

Building State Capacity: The Role of Institutional Experimentation and Scientific Innovation

Prepared for Africa Conference/ Crafts Lecture/ CAGE Launch Warwick (UK)

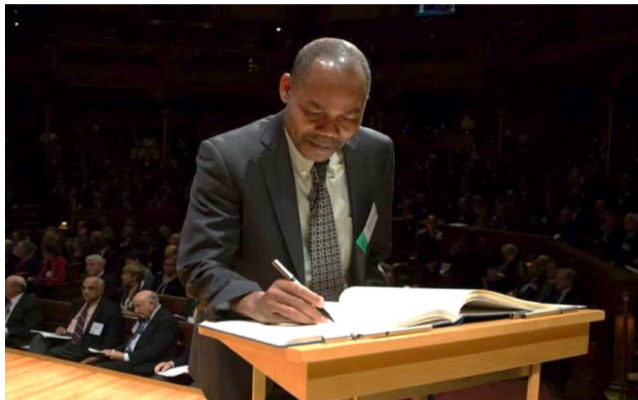
Leonard Wantchekon (Princeton and ASE)

29th April 2025



Figure 1: Maths Student and Pro-democracy Activist (1983)

Fellow of the American Academy of Arts and Sciences in 2013 and a Fellow of the Econometric Society in 2018.



Induction Ceremony at the American Academy of Arts and Sciences (2013)

Outline

Introduction

Institutional Editing and Experimentation

Deliberation as an Edit

Theory

Bureaucratic Performance and Agency

Deliberation and Education Policy

Science and State Capacity

Mechanisms

Conclusion

PASER Hub

Introduction

Growth, productivity and misallocation

- ▶ Contemporary macro development scholarship explains cross-country differences in income through divergent productivity (TFP) and the misallocation of factors of production (e.g., Restuccia and Rogerson, 2008; Hsieh and Klenow, 2009)
- ▶ **Stylized fact:** Disparities in capital and labor account for at most 50% of the differences in income-per-capita (Klenow and Rodriguez-Clare, 1997; Hall and Jones, 1996; see Caselli, 2005 for a review)
- ▶ TFP is responsible for rest 50%. Also referred to as Social Infrastructure of Development; it includes Social Cohesion and Governance (Hall and Jones, 1999).
- ▶ At the core of social infrastructure lies **State Capacity**.

What is State Capacity & How is it Measured?

- ▶ The ability of the state to get things done (Besley, 2022)
- ▶ 4 Pillars of State Capacity: **Autonomy** (Skocpol, 1985), **Authority** (Mann, 1984 ; Migdal, 1988), **Management**, (Mann, 1984 ; Fukuyama, 2004) & **Resources** (Tilly, 1985; Levi, 1988 ; Besley and Perrson, 2009)
- ▶ Coercive power, public good provision, taxation
- ▶ Macroeconomic management, structural interventions

A Critique

- ▶ The aforementioned indicators seem to be too technocratic, apolitical and focused on resource generation.
- ▶ This approach lacks a clear normative benchmark. The definition does not look at “how are things getting done?”
- ▶ It tends to ignore social & agency cost, and doesn't explicitly integrate the nature of State Institution and their ability to mobilize the individual and collective “capabilities” of citizens (Sen,1985)
- ▶ Transparency and citizen engagement may strengthen of state capacity by reducing information cost of policy implementation stimulating state holders,Äô investment in the outcomes. Khemani et al, 2016

Two Perspectives on Building State Capacity

- ▶ Consistent with this perspective on state capacity, there is a rich literature on the role of talent and expertise management in building state capacity (eg.: Francois, 2000 ; Ritz et al, 2016 ; Dal Bó et al, 2013 & 2018; Bergeron et al, 2020 & 2022; Okunogbe, 2022 & 2023; Pomeranz, 2015 & 2017)
- ▶ Using insights from Sen's capability approach (Sen, 1985), from Social Psychology (Bandura, 1999) & Sociology (Emirbayer & Mische,1998), we claim that State Capacity results from “Individuals or Groups with different objectives coming together under structural constraints to find common ground and coordinate to achieve it” (See Sharma, Voorneveld & Wantchekon, 2025)

Two Perspectives on Building State Capacity: II

- ▶ Thus, in many African countries, state failure is primarily an agency failure (Aman-Rana, et al, 2024)
- ▶ It also the results of distortionary politics. originating from institutions that that reward politicians and state actors for designing and implementing policies such as preferential regulation, or racial/gender discrimination that generate the misallocation of factors of production (Canen and Wantchekon, 2022)

Roadmap

- ▶ The goal of the talk is to propose an approach to strengthening State Capacity through institutional editing and experimentation.
- ▶ I will focus on institutions that promote political agency (public reason, deliberation, social contracts).
- ▶ I will show that deliberation helps strengthen state capacity through (i) better information sharing, (ii) prevention of coordination failure and, (iii) promotion of individual and group agency on the part of the citizens.
- ▶ I will later show how Scientific Innovation can profoundly shape capacity and improve the effectiveness of institutional editing.

Institutional Editing and Experimentation

Institutional Editing: Concept and “Science analogy”

- ▶ States are similar to organisms with interconnected components.
- ▶ State capacity arises from complex interactions among these components.
- ▶ Macro changes can result from minor edits to key factors, akin to genetic editing.
- ▶ Biological insights, such as experimental methods, reveal that deliberative processes reduce distortions in governance, refining systems much like genetic editing.
- ▶ One crucial difference in social settings: Humans and organizations are strategic
- ▶ To model such interactions, we use game theory

Institutional Editing

- ▶ Common problems in economics: coordination failure, information bottlenecks
- ▶ \implies Resultant equilibrium under institution G may be “inefficient”
- ▶ **Institutional Editing**: Course correction by transforming the game G to \tilde{G}
- ▶ Mathematically, an institutional edit maps the original game to a new game:
 $\mathcal{E} : \mathcal{G} \rightarrow \tilde{\mathcal{G}}$

How Institutional Editing Works

- ▶ Instead of watershed moments (See García-Ponce and Wantchekon, 2023 and Dercon, 2023), focus on incremental changes
- ▶ Key idea: Add or deduct stages in the original game to arrive at a new game in which the desired outcome is an equilibrium
- ▶ Coordination problem/strategic uncertainty \implies commitment device
 - ▶ Adding a stage for voting/deliberation
- ▶ Information asymmetry/structural uncertainty \implies information provision/design (Bergemann and Morris, 2019)
 - ▶ Adding a stage for information provision

Why Institutional Editing Should Work

- ▶ Institutions are a way to put stakeholders at the centre: as players with actions, information, payoffs. . .
- ▶ Incremental changes in institution change the behavior of players
- ▶ Changed behavior of players results in changed outcomes relevant for state capacity
- ▶ Potential agency costs/rents in the top-down approach such as moral hazard and adverse selection internalized
- ▶ Falsifiable, straightforward and clear theoretical predictions

Institutional Experimentation

Question: How do we measure the impact of a new institution?

- ▶ Institutional Experimentation aims at identifying the added value on an “edited” institution (henceforth institution 1) as compared to status quo institution (henceforth institution 0) . See *Atchade et al, 2021* for details.
- ▶ The edit in institution might lead to two complementary effects :
 - ▶ a better policy being chosen (an intermediate outcome).
 - ▶ more effort exerted towards the policy's implementation as a result of optimism/excitement among stakeholders.
- ▶ Together these two effects shape the final outcome.

More Technically

Let $Y(i, d)$ be the outcome for endogenously chosen policy $d \in \{1, \dots, L\}$ by institution $i \in \{0, 1\}$

- ▶ The **average institution effect** is defined by :

$$\tau_{0,1} = \mathbf{E}[Y(1, d(1)) - Y(0, d(0))] \quad (1)$$

- ▶ The **intrinsic effect** of institution 1 is captured by the additional effort/investment induced by the updated beliefs. (See Atchade et al, 2021 for details)
- ▶ We define the intrinsic effect of institution 1 compared to institution 0 under policy D by:

$$\tau_{0,1}(D) = \mathbf{E}[Y(1, d) - Y(0, d) \mid d = D] \quad (2)$$

Key Steps in Institutional Experimentation

1. Define and randomly assign institution 1 and institution 0.
2. Ensure treatment homogeneity (game form and implementation).
3. Measure the individual beliefs over the policy alternatives before the voting/deliberation stage and after the policy outcome.

Deliberation as an Edit

“Cultural Justification”: Deliberation as the essence of African Political Culture

- ▶ “The one who is alone is an animal but those that are two are human beings” - A Chewa (Maravi) proverb (Kayange, 2018)
- ▶ Wiredu, 1995 asserts that human beings are by nature mutually dependent on one another; and that this mutual interdependence is a “human mode of being ”
- ▶ Consensus Democracy was widespread across pre-colonial Africa - Marawi Kingdom (present-day Malawi, Zambia and Mozambique), Buganda people of Uganda, Zulu in South Africa and Ashantis of Ghana. This consensus was typically achieved through deliberation.

“Cultural Justification”: Deliberation as the essence of African Political Culture

- ▶ “Deliberations in a consensual democratic forum aim at restoring goodwill through reconciliation and persuasive discourse among participants who acknowledge and respect the deliberative capacity of other participants by recognising that dialogue ‚Äòpresupposes not just two parties (at least) but also two conflicting positions’ ” - Wiredu, 1997 (Ajei, 2016)

Deliberation

- ▶ Key idea: introduce deliberation within an existing institution so that
- ▶ Stakeholders may share information with each other
- ▶ Negotiate about the contributions expected from each other
- ▶ Underlying theme: The players have a more “active role” in the institution and may act more responsibly

Theory & Experiments on Deliberation for Building State Capacity

I present three projects that highlight the principles above.

1. Theory: Public goods provision and deliberation (Sharma, Voorneveld & Wantchekon, 2025)
2. Experiment: Bureaucratic deliberation and performance (Aman-Rana, Wantchekon and Kovo, 2024)
3. Experiment: Public deliberation and education policy (Wantchekon et al., 2023)

Theory

Sharma, Voorneveld & Wantchekon (2025)

- ▶ Setting: Multiple dimensions of public good and each player prefers a possibly different set
- ▶ School: student-teacher ratio, curriculum, bathroom facilities, . . .
- ▶ Different parents may want different attributes
- ▶ Financing a dimension requires voluntary contributions
- ▶ \implies A generalized public goods game
- ▶ Standard result: multiple inefficient Nash equilibria where few players contribute
- ▶ Can deliberation improve outcomes? If so, how?

Group Formation through Deliberation

- ▶ **Institution:** A centralized mechanism which dictates how goods will be financed (eg: Min. k players must contribute)
- ▶ **Edit:** Suppose now that the planner organizes a townhall, asks players to talk to each other and then offer their contributions as a group
- ▶ We keep as a black-box the exact protocol of deliberation and what players communicate to each other
- ▶ Instead, we let groups satisfy an intuitive and simple incentive compatibility condition
- ▶ **No-growth:** Groups cannot improve by inviting more players
- ▶ What does this yield?

Results

Under no-growth:

- ▶ **Collective Agency:** Each group is responsible contributes for its members' preferences
- ▶ **Pareto Optimality:** No player can Pareto improve upon their outcomes
- ▶ The exercise provides a normative benchmark of what deliberation can achieve
- ▶ \implies More clarity on how and what kind of deliberative practises may work in the field

Bureaucratic Performance and Agency

Aman-Rana, Wantchekon and Kovo (2023)

- ▶ Audits can help reduce corruption in local governments through external accountability [Avis, Ferraz & Finan, 2018]
- ▶ Can internal accountability be as effective? In other words : **Does the collective deliberation among bureaucrats regarding their governance enhance overall performance?**
 - ▶ (+) Increased agency and **autonomy** of bureaucrats [Rasul and Rogger, 2018; Duflo et al., 2018; Bandiera et al., 2021; Fujiwara and Wantchekon, 2013; Wantchekon and Guardado, 2023], while also providing crucial **information** regarding constraints on performance [Iaryczower, Shi & Shum, 2018; Canen & Iaryczower, 2024]
 - ▶ (-) Accountability or the sense that one is monitored can heighten tensions at the expense of internal **cohesion and trust** within organization [Mendelberg, 2002; Thompson, 2008]

Experimental design

- ▶ 3 meetings one month apart (starting Sept 2016)
 - ▶ The mayor was not invited
- ▶ Same structure: presentation and then open discussion on **external evaluation reports**
- ▶ Clear agenda
 - ▶ Meeting #1: Presentation of each **municipality's own audit reports** from last year
 - ▶ Meeting #2: Presented results from a **survey of bureaucrats** across the 20 municipalities
 - ▶ Meeting #3: Presented results from a **survey of citizens** from their own municipality
- ▶ **Control municipalities:** No deliberation

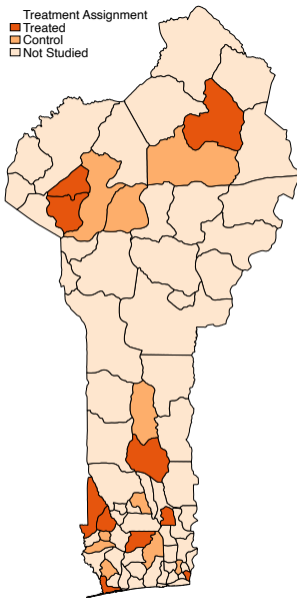


Figure 2: Spatial Distribution of Treatment Assignment.



Table 1: Did Collective Deliberation Affect Bureaucrat's Performance?

Dependent Variables	Pre-Period Control Mean	DID Estimate	Standard Error	P-Value	Randomization Inference P-Value	Obs.
	(1)	(2)	(3)	(4)	(5)	(6)
Municipal Audit-Based Performance	77.835	6.8286**	2.9555	0.032	0.000	112

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the municipality level.

Citizens' perceptions and experience with service delivery

Positive (insignificant) short-run effect of deliberation exercises on citizens' experience with government (0.17 std deviation increase; $p > 0.1$)

- ▶ Improved perceptions of accountability of bureaucrats
- ▶ Lower probability of payment of bribes
- ▶ Higher ease of access to services and better living conditions

Deliberation primarily **affected municipalities with below-average baseline performance**

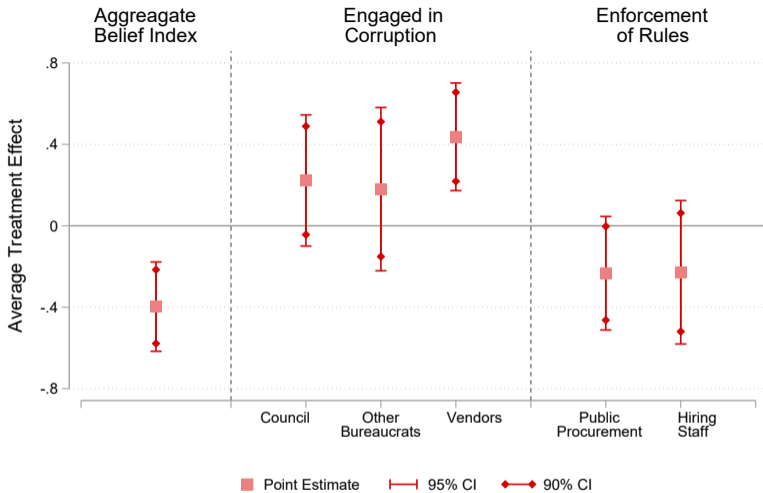
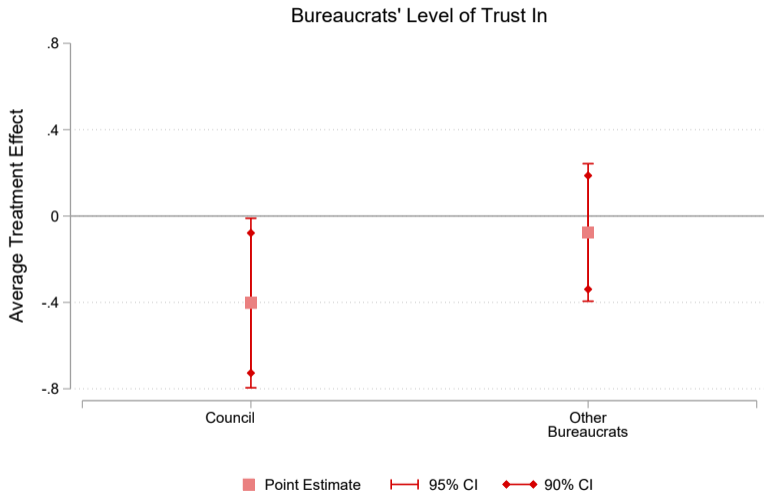


Figure 3: Impact of meetings on Bureaucrats' Perceptions

Effect on trust among bureaucrats



Mechanism key takeaways

- ▶ Lower bureaucratic **beliefs about enforcement of rules**
- ▶ Deliberation on accountability led to a **fall in bureaucratic trust and social cohesion** at the workplace

Deliberation and Education Policy

Public reason and social contracts: Do they work?

RISE Nigeria: Leverage role of deliberation in African traditional decision-making (Wantchekon et al., 2023):

- ▶ Context: Decision-making between local stakeholders in education.
- ▶ Step 1: Information gathering and dissemination on policy preferences
- ▶ Step 2: Deliberation through the organization of Education Summits
- ▶ Step 3: Drafting and signing of a “Social Contract”.
- ▶ Outcomes: Ownership of decisions, education investments, actual learning.

Implementation Summits



Social contract signed by local policymakers and education stakeholders.



Memorandum of Understanding
Nkanu West Local Government Education Summit
Maa-Mater Elizabeth High School, Asbani, Enugu State
December 9, 2020

Memorandum of Understanding signed by the SSA State Governor, (Representing the Commissioner of Education of Enugu State and Donor Representative; SBMC Representative; NGO Representative; Parent Representative; Traditional Rulers, hereafter referred to as the stakeholders.

Following the priority discussions that took place in person throughout today's Education Summit, We, the State Government of Enugu State and the stakeholders,

CONSCIOUS of the importance of education to: developing livelihoods; creating stronger communities; giving children a path to social mobility; fostering economic development, and aiding the process of creating a better future;

DESIROUS to work in unison towards the improvement of the education system in Nkanu West;

REAFFIRMING the crucial importance of every stakeholder in the design, implementation, and outcomes of all education policies; and

DETERMINED, as stakeholders and legislators, to contribute to the greatest extent of our abilities to the commitments outlined in this document,

HAVE AGREED AS FOLLOWS:

Article 1

Quality of Education

1. The State Government shall seek to spend an additional 100% increase to:
 - a. Specific Target 1: Establish a system that recruits trained and qualified teachers in the LGA. Abolish recruitment based on familiarity of government officials.
 - b. Specific Target 2: Pass the policy of lower teacher – student class ratio. Adopting the policy of 1:18 teachers per class.
 - c. Specific Target 3: Increase advocacy to encourage more male teachers in the LGA. About 39% increase in this recruitment.

Article 2

Financial Management

1. The State Government shall seek to spend an additional 100% of the existing budget on education to:
 - a. Specific Target 1: Establish at least 5 additional committees monitoring and tracking the disbursements of funds allocated Nkanu West LGA.
 - b. Specific Target 2: Increase spending allotted to teacher's welfare and retention by at least 20% of the existing budget allocation to Nkanu West LGA.
 - c. Specific Target 3: Creation of a department of education sector expenditure tracking and assessment at the local government level.

Article 3

Access to Education

1. The State Government shall seek to make an additional 100% increase to:
 - a. Specific Target 1: Introduce merit award system within school to reward efficient student.
 - b. Specific Target 2: Introduce a school local security system, deployment of a minimum of two security personnel in each school in the local government area.
 - c. Specific Target 3: Introducing a fencing policy for all schools in the local government. Each school is expected to have a well enclosed fence.
2. The State Government shall seek to make an additional 100% improvement to existing system on:
 - a. Specific Target 1: Abolish cultism and hoodlums in school environment. Incorporate the law enforcement agencies in providing a more secured environment for school and school-aged students

IN WITNESS WHEREOF, WE the Governor of Enugu State, The Commissioner of Education, and the stakeholders have signed below this Memorandum of Understanding on this 9th day of December, 2020.

Mr. Kingsley **Ammba**
Head Teacher

Igboko Onyebuchi
(Civil Society Organisation)

IRH Igwe Crescent Okiafor
Traditional Ruler

Chief **Ogbodo Chibwzor** Moses
SBMC Chairman

Uwakwe Jane Ngodi
Quality Assurance Educator

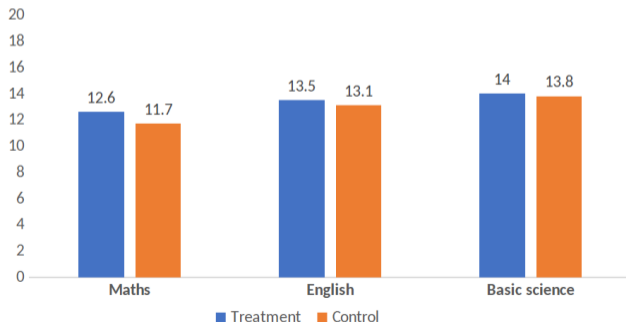
Lady Ann **Adaeze Onyebwena**
SSA to State Governor
(Representing the State Commissioner for Education)

Example from Nkanu (West LGA, Enugu State).

Summary of Results

- ▶ Strong improvements in school infrastructure
- ▶ Learning losses due to COVID-19 were smaller in treated locations
- ▶ Stakeholder commitment is inconclusive

Mean test score by Treatment vs Control LGAs



Science and State Capacity

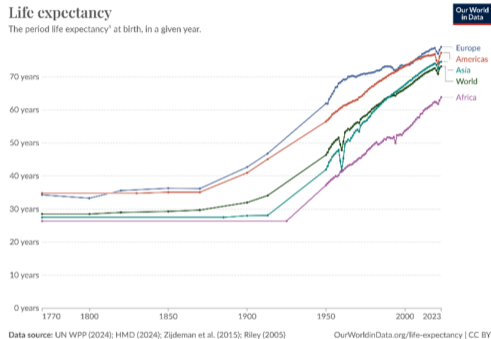
- ▶ Science is at the heart of technological progress and echoing growth economists.
- ▶ Abdul Salam asserts that Scientists are the torchbearers of progress.



Figure 4: Abdul Salam

The evidence from the past centuries is stunning

- ▶ Major breakthroughs: From 30 years to 73-76 years life expectancy.



1. Period life expectancy: Period life expectancy is a metric that summarizes death rates across all age groups in one particular year. For a given year, it represents the average lifespan for a hypothetical group of people, if they experienced the same age-specific death rates throughout their whole lives as the age-specific death rates seen in that particular year. Learn more in our articles: "Life expectancy" - What does this actually mean? and Period versus cohort measures: what's the difference?

Figure 5: Life expectancy, 1770-2023

The Hockey Stick

- ▶ Science is often viewed as the key to progress.

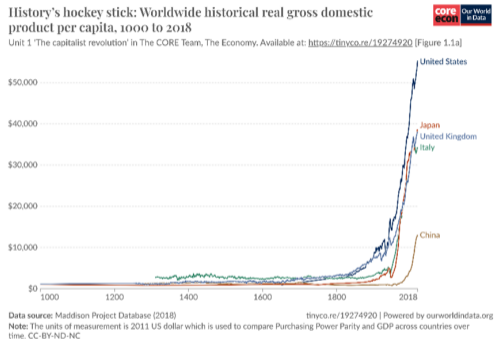


Figure 6: Real GDP per capita, 1000-2018

- ▶ Sciences drives progress, but how?

Mechanisms

Productivity

- ▶ “A country’s level of technological competence is seen as the basic factor constraining its productivity.” (Nelson, 2001).
- ▶ “Countries which have science-technology-innovation oriented global competitiveness strategies have sustainable competitiveness and long run growth.” (Şener and Sarıdoğan, 2011).
- ▶ “Technological innovation and adoption via greater investment in R&D remains a critical conduit to increased growth especially in developing nations.” (Nicolaidis, 2014).

State Capacity: Top Down Measures

- ▶ Public goods provision, taxation efficiency, and macroeconomic management (e.g. Francois, 2000; Dal Bó et al., 2018; Nistotskaya & Cingolani, 2016).
- ▶ Technology enhances the effectiveness of public service, the administrative capacity and the organization sophistication of the state (tax collection, education, health, transportation).

State Capacity: Bottom Up Measures

- ▶ Positive feedback loop between government, science and society (Zhang, 2025).
- ▶ “Quality” of social infrastructure (e.g. social cohesion), mobilization of individual and communities’ agency.
- ▶ Historical example from South Korea in the 1970s and 1980s: **Investments in science, technology, and education first stabilized autocracy and eventually destabilized it.**
- ▶ Printing Press introduced by missionaries has persistent on social capital in Africa (Cage et Rueda, 2016).
- ▶ In Europe, advances in Medical Science and communication might explain why the role of states expanded from the monopoly of use of violence to service provision and social protection

“The state is not only an institution of necessity but also of welfare. They [the propertyless] must be led to look upon the state not as an agency devised solely for the protection of the better-situated classes of society but also as one serving their needs and interests.” -Bismarck, 1883?

Conclusion

- ▶ This lecture covers recent attempts to meet Kant's challenge from more than two centuries ago. I argue, that institutional editing and experimentation is a great complement to existing more top-down state building strategies (investment in physical and human capital). It is theoretically grounded, incorporates insights from local political culture, while building on recent advances in Empirical Political Economy.
- ▶ Finally, a few words on my own academic entrepreneurship venture. . .

PASER Hub

PASER Hub: Research Branch of African School of Economics (ASE)



Figure 7: PASER Hub

PASER Hub: Divisions

- ▶ Macroeconomics, Microeconomics, Political Economy
- ▶ Biotechnology and Agriculture, Geosciences
- ▶ Climate Change and Sustainability
- ▶ Applied, Maths, Data Science and AI
- ▶ Arts, History & Philosophy

PASER Hub: Locations



***Nigeria:** African School of Economics, Abuja*



***South Africa:** Stellenbosch University*



***North America:** Princeton University, New Jersey, USA*



***Morocco:** University Mohammad VI Polytechnic, Rabat*



***Tanzania:** Location for African School of Economics, Zanzibar*

Figure 8: PASER's campuses

Universities as Social Projects

“The function of the university is not simply to teach bread,Äwinning, or to furnish teachers for the public schools or to be a center of polite society; it is, above all, to be the organ of that fine adjustment between real life and the growing knowledge of life, an adjustment which forms the secret of civilization.”

- W.E.B. Du Bois, The Souls of Black Folk