# IV Section

When considering the factors that might determine an individual’s decision to consume internet news in Sub-Saharan Africa between 2011 and 2021, it’s essential to focus on quantifiable variables that indirectly influence trust in political institutions only through internet news consumption. These factors shape how and why people access news, which in turn affect their views on political institutions.

## Why instrumenting

### Internet news consumption

1. Reverse causality

It is possible that individuals’ trust in political institutions influences their consumption of internet news, rather than the other way around. For instance, those who already distrust political institutions might actively seek out online news that confirms their biases (e.g., critical or oppositional sources), or they might avoid news altogether, leading to reverse causality. This creates a feedback loop, making it hard to identify the true direction of causality. Without an instrument, it's difficult to disentangle whether internet news consumption influences trust or if people's pre-existing trust in political institutions influences how much and which type of news they consume.

2. Omitted variable bias

Despite our comprehensive set of controls, they may still be unobservable factors affecting both internet news consumption and trust in political institutions. For instance, political interest, media literacy or cultural attitudes toward political institutions could influence both the amount of news consumed online and trust in institutions. These latent variables are hard to measure and control for directly, making an IV approach useful to isolate the exogeneous variation in internet news consumption. Moreover, psychological traits like cynicism, ideological preferences, or cultural attitudes toward the media can also influence both internet news consumption patterns and institutional trust. Since we cannot control for these, instrumenting can help mitigate this bias.

3. Measurement error

Self-reported internet news consumption may suffer from measurement error. Respondents may overestimate or underestimate their actual news consumption, or there may be variations in how individuals interpret what counts as “news”. Even if we control for demographic factors like education or rural/urban status, misreporting of news consumption could still introduce bias into estimates. Using an instrument that is not affected by these measurement errors can improve the accuracy of the estimates. Using an external factor as internet coverage as an instrument provides variation in news consumption that isn’t subject to misreporting.

### Interaction Distance from the capital city

Interaction terms can amplify endogeneity problems that exist in the individual variables. The interaction is essentially the combined effect of these two variables, meaning any endogeneity in either component will carry over into the interaction term, making it more difficult to estimate the true causal effect. While distance itself is typically exogeneous as geography does not change, its interaction with internet news consumption could reflect deeper regional factors like economic development or historical marginalization, which can affect institutional trust. By instrumenting the interaction, we estimate the effect of exogenous shifts in internet news consumption across regions that are closer to or farther from the capital. This allows to estimate how the influence of internet news consumption on trust varies depending on geographic proximity to the capital.

## Our instrument

The percentage of the population with access to the internet will determine whether individuals can consume news online. Access is essential for participation in internet-based information flow. Limited access restricts online news consumption, which could affect opinions on political institutions only for those who do consume. We measure the percentage of population with internet access (internet penetration rate).

Better internet coverage increases internet availability, which, in turn, increases internet news consumption. Distance from the capital could impact both internet access and internet news consumption. Regions closer to the capital might have better infrastructure and easier access to online news, while those farther away may have less access to the internet and may consume less news online.

The interaction term between internet access and distance from the capital should be relevant because internet access availability is likely to vary by distance from the capital. If internet access decreases with distance, we should expect internet news consumption to follow a similar pattern. Therefore, the instrument could plausibly explain variation in internet news consumption interacted with the distance from the capital city.

The rollout of mobile networks is often driven by commercial factors (e.g., profit potential, population density) and technical challenges (e.g., geographic barriers) rather than political considerations. If decisions about where to build mobile towers or improve network coverage are made based on economic or technical factors rather than political strategy, this instrument is more likely to satisfy the **exogeneity** assumption, meaning it would only affect institutional trust via its impact on internet news consumption.

## Instrument critics

There is a risk that internet access in Sub-Saharan Africa could be influenced by national government decisions, such as strategic deployment or regional favoritism. Governments may control or influence internet infrastructure and access, making decisions that could affect how and where internet is available.

1. Strategic deployment:

- A government might prioritize internet infrastructure development in regions where they have strong political support or seek to maintain influence, while deprioritizing areas where opposition is stronger. This could limit access to independent or critical online news in opposition regions.

- In many countries, governments have significant control over national telecommunications infrastructure, allowing them to control where internet service providers (ISPs) deploy services. This control could be used strategically to manage access to information in politically sensitive regions.

2. Regional favoritism:

- Governments may intentionally allocate more resources to regions that are economically or politically more important to them, leading to uneven internet development. Rural or opposition-held areas may be undeserved, reducing internet access and thus limiting access to diverse news sources.

- Governments could offer favorable conditions (such as licenses, subsidies, or tax breaks) to ISPs or telecom companies that align with government interests, encouraging them to invest in certain regions over others.

3. Control over Internet gateways:

In some countries, governments directly or indirectly control the infrastructure that connects the country to the global internet (international internet gateways). This allows them to control the flow of information, including the ability to shut down or throttle access during politically sensitive times (e.g., elections or protests).

4. Internet shutdowns or censorship:

- In some countries, governments have implemented temporary internet blackouts or restricted access to specific regions during elections, protests or conflicts. Such shutdowns can limit the flow of news and information to regions that are politically contentious, undermining public access to independent news.

- Governments can restrict access to specific news sites or social media platforms that they perceive as critical or unfavorable. This often happens during politically volatile periods and affects the consumption of news that could shape public trust in political institutions.

5. Geopolitical and ethnic factors:

In multi-ethnic or politically divided countries, governments may favor regions dominated by ethnic groups or political parties loyal to the regime. This may manifest in better internet access in those areas, providing them with more access to government-friendly media, while limiting access in opposition areas.

Implications for trust in political institutions:

- If certain regions have better internet access and are exposed to more government-friendly news while others are denied internet access or given limited information, this could create a situation where perceptions of political institutions vary widely across the country. Those with more access to independent news may distrust the government, while those in regions with limited or controlled internet access may remain more supportive.

- Unequal access to internet infrastructure can fuel perceptions of inequality and favoritism, leading to distrust in political institutions, particularly if marginalized regions feel they are being deliberately excluded from access to the broader flow of information.

## Counterarguments

1. Market-driven infrastructure development

Internet access is often driven by market forces, not solely government decisions. Telecom companies typically prioritize regions with the highest population density, economic activity, and consumer demand because they are more profitable. This economic logic, rather than political favoritism, often determines where internet infrastructure is developed first.

2. Universal Service Obligations (USOs)

Many countries have established Universal Service Obligations (USOs) to ensure equitable access to the internet across all regions, including rural and undeserved areas. These obligations legally require telecom companies to extend services beyond just profitable urban areas, ensuring that the deployment of internet infrastructure benefits everyone, not just politically favored regions.

3. Expanding civic engagement through digital platforms

The increasing availability of the internet, even if initially uneven, generally promotes greater civic participation and access to diverse viewpoints, particularly through social media platforms. Over time, the internet trends to empower opposition voices and civil society, even in areas with lower level of access, because information sharing is more difficult to fully control.

4. Technical challenges, not favoritism

Some regions may receive internet infrastructure later simply because of technical challenges (e.g., remote locations, lack of electricity) rather than political favoritism.

# Policy implications

By focusing on the interaction of internet news consumption and distance from the capital city, we study how geographic disparities mediate the effect of internet access on trust in political institutions. Understanding this interaction is crucial for designing policies aimed at bridging the digital divide. Indeed, the larger impact of internet news consumption on institutional trust in more remote areas suggest that expanding internet access in rural or distant regions might be an effective way to improve civic engagement and trust. Moreover, internet news consumption shifts institutional trust dynamics in more distant regions, revealing how information flows shape regional political perceptions.

# Rewriting IV section

# Specifically, our main treatment of interest is the interaction between internet news consumption and distance from the capital city. This approach allows us to capture potential heterogeneity in the effect of online news exposure across different geographic contexts.

# Trust in political institutions may influence internet news consumption patterns, and unobservable factors such as political interest, media literacy, or cultural attitudes may affect both news consumption and institutional trust, potentially biasing our estimates. Moreover, the self-reported nature of our internet news consumption variable heightens the risk of measurement error. Therefore, we perform a two stage least squares (2SLS) procedure, using the interaction between internet coverage and distance from the capital city to instrument the interaction between internet news consumption and distance from the capital city. Our instrument captures how the mobile internet coverage varies with distance from the capital city, which in turn affects the likelihood of internet news consumption across different regions. This allows us to estimate how the influence of internet news consumption on trust varies depending on geographic proximity to the center of political power, using only the variation in news consumption driven by exogenous factors related to internet infrastructure development.

# Governments may influence mobile internet infrastructure deployment for political reasons, which could violate the exclusion restriction. However, we assert that the main drivers for mobile internet diffusion are economic and technical in nature rather than political. Most of the telecom service providers, being international companies, normally decide on investment opportunities based on economic viability and anticipated returns on investment. This emphasis on financial incentives diminishes the probability of politically motivated deployment strategies. Second, most regional disparities in mobile internet diffusion arise due to technical and physical difficulties. The cost and practicality of the expansion are determined by factors such as terrain, population density, and the availability of supporting infrastructure. These technical considerations override any potential political motivation in infrastructure development decisions. We account for the complex interaction of economic and technical factors across various geographic contexts by employing an instrument that combines mobile internet coverage with distance from the capital.

# Robustness to do:

To further validate our approach, we will conduct several robustness checks. These include placebo tests using pre-internet measures of institutional trust and sensitivity analysis to assess the impact of potential violations of the exclusion restriction. We will also explore non-linear relationships between distance and our variables of interest to ensure our linear interaction terms do not mask more complex spatial patterns.

While our instrument choice is theoretically justified, we acknowledge and address several potential criticisms:

1. Government Influence on Internet Infrastructure

Critics may argue that governments in Sub-Saharan Africa could strategically influence internet infrastructure deployment for political reasons, potentially violating the exclusion restriction. For instance, governments might prioritize internet development in regions where they have strong political support or seek to maintain influence, while deprioritizing areas where opposition is stronger. This could limit access to independent or critical online news in opposition regions, directly affecting trust in political institutions through channels other than news consumption.

To counter this criticism, we argue that while government influence exists, it is not the primary driver of internet infrastructure development. The rollout of mobile networks and internet infrastructure is predominantly driven by commercial factors such as profit potential and population density, as well as technical challenges like geographic barriers. Telecommunications companies, often including multinational corporations, make investment decisions based on economic viability rather than political strategy. Moreover, many Sub-Saharan African countries have implemented policies to attract foreign investment in their telecommunications sectors, which further dilutes direct government control over infrastructure deployment.

2. Regional Favoritism and Inequality

Another criticism is that uneven internet development could reflect broader patterns of regional inequality, which might independently affect trust in institutions. The interaction with distance from the capital could exacerbate these concerns if there are systematic differences in how internet infrastructure is rolled out in relation to proximity to the political center.

We address this by noting that while regional inequalities exist, they do not necessarily invalidate our instrument. First, we control for a wide range of regional socioeconomic factors in our models, which helps isolate the effect of internet access. Second, the variation in internet access over time within regions provides identifying power that is less subject to fixed regional disparities. Third, we argue that any remaining regional inequality captured by our instrument affects trust in political institutions primarily through its impact on access to online information, aligning with our proposed causal mechanism.

3. Violation of the Exclusion Restriction

Critics might contend that internet access interacted with distance from the capital could affect trust in political institutions through channels other than news consumption. For example, better internet access might facilitate e-governance initiatives or online public services, which could directly influence trust.

To address this, we conduct several robustness checks. We include controls for e-governance initiatives and digital public services where data is available. We also perform placebo tests using outcomes that should not be affected by online news consumption but might be influenced by general internet access. Furthermore, we employ bounds analysis to quantify how large any violation of the exclusion restriction would need to be to invalidate our results.

4. Measurement and Proxy Quality

Some might question whether internet penetration rates accurately proxy for individual-level access to online news, especially when interacted with distance from the capital. Rural areas, for instance, might have internet access but limited electricity or device availability, potentially weakening the relationship between our instrument and the endogenous variable.

We counter this by using the most granular data available on internet penetration, often at the sub-regional level. We also conduct sensitivity analyses using alternative measures of internet accessibility, such as mobile phone ownership rates or household computer access, to ensure our results are robust to different proxies for online connectivity.

5. Complexity of Spatial Relationships

Critics might argue that the linear interaction between internet access and distance from the capital oversimplifies complex spatial relationships in internet infrastructure development and news consumption patterns.

To address this, we explore non-linear specifications in our first-stage and reduced-form equations. We use polynomial terms for distance and consider threshold effects in internet penetration rates. We also employ geospatial analysis techniques to account for potential clustering and spillover effects in internet infrastructure development.

By addressing these criticisms head-on and implementing a comprehensive set of robustness checks, we strengthen the credibility of our instrumental variable approach. We demonstrate that while no instrument is perfect, ours represents a strong and theoretically justified strategy for identifying the causal effect of internet news consumption on trust in political institutions across varying distances from the capital in Sub-Saharan Africa. This rigorous approach allows us to contribute meaningful insights to the literature on media effects, institutional trust, and center-periphery dynamics in developing contexts, while openly acknowledging and mitigating potential limitations in our methodology.