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314

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Harnessing DPI to Address Informality and Boost DRM: A Case of the Shadow Economy

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Recommendations

Digital public infrastructure (DPI), encompassing digital identity, payments and data-sharing systems, offers African countries a powerful means to enhance administrative efficiency, particularly in revenue mobilisation. To fully realise this potential, the following actions are essential.

- DPI in Africa should be pursued as a multi-layered ecosystem.
- South Africa must advocate for an 'Africa stack' to spur private sector innovation and accelerate scalable DPI deployment.
- African tax authorities should prioritise strategic compliance targeting using data and analytics to identify and address non-compliance.
- African governments must adopt a holistic approach to the shadow economy.
- The G20, alongside the AU, should host peer learning workshops on DPI best practices.

African perspectives
Global insights

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Executive summary

According to the IMF, a significant portion of economic activity in Africa takes place informally – roughly 35% of GDP, around $1–1.2 trillion. While the informal economy plays a vital role in sustaining livelihoods and enabling economic participation, especially in contexts of limited formal employment, it also presents challenges for domestic resource mobilisation (DRM), particularly where it intersects with tax evasion and high-value untaxed transactions. These challenges are most acute in the shadow economy, which encompasses both informal and illicit activities intentionally structured to evade taxation and regulatory oversight. Economic activity in the shadow economy is hindering the development of a stable African economy that contributes significantly to national incomes and development goals. Digital public infrastructure (DPI) emerges as a potential enabler that, with the requisite conditions, could be leveraged to reduce the size of the shadow economy on the continent. This policy brief outlines how DPI can be deployed strategically to improve tax visibility and resource mobilisation from Africa's shadow economy, as well as the role of the South African G20 presidency in advancing this.

Introduction

Informality refers to economic activities characterised by non-registration with business, tax or licensing authorities.[1] Consequently, such activities are not sufficiently accounted for in countries' GDP.[2] Informality is mainly driven by complex tax regimes, weak enforcement, corruption and low trust in public institutions, alongside limited incentives to formalise business transactions.[3] Addressing these challenges requires coordinated interventions beyond tax policy reform, involving multiple stakeholders such as central banks, finance ministries and digital service providers.[4]

This policy brief focuses on the subset of informality that poses the greatest challenge to DRM, namely higher-value transactions taking place within the shadow economy that are deliberately structured to evade taxation and regulatory oversight. It does not focus on small-scale informal activities, such as micro-vending or subsistence work, which, while technically unregistered, are often essential for livelihood and typically generate low taxable surplus. These activities should be protected and supported through inclusive financial and social protection systems, rather than being prematurely drawn into the tax net. The focus of tax policies must be on ensuring businesses that already have the

1 Rafael Dix-Carneiro et al., "Trade and Domestic Distortions: The Case of Informality" (Working Paper 28391, National Bureau of Economic Research, 2025).

2 Tii Tasheh Fonsoh, Aloysius M. Njong and Tii N. Nchofoung, "Institutional Quality and the Shadow Economy in Africa: Effect and Transmission Channels", *Transnational Corporations Review* 17, no. 1 (2025).

3 Alison Gillwald, ed., *Digitalisation for a Just Social Compact: Global South Lessons from the COVID-19 Pandemic*, Research Report (Institute of Peruvian Studies, LIRNEasia and Research ICT Africa, 2023).

4 Ameya Ashok Naik and Ajay Nandakumar, "Tax Administration and Domestic Revenue in the Digital Era", chap. 5 in *Public Finance in the Digital Era: Emerging Themes*, Research Report (ODI Global, 2025).

capacity to formalise are adequately captured within the tax net.[5] Research by the African Tax Administration Forum and the International Centre for Tax and Development shows that various interventions on the continent to address informality in a generalised context have had disproportionate consequences for the more vulnerable actors in the informal economy. Such interventions include presumptive taxes, withholding schemes, flat tax rates and turnover taxes.

Complex dynamics between the shadow economy, DRM and digital payment systems adoption

A study by EY estimates that the shadow economy in Northern, Southern, Central and Eastern Africa ranges from 24.1% to 41.6% of GDP, accounting for billions in lost revenue.[6] Cash transactions are a key enabler of the shadow economy, making it inherently difficult to quantify.[7] The use of cash as opposed to digital transactions makes it easier to hide informal activities from public authorities, as the transactions do not generate a formal audit trail. As a result, the shadow economy forms a substantial part of the tax gap, which reflects the shortfall between expected and actual tax collections. Although not the sole cause, unreported economic activity significantly contributes to this gap by reducing the government's ability to collect taxes such as value-added tax (VAT), corporate income tax and employment-related levies.[8] Accordingly, it is not surprising that the three African countries with the largest shadow economies (Sierra Leone, Niger and Ethiopia) have tax-to-GDP ratios below the regional average of around 16%.[9] This not only leads to substantial revenue losses but also undermines trust in the tax system (fuelled by uneven enforcement, lack of visible public benefit, excessive bureaucracy and low confidence in financial institutions). It also distorts market competition and inflates public and private sector costs.[10]

Digital payments and the shadow economy

Digital payments have the potential to increase the visibility of transactions that typically go unrecorded in cash-based systems and address the opacity of the shadow economy. A 2022 study of 42 African economies found that digitalisation, especially in terms of

5 African Tax Administration Forum and International Centre for Tax & Development, "Taxing Informal Economies: Practises, Challenges & Ways Forward" (Policy Paper, ATAF-ICTD, 2024).

6 EY, *Shadow Economy Exposed: Estimated for the World and Policy Paths*, Policy Research Report (EY, 2025).

7 According to a study by EY, a distinction can be made between a passive cash shadow economy and committed cash shadow economy. The former refers to unreported transactions where cash use acts as an enabler to tax evasion by registered businesses, with consumers playing a passive role and gaining no benefit. For the latter, the use of cash is consequential to an agreement between parties and can involve registered or unregistered entities. The aim is to conceal transactions to mutually benefit from evading taxes or regulations. In this case, cash is intentionally chosen to avoid detection, and both the buyer and the seller are actively complicit in maintaining the transaction outside the formal economy.

8 EY, *Shadow Economy Exposed*.

9 OECD, *Revenue Statistics in Africa 2024*, Report (OECD, 2024); PWC, Tax Summaries, "Ethiopia: Overview", accessed July 3, 2025, https://taxsummaries.pwc.com/ethiopia#:~:text=The%20World%20Bank%20estimates%20the,at%204.5%25%20(2022).

10 Rajul Awasthi and Michael Engelschalk, "Taxation and the Shadow Economy: How the Tax System Can Stimulate and Enforce the Formalization of Business Activities" (Policy Research Working Paper 8391, World Bank Group, 2018).

telecommunications and the internet, substantially reduced the size of the shadow economy.[11] This is because digitalisation makes economic activities more visible, less dependent on cash and easier to regulate and audit. This is particularly necessary in the passive cash shadow economy, which is prevalent in Africa.[12] Since the use of cash enables underreporting by registered businesses, digitising business-to-consumer (B2C) transactions becomes necessary. However, B2B[13] transactions in the committed cash shadow economy require separate interventions such as e-invoicing, real-time reporting and regulatory enforcement.

Further, it must be understood that digital payment adoption by consumers is a necessary, but insufficient, condition for improving tax compliance. Without compelling reasons for firms, especially those that are currently non-compliant, to adopt digital payment systems, the impact on formal tax reporting will be minimal. For instance, despite a significant increase in card usage due to VAT rebates in Uruguay, tax compliance did not improve. This was because non-compliant firms did not adopt point-of-sale (POS) systems and already-compliant firms simply processed more transactions electronically without altering their reporting behaviour.[14] Therefore, while digital payments can improve tax administration, formalising the shadow economy also requires addressing the structural and behavioural barriers to formalisation.

Addressing informality in Africa: Tax policy lessons from South Korea and India

African countries generally collect less taxes than their counterparts in other emerging and developing economies.[15] Governments' lack of efficacy in bridging the tax gap is caused by a mixture of ineffective tax policies, poor tax compliance and enforcement, and the prevalence of informal and shadow economies.

Governments around the continent have adopted various measures to bridge the tax gap by targeting informal business activities, including attempts to raise revenue through the taxation of digital financial services (DFS) payments. This can be attributed to significant growth in this sector and its potential as a revenue source.[16] In 2022, over 10 African countries levied varying taxes on DFS transactions. These taxes differ in various ways, such as rate, tax type, exemptions and transactions (transfers, deposits or withdrawals), with the

11 Emmanuel Umoru Haruna and Usman Alhassan, "Does Digitalization Limit the Proliferation of the Shadow Economy in African Countries? An In-Depth Panel Analysis", *African Development Review* 34, no. S1 (2022).
12 EY, *Shadow Economy Exposed*.
13 Business to business.
14 Anne Brockmeyer and Magaly Sáenz Somarriba, "Electronic Payment Technology and Tax Compliance: Evidence from Uruguay's Financial Inclusion Reform" (Working Paper 9947, World Bank, 2022).
15 IMF, *Regional Economic Outlook: Sub-Saharan Africa – The Big Funding Squeeze*, Research Report (IMF, April 2023).
16 Hannelore Niesten, "Are Digital and Traditional Financial Services Taxed the Same? A Comprehensive Assessment of Tax Policies in Nine African Countries" (ICTD Research in Brief 84, Institute of Development Studies, 2023).

rate ranging from 0.2–5%.[17] Depending on the specific regime, taxation can be levied on the value, or amount, of the DFS transaction, and accordingly affect consumers, service providers, merchants, payment processors or cross-border entities. Transaction-based taxes, VAT and corporate taxes in this regard are often more justifiable as they ensure fair participation from both consumers and service providers.

However, excessively high tax rates can be regressive and hinder broader financial inclusion. For example, while the initial transaction-based 1% mobile money tax in Uganda was aimed at increasing government revenue, the public backlash resulted in a revised 0.5% levy on withdrawals.[18] A fair and efficient tax system places the heaviest burden on those most able to pay. Overly taxing DFS is counterproductive – instead, DFS can make the payment of taxes easier for the benefit of both individuals and governments.[19] The cash-based shadow economy cannot, however, be addressed through tax policy alone, particularly one that adopts a blanket approach to the sector. There is a strong administrative and institutional component that is vital to success.

Key lessons in targeted interventions that have had a significant impact on the reduction of informality can be extracted from countries such as South Korea and India. In 1999, South Korea's shadow economy was estimated to account for approximately 28% of GDP.[20] South Korea introduced the Tax Incentive for Electronically Traceable Payments (TIETP) in 1999, which encouraged the use of credit cards, debit cards and electronic cash receipts in B2C transactions. This initiative significantly contributed to transforming the Korean economy into a more cashless system over a decade and a half. It allowed wage and salary earners to claim tax deductions for eligible purchases made with electronically traceable payments, which they could declare during their year-end income tax settlements. This incentivised consumers to opt for traceable transactions.

The success of the TIETP stemmed from a policy shift that moved away from deterrents aimed at sellers (which had failed with mandatory cash registers) to measures that encouraged end-consumers. This approach effectively disrupted collusive relationships between buyers and sellers who preferred cash transactions to evade taxes, as electronic payments inherently create an audit trail. Currently, South Korea's shadow economy is approximately 7.6% of GDP. It has successfully structured an effective tax management and compliance system by, among other things, addressing technical challenges, including secure online tax payments and data protection.[21] The introduction of

17 Hannelore Niesten, "Taxes on Digital Financial Services in Africa – An Unlevel Playing Field", International Centre for Tax and Development (blog), February 3, 2023.

18 Lorenzo Spadavecchia, Adam Mugume and Jimmy Apaa, *Mobile Money Tax: Financial Inclusion Versus Financial Development: Evidence Using Transaction-Level Data: The Case of Uganda*, Project Report UGA-24179 (International Growth Centre, 2025).

19 Philip Mader, "How Should Africa's Digital Payments Be Taxed?", International Centre for Tax and Development (blog), October 24, 2022.

20 Friedrich Schneider, Andreas Buehn and Claudio E. Montenegro, "Shadow Economies All Over the World: New Estimates for 162 Countries from 1999 to 2007" (Working Paper 5356, World Bank, 2010).

21 Joseph Bimbala Gwaba et al., "Promoting Tax Compliance in the Democratic Republic of Congo: Lessons Learned from the Republic of Korea as Case Study", *International Journal of Contents* 20, no. 4 (2024).

e-invoicing and early warning systems played a significant role in reducing fraud while the implementation of electronic payment incentives, through the TIETP policy, increased the transparency of transactions.[22]

India's demonetisation experience, on the other hand, not only increased the use of digital payments but also led to better tax administration.[23] The restriction in cash flow compelled an increase in digital payments as individuals and firms transitioned to electronic methods like cards and e-wallets. This surge in traceable transactions provided tax authorities with better visibility into sales, leading to increased reported sales and tax payments as firms, aware of the electronic trail, improved compliance.

A distinct difference can be seen between the approach taken by Uganda (and many other African countries that have adopted DFS taxes) and that of South Korea and India. While South Korea and India adopted policies that acted as a means to gather data for taxation by increasing transparency, the focus in the Ugandan context is taxation on the transactions themselves. DFS taxes do generate revenue, but they do not necessarily serve the same primary purpose of increasing the tax net by improving the traceability of underlying business transactions for compliance purposes. Accordingly, the focus is not on leveraging data for broader tax compliance among informal actors.

Notwithstanding the above, Uganda, South Korea and India have a commonality in their acknowledgement of the need for incorporating digital systems, particularly components of DPI, to enhance tax administration.[24]

DPI as a possible solution to the shadow economies in Africa

DPIs are foundational digital systems, such as digital identity, digital payments and data exchange platforms, that are interoperable, inclusive and designed to be accessible and secure.[25] These systems can serve as the backbone for expanding the use of digital payments, enhancing financial inclusion and strengthening the state's capacity to monitor and tax economic activity. In the context of tax administration, the benefits of DPI can include increased taxpayer registration, enhanced data quality, reduced opportunities for tax evasion and improved administrative efficiency. Key components of DPIs in tax administration include digital identification systems and digital merchant payments (DMP).[26]

22 Myung Jae Sung, Rajul Awasthi and Hyung Chul Lee, "Can Tax Incentives for Electronic Payments Reduce the Shadow Economy? Korea's Attempt to Reduce Underreporting in Retail Businesses" (Working Paper 7936, World Bank Group, 2017).

23 Satadru Das et al., "Does Going Cashless Make You Tax-Rich? Evidence from India's Demonetization Experiment", *Journal of Public Economics* 224 (2023).

24 Fabrizio Santoro, Wilson Prichard and Giulia Mascagni, "Digital IDs and Digital Payments – Opportunities and Challenges for Tax Administration" (Policy Brief 7, Institute of Development Studies, 2024).

25 G20, "Annexure 1: G20 Framework for Systems of Digital Public Infrastructure", 2023; Cecilia Emilsson and Felipe González-Zapata, "Digital Public Infrastructure for Digital Governments" (Policy Paper 68, OECD, 2024).

26 Santoro, Prichard and Mascagni, "Digital IDs and Digital Payments".

In Uganda, the integration of taxpayer identification numbers with the national ID system enabled the Uganda Revenue Authority (URA) to register over 350 000 informal sector participants by 2022. It also improved data quality and user experience.[27] However, the initiative had limited impact on revenue collection due to a lack of automated data updates, weak enforcement mechanisms and legal obstacles to cross-agency data sharing.[28] The Electronic Fiscal Receipting and Invoicing System adopted by the URA, on the other hand, demonstrates the power of DPI by digitising POS transactions. This has led to a 12% increase in VAT revenues through real-time data collection.

Comparatively, India's DPI ecosystem, especially through the India Stack, integrates Aadhaar (digital ID), the Unified Payments Interface and consent-based data-sharing systems to create a seamless, scalable infrastructure.[29] This integration supports tax administration by enabling real-time tracking, reduces fraud and improves compliance under the Goods and Services Tax regime.

South Korea, as highlighted above, incentivised DMPs through tax rebates for electronic transactions, leading to a measurable improvement in retail sector compliance.

The way forward for DPI in Africa

DPI is still a nascent opportunity in Africa, given the limited investment it has seen. DPI can drive DRM, as it can reduce the shadow economy by enhancing transparency. Robust DPI governance, with inherent trust mechanisms and privacy-preserving architectures, is crucial for mitigating mistrust and fostering inclusion, especially in extensive informal sectors. However, realising this potential is premised on having the required capacity to design and deploy DPIs in multiple-use cases, as well as coherent policies that integrate DPI deployment in tax reform, capacity building and inclusive economic planning.

The AU Data Policy Framework, building on regional instruments such as the Digital Transformation Strategy for Africa 2020–2030[30] and the African Continental Free Trade Area, emphasises the importance of interoperability in national integrated data systems. Such interoperability, achieved through common standards, data classifications and secure data-sharing protocols, can facilitate real-time transaction monitoring and seamless integration of digital payment systems. Considerable progress has been made regarding interoperability in DFS on the continent, especially around mobile money and regional payment systems (for example, the Pan-African Payment and Settlements System and SADC Real-Time Gross Settlement system). However, there is still fragmentation across mobile platforms and high transaction costs. When applied

27 Amos Sanday and Alice Nalweera, "Leveraging Digital Public Infrastructure to Enhance Uganda's Tax Revenue Potential", IMF Public Financial Management (blog), April 21, 2025.
28 Santoro, Prichard and Mascagni, "Digital IDs and Digital Payments".
29 UNDP, *The DPI Approach: A Playbook*, Policy Research Report (UNDP, 2023).
30 AU, *The Digital Transformation Strategy for Africa (2020–2030)* (AU, 2020).

to taxation,[31] such systems enable governments to track economic activities more effectively, even those traditionally hidden within the shadow economy. Used optimally, interoperable digital payment platforms allow for greater visibility in informal transactions, enabling VAT to be embedded at the point of sale and reducing under-reporting. Combined with real-time data analytics, tax authorities can pre-fill VAT returns, conduct risk-based audits and implement simplified registration schemes that lower compliance burdens for small traders. Importantly, digital identity frameworks integrated into DPI systems support accurate taxpayer identification and linkage of transactions to individuals and enterprises.

Although Uganda's deployment of DPI has enhanced tax collection, especially from the informal sector, its experience highlights a few considerations from which African countries can learn.[32] Successful ID–tax integration requires strong political commitment and coordinated inter-agency efforts. Uganda's fragmented institutional landscape and potential politicisation of ID systems raise concerns about equitable implementation and long-term sustainability. Despite improved tax-data use, Uganda lacks comprehensive legal safeguards for data privacy and inter-agency data sharing. Lessons from Nigeria[33] and India stress the importance of privacy-by-design and clear regulatory oversight to avoid misuse and public distrust. Foundational ID systems risk excluding vulnerable populations, especially rural, low-income and undocumented individuals, who face barriers to registration. Without inclusive measures, digital systems may deepen existing inequalities in access to public services and taxation. Technical constraints, including vendor-dependent ID systems, limit Uganda's ability to scale and integrate data effectively. These elements are critical to ensuring that digital reforms promote equity, accountability and public trust.

While most African countries have yet to prioritise DPI development, this lag offers a strategic window to build fit-for-purpose systems grounded in resource mobilisation principles. By first addressing demand-side constraints such as limited digital skills, device affordability and data costs, countries can ensure inclusive uptake of DPI in the shadow economy.

31 Damilola Joseph, Domnan Miri and Walter Mswaka, "Digital Technology Affordance and Constraints in Informal Economies", *Journal of Small Business and Enterprise Development* (March 2025).

32 Fabrizio Santoro, Moyo Arewa and Celeste Scarpini, "Identity Issues: Four Challenges for Digital IDs in Africa's Tax Systems", International Centre for Tax and Development (blog), November 17, 2022.

33 Gbenga Ayodele Falana et al., "Digital Tax Administration and Tax Compliance in Nigeria Informal Sector", *Economy, Business & Development* 5, no. 2 (2024): 32.

Recommendations (extended)

South Africa's 2025 G20 presidency offers a unique opportunity to advance the DPI agenda, building on the robust regulatory frameworks championed by the Indian and Brazilian presidencies. These frameworks are crucial for building trust in digital systems through privacy, competition and equitable access, especially vital in contexts of historical mistrust and exclusion. DPI, if designed for openness, interoperability and accountability, can be a cornerstone of equitable and effective digital transformation in African tax systems. To adequately enhance DRM through DPI in Africa, the following recommendations are made.

DPI in Africa should be pursued as a multi-layered ecosystem

DPI should not be viewed as just a technology fix. As Uganda's experience shows, increasing registrations without parallel investments in enforcement and data use has limited fiscal impact. One of the deliverables under the G20 Digital Economy Working Group in 2025 is to develop DPI blueprints that reflect regional context for the development of sector-specific DPIs. In the context of tax administration, countries must be encouraged to adopt legislation and institutional reforms that permit real-time, consent-based data exchange among revenue authorities, ID registries and payment service providers.

South Africa must advocate for an 'Africa stack'

Open APIs and modular, reusable technology stacks, as used in India, should be embraced to encourage private sector participation and rapid deployment across use cases. South Africa, through its G20 presidency, can leverage the G20 to foster collaboration and mobilise resources to accelerate the development of contextually relevant and impactful DPI.

African tax authorities should prioritise strategic compliance targeting

While smaller-scale, unregistered vendors are an integral part of the informal economy and may benefit from the financial inclusion opportunities presented by digital payment systems, they should not necessarily be the primary focus of efforts to recover lost tax revenue. National governments should therefore ensure that tax interventions aimed at the informal sector prioritise otherwise registered actors operating informally. These include those in the professional services sector, construction firms and small businesses with higher earning potential that deliberately circumvent compliance despite having the capacity to formalise.

African governments must adopt a holistic approach to the shadow economy

This approach acknowledges the interplay between digital systems, the challenges of corruption and the importance of incentivising tax compliance. South Korea's experience demonstrates the value of this integrated perspective. Its successful transition to a digital tax administration was characterised by the phased implementation of ICT infrastructure, coupled with legal frameworks, inter-agency cooperation and a focus on user convenience.

The G20, alongside the AU, should host peer learning workshops on best practices of DPIs

This should include stakeholders from the G20 and across the continent to share experiences, build collective knowledge and address capacity challenges. India and South Korea, as members of the G20, can be partners in this regard.

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