

## Policy Brief

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# Digital IDs and Digital Payments – Opportunities and Challenges for Tax Administration

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## Introduction

Tax administrations in Africa and, more broadly, low-income countries (LICs), are increasingly investing in advanced digital technologies, in an effort to build more effective, rules-based and efficient tax systems. Those efforts fit within broader government efforts towards [e-government](#) and the establishment of [digital public infrastructures \(DPI\)](#).<sup>1</sup> While these efforts to digitalise tax administration are multi-faceted, affecting all aspects of administration, recent years have seen growing attention to the potential impacts of digital ID systems (DIS) and digital merchant payments (DMP), both of which are linked closely to broader discussions of the potential of DPI to strengthen development outcomes. This growing attention has been driven by hopes that building such systems can contribute to significant improvements in tax systems and revenue collection as part of broader and ambitious digitalisation efforts undertaken by African governments (World Bank 2016; IMF 2020).

Amidst growing interest in DIS and DMPs as potential catalysts to improved tax outcomes, two key questions emerge:

1. To what extent are these new investments in fact being translated into improvements in tax systems and revenue mobilisation?
2. Where is further progress most needed in order to maximise the potential of these digitalisation efforts in Africa?

This brief seeks to summarise what we know about these questions so as to inform future strategies. In addressing those questions it also speaks to the broader challenges of translating investments in DPI into improved development outcomes – and the potential for investments in strengthening digitalisation of tax systems to be a catalyst for digitalisation of the public sector more broadly.

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<sup>1</sup> According to Okunogbe and Tourek (2023), of the taxation-related projects approved in 116 countries by the World Bank between 2010 and 2022, 91 countries (78 per cent) had a project that included a tax modernisation or information technology component.

The next section provides a framework for understanding the links between DIS, DMP and taxation, summarising the potential of these new technologies and conditions for success. The following two sections then review key messages in relation to DIS and DMP, respectively. In each case that review draws on existing, but limited, experience with those new technologies,<sup>2</sup> while also drawing relevant lessons from experiences with digitalisation efforts in LICs more broadly. The brief concludes with reflections on key future priorities for strengthening the potential and impact of these new technologies, and the effectiveness of digitalisation efforts more broadly.

## Linking digital ID systems, digital merchant payments and improvements in taxation

Existing research provides a clear narrative about the ways in which investments in foundational DPI – and in strengthening DIS and DMP in particular – may translate into improvements in tax systems and revenue mobilisation.

The expansion of DIS aims to enhance the ability of revenue authorities to identify, verify and track taxpayers over time, while simplifying tax registration and compliance for taxpayers. Integrating with DIS holds the potential to improve the quality of tax administrative data, especially in Africa where tax registries are often inaccurate and incomplete (Mayega *et al.* 2019; Nyanga 2021; Moore 2020).<sup>3</sup> The widespread use of DIS also holds the potential to enable more effective data sharing across government in order to identify taxable incomes and non-compliance, and simplify taxpayer engagement with government.

The expansion of DMP promises to ease tax compliance by taxpayers, as transactions are digitally recorded. In turn, widespread use of DMP promises to create a ‘paper trail’ around economic transactions which could help tax administrations both to enforce tax compliance and to better identify taxable incomes, where there is effective sharing of DMP data with tax authorities (Santoro *et al.* 2022).

Foundational experiences in a subset of middle- and high-income countries clearly point towards the potential for significant gains. India has famously invested heavily in its DPI, called India Stack, and enjoyed particular success in developing a DIS (Aadhaar) that has helped to support a range of improved outcomes, including related to taxation (Alonso *et al.* 2023). DIS are now replacing pre-existing taxpayer identification numbers (TINs), promoting consistency in tax data and reducing fraud. Importantly, Aadhaar is also used to boost compliance with the Goods and Service Tax, for which buyers and sellers are unambiguously identified with their digital ID (Alonso *et al.* 2023).<sup>4</sup>

Research indicates that in India demonetisation policies aimed at fostering adoption of digital payments have similarly had positive impacts on tax revenue (Das *et al.* 2022). Similarly, South Korea is often cited as a country that actively promoted the adoption of DMP and saw subsequent improvements in tax compliance as a result of improved tracking and simplified tax filing (Sung, Awasthi and Lees 2017). Studies have similarly shown gains from third-party reporting of electronic sales data in China (Li, Wang and Wu 2020), and Europe (Hondroyannis and Papaoikonomou 2017; Immordino and Russo 2018).

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<sup>2</sup> Regrettably, evidence on DIS and DMP is constrained by the limited number of case studies in African tax systems, challenges in collaborating with private entities like telcos, and government agencies beyond tax administrations, such as national identity entities.

<sup>3</sup> Of the 61 Tax Administration Diagnostic Assessment Tool (TADAT) assessments conducted in LICs from 2013 to 2020, only 20 per cent of tax authorities had a score of good or very good for knowledge of their taxpayer database and only 5 per cent had these scores for accuracy of information in the taxpayer registry.

<sup>4</sup> The DPI Aadhaar is also used in social assistance programmes, reducing leakage, inefficiency and corruption in benefits transfer.

However, achievement of these goals will not happen through technological investments alone. They need to be accompanied by a broader set of policy, institutional and administrative reforms – backed by political support – to translate potential into impact.

Our research has highlighted three elements that are critical to realising the potential of investments in DIS and DMP in practice.

1. **Adoption and usage:** Take-up and usage should be widespread and frictionless, leaving no one behind (Santoro *et al.* 2023). Usage needs to be consistent and not distorted by strategic responses designed to avoid taxes.
2. **Data sharing:** Key data from DIS and DMP should be shared with tax administrations seamlessly, thanks to an enabling environment, formal inter-institutional agreements and a conducive regulatory framework.
3. **Data use:** The necessary analytical skillset and commitment within tax administration should exist to make effective use of new data and tools to practically boost core functions.

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## Opportunities and challenges in maximising the potential of digital IDs

To some degree, the potential of DIS, as previously described, is being realised in a subset of LICs who have ambitiously pursued the expansion of these systems and used them to strengthen registration of taxpayers. The Uganda Revenue Authority (URA) integrated its registration system with that of the National Identification and Registration Agency (NIRA). This integration facilitated the creation of the *Instant TIN*, an online registration process in which individuals input their national ID number and obtain a TIN associated to it, triggering the automatic pull of data from the NIRA system (Scarpini *et al.* forthcoming). Similarly, the Ghana Revenue Authority (GRA) leveraged DIS for tax registration by utilising the Ghana Card PIN, thereby replacing all pre-existing TINs. The collaboration between the GRA and the National Identification Authority (NIA) led to the establishment of an interface enabling the seamless transfer of identity information from the NIA registry to the GRA (Santoro, Scarpini and Okiya forthcoming).

A clear benefit from this integration consists in significantly augmenting tax registration numbers. In Uganda, *Instant TIN* accounted for 35 per cent of total registrations in 2022, or about 350,000 taxpayers. Most of these were previously-informal entities (Scarpini *et al.* forthcoming). In Ghana, the Ghana Card registrations led to a threefold increase in total tax registrations in 2021–22 (Santoro *et al.* forthcoming). Qualitative insights from Uganda suggest a high level of satisfaction among taxpayers due to the instant and seamless service. Female and younger taxpayers, more likely to use *Instant TIN*, may arguably appreciate the simplified, fast, online procedure, without direct interaction with tax officials, as more appealing to their needs. In Ghana, self-reported survey evidence shows that registering via PIN significantly reduced face-to-face interactions with GRA and the perceived probability of audit.

A second key benefit from integration consists of addressing some gaps in tax data quality and streamlining internal processes. In Uganda, *Instant TIN* is credited with significantly reducing time and resources spent on registration tasks and with preventing duplicate registrations. *Instant TIN* also enhances the quality of individuals' contact details, addressing historical issues of poor registry data. Integration meant access to a more comprehensive and consistent database of personal information than what was historically recorded for tax registrations (Scarpini *et al.* forthcoming).

In Ghana, the NIA database provides valuable information on citizens' occupations at the time of PIN registration. This information enables the GRA to automatically enrol previously unregistered citizens with identifiable income sources. Coupled with automatic SMS communication, this strategy helps the GRA uncover undisclosed income activities (Santoro *et al.* forthcoming).

However, while DIS have shown their potential to expand the tax base, their impact on revenue mobilisation is significantly less clear. Descriptive evidence from Uganda is inconclusive. In Ghana, compliance outcomes are mixed for taxpayers registered using the PIN-based system. They are 7 percentage points less likely to file for any tax, but approximately 10 percentage points more likely to pay taxes, suggesting a GRA emphasis on collecting payments from a smaller group of taxpayers rather than maximising tax filing (Santoro *et al.* forthcoming). In South Africa as well, a threefold increase in registration numbers, boosted by the integration with the business registry, did not translate to increased revenues due to small business size and poor compliance (Lediga, Riedel and Strohmaier 2022).

This mixed evidence, so far, about the impacts of DIS on revenue reflects the fact that while they have been effective in facilitating registration and, to at least some degree, data quality, additional barriers to realising their full potential remain.

1. **Adoption:** The limited coverage of DIS, in Ghana<sup>5</sup> and elsewhere<sup>6</sup>, could limit the potential of DIS data for tax purposes, though it is worth noting that those who are not covered are likely to have low incomes and that coverage is likely to improve over time.
2. **Data quality:** While registration drives have been successful, there is still uncertainty about the degree to which DIS integration succeeds in ensuring up-to-date taxpayer information to enable tracking and outreach initiatives. In Uganda, integration still lacks in the fact that the updating of personal details with NIRA does not automatically update that information in the URA registry. Also, it is for now unclear whether DIS-based contact information alone is adequate to facilitate effective tracking for compliance purposes.
3. **Data sharing:** Legislation around data sharing remains strict in many African countries, alongside administrative and political resistance to effective data sharing, meaning that in most cases data sharing remains very limited (Okunogbe and Santoro 2023).<sup>7</sup> This dulls a key promise of DIS – that by having a unified ID system it will be possible for governments to access data from across different government systems, and potentially also from the private sector.
4. **Follow up:** DIS have served primarily to support higher numbers of registration targets, primarily among smaller taxpayers and businesses. However, mass registration campaigns are rarely successful in yielding expected benefits (Gallien *et al.* 2023). This reflects the fact that such campaigns often involve registering large numbers of small taxpayers who offer limited revenue potential and are difficult to track, while tax administrations lack the capacity to actively pursue compliance efforts. Improvements in tax collection and equity will depend on governments being able to track and follow up with new taxpayers – and effectively targeting those with greater tax potential and ability to pay. If not, the risk is that DIS inflate registration numbers but with more limited impacts on actual collection.

<sup>5</sup> Even though the Ghana Card is the national identity document in Ghana, and its PIN is currently necessary to access almost all the public services in the country and many of the private ones, its current coverage is still quite limited. Data from the NIA suggests that at the end of 2023 only half of the Ghanaian population had their Ghana Card.

<sup>6</sup> More broadly, 45 per cent of people in Sub-Saharan Africa do not have an official proof of identity (World Bank ID4D dataset <https://id4d.worldbank.org/global-dataset>).

<sup>7</sup> Apart from what discussed in Okunogbe and Santoro (2023), this reflects insights from experience across multiple countries in which DIGITAX is active, such as Rwanda, Uganda, and Eswatini.

## Opportunities and challenges in maximising the potential of digital merchant payments

Given the promise offered by the expansion of DMP to strengthen tax administration, as already described, there has been growing interest in this model in Africa, with some countries exploring both the possibility of incentivising expanded use of DMP and the possibility of drawing on that data to strengthen tax administration. Our research offers a range of insights about the potential of this model, and what is needed to realise it.

With respect to incentivising DMPs, evidence remains mixed, in line with the inconclusive evidence beyond Africa.<sup>8</sup> We see some evidence that where incentives have been provided it has encouraged broader adoption. In Ghana, for instance, the introduction of a tax on mobile money payments, the e-levy, included an exemption for DMPs. Survey data shows that DMP users have positive perceptions of the e-levy exemption – and agree more with the e-levy policy as a whole, if they benefit from the exemption (Scarpini *et al.* forthcoming). In Rwanda, telcos introduced a fee waiver for DMP in March 2020, removing the 1 per cent charge on DMP, which encouraged increased adoption by 20 per cent, and a parallel decline in cash. When fees were subsequently reintroduced in September 2021 there was then a smaller decline in usage, by 5 per cent. Overall, DMP usage remained higher than before the waiver (Bernad *et al.* 2023). On the other hand, some reluctance is apparent among taxpayers with limited trust in technology, businesses with limited technical capacity, and entities traditionally operating in cash along the supply chain.<sup>9</sup>

In any case, cash remains king in all the African economies under study, adopted by a minimum of 85 per cent (Uganda, Burkina Faso) to a maximum of 99 per cent (Ghana) of traders. Cash-based transactions also involve higher daily amounts. DMP emerge as the second preferred option, with adoption levels reaching approximately two-thirds of the sample in Burkina Faso, half in Rwanda, 40 per cent in Ghana, and about a quarter in Uganda and Tanzania. Despite strong incentives for DMP, usage is still not universal, implying probably limited usefulness of its data for tax purposes (Santoro *et al.* forthcoming).

Evidence about the ability of governments to make use of DMP data to strengthen tax administration is much more limited still. We summarise some initial insights from preliminary experience, while also drawing on broader evidence from digitalisation efforts to shed light on the likely potential and challenges for using DMP data to strengthen tax administration (Okunogbe and Santoro 2023).

The most basic lesson from experience to date across most of Africa is that it has not been possible for governments to make effective use of data from DMP to strengthen tax administration owing to legal or administrative constraints on accessing that data. In cases involving telcos' DMP data, government agencies face legal constraints, necessitating specific, often-debated, legislation for data sharing. In 2018, for instance, the URA lost an important battle to access financial transaction information from banks (Busuulwa 2018) after vehement protests from the industry (Waswa 2018). In that case, the government quickly blocked this attempt, stressing the political element around inter-institutional data sharing. In Rwanda, telcos' data is not shared with tax administration (Bernad *et al.* 2023), and in Ghana only partially (Scarpini *et al.* forthcoming). This insight is at once basic and profoundly important: in the absence of enabling data access, the potential of DMP will remain just that.

<sup>8</sup> Positive outcomes from fiscal incentives are documented in Mexico (Bachas, Higgins and Jensen 2020) and India (Das *et al.* 2022) but countered by limited impacts in Uruguay (Brockmeyer and Somarriba 2022).

<sup>9</sup> Interestingly, similar digital divides between users and non-users are found with the adoption of other technology, such as tax e-filing and e-payment (Yimam, Lidetu and Belete 2024; Santoro *et al.* 2023).

Alongside the ability of governments to access data, the potential of DMP depends on the ability of governments to make the best use of it. Because of problems of access we do not have any clear example of effective DMP data use from the African context. However, we can gain insights into likely potential and challenges by looking at parallel experiences with the introduction of electronic fiscal devices (EFD). Like DMP, the role of EFD is to create an electronic record of economic transactions at the point of sale, and relay that information to tax administrations, so that they can identify taxable transactions and under-declaration of revenues.

On one hand, existing evidence points clearly towards the potential of EFD in raising revenues (Hakizimana and Santoro 2023) and increasing filing accuracy (Mascagni *et al.* 2022). On the other hand, recent research has highlighted a key challenge: improved information about sales appears to often have a more limited impact on revenues, as increased sales are offset by those same firms declaring higher expenses on other less verifiable margins (Mascagni *et al.* 2022; Carrillo, Pomeranz and Singhal 2017; Slemrod *et al.* 2017). This strategic behavioural response of EFD users is documented with DMP users as well. In Rwanda, DMP users increase reported outputs for VAT, but also inputs, thus leaving the final VAT liability unchanged (Bernad *et al.* 2023). This may present a still larger challenge for DMP data, owing to the smaller share of transactions that are captured. The key message is that access to new data is useful, but fully realising that potential requires that it be embedded within a broader strategy to detect and monitor tax avoidance and evasion (Okunogbe 2023; Kotsogiannis *et al.* 2023).

## Conclusion and ways forward

The expanded adoption of DIS and DMP offers significant potential for tax administrations. Yet while significant progress has been made, progress in translating those gains into more concrete improvements in tax system performance remains at a more nascent stage.

This brief has highlighted three key messages, in particular, about what research tells us about what will be required to more fully realise that potential moving forward.

- Strengthening data sharing:** Most definitions of DPI focus on three key pillars: DIS, payment systems and data exchange (World Bank 2022; UNDP n.d.). This reflects their complementarity: the value of DIS and electronic payment information in strengthening tax administration depends significantly on effective data sharing across government. That data sharing is critical to allowing governments to access and use electronic payment data, and to maximising the value of DIS in linking taxpayer information across government systems to identify unreported incomes or provide support. In practice, major barriers – both legal and institutional/political – to data sharing have hindered the realisation of those benefits (Okunogbe and Santoro 2023; Ligomeka 2019; Mengistu and Mascagni 2018). Attention to facilitating the sharing of high-quality data across government, and with private third parties, thus emerges as a clear priority, including enabling legal reform, building strong inter-institutional links, and the establishment of data governance protocols, encompassing policies and procedures aimed at overseeing the accessibility, usability, integrity, and security of the data (UNDP n.d.).
- Embedding technology within broader administrative reform:** A longstanding, but oft forgotten, lesson of digitalisation efforts is that to be successful digitalisation must be embedded in a broader set of administrative reforms that ensure sustained data quality and effective use of the data made available by digitalisation (Okunogbe and Santoro 2023). That message figures centrally in existing evidence

about DIS and DMPs. DIS have been useful for strengthening registration, but evidence suggests that, alongside better data sharing, maximising the value of DIS will depend on systems to maintain up-to-date data useful for tracking and outreach to taxpayers, and then using that data to support enforcement and monitoring of compliance, the provision of more targeted assistance to taxpayers, and decision-making processes more broadly. The value of DMP similarly requires not only access to data, but an ability to make use of that data. Experience with other new sources of data – from EFD or VAT chains – highlights the potential of new data sources, but also the capacity challenges governments face in fully exploiting new data and the risk that new data on sales alone may not improve revenues, unless paired with broader audits and controls.

3. **Appropriate targeting and priorities:** To a significant degree the promise of DIS and DMP for tax administration has often been framed around the potential to broaden the tax base and better tax the ‘informal sector’. These are important goals. However, as recent work on mass registration campaigns, and taxation of the ‘informal sector’, has shown, a focus on maximising registration and taxation of large numbers of small taxpayers may raise little revenue, increase inequities for those with least ability to pay, and misdirect scarce administrative capacity. The potential of DIS and DMP is likely to be more fully realised where governments adopt a more targeted approach, prioritising using new data to identify and tax larger non-compliant taxpayers while creating simple and equitable pathways to formalisation for smaller taxpayers (Gallien *et al.* 2023).

Successfully leveraging DIS and DMP also requires broader success in digitalising tax administration, starting with the implementation of integrated and automated systems and building a staff with appropriate skills. Those digital systems – and the capacity and willingness of staff to use them – are foundational to all of the goals described in this brief. While not the focus here, the broader challenges of effective digitalisation are addressed extensively elsewhere in our work, highlighting challenges related, among others, to systems design, accessibility to taxpayers, technical capacity and training, inter-institutional cooperation, politics and change management (Okunogbe and Santoro 2023; Occhiali, Akol and Kargbo 2022). In turn, there are good reasons to believe that investments in digitalising tax administration can be a catalyst for broader digitalisation across the public sector, owing to the data intensity of tax administration, the importance of connections between tax administration and other areas of government, the clear revenue incentives for strengthening digitalisation and the potential for tax administration to be a model for other government agencies (Prichard and Leonard 2010).

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## Credits

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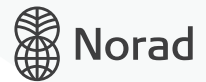
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