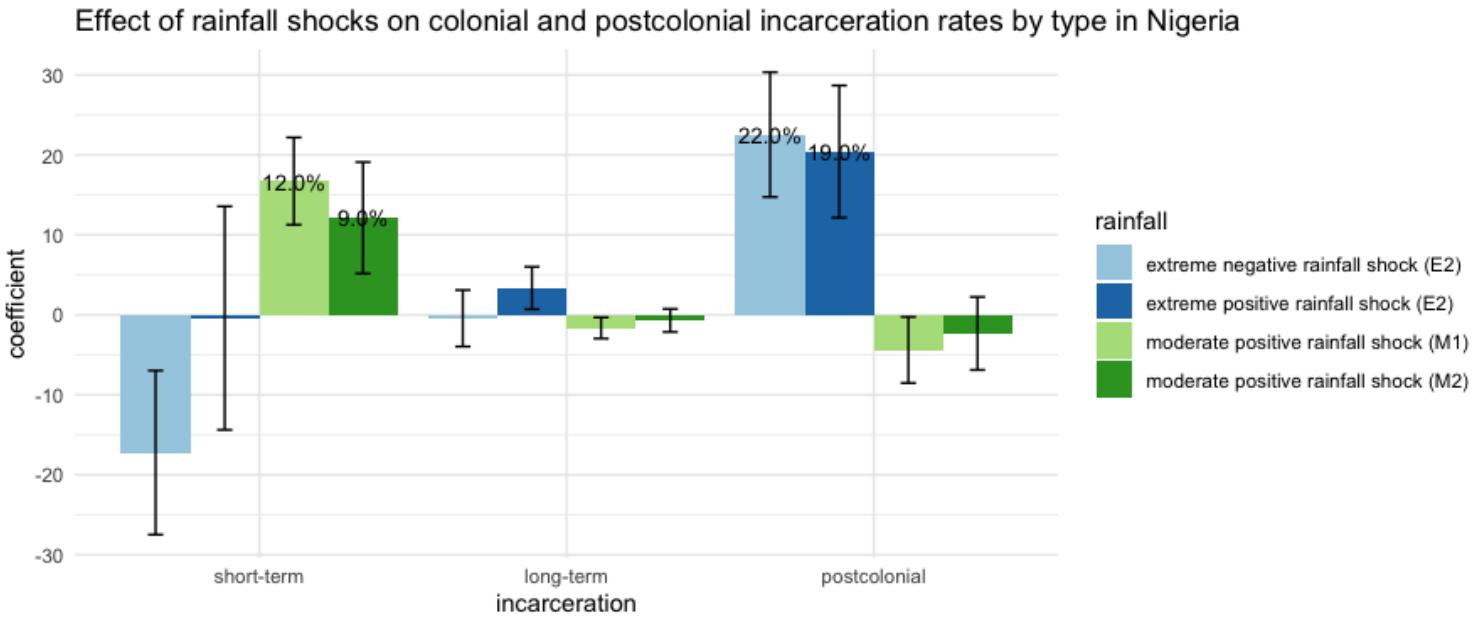


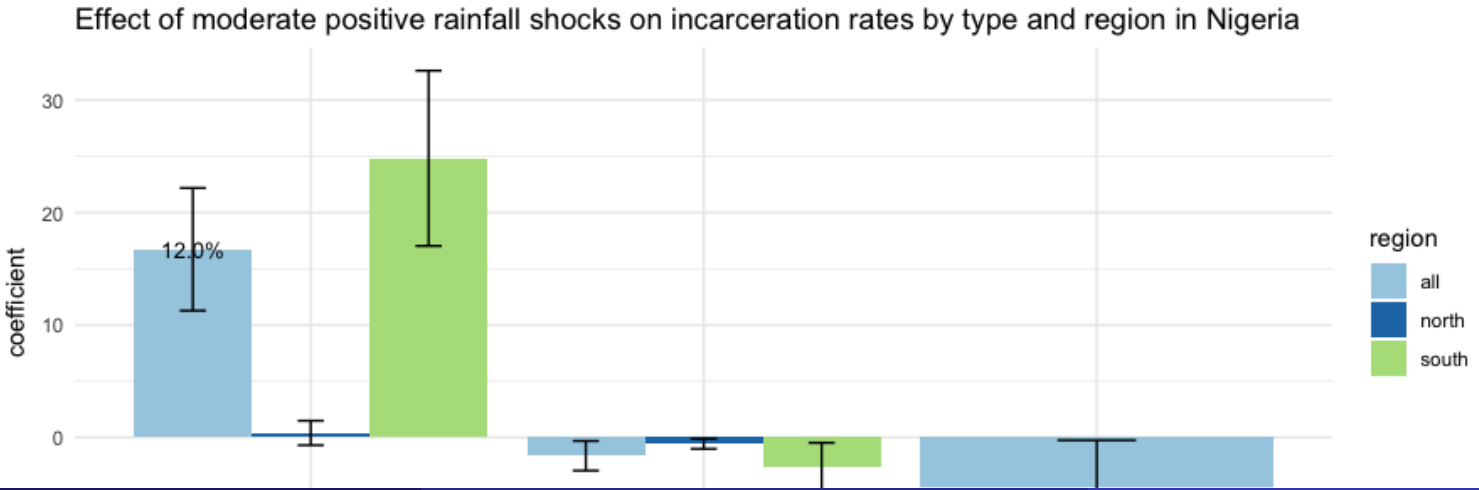




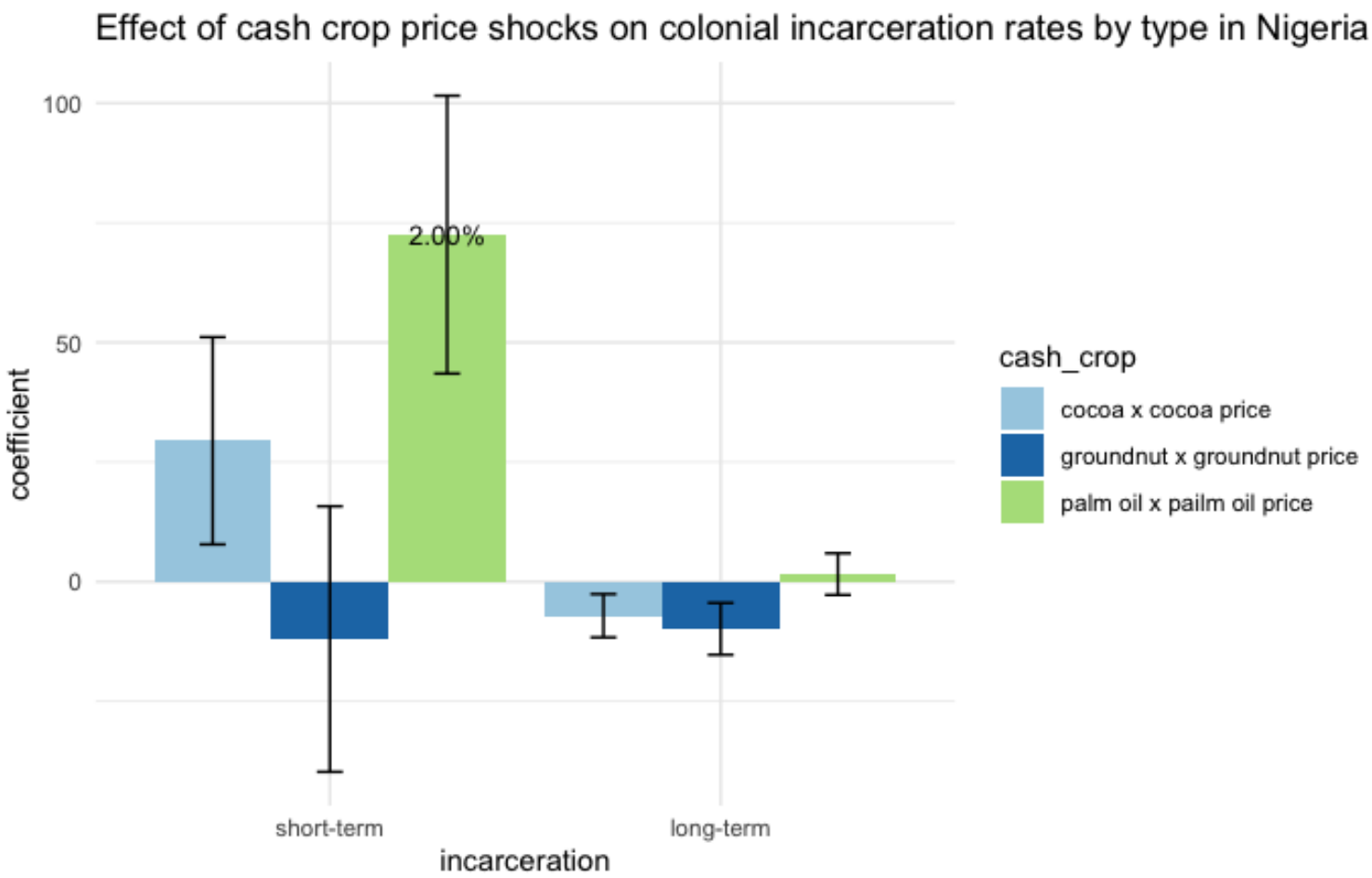


Moderate positive rainfall shocks increase short-term colonial incarceration rates





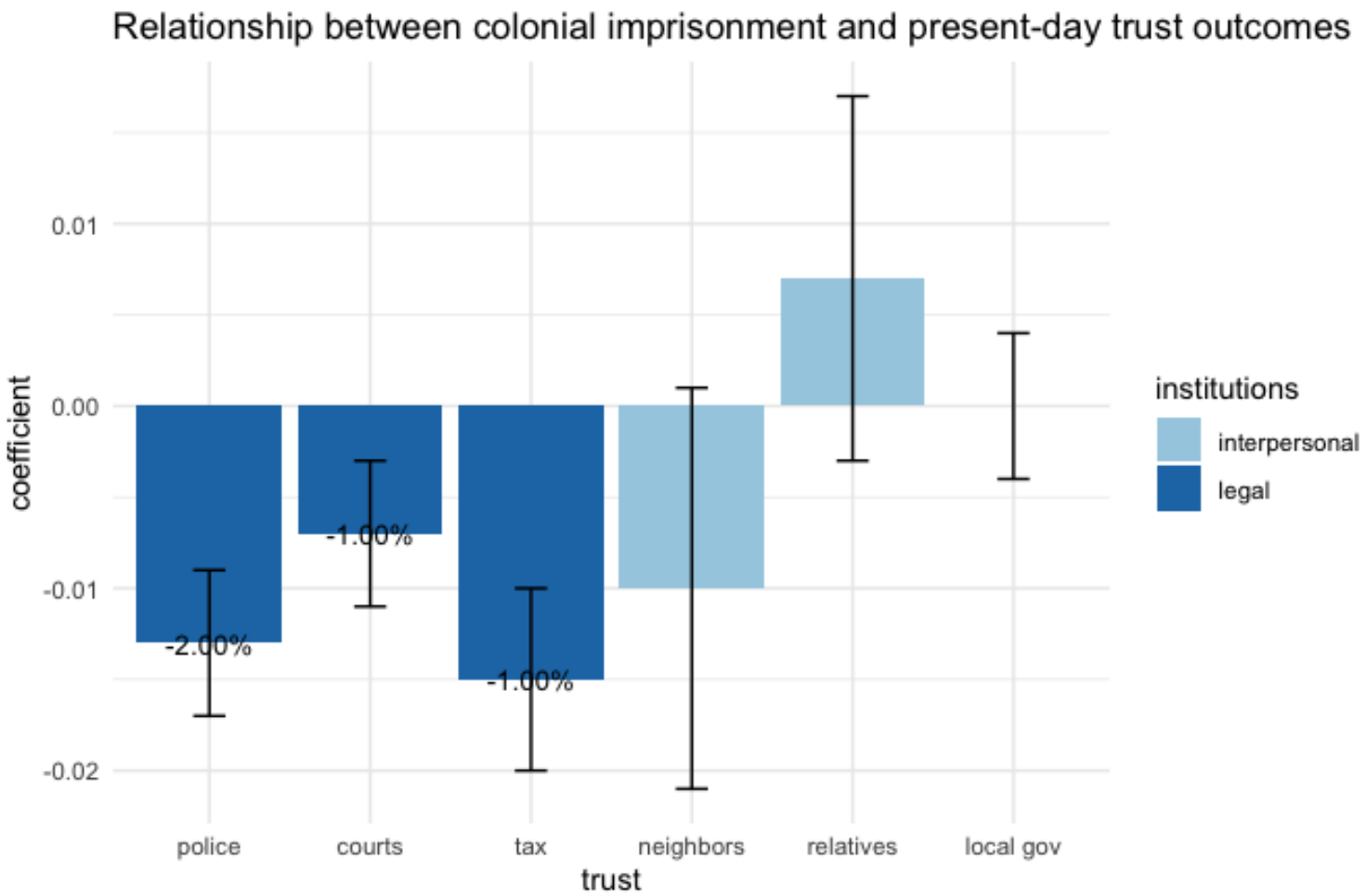
Increases in prices of relatively higher valued southern crops like palm oil increase short-term incarceration rates



Q3: Data on Contemporary Trust

- Geocoded data on trust from Afrobarometer surveys
- Over 5 rounds, 2003-2014
- Trust in historical legal institutions: trust in courts, police, and trust in tax administration
- Falsification test: Interpersonal trust: trust in neighbors, trust in relatives, trust in local governing council member
- Population density, individual controls, geographic controls, disease controls and controls for precolonial and colonial institutions

OLS Estimates: Respondents from areas with higher colonial imprisonment report lower trust in legal institutions like police



Suggestive evidence from other regions that coercive colonial policing may have reduced contemporary trust in police

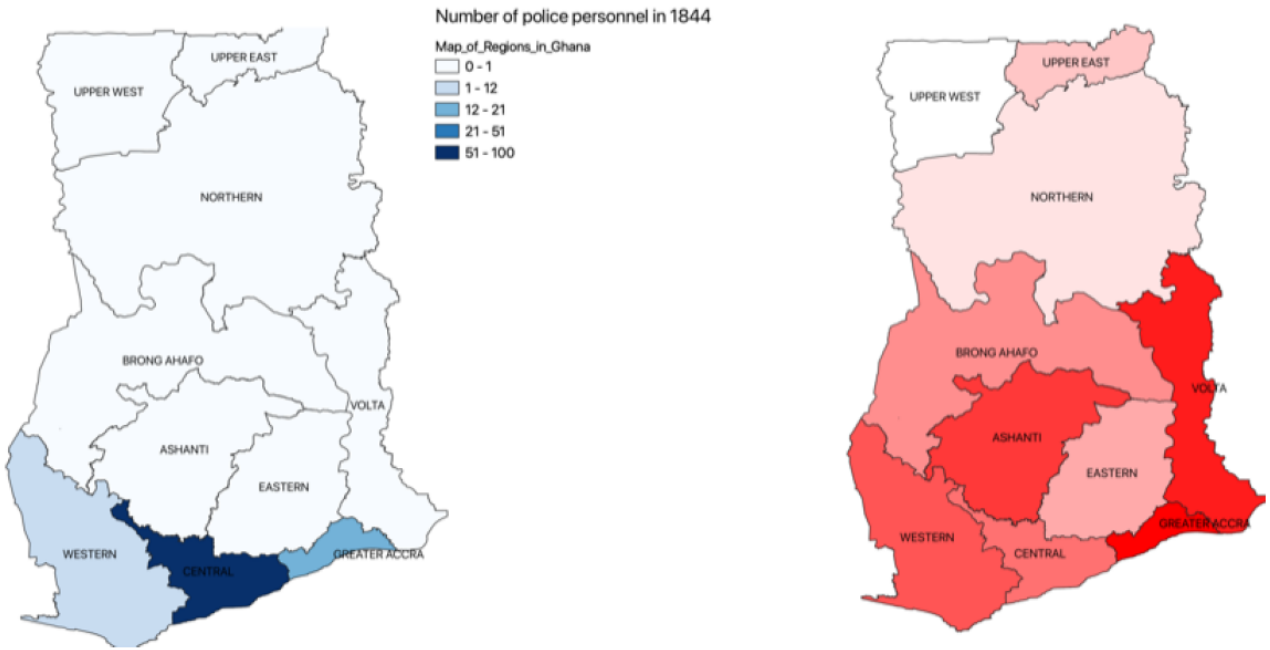


Figure 6: Regional variation in colonial police presence and modern trust (In the right panel, darker reds show higher mistrust)

Figure: Evidence from Ghana (Source: Naasey Kanko Arthur, 2021)

Conclusion

1. Who built colonial era infrastructure in Africa? Often African forced labor and prison labor. Lessons for long-run colonial development studies
2. Prison labor economically valuable to colonial regime. Significant share of public works expenditures. Strictly positive net value in most of colonial period
3. Incarceration rates are procyclical during colonial period. Positive economic shocks inc. colonial incarceration $->$ labor demand, shortages and tight labor markets
4. Result is reversed in the postcolonial period where prison labor is not a major feature of state policy and public finance
5. Areas with high rates of colonial imprisonment have lower trust in legal institutions like police today, no effect on interpersonal trust
6. First estimates on value of prison labor, effects on incarceration and long-term trust in police
7. Policy implications for the use of prison labor today