

DOI [10.5281/zenodo.21852852](https://doi.org/10.5281/zenodo.21852852)**FINANCIAL INCLUSION AND THE INFORMAL SECTOR TAX BASE:
DOES DIGITAL PAYMENTS FACILITATE OR DETER TAX COMPLIANCE?****¹Dr. Sujit Dey; ²Dr.Chandra Mohan Singh; ³Dr.Payal Dubey; ⁴Dr.Suresh Kumar
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Orchid No. 0009-0005-1443-5245.⁵Associate Professor; Anjaneya University, Raipur, Email: ila.dixit1@gmail.com; Orcid no-
0000-0002-5058-496X.**Abstract**

The proliferation of digital payment systems has fundamentally transformed the economic architecture of developing and emerging market economies, raising profound questions about the relationship between financial inclusion and tax compliance among informal sector participants. This paper examines the dual nature of digital financial services as both a potential tool for expanding the tax base and a mechanism through which informal economic actors may navigate, or circumvent, formal fiscal obligations. Drawing on theoretical frameworks from information economics, institutional theory, and behavioral economics, alongside empirical evidence from Sub-Saharan Africa, South and Southeast Asia, and Latin America, this study investigates whether digital payment adoption facilitates or deters tax compliance in informal economies. The analysis reveals a nuanced picture: while digital payment trails create unprecedented opportunities for tax authorities to observe previously opaque economic transactions, structural barriers including digital literacy gaps, trust deficits, and inadequate regulatory frameworks often undermine compliance gains. The paper argues that the net fiscal effect of digital payment adoption depends critically on the complementary institutional environment, including the design of tax incentive structures, the capacity of revenue authorities, and the inclusiveness of financial regulation. Policy implications center on the need for integrated strategies that pair financial digitization with proportionate, trust-building tax frameworks tailored to the heterogeneous character of the informal sector.

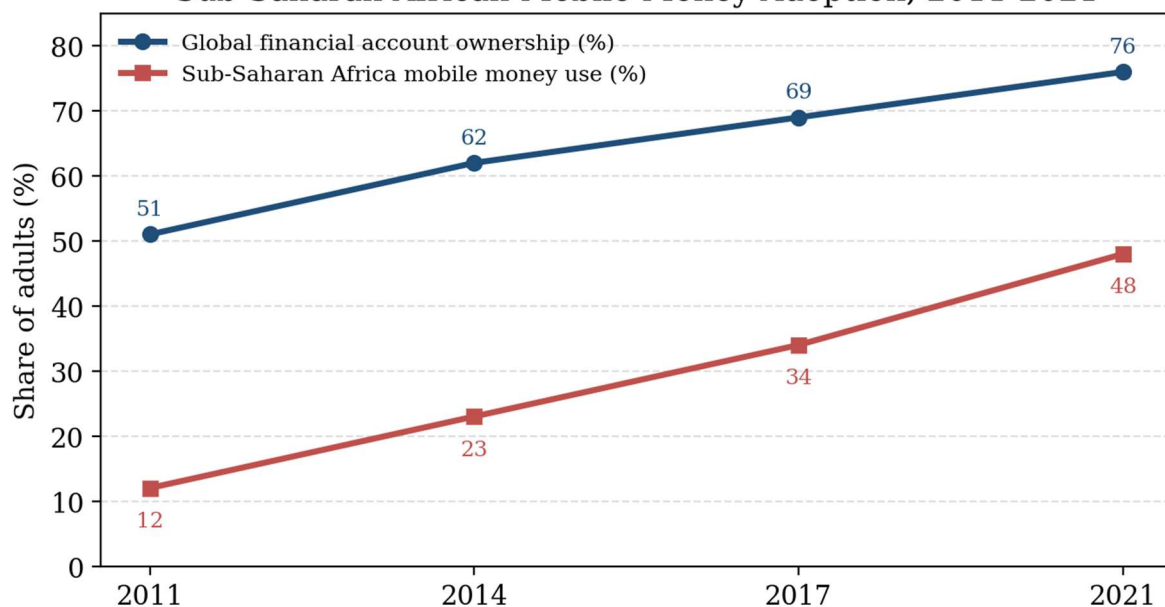
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1. Introduction

The informal economy constitutes a defining feature of economic life across much of the developing world, accounting for an estimated 70% of total employment and between 25% and 40% of gross domestic product (GDP) in low- and middle-income countries (Medina & Schneider, 2018). This vast sector — encompassing street vendors, smallholder farmers, domestic workers, artisanal producers, and micro-entrepreneurs — has historically existed beyond the reach of formal financial systems and, by extension, formal tax systems. The structural exclusion of informal workers from banking infrastructure meant that their economic transactions left no auditable financial trail, rendering them essentially invisible to revenue authorities. The consequence has been chronic undercollection of tax revenue, with the International Monetary Fund (IMF) estimating an annual tax gap in developing countries of more than USD 200 billion attributable to the informal economy alone (Cottarelli, 2011).

The rapid diffusion of digital financial services — encompassing mobile money platforms, digital wallets, card-based payments, and agent banking networks — has fundamentally disrupted this longstanding arrangement. Between 2011 and 2021, the share of adults globally with access to a financial account rose from 51% to 76%, driven predominantly by mobile money adoption in Sub-Saharan Africa and digital banking expansion in South and Southeast Asia (World Bank, 2022). Critically, a significant proportion of new account holders are informal sector participants who have never held a formal bank account. This financial inclusion breakthrough creates an entirely new dynamic in the relationship between the state and the informal economy: for the first time, the economic activities of millions of previously unbanked informal workers generate digitally traceable financial records.

Figure 1. Global Financial Account Ownership vs. Sub-Saharan African Mobile Money Adoption, 2011-2021



Source: World Bank (2022), Global Findex Database 2021.

The central policy question that emerges from this transformation is whether digital payment adoption translates into greater tax compliance among informal sector actors. The answer is neither straightforward nor uniformly positive. On one hand, digital payment trails create information that tax authorities can, in principle, use to identify taxable economic activity and enforce compliance. Several governments — including Kenya, Ghana, Tanzania, and India —

have already moved to leverage digital financial data for tax purposes (Osei-Assibey, 2015; Gupta et al., 2020). On the other hand, the same informal actors who have adopted digital payments retain the capacity to conduct transactions in cash, structure their activities to remain below reporting thresholds, and respond to tax enforcement threats by retreating from the formal digital system entirely. The theoretical ambiguity is substantial, and the empirical evidence is still nascent.

This paper seeks to contribute to this emerging debate through a systematic examination of the economic mechanisms through which digital payments interact with tax compliance incentives in the informal sector. The analysis proceeds from a foundation in information economics and principal-agent theory, situating digital financial data as a resolution to the fundamental informational asymmetry that has historically enabled informal sector tax avoidance. It then incorporates insights from institutional economics to assess how the broader regulatory and governance environment conditions the compliance effect of digitization. Finally, it draws on behavioral economics to examine how trust, perceived fairness, and tax morale shape the individual compliance decisions of informal workers confronted with new digital payment modalities.

The paper is structured as follows. Section 2 provides a theoretical framework integrating information economics, institutional theory, and behavioral approaches to tax compliance. Section 3 reviews the empirical literature on digital payments, financial inclusion, and informality. Section 4 examines the mechanisms through which digital payments may facilitate tax compliance. Section 5 analyzes the countervailing mechanisms through which digitization may deter or fail to produce compliance. Section 6 synthesizes the evidence and discusses policy implications. Section 7 concludes.

2. Theoretical Framework

2.1 The Economics of Tax Compliance in the Informal Sector

The canonical economic model of tax compliance originates with Allingham and Sandmo (1972), who modeled the taxpayer's compliance decision as a choice under uncertainty, analogous to a gamble between the utility of successful evasion and the expected disutility of detection and penalty. In this framework, compliance increases with the probability of audit and the severity of penalties, while it decreases with the tax rate insofar as a higher rate raises the return to evasion. The Allingham-Sandmo model provides the foundational logic for why informal sector actors exhibit low compliance: the subjective probability of detection is negligible when transactions are conducted exclusively in cash, rendering the expected cost of non-compliance close to zero regardless of statutory penalties.

The application of this model to the informal sector context requires modification, however. Kleven et al. (2011) demonstrated in the Danish context that third-party information reporting — the mechanism by which employers, banks, and other intermediaries report taxpayer income to revenue authorities — is the primary driver of compliance rather than audit intensity per se. This insight is of transformative importance for understanding the fiscal implications of digital financial inclusion. When informal sector actors adopt digital payment platforms, they generate precisely the kind of third-party information record that Kleven et al. (2011) identify as the critical determinant of compliance. The digital payment system becomes, in effect, an involuntary third-party reporter of economic activity.

Gordon and Li (2009) developed an influential model of informality and taxation in developing countries that establishes the fundamental link between financial access and fiscal capacity. In their framework, firms with access to formal financial systems — and who therefore depend on bank credit and payment infrastructure — are unable to hide their transactions from the tax authority and thus comply with tax obligations. Firms that operate exclusively in cash can

credibly threaten to exit the formal financial system and thus have stronger bargaining power to evade. The Gordon-Li model predicts that expanding financial access to informal firms will expand the tax base, a prediction that is directly testable in the context of mobile money adoption.

Cull et al. (2014) extended this framework to examine how the depth and breadth of financial inclusion — not merely account access but the active and intensive use of digital financial services — conditions the relationship between formalization and tax compliance. Their analysis highlights that the compliance dividend of financial inclusion depends critically on whether digital financial participation is voluntary and deep, or shallow and coerced. Informal actors who adopt digital payments primarily for the transactional convenience of remittances and bill payments, while maintaining parallel cash-based business operations, may generate only marginal improvements in tax visibility.

2.2 Institutional Economics and the Compliance Environment

North's (1990) institutional economics framework provides the conceptual lens through which to understand why individual compliance responses to digital payment adoption vary so dramatically across national contexts. North distinguishes between formal rules — including tax statutes, financial regulations, and enforcement mechanisms — and informal constraints — the norms, conventions, and self-imposed codes of conduct that govern economic behavior. Tax compliance in the informal sector is shaped not only by the formal probability of detection and penalty that Allingham and Sandmo (1972) emphasize, but also by the informal institutional environment: the degree of trust in government, the perceived fairness of the fiscal system, and the social norms surrounding tax payment.

Acemoglu and Johnson (2005) demonstrated that the quality of contracting institutions, including the reliability and impartiality of legal enforcement, is a primary determinant of long-run economic outcomes. Applied to the tax compliance context, their framework suggests that informal sector actors in environments characterized by weak governance, arbitrary enforcement, and corruption will respond to increased tax visibility not by increasing compliance but by seeking alternative strategies to remain opaque — including reverting to cash transactions, migrating to less traceable digital platforms, or paying bribes. This adverse response undermines the fiscal dividend of digital financial inclusion and may explain why empirical evidence on the tax effects of mobile money adoption is mixed.

Torgler (2011) synthesized the literature on tax morale — the intrinsic motivation to pay taxes — and found that it is significantly shaped by perceived government trustworthiness, fiscal exchange (the perceived link between taxes paid and public services received), and the fairness of the tax system. In informal economies where the social contract between state and citizens has historically been weak, where public service delivery is unreliable, and where the tax burden falls disproportionately on the formal sector while informal actors enjoy *de facto* exemption, tax morale is likely to be low. Digital payment adoption that increases the visibility of informal income may therefore generate compliance resistance rather than acceptance if not accompanied by credible reforms in fiscal exchange and service delivery.

2.3 Behavioral Economics and the Digital Payment Interface

Behavioral economics contributes a third theoretical lens through which to examine compliance responses to digital payment adoption. Thaler and Sunstein (2008) established that the architecture of choice environments — how options are framed, sequenced, and presented — has powerful effects on decision-making, often dominating the role of economic incentives. The design of digital payment interfaces may constitute a form of choice architecture that either facilitates or impedes tax compliance among informal sector users.

Slemrod (2019) applied behavioral insights to tax compliance and identified three critical mechanisms: salience (the degree to which tax obligations are visible and attention-grabbing), simplicity (the cognitive ease of understanding and fulfilling tax obligations), and trust (confidence that the tax authority will act fairly and competently). Digital payment platforms that integrate tax calculation, filing, and remittance functions directly into the payment interface — as seen in some implementations of mobile money tax integration in East Africa — score highly on salience and simplicity, potentially producing compliance gains beyond what purely rational models would predict. Conversely, platforms that generate visible digital records while maintaining complex and burdensome separate tax filing requirements may increase the salience of tax obligations without reducing the compliance cost, producing anxiety and disengagement rather than compliance.

Ariely et al. (2009) demonstrated that individuals are significantly more likely to engage in dishonest behavior when payment is indirect or abstract rather than tangible. The shift from cash to digital payments may paradoxically facilitate tax reporting honesty by making the link between economic activity and financial obligation more concrete and salient. However, this behavioral mechanism is contingent on the digital payment interface actively connecting transactions to tax obligations; absent such integration, digitization may merely shift the form of economic opacity without reducing its extent.

3. Empirical Evidence: Digital Payments, Financial Inclusion, and Tax Behavior

Table 1. Global Account Ownership and Digital Payment Adoption, 2011-2021

Indicator	2011	2014	2017	2021
Adults with a financial account (%)	51	62	69	76
Adults using mobile money (Sub-Saharan Africa, %)	12	23	34	48
Adults making/receiving digital payments (%)	42	56	64	72
Adults using a mobile phone or internet for account access (%)	n/a	36	47	58

Source: World Bank (2022), Global Findex Database 2021.

3.1 Mobile Money and Tax Revenue in Sub-Saharan Africa

Sub-Saharan Africa represents the most fertile empirical ground for examining the relationship between digital financial inclusion and tax compliance, given both the extraordinary penetration of mobile money platforms and the depth of informal economic activity in the region. Kenya's M-Pesa platform, launched by Safaricom in 2007, rapidly achieved near-universal adoption in urban and peri-urban areas and has since expanded deeply into rural communities (Jack & Suri, 2011). By the early 2020s, more than 90% of Kenyan households were using mobile money, a proportion that includes a majority of informal sector workers and small business operators (Suri & Jack, 2016).

Mbiti and Weil (2016) examined the macroeconomic effects of M-Pesa adoption in Kenya and found significant effects on household income and savings, consistent with a financial inclusion premium. However, their analysis did not directly estimate the fiscal consequences of mobile money adoption. More directly relevant is the work of Gupta et al. (2020), who used panel data from 52 African countries to estimate the effect of mobile money adoption on tax revenue as

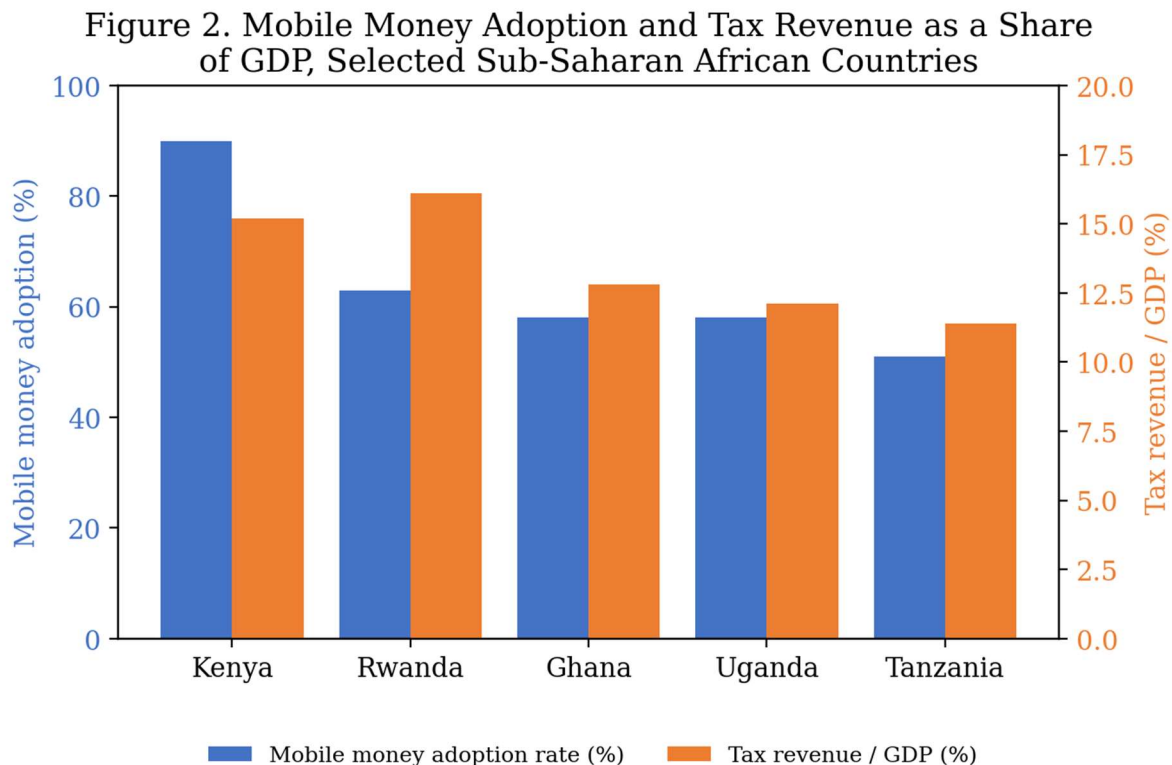
a share of GDP. Their instrumental variable estimates, exploiting variation in mobile network coverage as an exogenous driver of mobile money adoption, suggest that a one standard deviation increase in mobile money adoption is associated with a 1.3 percentage point increase in tax revenue as a share of GDP. This is an economically significant effect, consistent with the information-trail mechanism described by Kleven et al. (2011).

At the firm level, evidence from Ghana studied by Osei-Assibey (2015) found that informal enterprises that adopted mobile money for business transactions reported significantly higher rates of voluntary tax registration and filing than comparable firms relying on cash. Importantly, Osei-Assibey (2015) found that the compliance effect was concentrated among firms that used mobile money intensively for collections — receiving payments from customers via mobile money — rather than firms that used it only for disbursements such as supplier payments or employee wages. This heterogeneity is consistent with the Gordon-Li (2009) prediction that compliance effects are strongest when digital payment adoption creates visible income records, not merely visible expenditure records.

Table 2. Mobile Money Adoption and Tax Revenue Effects, Selected Sub-Saharan African Countries

Country	Mobile Money Adoption Rate (% , early 2020s)	Tax Revenue / GDP (%)	Estimated Compliance Effect
Kenya	90+	15.2	+1.3 pp per 1 SD increase in adoption (Gupta et al., 2020)
Ghana	58	12.8	Higher voluntary registration among mobile-money-collecting firms (Osei-Assibey, 2015)
Tanzania	51	11.4	Digital tax stamp integration; presumptive tax piloting
Uganda	58	12.1	Mobile money data used for cross-checking declared liabilities
Rwanda	63	16.1	Transaction data cross-checked against declared liabilities (Moore, 2019)

Source: Gupta et al. (2020); Osei-Assibey (2015); Moore (2019); World Bank Global Findex (2022) for adoption rates; IMF Government Finance Statistics for tax revenue/GDP figures.



Source: Gupta et al. (2020); World Bank Global Findex (2022); IMF Government Finance Statistics.

3.2 Digital Payments and Tax Formalization in South and Southeast Asia

India's demonetization episode of November 2016, in which the government abruptly invalidated 86% of currency by value in circulation, provides a dramatic natural experiment in the forced adoption of digital payments and its fiscal consequences. Lahiri (2020) documented a significant short-term increase in digital payment volumes and a measurable increase in Goods and Services Tax (GST) registration and filing in the months immediately following demonetization. However, Chodorow-Reich et al. (2020) found that the GDP cost of demonetization — concentrated in the informal, cash-dependent sector — was substantial, raising important questions about the welfare implications of forced financial digitization as a compliance strategy. The Indian experience suggests that the information value of digital payment data for tax purposes is real but may be outweighed by the disruption cost imposed on informal sector actors when digitization is coercive rather than organic.

Indonesia's electronic payment system expansion, studied by Bachas et al. (2021), provides a more positive case study. The Indonesian government's rollout of electronic social transfer cards to beneficiaries, which included debit functionality at agent banking outlets, generated a significant financial inclusion effect for previously unbanked low-income households. Bachas et al. (2021) found that account ownership through the social transfer program led to increased savings and, importantly, to gradual formalization of economic activity as households became accustomed to digital financial transactions. While this study does not directly measure tax compliance, the formalization trajectory it documents is consistent with the institutional pathway from financial inclusion to tax base expansion.

Evidence from the Philippines, where digital payment adoption has been driven by remittance flows and mobile banking, suggests a more ambiguous picture. Llanto and Rosellon (2017) found that while digital payment adoption was correlated with greater participation in

formal financial markets, the link to tax compliance was weak among informal sector micro-entrepreneurs. Their qualitative interviews revealed that many micro-entrepreneurs deliberately maintained separate cash-based business systems to avoid tax detection, accepting the transaction costs of dual-system management as the price of continued informality. This behavioral response — maintaining selective engagement with digital payment systems while preserving cash-based opacity in taxable transactions — represents a sophisticated adaptation by informal sector actors and poses a significant challenge to the financial inclusion-tax compliance narrative.

Table 3. Digital Payment and Tax Formalization Outcomes in South and Southeast Asia

Country/Episode	Digital Payment Driver	Fiscal Outcome	Key Study
India (2016 demonetization)	Forced currency invalidation (86% of value)	Short-term rise in digital payment volume and GST registration; substantial GDP cost in informal sector	Lahiri (2020); Chodorow-Reich et al. (2020)
Indonesia (social transfer cards)	Government-issued debit cards at agent banking outlets	Increased savings; gradual formalization trajectory among low-income households	Bachas et al. (2021)
Philippines (remittance-led adoption)	Mobile banking and remittance flows	Greater formal financial participation; weak link to tax compliance among micro-entrepreneurs	Llanto & Rosellon (2017)

Source: Author's synthesis of cited studies.

3.3 Latin American Evidence: Digital Receipts, VAT, and Compliance

Latin America has pioneered the use of electronic invoicing and digital receipt systems as compliance tools, providing particularly rich evidence on the mechanisms connecting digital financial infrastructure to tax compliance. Chile's mandatory electronic invoice system, introduced in 2003 and progressively expanded, has been studied by Pomeranz (2015) in a landmark randomized controlled trial of VAT compliance. Pomeranz (2015) found that the audit threat communicated through the electronic invoicing system produced significant compliance responses, particularly at stages of the value chain where transactions crossed from the formal to the informal sector. The electronic invoice trail effectively replicated the third-party information mechanism that Kleven et al. (2011) identified as the driver of compliance in developed country contexts.

Brazil's Nota Fiscal Paulista program, which incentivized consumers to request electronic receipts from businesses by offering lottery prizes funded from recovered VAT revenue, provides evidence on the demand-side drivers of digital payment compliance. Naritomi (2019) found that the program produced significant reductions in VAT evasion, particularly among small and medium-sized enterprises operating at the formal-informal boundary. The compliance effect operated primarily through the consumer demand channel: businesses that faced digitally

empowered consumers demanding receipts had strong incentives to record transactions in the formal system. This evidence highlights the role of digital payment systems in creating compliance pressures not only through supply-side enforcement but through the incentives of transacting parties.

Mexico's mandatory electronic invoicing system (Comprobante Fiscal Digital por Internet, or CFDI) provides additional evidence on the systemic effects of digital payment mandates. Hernandez et al. (2017) found that the CFDI requirement, while effective in increasing the formal registration of business-to-business transactions, had more limited effects on the large informal sector of cash-based business-to-consumer transactions that characterizes much of Mexico's micro-enterprise economy. This finding underscores a critical structural limitation of digital payment-based compliance strategies: they are most effective when both parties to a transaction have incentives to participate in the formal digital system, but lose effectiveness when one party — typically the individual consumer in informal markets — has no compelling reason to demand a digital receipt.

Table 4. Electronic Invoicing and Digital Receipt Programs in Latin America

Country	Program	Year Introduced	Primary Compliance Channel	Documented Effect
Chile	Mandatory electronic invoicing	2003	Supply-side audit threat via invoice trail	Significant VAT compliance gains at formal-informal transaction boundaries (Pomeranz, 2015)
Brazil	Nota Fiscal Paulista	2007	Demand-side consumer receipt requests (lottery incentive)	Reduced VAT evasion among small and medium enterprises (Naritomi, 2019)
Mexico	CFDI mandatory e-invoicing	2011	Business-to-business transaction reporting	Increased formal B2B registration; limited effect on cash-based B2C sector (Hernandez et al., 2017)

Source: Author's synthesis of cited studies.

4. How Digital Payments Facilitate Tax Compliance

4.1 Information Trail Creation and Third-Party Reporting

The most fundamental mechanism through which digital payment adoption facilitates tax compliance is the creation of an auditable information trail that tax authorities can access and analyze. Every transaction conducted through a digital payment platform — whether a mobile money transfer, a card payment, or a digital wallet disbursement — generates a timestamped, party-identified record that is stored on the payment service provider's servers. Unlike cash transactions, which are inherently unverifiable without contemporaneous third-party observation, digital payment records constitute objective evidence of economic activity that can be used to reconstruct income and turnover for tax purposes.

The fiscal value of this information trail depends on the regulatory framework governing tax authority access to digital payment data. In jurisdictions where tax authorities have legal access to digital payment records — either through mandatory reporting requirements imposed on payment service providers or through information-sharing agreements between financial regulators and revenue authorities — the information created by digital payment adoption constitutes a powerful compliance enforcement tool. Rwanda's Revenue Authority, for example, has pioneered the use of mobile money transaction data to cross-check declared tax liabilities, producing significant increases in assessed tax revenue from informal sector actors (Moore, 2019). Similar approaches have been adopted, with varying degrees of sophistication and success, in Kenya, Tanzania, Uganda, and Ethiopia.

The information trail mechanism is amplified by the network effects of digital payment adoption. When a sufficiently large proportion of economic transactions in a market are conducted digitally, the informal sector actor who continues to transact in cash becomes visible precisely through their absence from the digital record. Tax authorities that can observe the full digital payment ledger of a market — knowing which traders sell to which customers, at what volumes and frequencies — can identify anomalies between a trader's reported income and the digital payment inflows that counterparties report having sent. This network externality of digital payment adoption for tax enforcement has not been fully exploited in most developing country contexts but represents a significant long-run potential for fiscal capacity expansion.

4.2 Reduced Compliance Costs Through Integration

A second mechanism through which digital payment adoption may facilitate tax compliance is the reduction of compliance costs through the integration of tax calculation, recording, and remittance functions into the digital payment workflow. Slemrod and Venkatesh (2002) estimated that compliance costs — the time, money, and cognitive effort required to meet tax obligations — represent a significant deterrent to voluntary compliance, particularly for small businesses with limited administrative capacity. For informal micro-entrepreneurs, compliance costs that would be trivial for a formal firm with dedicated accounting staff may represent substantial burdens relative to the scale of their operations.

Several governments and fintech providers have responded to this compliance cost barrier by developing integrated tax payment solutions that leverage digital payment infrastructure. Kenya's iTax platform, linked to M-Pesa, allows micro-taxpayers to calculate, file, and pay taxes directly through their mobile phone without visiting a physical tax office or engaging an accountant. Tanzania's digital tax stamp program integrates excise tax collection into digital payment flows for goods in the alcohol, tobacco, and beverage sectors. These integrated systems reduce the transaction cost of compliance and, consistent with the behavioral mechanisms described by Slemrod (2019), make tax obligations more salient and procedurally simpler for informal sector actors who may have limited tax literacy.

The presumptive tax regime adopted by several African and Asian countries — in which small informal businesses pay a fixed periodic tax based on estimated turnover rather than actual profit — represents a further institutional adaptation that harnesses digital payment data to simplify compliance. When the presumptive tax assessment is based on mobile money transaction volumes, the compliance obligation becomes near-automatic: the tax authority calculates the presumptive liability from the payment record, and the business owner need only confirm and pay. Rwanda and Ethiopia have piloted such approaches with promising early results, though rigorous impact evaluations remain scarce (Moore, 2019).

4.3 Voluntary Formalization and the Credibility Mechanism

A third facilitation mechanism operates through the voluntary formalization choices of informal sector actors who perceive digital financial participation as a pathway to expanded economic opportunities. As Fafchamps (2004) documented, informal enterprises face chronic constraints on their ability to access credit, enter into enforceable contracts, and expand their customer base beyond immediate social networks. Formal financial participation — which digital payment adoption increasingly entails — signals creditworthiness to financial intermediaries and business partners, enabling access to working capital loans, trade credit, and supply chain relationships with formal sector buyers.

This credibility mechanism creates voluntary compliance incentives that operate independently of enforcement threats. An informal micro-entrepreneur who adopts mobile money to receive payments from a formal sector wholesale buyer, and who subsequently uses the digital payment record to secure a mobile credit facility, has strong incentives to formalize the business and comply with tax obligations in order to protect the formal financial relationships that underpin the enterprise's growth trajectory. De Mel et al. (2013) found, in a randomized experiment in Sri Lanka, that the perceived benefits of formal registration — including access to finance and legal protection — were the primary driver of voluntary formalization among informal micro-enterprises, supporting the credibility mechanism.

5. How Digital Payments May Deter or Fail to Produce Tax Compliance

5.1 Evasion Adaptation and Digital Avoidance

The most direct challenge to the digital payment-tax compliance nexus is the capacity of informal sector actors to adapt their transaction behavior in response to increased digital scrutiny. Economic theory predicts that rational agents facing an increase in the probability of detection will adjust their behavior to minimize expected tax liability through a combination of reduced evasion (compliance) and substitution toward less detectable forms of evasion (avoidance). In the digital payment context, this substitution takes the form of maintaining parallel cash systems for taxable transactions while using digital payments selectively for non-taxable or below-threshold activities.

Evidence of this adaptation is well-documented in the literature. Kumler et al. (2020) studied Mexican informal firms' response to expanded electronic invoicing requirements and found significant evidence of transaction steering: firms that anticipated increased digital scrutiny restructured their sales to concentrate digital transactions below reportable thresholds while conducting high-value transactions in cash. This behavior is analogous to the 'structuring' behavior documented in the anti-money laundering literature and suggests that informal sector actors may be sophisticated enough to exploit threshold-based exemptions in digital reporting regimes.

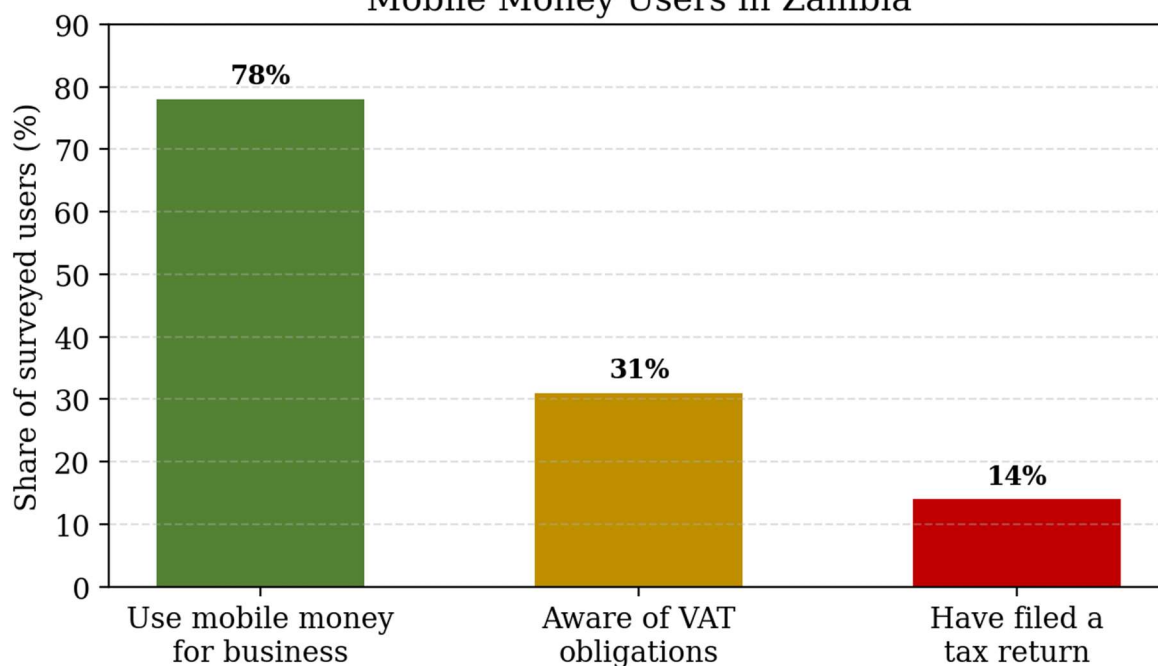
The proliferation of alternative digital payment platforms, including cryptocurrency and informal peer-to-peer transfer systems, provides additional avoidance channels that may substitute for monitored mobile money transactions. While cryptocurrency penetration remains limited in most developing country informal sectors, the global trend toward the fragmentation of digital payment infrastructure — with multiple competing platforms operating under different regulatory

regimes — creates opportunities for regulatory arbitrage that sophisticated informal actors can exploit. Tax authorities that invest heavily in accessing M-Pesa data, for example, may find that a subset of informal businesses migrates to less regulated digital platforms precisely in response to that enforcement activity.

5.2 Structural Barriers to Compliance in the Informal Economy

Even where informal sector actors do not actively avoid digital payment-facilitated tax enforcement, structural barriers may prevent digital payment adoption from translating into compliance. Digital literacy limitations are a fundamental constraint: the ability to use digital payment platforms does not automatically convey the knowledge of tax obligations, filing procedures, or compliance deadlines that are prerequisites for voluntary compliance. Mwenda et al. (2021) found, in a survey of mobile money users in Zambia, that while 78% of respondents used mobile money regularly for business purposes, only 31% were aware of their VAT obligations, and only 14% had ever filed a tax return. Digital financial inclusion had expanded the transaction capacity of informal businesses without correspondingly expanding their fiscal knowledge.

Figure 3. The Digital Literacy-Tax Awareness Gap:
Mobile Money Users in Zambia



Source: Mwenda et al. (2021).

Table 5. Digital Financial Inclusion Without Corresponding Tax Awareness: Evidence from Zambia

Indicator	Share of Surveyed Mobile Money Users (%)
Use mobile money regularly for business purposes	78
Aware of VAT obligations	31
Have ever filed a tax return	14

Indicator	Share of Surveyed Mobile Money Users (%)
Time cost of tax compliance for formal small businesses (Sub-Saharan Africa average)	306 hours/year

Source: Mwenda et al. (2021); Coolidge (2012).

The complexity and cost of the formal tax system represents a parallel structural barrier. In many developing countries, the tax compliance process remains burdensome even for businesses that are willing to comply: filing requirements may necessitate physical visits to tax offices, the engagement of tax professionals whose fees are prohibitive for micro-enterprises, or the maintenance of formal accounting records that exceed the administrative capacity of owner-operated informal businesses. Coolidge (2012) estimated that the time cost of tax compliance in Sub-Saharan Africa averaged 306 hours per year for formal small businesses, a figure that would be insurmountable for informal micro-enterprises whose entire operations may involve the proprietor working alone without administrative support.

Trust deficits between informal sector actors and tax authorities constitute perhaps the most fundamental structural barrier to compliance. In environments where government institutions are perceived as corrupt, where tax revenues are believed to be misappropriated, and where enforcement is experienced as arbitrary and predatory, informal actors may resist digital payment adoption itself as a mechanism of state surveillance rather than embrace it as an opportunity for economic formalization. Fjeldstad and Semboja (2001) found, in a study of tax administration in Tanzania, that distrust of the revenue authority was a primary predictor of non-compliance among small business operators, overriding the effect of enforcement probability in the Allingham-Sandmo model. Digital payment adoption that increases state visibility of informal economic activity without addressing the underlying trust deficit may provoke non-compliance resistance rather than facilitating fiscal engagement.

5.3 Regressive Fiscal Impacts and Distributional Concerns

A further concern is that the expansion of the informal sector tax base through digital payment monitoring may have regressive distributional consequences, disproportionately burdening the poorest and most economically vulnerable informal workers. Informal sector participants are not a homogeneous group: they range from micro-entrepreneurs earning subsistence incomes to substantial informal businesses whose owners are, in economic terms, affluent. Tax policies that harness digital payment data to expand the tax base may, if poorly designed, fall most heavily on the subsistence informal worker — the street vendor whose mobile money account reveals a daily transaction volume that crosses a taxable threshold — while leaving wealthier informal businesses with the resources and sophistication to manage their digital footprint strategically.

Bird and Zolt (2005) argued that the introduction of presumptive tax regimes targeting small informal businesses has historically produced regressive outcomes in developing countries, as the statutory burden often falls most heavily on those with the least capacity to pay and the least ability to resist enforcement. The application of digital payment data to enforce or expand such presumptive regimes carries similar risks. Policymakers who view digital financial inclusion primarily as a tax collection opportunity may undermine the very financial inclusion goals that the digital payment expansion was designed to achieve, as informal workers who associate digital payment adoption with unwanted fiscal attention withdraw from digital financial systems.

6. Synthesis: Net Effects, Conditioning Factors, and Policy Implications

6.1 Assessing the Net Fiscal Effect

The evidence reviewed in this paper does not permit a simple verdict on whether digital payment adoption facilitates or deters tax compliance in the informal sector. The relationship is conditional — it depends on the institutional environment, the design of the tax system, the degree of trust between state and informal sector actors, and the behavioral responses of informal workers to the incentive changes that digital payment adoption creates. Macro-level cross-country studies, such as Gupta et al. (2020), find a positive net effect of digital financial inclusion on tax revenue as a share of GDP, suggesting that on average and in the long run, digital payment diffusion expands fiscal capacity. However, micro-level studies reveal significant heterogeneity and important mechanisms that can undermine or reverse this aggregate effect.

The key conditioning factor that emerges from the evidence is the quality of the complementary institutional environment. Countries with strong revenue authorities capable of effectively analyzing and acting on digital payment data, functioning legal frameworks for information access and taxpayer rights, and credible service delivery that sustains tax morale are best positioned to realize the fiscal dividend of digital financial inclusion. Countries with weak governance, high corruption, and limited administrative capacity may find that the behavioral response of informal sector actors — avoidance adaptation, platform migration, and trust-based resistance — overwhelms the information value of digital payment records, producing minimal net compliance gains despite significant technological investment.

Table 6. Conditioning Factors Determining the Net Fiscal Effect of Digital Payment Adoption

Institutional Condition	Effect on Compliance Dividend	Illustrative Evidence
Strong revenue authority capacity to analyze payment data	Amplifies compliance gains	Rwanda's use of mobile money data for cross-checking (Moore, 2019)
High governance quality, low corruption	Amplifies compliance gains	Acemoglu & Johnson (2005) institutional quality framework
High tax morale, perceived fiscal exchange	Amplifies compliance gains	Torgler (2011) tax morale synthesis
Weak governance, arbitrary enforcement	Undermines/reverses compliance gains	Avoidance adaptation documented in Mexico (Kumler et al., 2020)
Coercive or abrupt digitization	Undermines compliance gains, imposes welfare cost	India's 2016 demonetization (Chodorow-Reich et al., 2020)
Integrated tax calculation within payment interface	Amplifies compliance gains	Kenya's iTax-M-Pesa integration; Slemrod (2019) salience/simplicity
Low digital and tax literacy	Limits compliance gains despite adoption	Zambia survey evidence (Mwenda et al., 2021)

Source: Author's synthesis of Sections 4 and 5.

6.2 Policy Implications

The policy implications of this analysis are multifaceted and resist simple prescription. A first and foundational implication is that digital payment adoption should not be viewed primarily as a tax enforcement tool by governments in developing countries. Positioning mobile money and digital financial services as surveillance mechanisms that enable greater tax extraction from informal workers risks producing the trust deficit and avoidance adaptation responses that undermine financial inclusion goals while failing to achieve meaningful fiscal gains. Governments that successfully leverage digital payment data for tax purposes have generally done so as part of a broader agenda of fiscal transparency, service improvement, and governance reform that builds the legitimacy of the tax system rather than simply intensifying its reach.

A second policy implication concerns the design of tax regimes applicable to the informal sector. Threshold-based presumptive tax regimes that are calibrated to digital payment volumes, automatically calculated, and payable through the payment platform itself represent the most promising integration of financial inclusion and fiscal compliance objectives. Such systems minimize compliance costs, leverage the salience and simplicity benefits of digital interfaces, and avoid the complexity barriers that deter informal sector actors from voluntary compliance with conventional tax systems. The critical design challenge is ensuring that the presumptive tax burden is set at a level that is proportionate to the earning capacity of the informal businesses targeted, and that threshold exemptions are generous enough to avoid capturing subsistence-level informal workers.

A third implication concerns the sequencing of financial inclusion and tax policy initiatives. The evidence suggests that digital financial inclusion should precede, not coincide with, the deployment of tax enforcement mechanisms that exploit digital payment data. Informal sector actors who are still in the early stages of digital payment adoption — who are learning the technology, building trust in digital financial institutions, and experiencing the economic benefits of mobile money — are most vulnerable to trust-damaging experiences of tax enforcement. Governments that allow a maturation period in which digital financial participation delivers demonstrable economic benefits to informal workers before deploying the compliance enforcement potential of payment data are more likely to achieve sustainable compliance gains than those that pursue immediate fiscal extraction from newly digitized informal sector activity.

A fourth implication addresses the regulatory framework governing tax authority access to digital payment data. The fiscal dividend of digital financial inclusion is conditional on tax authorities having timely, accurate, and usable access to relevant payment data, subject to appropriate privacy protections and due process safeguards. In many developing countries, the legal and technical framework for this data access is underdeveloped, either permitting overly broad and indiscriminate surveillance that chills digital payment adoption or restricting access to the point that the information value of digital payment records is not realized. Developing proportionate, rights-respecting frameworks for digital payment data access — modeled on existing international standards for financial information exchange but adapted to the informal sector context — is a priority policy reform.

Finally, the evidence underscores the importance of complementary investments in tax literacy and compliance support for informal sector actors. The digital payment systems that most successfully facilitate compliance are those that actively assist informal users in understanding and fulfilling their tax obligations, not merely those that create data trails that tax authorities can exploit. Mobile money platforms that integrate real-time tax calculators, simplified filing interfaces, and plain-language explanations of tax obligations transform the compliance

experience from a burdensome external demand into an integrated feature of the digital financial service. Partnerships between revenue authorities, mobile network operators, and civil society organizations to deliver tax literacy programming through digital payment platforms represent a promising avenue for complementing the information-side benefits of digital financial inclusion with demand-side compliance support.

7. Conclusion

This paper has examined the relationship between digital payment adoption, financial inclusion, and tax compliance in the informal sector through the integrated lenses of information economics, institutional theory, and behavioral economics. The analysis reveals that the relationship is genuinely complex: digital payment adoption creates information trails that, in principle, resolve the informational asymmetry that has historically enabled informal sector tax evasion, but the translation of this information advantage into compliance gains is conditioned by institutional quality, tax system design, behavioral responses, and the trust environment.

The evidence from Sub-Saharan Africa, South and Southeast Asia, and Latin America suggests that digital payment adoption is, on average, associated with positive fiscal outcomes at the macro level, consistent with the information trail mechanism. However, this aggregate effect conceals important heterogeneity: informal sector actors in weak institutional environments, poorly designed tax regimes, and low-trust fiscal contexts may respond to digital financial inclusion with avoidance adaptation that limits compliance gains, while distributional concerns raise the risk of regressive fiscal impacts on the most economically vulnerable informal workers.

The policy conclusion that emerges is that digital financial inclusion can be a powerful instrument for expanding the informal sector tax base, but only when embedded in a broader strategy of fiscal governance reform, tax simplification, and trust-building that addresses the structural and behavioral barriers to compliance. Governments that pursue digital payment-based tax enforcement as a short-term revenue extraction strategy, without attending to the complementary institutional and behavioral conditions that sustain compliance, are likely to be disappointed by the results and may undermine the financial inclusion objectives that digital payment expansion is intended to serve.

The research agenda on this topic remains expansive. Rigorous impact evaluations of specific digital payment-tax integration programs — randomized controlled trials and quasi-experimental studies exploiting plausible sources of identification — are needed to establish causal estimates of compliance effects and to identify the design features that maximize the fiscal dividend of financial inclusion. Comparative institutional analysis of the regulatory frameworks governing tax authority access to digital payment data across different national contexts would illuminate the legal and governance conditions that determine whether digital payment information is effectively mobilized for compliance purposes. And deeper qualitative research into the subjective compliance experiences, tax morale, and behavioral responses of informal sector actors themselves would enrich the understanding of the demand-side dynamics that aggregate data cannot capture. As digital payment systems continue to diffuse across the developing world at remarkable speed, the stakes of getting this policy interface right grow correspondingly.

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