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The E-Levy and Merchant Payment Exemption in Ghana

Celeste Scarpini, Fabrizio Santoro,
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Summary

In this paper we look into the increasing use of electronic payment technologies in low-income countries (LICs), with a particular focus on the use of mobile money in Ghana. Our study evaluates the effectiveness of tax exemptions for incentivising businesses and customers to adopt digital merchant payments, and shaping their perceptions of the tax system. Specifically, we investigate the impact of an exemption embedded in Ghana's electronic transfer levy (e-levy), implemented in May 2022.

Through a mixed-methods approach, involving survey data from 1,065 businesses and focus group discussions with Ghanaian citizens, we explore the barriers and drivers to merchants' (businesses') registration with mobile money for digital merchant payments. We assess the impact of the exemption on payment methods and customer preferences, as well as merchants' perceptions of the tax system.

Our findings highlight that larger digitally- and financially-inclusive businesses are more likely to adopt digital merchant payments. The exemption appears to have encouraged the use of mobile money for merchant payments, leading to a shift away from personal accounts. However, cash remains prevalent among both users and non-users of mobile money. Merchants using the exempted service express more satisfaction with various aspects of the e-levy policy, and show greater trust in the government and the fairness of the tax system.

Our study offers valuable insights into the adoption of digital merchant payments in LICs, and the impact of tax exemptions on merchants' behaviour and perceptions. We provide policy recommendations aimed at promoting the uptake of digital payments among merchants, and enhancing the effectiveness of the tax administration.

Keywords: digital merchant payments; mobile money adoption; Ghana; e-levy; tax exemption.

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Acronyms

DID	Difference in differences
FGD	Focus group discussion
GRA	Ghana Revenue Authority
LIC	Low-income country
OLS	Ordinary least squares
P2P	Peer-to-peer
PIN	Personal identification number
POS	Point of sale
RGD	Registration-General's Department
SIM	Subscriber identification module
TIN	Taxpayer identification number
VAT	Value added tax

1 Introduction

Use of electronic payment technologies in low-income countries (LICs) has dramatically increased in the last decade, in parallel with a rise in the use of mobile money. This phenomenon is particularly relevant in Africa, where mobile money has made great strides in increasing access to digital financial services and bridging the gap in financial inclusion. According to the *The Global Findex Database 2021*, 29 per cent of the adult population in Africa in 2021 had a mobile money account – in 2017 it was 23 per cent.

Ghana is a particularly important case study for understanding the development of mobile money products, given their explosive uptake by its population. In Ghana mobile money accounts are more prevalent than the average in Africa – as many as 60 per cent of adults had a mobile account in 2021, up from 39 per cent four years earlier. By November 2021 Ghana had 47.3 million registered users, 18.4 active users and over GH¢80 billion (US\$13 billion) of mobile money transactions carried out, with Ghana becoming one of the fastest-growing mobile money markets in Africa. In 2021 about a third of mobile money account owners in Africa used their account to make or receive at least one payment that was not person-to-person – up from 28 per cent in 2017 (Demirgüç-Kunt et al. 2022). This share is much higher in Ghana – 64 per cent, increasing from 43 per cent in 2017 (Demirgüç-Kunt et al. 2022). This type of payment, which we call a digital merchant payment, can be defined as retail transactions between businesses and customers that use a digital means of payment – not using cash. Mobile money is the primary method of digital merchant payment in Ghana.

Mobile-money-enabled digital merchant payments are believed to have great promise for improving tax compliance in LICs, tackling several long-standing challenges (Santoro et al. 2022b). First, by being more accessible – thanks to lower fees and fewer bureaucratic steps than the traditional banking sector – this kind of digital merchant payment facilitates safer and quicker formal payments (Bernard et al. 2023). Generally speaking, supply-side merchants' adoption can be reinforced by customers' preference for digital payment on the demand side, in a positive digital payment cycle (Higgins 2022). In turn, more reliance on digital payments can help merchants to keep better track of their business activity, expenses and receipts, which can then be more easily reported for tax purposes, increasing filing accuracy (Okunogbe and Pouliquen 2018; Okunogbe and Santoro 2022). Consequently, digital payments could improve merchants' perceptions of the transparency and predictability of the tax system, as tax liabilities are now based on more accurate digital information.

Second, the digital paper trail created by electronic payments can, at least in theory, be accessed and used by revenue authorities to enforce tax compliance and deter under-reporting (Carrillo et al. 2017; Das et al. 2022; Okunogbe and Santoro 2022; Pomeranz 2015). Relatedly, merchants' perceptions around the enforcement capacity of the tax administration could be shaped after adoption of digital payments, as data can be used by the tax agency to monitor their activity.

Finally, and more importantly for this study, digital merchant payments can be used by governments as a tool to leverage the formalisation of businesses, by exempting them from newly-introduced taxes on mobile money transactions (Bernad et al. 2023). Many resource-

constrained African governments, including Ghana, have adopted this strategy, while taxing other types of transactions (e.g. mobile money withdrawals and person-to-person).¹

This paper evaluates the effectiveness of tax exemptions for customers using digital merchant payments in encouraging businesses to use digital merchant payment accounts when transacting with customers. It also evaluates the impact of being eligible for these exemptions on merchants' perceptions of the tax system. We do this by looking at the impact of an exemption for digital merchant payments embedded in the design of the Ghanaian electronic transfer levy (e-levy). The e-levy was implemented in May 2022, and currently constitutes a 1 per cent levy on electronic transfers conducted via mobile money and banking platforms. Among the exempted transactions are specified merchant payments made electronically to businesses that are registered with the Ghana Revenue Authority (GRA) for income tax or value added tax (VAT). Among the exempted transactions are those made using mobile money business accounts, uniquely available to businesses that are registered for tax purposes. The motivation behind this policy is the government's goal of curbing business informality – providing the exemption as a competitive advantage for merchants, and inducing them to register. At the same time, telecommunication companies in Ghana have been pressing the government to stop the e-levy hampering the uptake of relatively new products, such as MTN's MoMoPay.²

Against this background, this paper studies the impact of the e-levy exemption for merchant payments on uptake of mobile money business accounts, the preferred methods of payment and tax perceptions. In our research we look at MoMoPay, as the MTN service represents nearly the totality of mobile money business accounts.³ More specifically, we aim to answer the following research questions: (i) what are the barriers and drivers of merchants' registration with MomoPay, and how does the e-levy exemption for merchant payments fit into the picture?; (ii) how does the exemption impact the usage of digital merchant payments and customers' preferences?; and (iii) what is the impact of using the exempted account on merchants' perceptions around the e-levy policy and tax system?

Our study relies on a mixed-methods approach. We combine original survey data from 1,065 individual businesses (which we call merchants) in the Greater Accra region, with 14 focus group discussions (FGDs) with Ghanaian citizens. With the survey, we collect quantitative information on business characteristics, payment methods and merchants' broad perceptions of the tax system and e-levy policy. We then quantitatively explore their relationship with ownership of a MoMoPay account. We complement our analysis with qualitative evidence from the FGDs, shedding light on mechanisms behind the quantitative results. Our quantitative analysis is mostly correlational. By relying on multivariate ordinary least squares (OLS) regression models, we explain MoMoPay adoption with a range of factors, as well as regressing perception outcomes over an indicator for MoMoPay usage. To understand the impact of the MomoPay exemption on customers' preferences, we apply a difference-in-differences (DID) framework to a pseudo-panel obtained from our survey data.

We present three sets of findings. First, we show that larger, more digitally- and financially-included businesses adopt the merchant-specific payment service. Importantly, these

¹ More information on approaches to taxation of digital financial services (DFS) can be found in the DFS TaxMap, a dynamic web portal tracking diverse approaches to DFS taxation: DIGITAX Program - ICTD (digitalfinancialservices.tax). Also, see Munoz et al. (2022).

² MoMoPay is a merchant payment service launched by MTN Ghana in 2017.

³ The analysis of GRA administrative data revealed that more than 95% of the mobile money business accounts linked to a tax identification number are MTN accounts.

businesses show more knowledge about the e-levy exemption. MoMoPay merchants use the service to reduce transaction costs – a key benefit from digitalised transactions – and, relevantly, to avoid the e-levy. We also document a combination of resignation and ignorance among non-users, who either tried to take-up MoMoPay but found the process to be too complex, or say they do not need it as they do not know about its benefits.

Second, we show that the exemption seems to have curbed the usage of mobile money personal accounts, which are not exempt from the e-levy, when comparing self-reported usage levels before (2021) and after (2023) the e-levy. Cash remains king, however, and has been untouched by the exemption policy. Cash is used by the vast majority of MoMoPay users and non-users. We also show that MoMoPay users believe that customers do their best to avoid the e-levy and strategically select exempted businesses, and merchants' profitability might benefit from the exemption.

Finally, we find that using the exempted service strongly correlates with an agreement index of satisfaction with seven aspects of the e-levy. While overall agreement is positively correlated, we also show that this positive pattern is driven by particular aspects of the e-levy, such as the exemption threshold for non-exempted transactions, the feasibility of policy goals, and the policy change. Exempted merchants seem indifferent about other aspects of the e-levy, such as its introduction, the rate, and its perceived fairness and transparency. When it comes to broader tax perceptions, exempted merchants also show greater levels of trust in the government, satisfaction with public service provision, and perceived fairness of the tax system. Crucially, the perceived probability of audit of exempted merchants – expected to increase given the clear traceability of business transactions through MoMoPay – remains untouched, in line with evidence from Rwanda (Bernad et al. 2023). This indicates that merchant-specific digital payments are not enough to shape merchants' perceptions of feeling more on the radar, a finding that has important implications for changes in actual tax compliance behaviour. However, we are unable to test this in this study.

This study makes three contributions to the literature. First, we add to the thin evidence around digital merchant payment adoption in LICs. Ligon et al. (2019) in Jaipur, India, show that supply-side barriers – obtaining necessary infrastructure or meeting requirements – to adopting digital payments explain the low level of adoption. In addition, they find that merchants' perceptions of future increases in tax liability, and a fear of being more visible to the tax authority, matter. In Rwanda, instead, Bernad et al. (2023), document that larger, more IT-sophisticated firms with bank accounts are more likely to use mobile money for merchant payments. Also, performing better in a quiz on mobile money significantly correlates with adoption of electronic payment. Our study complements this literature by presenting similar findings in Ghana, adding evidence on the role of the exemption for merchant payments – a factor that has not been studied in other contexts. Our findings on factors explaining technology adoption also resonate with more qualitative evidence from Africa on different tax e-services (Efobi et al. 2019; Mas'ud 2019; Obert et al. 2018).

Second, and relatedly, we contribute to the ongoing debate around government strategies to encourage digitalisation and formalisation, and specifically to the nascent literature around taxation of digital financial services (Munoz et al. 2022). Only a handful of studies try to evaluate the impact of these taxes, with inconclusive results and no reference to merchants' behaviour (Clifford 2020). The literature on the often-multidimensional formalisation strategies is instead more informative, although results are still inconclusive. On the one hand, a broad macro-analysis from Jacolin et al. (2021) find a negative relationship between the expansion of digital financial services and informality, by considering 101 emerging and

developing countries over the period 2000-2015. A similar macro study consistently finds a positive impact of the spread of mobile money on the efficiency of tax revenue mobilisation over the period 2006-2020 (Apeti and Edoh 2023). For specific incentive strategies, Higgins (2022) finds a strong positive spillover effect on retail merchants' point of sale (POS) adoption from providing consumers with credit cards in Mexico. This policy proved effective, also considering Mexico's efforts to demonetise the economy and tax cash deposits. Also in Mexico, Bachas et al. (2020) evaluate the impact of punishing cash with a 2 per cent tax on cash deposits, finding cash deposits to be very elastic – a 1 per cent increase in tax led to a 60 per cent reduction in cash deposits. A similar successful demonetisation effort comes from India, where Gadenne et al. (2022) find that limiting the availability of cash led to a large increase in the use of electronic forms of payment. This, in turn, translated into a strong positive impact on firms' sales reported to the tax authority. In Uruguay, in contrast, research shows that the attempt to expand POS infrastructure through tax credits and rental fee subsidies did not raise tax compliance (Brockmeyer and Somarriba 2022). While consumers, as in Mexico, are highly responsive to incentives for adoption of electronic payment, firms are less responsive – 80 per cent of those taking up the subsidy in Uruguay already had a POS infrastructure. The policy was ineffective in increasing the number of firms with POS, and raising more taxes.

Finally, we attempt to connect technology adoption and broader tax perception outcomes, in line with the growing literature around tax e-services and tax compliance reviewed in Okunogbe and Santoro (2023). Most of the literature focuses on e-invoicing (Fan et al. 2018), the electronic submission of tax returns or e-filing (Jouste et al. 2021; Okunogbe and Pouliquen 2018; Santoro et al. 2022a), and the use of electronic sales registry machines (Hakizimana and Santoro 2023; Mascagni et al. 2021). We, instead, focus on a more recent and less explored technology – electronic payment – which is expected to have a similar impact on perceptions and behaviour. Recent evidence from Rwanda aligns well with what we find in this study. Bernad et al. (2023) find that merchants' VAT filing improves after adoption, but only in the short term. This could be explained by the perception of merchants that the tax administration's enforcement capacity is unaffected when using electronic payments – mostly because merchants do not think that the Rwanda Revenue Authority would get access to mobile money data.

The policy relevance of this study is immediate. As the research was implemented with the support of the Ghana Revenue Authority, it aims to inform policymakers and industry around the impact of the e-levy exemption on merchants' behaviour. These findings are relevant beyond Ghana, as they bring concrete policy recommendations on fiscal incentives for digital payments that can be applied in other contexts. In the last section of the paper, we formulate policy recommendations that focus especially on ways to encourage merchants' uptake of digital payments, and the need to share mobile money data for better tax administration.

The remainder of the paper is as follows. Section 2 describes the context of the study, Ghana, the e-levy policy and the exemption for merchant payments. Section 3 presents the data sources and empirical strategy. Section 4 presents the different sets of results, while section 5 concludes and provides policy recommendations.

2 Context

2.1 The e-levy and merchant payment exemption

Similarly to most countries in Africa, Ghana is characterised by a vast informal sector and a need to raise adequate revenue – especially after the COVID-19 pandemic (Ministry of Finance 2023). Poor revenue collection is widely attributed to the large number of informal businesses, among other challenges (Besley and Persson 2013; Medina and Schneider 2019). The Ghana Revenue Authority (GRA) is investing heavily in efforts to encourage formalisation and registration, to include informal entities in the tax net, and, at least potentially, increase tax revenue (Gallien et al. 2021; Jouste et al. 2021; Lediga et al. 2020; Moore 2022).

In order to collect revenue and increase formality in a vast informal economy, the Parliament of Ghana passed the Electronic Transfer Levy Act, 2022 (Act 1075) in March 2022, imposing an electronic transfer levy of 1.5 per cent on electronic transfers (E-Levy Act 2022). The Act was implemented on 1 May 2022, bringing the e-levy into force.⁴ In November 2022, in the face of widespread public opposition to the tax, and hoping to increase revenue from the e-levy, the 2023 Budget reduced the headline rate to 1 per cent (Minister for Finance 2022).⁵ The reduction took effect in January 2023 (Appendix Figure A1). The e-levy applies to electronic transfers conducted via mobile money, banking platforms and inward remittances. However, the tax design provides several exemptions to exclude specific transfers and transactions.

Among the exempted transactions are ‘specified merchant payments’, namely ‘Transfers made through an electronic payment service (mobile money, bank application, FinTech platform, etc.) to a commercial establishment which is registered with the Ghana Revenue Authority for the purposes of Income Tax or Value Added Tax’ (GRA 2023). In other words, customers making payments to businesses that are registered with GRA for tax purposes and own a merchant account are exempted from paying the e-levy on those transactions.⁶ There are various kinds of merchant accounts, the most common being mobile money merchant accounts (hereafter MomoPay accounts), banking applications (like PayPal), or bank accounts.

The motivation for introducing this exemption is twofold. On the one hand, the GRA designed this exemption to encourage formalisation of businesses (section 1). As explained by Clifford (2020), ‘taxing mobile money appears at first glance to offer the opportunity to expand the tax base to these new taxpayers and thus appears attractive to tax authorities’. In the Ghana case, thinking that the exemption for merchant payments would work as a comparative advantage for businesses as they would be able to attract more customers by guaranteeing payments free from the e-levy, the GRA expected informal businesses to register for tax purposes and use the specific merchant payment service MoMoPay. While there are no official international statistics of the size of tax registries across countries, Medina and

⁴ The e-levy was initially announced with the rate of 1.75% of transaction value by the Minister of Finance in the 2022 Budget Statement and Economic Policy of the Government in November 2021 (Ministry of Finance 2022).

⁵ The 2023 Budget also proposed the removal of the GH¢100 threshold, but this was rejected by parliament.

⁶ The other transactions exempted from the e-levy are: cumulative transfer of GH¢100 per day made by the same person using mobile money; transfer between accounts owned by the same person; transfers for the payment of taxes, fees, and charges; electronic clearing of cheques; transfers among principal, agent, and master-agent accounts (GRA 2023).

Schneider (2019) measure the size of the informal economy in Ghana at 41 per cent of its official Gross Domestic Product, slightly higher than sub-Saharan Africa (39 per cent). This may help contextualise the government's efforts to curb informality. On the other hand, informative interviews with the GRA showed that telecommunication providers strongly pushed the Ghanaian government to include this exemption to avoid the e-levy suppressing the development of MoMoPay, a relatively new mobile money product in the Ghanaian market.

Businesses wanting to offer their customers mobile money payments free from the e-levy, which were not already registered with the GRA and using a mobile money personal account in their business, would have to go through a twofold process – to register with the GRA for income tax and/or VAT, and for a MoMoPay account.

2.2 Registration for a merchant account

MoMoPay – the mobile money service for digital merchant payments – was launched in Ghana in January 2017 by the leading telecommunication company, MTN. MoMoPay is offered to encourage the digitisation of commerce as an alternative to standard peer-to-peer (P2P) transactions. Merchants that take up the service receive a merchant SIM card linked to a separate merchant account. Customers can pay merchants through MomoPay by putting in a 5- or 6-figure code in place of the usual mobile number (Rowntree 2020).

Obtaining a Momo business account – or MoMoPay – entails obtaining a special SIM that is linked to a mobile money account, and enhanced with some features that are advantageous for businesses, especially in terms of fees.⁷ Fees for merchant payments are lower than for P2P transactions – there are no fees for MomoPay merchants to receive payments from clients, or for customers to pay a MomoPay merchant, as against 1 per cent for standard P2P payments. Moreover, MomoPay account owners can transfer money from their merchant account to their bank account, and take cash out, without fees. To register for MoMoPay, business owners are required to provide a business certificate, a letter of application and the national identity document – the Ghana Card. The process of acquiring a MoMoPay account SIM takes between 15 and 20 working days, and can either be initiated online or via SMS.⁸

Even though the process of obtaining a MoMoPay account might seem easy on paper, it is not in practice. First, obtaining the documentation required to activate an account is a cumbersome process, which can be expensive in time and money. A business certificate is issued by the Registrar-General's Department (RGD), upon completing an online or in-person form and providing supporting documents.⁹ Moreover, even the apparently obvious ownership of the identification document required for registration, the Ghana Card, is not a given for Ghanaian citizens. The Ghana Card roll-out started in 2017, but its current coverage is still quite limited. As of November 2023, only 16,950,560 of the 33,475,870 citizens reported by the World Bank (World Bank 2023) had their Ghana card (National Identification Authority 2023). In addition to the potential challenge of providing the required

⁷ In addition to the absence of fees, having a MomoPay account allows merchants to earn some interest on the money held in their wallet and to receive higher-value transactions. However, as with P2P transactions, if owners of MomoPay accounts take cash out from their merchant account at an agent outlet regular Momo transaction charges apply.

⁸ Information on the MomoPay registration process was retrieved from the webpage Business | MTN Ghana, in the FAQ section.

⁹ Information on how to obtain a business certificate can be found at the Registrar-General's Department website: Registrar General's Department (rgd.gov.gh).

documentation for registration of a MomoPay account, some citizens might need to register for all the required documents before being able to obtain a merchant SIM.

2.3 Registration with the Ghana Revenue Authority

The process of registering with the GRA and getting a Taxpayer Identification Number (TIN) is another layer of complexity that businesses who want to get a MomoPay account and benefit from the exemption have to face. The process is different, depending on the nature of the TIN. For individual registration, from 1 April 2021 the Ghana Card Personal Identification Number (Ghana Card PIN) is used as a form of TIN. This means that the Ghana Card PIN has replaced the TIN issued by the GRA for individual taxpayers. However, if an individual already has a Ghana Card, but has not interacted with the GRA before, they have to visit a GRA office to update their tax profile and provide information on their economic activity. If individuals wanting to register with GRA do not have a Ghana Card, they have to obtain one at the National Identification Authority offices located at one of the thirteen GRA offices across the country. For company registration, the GRA issues TINs in the traditional manner, expecting them to first register at the RGD. Taxpayers can then register at TIN centres on the RGD premises. If the registration is of organisations that are not required to register with the RGD,¹⁰ taxpayers have to submit an Organisational TIN Form, attaching an introductory letter and other relevant documents at any of the 13 GRA offices, using the Taxpayer Service Centre.¹¹

The process to obtain the necessary documents for MomoPay and tax registration – and those needed to obtain these documents – can imply monetary costs, like fees or travelling to the various offices, time spent in travel and appointments, and the psychological burden. As suggested by the literature on tax compliance costs (Mascagni et al. 2019; Yesegat et al. 2017), the complexity of registration processes might especially prevent small businesses from seeking eligibility for the exemption, thus leaving money on the table (Benzarti 2015).

3 Data and methodology

3.1 Data sources

We rely on various data sources. First, we collected detailed survey data from a sample of more than 1,000 merchants in the Greater Accra Region. The survey company first performed a thorough listing exercise in the field, to be able to identify potential respondents and reach the required sample size of 1,000. A few criteria were followed in the listing exercise. First, all respondents are based in Accra, and are representative of population distribution across the six sub-districts. This was due to budget constraints, which did not allow us to work outside of the capital. Nevertheless, Accra is an ideal context for this research, being Ghana's capital city and the country's economic hub. The city is the main destination for work migration – both from more rural areas of Ghana and the broader region – partly due to its vibrant economy and high concentration of markets (Akua Anyidoho et al. 2022). Second, all survey participants are businesses registered for income tax purposes

¹⁰ Examples of organisations that do not require RGD registration are: ministries, departments and agencies, cooperatives, foreign missions, trusts, metropolitans-municipals-districts-assemblies, and public institutions.

¹¹ Information on how to obtain a TIN for individuals and organisations can be found at the GRA website: TIN – GRA.

with the GRA,¹² and carry out business activities with a traditional physical presence. This means that the vast majority (87 per cent) are involved in trade, selling goods to the general population. We opted for this criterion to make the sample more homogenous, and to be able to better link the e-levy exemption with key tax perceptions. Finally, and more importantly, half the sample had to be registered for a MoMoPay merchant account, while the other half was not. This criterion was crucial to have an even split of MoMoPay take-up in the sample, and to be able to run comparative analysis across the two groups with sufficient statistical power.

The questionnaire, carefully designed with inputs from GRA and pre-tested, is structured according to different modules. After getting informed consent from participants, we collected demographic information and captured business-related characteristics, including preferred payment methods. We then asked questions on mobile money usage, including use cases and distance from a mobile money agent. A module on tax perceptions captured opinions on various aspects of the tax system. Further, a lengthier module around the e-levy was run to measure attitudes and perceptions around the e-levy, including the level of knowledge through a mini-quiz on the tax. A final module focused on owning a MoMoPay account, capturing the reasons for opening one, the level of knowledge of and perceptions around the exemption, and the perceived behaviour of merchants' clients after the e-levy.

The collection of survey data took place in May and June 2023 (Appendix Figure 1). A total of 1,065 merchants were successfully surveyed, of which 530 (49.8 per cent) have a MoMoPay account, satisfying the sampling criterion discussed above. Sample summary statistics are reported in Appendix Table 1.a for the pooled sample, and Appendix Table 1.b when splitting by MoMoPay ownership. Female merchants represent a sizeable 37 per cent of the sample, and a similar share have higher education. Merchants own very small businesses, and the vast majority (86 per cent) have less than five employees. Bookkeeping practices are present in 78 per cent of the sample, and a little less than half use the internet at work or trade online. Two-thirds have a bank account. Merchants made average monthly sales of GH¢330,600 (about US\$29,400) at the time of the survey. When looking at sales, surveyed businesses can be considered quite small, as 45 per cent of them are below the annual sales threshold for VAT registration, and hence operate through a simplified tax regime. Interestingly, 55 per cent worked informally before registering with the GRA, and tax registration on average took place about eight years ago. Appendix Figure 2 shows the year of adoption of MoMoPay, as reported by respondents. This suggests a steady increase in take-up in the last five years, before and during implementation of the e-levy (Appendix Figure 1). There were a sizeable number of new adopters in 2023, the year of the survey, when the e-levy was in place.

Second, we complement the survey data with additional methods of qualitative data collection, such as FGDs and key information interviews. We ran 14 FGDs with between six and eight participants in March 2023. Participants were randomly drawn from eligible respondents in the Greater Accra and Eastern regions. In each group, selection of participants was based on the following characteristics: (1) urban informal workers/formal workers, (2) rural agricultural informal workers/non-agricultural informal workers, (3) students, (4) rural/urban (5) gender, (6) political affiliation, (7) age, (8) mobile money users/non-users, and (9) merchants/non-merchants. Within each of these groups there will be a combination of gender representation and remittance receiver/senders. The FGDs were

¹² We do not consider VAT registration status. In the Ghana tax system, businesses with annual sales lower than GH¢200,000 are exempted for VAT. About 45% of our sample falls below the threshold. VAT registration is most likely taken care of by the sales size dimension, which we include in our regression framework.

run in March 2023, to understand the level of awareness of, and perceptions around, the e-levy and the specific ‘merchant payments exemption’ across these categories of the population. Although the majority of our focus group samples represent consumers rather than merchants, this contrast with our survey sample allows us to supplement the survey findings with anecdotal evidence from a consumer perspective. This may represent an important component of the success of the merchant exemption initiative. Appendix Table 3 gives details of the focus groups.

3.2 Methodology

3.2.1 Drivers of MoMoPay adoption

To address our first research question, we start by descriptively mapping the different payment methods accepted, and the reasons behind this. Then, we implement a simple multivariate regression model by regressing the adoption of MoMoPay, on a range of explanatory variables. The following OLS equation describes our approach:

$$Y_i = f(\beta' \text{ Background}; \gamma' \text{ DFS}; \delta' \text{ Pol}; \varepsilon) \quad (1)$$

where Y_i is the dependent variable, a binary variable indicating adoption of MoMoPay. We include a set of background features of the respondent, both at the individual¹³ and business level.¹⁴ We also consider a set of features related to mobile money and other digital financial services.¹⁵ Finally, we include an indicator for political support.¹⁶ The corresponding OLS coefficients indicating the relevance of each factor are given by β' , γ' and δ' . Importantly, we cluster the standard errors ε at the district level, to capture any heterogeneity at the geographical level. We also replicate the same approach by using a probit model, which leaves the results unchanged.

3.2.2 Impact on payment behaviour and clients' preferences

For the second research question we adopt a two-pronged approach. First, we reshape our survey dataset to create a pseudo-panel, where questions on the share of each payment method over the sales total are asked twice, in 2021 and 2023 – before and after the e-levy.¹⁷ These questions are asked regardless of MoMoPay registration, and are consistent with a null share of MoMoPay over total sales for merchants who are not using it. This allows us to capture, albeit imperfectly, the impact of having a MoMo pay account on the intensity of usage of different payment methods after the introduction of the exemption, compared to the period without the exemption, as if in a pseudo-DID design:

$$Y_i = \alpha' + \beta' \text{ MoMoPay} * \text{Post} + \gamma' \text{ MoMoPay} + \delta' \text{ Post} + \varepsilon \quad (2)$$

¹³ Such as gender, civil status and education.

¹⁴ Such as the number of employees in the business, whether bookkeeping practices are present, whether the business uses internet in its operation or if it trades online, whether the business owns a bank account, monthly sales, whether the business was informal before registering for tax with GRA, and the registration year.

¹⁵ Such as the distance from a mobile money agent and from a bank branch, whether the business owns a credit/debit card, an e-levy knowledge index coming from seven questions on the e-levy and, more specifically, an indicator for knowledge of the conditions to enjoy the exemptions (see sec. 2).

¹⁶ We introduce a binary variable for strong political support, derived from the question: ‘On a scale from 1 to 5, how strongly do you support this party of preference?’

¹⁷ The question reads: ‘In a typical month in 2021/2023, what percentage of your turnover was transacted through these payment methods?’

where the key outcome variable is a continuous variable for the share of that payment method over the total sales in an average day. The DID coefficient of interest β is the interaction between the MoMoPay indicator variable and the *Post* indicator for outcomes after the introduction of the exemption – during 2023. This coefficient captures any change in payment methods due to the exemption on MoMoPay. We also control for the same sets of features as in equation (1), which we omit from equation (2) for brevity, and cluster standard errors at the district level.

Second, to measure potential changes of clients after the e-levy, we regress merchants' perceptions around clients' behaviour over an indicator for MoMoPay account ownership, according to the following multivariate OLS model:

$$Y_i = f(\beta' MoMoPay; \gamma' Background; \delta' DFS; \eta' Pol) \quad (3)$$

where outcomes are a battery of questions around clients' behaviour after the e-levy. Specifically, we look at: (i) whether clients seek businesses where their payments will be exempted; (ii) whether exempted businesses sell more than those not exempted; (iii) whether clients have broadly changed their method of payment after the e-levy; (iv) whether clients prefer cash, to avoid the e-levy in any case; and (v) whether clients are aware that mobile money payments to certain businesses are exempted even if above GH¢100. The key explanatory variable is whether the merchant has a MoMoPay account, hence if they have the exemption, and the coefficient of interest is given by β . As with (2), we control for the same features to make our analysis more precise.

3.2.3 Impact on tax perceptions

Finally, we aim to connect MoMoPay usage, and the associated exemption, with a range of tax perceptions. The model we run is the same as in (3), which we do not repeat for the sake of brevity, where having MoMoPay is the key explanatory factor. The outcome variables refer instead to two sets of tax attitudes and perceptions. A first set is more specific to the e-levy. We built a standardised weighted index summarising the level of agreement with the e-levy policy. The index is derived from seven survey items, following a generalised least squares (GLS) weighting procedure as described in Anderson (2008).¹⁸ We opted for the creation of an index to aggregate variation across multiple outcomes, reducing noise through standardisation, and specifically to reduce bias from multiple hypotheses testing – likely to arise when testing seven different outcomes. We then regress this index over having MoMoPay, controlling for the usual factors as in (3). At least descriptively, we also repeat the regression for each single e-levy aspect, to explore the more complex nature of perceptions around the e-levy.

Second, a broader set of tax attitudes and perceptions refers to the tax system as a whole, as we argue that getting the exemption can also affect these more high-level opinions. In particular, we focus on: (i) practical considerations, such as how easy it is to comply and file a tax return;¹⁹ (ii) perceptions referring to deterrence, such as the perceived probability of getting audited;²⁰ and (iii) a set of soft motivations to comply – all connected to tax morale

¹⁸ We capture the level of agreement with the introduction of the tax in general, with the current tax rate and exemption threshold. We also measure the perceived fairness of the e-levy, and its transparency in the way revenue is used. We also capture the level of agreement with the policy change, and whether the respondent thinks the e-levy can achieve its purposes.

¹⁹ The survey question reads: 'On a scale from 1 to 4, how difficult/easy it is to navigate the tax system?'

²⁰ 'What do you think is the approximate likelihood that you will be selected for audit or review this year regarding your taxes, from 0% to 100%?'

(Luttmer and Singhal 2014), such as trust towards the government,²¹ the perceived fairness of the tax system,²² whether the tax system has become fairer now compared to the past,²³ and whether the respondent thinks tax evasion can be justified.²⁴

3.2.4 Focus group discussions

For the additional qualitative data collection exercises, the accompanying notes have been analysed ex-post around key thematic areas. Portions of text have been allocated questions and topics to identify common patterns and findings across the 14 focus groups, and to determine any outliers or discrepancies in answers or groups. The main thematic areas can be divided into knowledge of the e-levy, sentiments towards the e-levy, and reported behavioural changes. To capture specific information about the merchant exemption, we first ask a broad question about coping strategies in the face of the e-levy, and then knowledge of specific exemptions and how people may use them. Once answers were exhausted on these questions, we provide information about the exemption and ask about sentiments regarding the new information. This is to test any recollection of information, in case this was forgotten for the previous questions, and to test initial reactions to the policy for those who were unaware of the merchant exemption.

3.2.5 Limitations

Our study has limitations that are noteworthy. First, our reliance on survey data to discern usage patterns of payment methods over time introduces a potential source of recall bias. This is a concern, specifically for observations on the proportion of payments received through different payment methods between 2021 and 2023, which we use as an outcome variable (section 3.2.2). The risk is that retrospective responses about shares in 2021 might be inaccurate or incomplete. Recall bias has been found to be significant in agricultural and consumption survey data, especially when the salience of the event to recall is not high, as in the case of usage of payment methods (Beegle et al. 2012; Friedman et al. 2016). In this specific case, the direction the recall bias might take is not clear. We could also hypothesise that these responses were affected to some extent by desirability bias. The fact that merchants decided to obtain a MoMoPay account, going through the process and challenges described in section 2, might condition and boost their perceptions of the proportion transacted through this type of mobile money service.²⁵ We call this a pseudo-panel, and take the results from the associated pseudo-DID with caution.

Second, desirability bias could affect our evidence in other ways. While the survey instrument more effectively captures knowledge levels through objective questions relating to technical aspects of the e-levy, the inclusion of more subjective questions on perceptions around the e-levy may be subject to some degree of social desirability bias (section 3.2.3). It is important to acknowledge that these perception levels may represent an overestimation of

²¹ 'Imagine the national government proposed that if you paid more taxes, they would provide you with better services. How much would you trust them that these better services would actually materialise? 1 means not trust at all, and 5 means completely trust'.

²² 'On a scale of 1 to 5, how fair do you think the tax system is? 1 being very unfair and 5 being very fair'.

²³ 'Compared to 3 years ago, do you think that the tax system is more or less fair?'

²⁴ 'Please tell me for the following statement whether you think it can always be justified, never be justified, or something in between: Under-declare income to pay less tax'.

²⁵ The same bias can apply to merchants' perceptions around their customers' preferences for MoMoPay (section 4.2). We acknowledge this bias, but corroborate our evidence with a parallel survey study on the e-levy taking the perspective of ordinary citizens (Abounabhan et al. forthcoming).

attitudes and opinions (Krumpal 2013), especially the more sensitive ones for which a positive response is desirable – such as trust in the government and perceived fairness. However, in comparison to contexts like Rwanda, our study reveals sufficient variation in perception outcomes, suggesting respondents probably responded truthfully. If anything, we tend to replicate perception questions from the vast methodological literature on tax attitudes and opinions, building around the Afrobarometer survey, abundantly analysed in the literature (Blimpo et al. 2018; Isbell and Olan’g 2020), and other international standard surveys.

Third, our sampling strategy, grounded in random selection based on specific criteria, such as registration with the Ghana Revenue Authority, deviates from an ideal scenario where the tax administration’s taxpayer registry would have been directly accessed and employed for sampling. Unfortunately, data privacy regulations precluded the sharing of registry data with survey implementers, leading us to adopt a suboptimal sampling strategy. Consequently, self-reported registration status with the GRA may introduce biases into our sample, also capturing non-registered businesses. For the same inability to connect our respondents to a taxpayer identification number, we could not measure the links between adoption of electronic payments, tax filing and payment behaviour.²⁶

Finally, the lack of access to administrative data from telecommunication companies limits the robustness of our impact estimation strategy. A parallel study on the e-levy impacts, utilising this data, has observed an upward trend in merchant payments over time, thereby complementing our qualitative findings (Carreras et al. forthcoming).

4 Results

4.1 Drivers of adoption

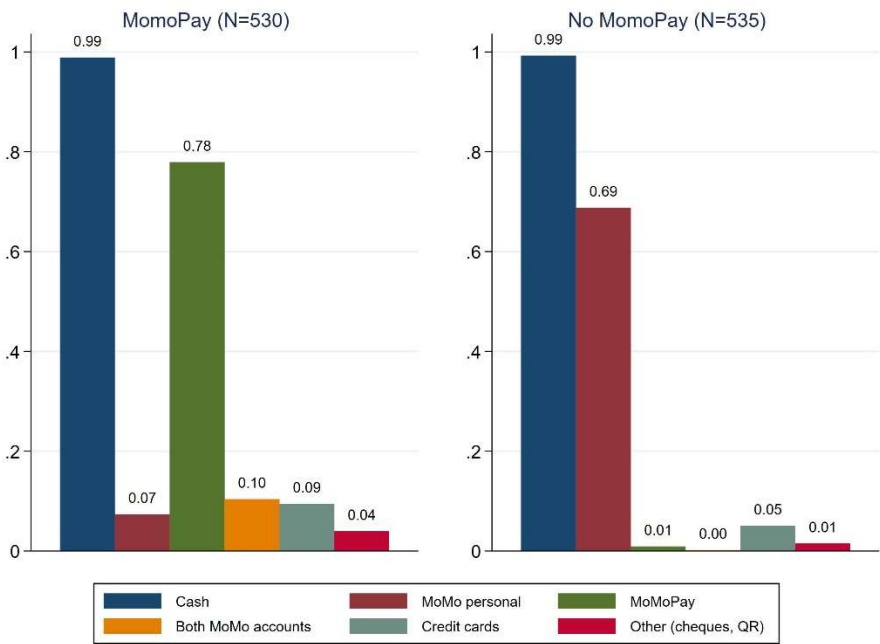
A preliminary mapping of the payment methods accepted by merchants is useful to extract some first key findings. Figure 4.1.a shows the frequency of using a given payment method by whether merchants have a MoMoPay account. A first key finding is that cash is widespread across the two categories, implying that cash remains the most popular payment method in most circumstances. This evidence resonates well with statements from the government when proposing the tax. This evidence also confirms previous findings from Africa (Bernad et al. 2023; Fjeldstad et al. 2020). Interestingly, about 78 per cent of MoMoPay account holders report to actually use it, indicating a gap between registering for the service and actually using it (intensive margin), which we analyse more in depth below.²⁷ MoMoPay merchants rely more on mobile money personal accounts (69 per cent), as the preferred digital, mobile-money-based, payment method, in line with evidence from Rwanda (Bernad et al. 2023). Finally, MoMoPay users tend to diversify their payment method options more than non-users – either by also using mobile money personal accounts or accepting credit cards, or MoMoPay users transact in cash at a lower rate than non-users over the total of monthly sales. Likewise, they tend to use the digital payment method of preference, in this case MoMoPay, more than non-users use mobile money personal accounts.

²⁶ This was possible in a similar study in Rwanda, showing perverse filing response after adoption (Bernad et al. 2023).

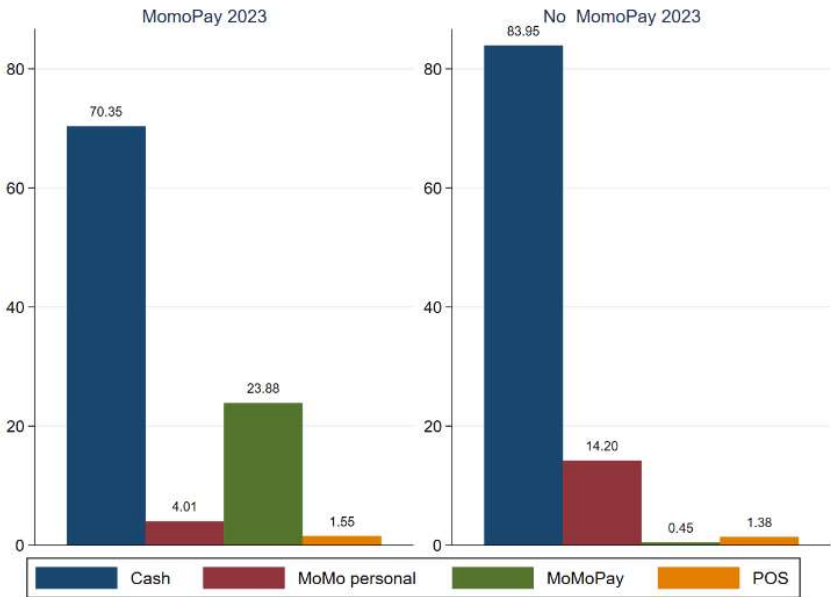
²⁷ This is not surprising. According to GSMA (2023), in 2022 the number of active (in the past 90 days) mobile money accounts worldwide was 586 million, which is only 36% of the 1.6 billion registered accounts.

Figure 4.1 Usage of payment methods

4.1.a Frequency of usage of payment methods



4.1.b Share of payment methods over total monthly sales in 2023

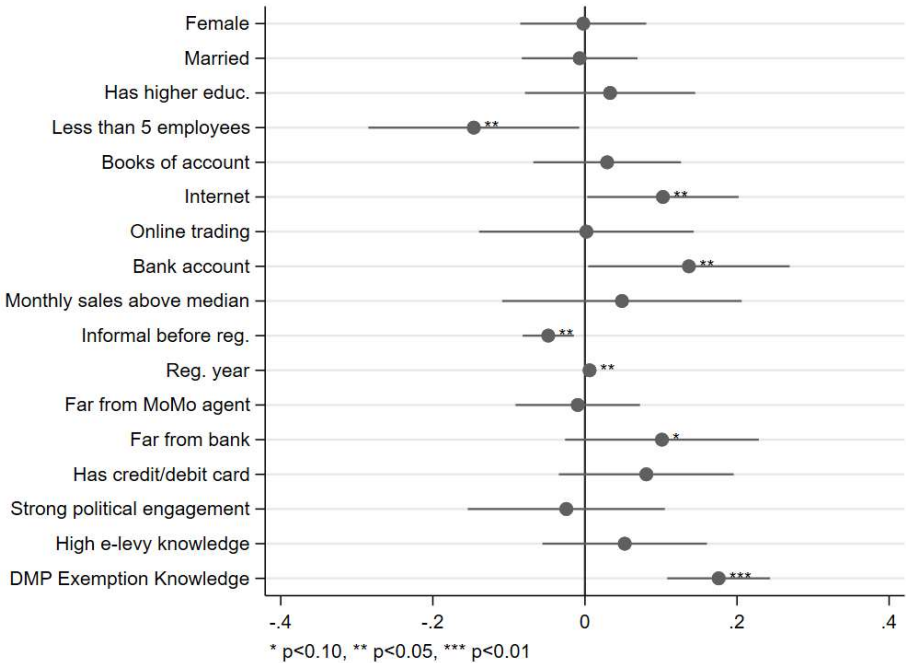


Note: For Figure 4.1.a, data is derived from the survey question: 'Which types of payments to your business do you accept?'. For Figure 4.1.b, the survey question is: 'In a typical month in 2023, what percentage of your turnover is transacted through these payment methods?'
 Source: Authors own from survey data

When we run equation 1 to understand the main correlates of MoMoPay adoption, OLS coefficients in Figure 4.2 are produced. A few findings emerge. First, businesses that are larger, those that have operated for longer, and those less likely to operate informally before

registration, are more likely to use a merchant-specific account.²⁸ Second, that businesses that also have a bank account and use the internet take up the merchant-specific account more – as indicated by the positive coefficients for *Bank account* and *Internet*. Having a bank account for the business is a key predictor of MoMoPay usage (consistent with higher disposition towards POS and cheque payments of MoMoPay users from Figure 4.1), such as using the internet in the business. Finally, and more importantly, knowledge about the e-levy exemption is the strongest correlate of MoMoPay adoption in the model. The coefficient is sizeable, as knowing about the exemption translates into an 18 percentage point higher probability of having a MoMoPay account.

Figure 4.2 Drivers of MoMoPay adoption



Note: Data derived from survey question ‘Do you have a mobile money merchant/business account for your business?’ The outcome is a 0-1 indicator variable for accepting MoMoPay from clients. Coefficients are extracted from the multivariate OLS regression 1, as described in section 3.
 Source: Authors own from survey data

As a robustness check, we repeat the same regression above but drop the 22 per cent of merchants registered with MoMoPay who report to not actually be using it (Figure 4.1.a). Excluding this rather small subgroup (117 units) does not alter the regression results. As shown in Appendix Figure 4, the patterns from Figure 4.2 are fairly similar, with a stronger role played by financial inclusion (having a bank account), and a weaker effect of internet connectivity. This result is primarily due to the fact that businesses who are registered but not actively utilising MoMoPay are not different from those using it. This is shown in Appendix Figure 5, representing the regression framework applied on a subset of 530 MoMoPay-registered merchants. Descriptively, non-users registered for MoMoPay more recently than users (52 per cent of non-users registered in the last one and a half years, compared to 35 per cent of users), and it could be that they are not yet familiar with the services. This lack of

²⁸ Despite the most intuitive and recognised meaning of ‘a formal business’ capturing whether the business is registered for tax purposes, we refer to a more nuanced definition of formality, considering that businesses might have been linked to other formal institutions - for example, the RDG or Accra Metropolitan Assembly (AMA). See Gallien and van den Boogaard (2023).

any statistical difference between the two subgroups makes us confident in using the broader group of MoMoPay registrations, including those not yet using it, in the remaining analysis.

As a further check, we focus on the knowledge dimension. Figure 4.2 indicates that knowledge of the e-levy exemption is a strong correlate of MoMoPay adoption, while broader e-levy-related knowledge has no influence. In Appendix Figure 6 we show that, when removing specific knowledge of the exemption from the framework, the broad knowledge index of the different e-levy aspects turns significant. This hints at the strong role played by the exemption-specific knowledge, which outshines broader e-levy knowledge. Yet, the latter broader knowledge on the e-levy is still pivotal, and turns relevant as soon as we remove the exemption-specific factor. In sum, awareness and knowledge represent a key correlate of adoption, both of the specific feature of the MoMoPay exemption and broader aspects of the e-levy policy.

The correlational evidence above speaks of more sophisticated, financially-led and formal businesses naturally opting for the merchant-specific account – mirroring recent evidence from Rwanda (Bernad et al. 2023). Importantly, technical knowledge around how the exemption works is a key correlate – merchants who know well how arguably complex the process of getting an exemption works are more likely to take up MoMoPay. This result, however, might also suggest that MomoPay users are more knowledgeable about the e-levy exemption as it directly concerns their businesses. This finding also relates quite well with the difference in mobile money use cases between MoMoPay users and non-users (Appendix Table A4), with the former using mobile money less for simpler tasks, such as getting airtime or sending money, and more for sophisticated purposes, such as paying utility bills and, importantly, saving.

Further, this evidence can be corroborated from more qualitative findings on the reasons for not using MoMoPay, summarised in Appendix Figure 3. The FGDs hinted at very little knowledge about either the existence of merchant accounts or the exemption for merchant payments in the general population. One participant said: 'I didn't know about this MoMo account (merchant account). Therefore, whenever I go there (to the shop) and they ask me to send it to the merchant account, I always add the charges'. Another participant also echoed little awareness of the exemption due to prior beliefs, saying: 'I don't check on every transaction I have paid through a merchant account. Because I have in mind that I was paying the e-levy I did not really look at that statement'. Some respondents were surprised about the existence of this exemption, and blamed the government for not giving them enough information so they could benefit from it. One participant remembered noticing they had not been charged the e-levy in a transaction with a merchant account, but thought this was a fault in the system rather than an exemption.

In line with this evidence, only two interviewees – one who mentioned having an import and export business and a master's student with a side business – reported having a MoMoPay SIM. In the survey (Appendix Figure 3), 37 per cent of non-users said they did not need it, which signals potential misperception and lack of knowledge of its benefits. The second most relevant reason (26 per cent) for not using MoMoPay is that merchants are in the process of getting it. The fact that 17 per cent of non-users report the process to be too complex, and that an additional 8 per cent tried to get MoMoPay but failed, could be explained by the cumbersome registration process described in Section 2, as well as difficulty in getting the supporting documentation from the RGD and the Ghana Card. It also suggests knowledge barriers that constrain MoMoPay take-up. At least descriptively, we understand from our survey data that those who tried and failed, and those who are in the process of getting it,

are much more knowledgeable about the e-levy as a whole, and of its exemption requirements, than those who say they do not need it. This could suggest the latter may have given up on getting a merchant SIM due to little knowledge about the e-levy. The qualitative evidence collected through the FGDs suggests that lack of knowledge of the benefits of a MoMoPay account for business, including the exemption for clients, are not the only reason that seems to drive the seemingly low uptake of merchant accounts after implementation of the e-levy. Despite very few participants knowing about the exemption, when the enumerators explained it to them some acknowledged the benefits it brings to clients in terms of avoiding e-levy payments. However, they also noted they would have to pay taxes on the amounts remitted, offsetting the potential benefits for their business. Someone also noted that the exemption would help the GRA track transactions that were not previously on its radar. Several participants also said they did not believe the exemptions were in effect and were only 'on paper', emphasising their distrust of information shared about the e-levy.

Another reason for respondents being reluctant to pursue the exemption criteria of GRA and MoMoPay registration was the perceived lack of benefits from the exemption in terms of profit margins. When asked if the incentive would be enough for them to register with the GRA, they said:

Not at all. I would have considered it if it was in the past. These days people do not use MoMo a lot. So if this is the only motivation to register with the GRA, then it is not worth it because the MoMo platform doesn't bring in as much money as in the past.

This may be explained by the reluctance to use mobile money, especially during its implementation, given the strong negative sentiments expressed by the Ghanaian population. Data shows a sharp drop in mobile money usage before and after implementation (Carreras et al. forthcoming). Although this has since returned to levels before the e-levy, it would not be surprising if there are lingering effects from the steep drop on perceptions of the platform at the time of interviews. At the time of the survey, 69 per cent of the Ghanaian population still disagreed or strongly disagreed with the introduction of the e-levy, and 72 per cent thought the e-levy was unfair or somewhat unfair (Abounabhan et al. forthcoming).

4.2 Impact on payment behaviour and clients' preferences

At this stage, it is important to ascertain whether using MoMoPay, and benefiting from the exemption, correlates with merchants' payment behaviour and clients' preferences. To do this, we first follow model (2) in section 3, and compare reported usage patterns before and after the exemption (in 2021 and 2023) across users and non-users, as in a pseudo-DID setting.

Table 4.1 reports the pseudo-DID estimates from our model (2), both without and with controls. First, it shows that the effect of using MoMoPay in 2023, hence with the exemption, does not change cash usage as compared to 2021 (col. 2), and POS usage (col. 8) is untouched by the new exemption policy. Second, and most importantly, we notice a decrease in the share of mobile money payments performed with personal accounts (col. 4).

Table 4.1 Impact of e-levy exemption on payment behaviour

	(1)	(2)	(3)	(4)	(5)	(6)
	% Cash	% Cash	% MoMo personal	% MoMo personal	% POS	% POS
Has MoMoPay*Post exemption	-1.95 (1.05)	-1.97 (1.04)	-2.53*** (0.31)	-2.53*** (0.32)	-0.63 (0.45)	-0.63 (0.46)
Post exemption	2.11** (0.80)	2.12** (0.80)	1.37* (0.54)	1.37* (0.54)	0.32 (0.29)	0.32 (0.30)
Has MoMoPay	-11.64*** (1.28)	-8.42*** (1.65)	-7.65*** (1.83)	-8.52*** (1.65)	0.80 (0.41)	-0.39 (0.54)
Controls	No	Yes	No	Yes	No	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. variable	76.57	76.57	9.06	9.06	1.46	1.46
R-sq.	0.118	0.209	0.117	0.179	0.007	0.084
Observations	2110	2110	2127	2127	2118	2118

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is a continuous variable for the share of that payment method over the total sales in an average day in either 2021 or 2023. The DID coefficient of interest is the interaction between the MoMoPay indicator variable and the Post indicator for outcomes after the introduction of the exemption – during 2023. See section 3 for more details.

Source: Authors' own.

The evidence above on merchants' payment behaviour can be merged with evidence on merchants' perceptions around their clients' behaviour, whose measurement follows equation 3 – discussed in section 3. Table 4.2 shows that MoMoPay users have different perceptions of their clients than non-users, which is important for understanding the potential behavioural impact of the e-levy.

Table 4.2 MoMoPay usage and perceived clients' behaviour

	(1)	(2)	(3)	(4)	(5)	(6)
	Prefer shopping with MoMoPay	Seek businesses to avoid e-levy	Clients prefer cash	Exempted businesses sell more	Clients changed payment method	Clients aware of exemption
Has MoMoPay	0.20*** (0.03)	0.15** (0.04)	-0.02 (0.03)	0.11** (0.03)	0.12** (0.04)	0.08* (0.04)
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Mean of Y	0.42	0.53	0.72	0.45	0.54	0.47
R-sq.	0.131	0.118	0.094	0.105	0.163	0.112
Observations	1065	1065	1065	1065	1065	1065

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variable is an indicator variable for whether the merchants perceive that specific client behaviour. The main regressor is whether the merchant is a MoMoPay user. See section 3 for more details.

Source: Authors' own.

First, MoMoPay users tend to believe that clients prefer shopping and paying through the merchant-specific service, and significantly so. Second, and relatedly, according to MoMoPay users, clients are more likely to actively seek exempted businesses – those

registered with MoMoPay – to strategically avoid the e-levy. Consistently, it follows that MoMoPay users are more likely to believe that clients changed their payment methods. Finally, according to MoMoPay users’ perceptions, exempted businesses sell more. Interestingly, and in line with the evidence presented above, there is no significant impact of MoMoPay ownership on the perception that clients prefer cash, or whether they are aware of the exemption. This lack of significant effect is consistent with the null findings derived when regressing turnover in 2023 over an indicator for MoMoPay usage, with the strong prevalence of cash across the two merchants’ categories (Figure 4.1), and with recent evidence from a parallel study on Ghanaians’ ignorance of the e-levy (Abounabhan et al. forthcoming).

More broadly, the regressions below indicate a parallel story of MoMoPay non-users believing that their clients did not adapt their behaviour to cope with the e-levy. These perceptions, the opposite of MoMoPay users’, could justify why non-users keep transacting outside MoMoPay – they do not see any immediate demand for it from clients. In other words, non-users could probably explain their lack of adoption of MoMoPay by subjective perceptions around clients’ behaviour, reinforcing their decision on preferred payment methods.

In sum, this analysis corroborates the fact that the e-levy exemption had some role in shifting the usage of personal accounts to MoMoPay for transactions to merchants. This result suggests that, after introduction of the e-levy, merchants (or clients) might have tried to substitute payments through personal accounts with merchant payments to benefit from the exemption and avoid the e-levy. At least partially, the exemption has also shaped clients’ behaviour in the eyes of merchants, and potentially favoured businesses owning a merchant account over those who do not. However, the exemption seems not to be enough to reduce reliance on cash. Equally importantly, the exemption appears to not be familiar to, or well understood by, the general population of consumers, while knowledge about it matters more for merchants’ decisions to use MoMoPay (Figure 4.2).

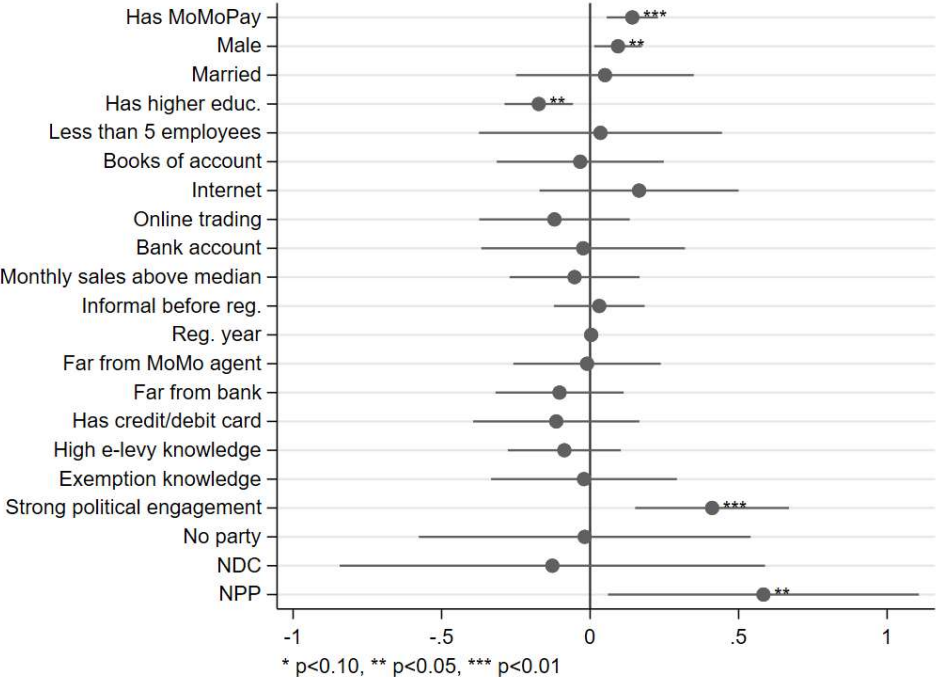
4.3 Impact on tax perceptions

As a final exercise, we aim to correlate MoMoPay usage, and the associated exemption, with a range of tax perceptions. We start with more e-levy specific perceptions, by building an e-levy agreement index as a standardised weighted average of seven survey items, as described in section 3. As mentioned above, we tend to prefer the aggregation and standardisation of the seven perception outcomes into an index due to important methodological benefits (section 3.2.3). Figure 4.3 below reports the OLS coefficients, where using MoMoPay is the key regressor of interest, and the other variables are used as controls, but still providing a useful interpretation.

Figure 4.3 shows that using MoMoPay has a positive and highly significant correlation with the agreement index, implying a 14 per cent increase in agreement compared to those not using MoMoPay. Other patterns emerge as well. For instance, male and less educated merchants are more in favour of the policy. Also, political aspects are quite relevant in explaining agreement with the e-levy. Merchants with a strong political engagement are significantly more in favour of the tax. Relatedly, supporting the New Patriotic Party (NPP), the ruling party, has an expected positive correlation with a tax policy implemented by it. Having voted for the opposition party, the National Democratic Congress (NDC), does not correlate with the agreement level. Instead, it is interesting to note that neither knowledge of the e-levy nor specific knowledge of the exemption are found to correlate with agreement

with the tax. This result aligns with findings from household-level evidence suggesting that supporting the current government positively impacts agreement with the e-levy (Abounabhan et al. forthcoming). It is equally interesting to note that, once the politics-related factors are omitted, results do not change. For instance, knowledge still remains insignificant, as indicated in Appendix Figure 6. When ruling out political support and affiliation, the same factors significantly correlate with the index – namely, enjoying the exempted MoMoPay account, being male and less educated. This suggests that, apart from political factors, there are no key elements explaining agreement with the e-levy other than enjoying the exempted MoMoPay account and a few demographic features (gender and education).

Figure 4.3 MoMoPay usage and e-levy agreement index



Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The explanatory variable is the e-levy agreement index, built as a standardised weighted average of seven survey items, as described in section 3. The main regressor is whether the merchant is a MoMoPay user. See section 3 for more details.

Source: Authors' own.

More granular insights arise when repeating the regression model on the disaggregated items composing the index, whose results are summarised in Appendix Table A5. MoMoPay users are particularly satisfied with the e-levy threshold. They also tend to believe more that the e-levy will successfully reach its policy goals, and are happier with the 2023 policy change than non-users. No significant correlation is found between using MoMoPay and agreement with the first introduction of the e-levy, nor with its tax rate. More broadly, using MoMoPay does not positively correlate with its perceived fairness, nor with the perceived transparency of how its revenue is used. In sum, overall agreement with the e-levy positively correlates with MoMoPay usage, but this is driven by specific aspects of the tax, suggesting the complex nature of perceptions around the e-levy policy.

As a second exercise, we connect MoMoPay usage and seven broader tax perceptions, as described in section 3. The regression module remains the same as above. Table 4.3 reports the OLS coefficients for using MoMoPay, as regressed on a specific tax perception. Results are only marginally positive. Using MoMoPay, and enjoying the exemption, has a weakly

significant impact with three out of seven outcomes – trust in government, satisfaction with public service provision, and fairness of the tax system. A broader indicator for tax morale, whether the merchant does not ever justify tax evasion, remains unchanged. Interestingly, perceived compliance costs with tax obligations and perceived audit likelihood are untouched, consistent with what was found in Rwanda (Bernad et al. 2023). This last finding may suggest that MoMoPay users do not feel more on the tax agency’s radar due to transacting with more traceable financial services, despite the digital data trail it generates. This finding has important implications for potential changes in actual tax compliance behaviour, which we are unable to test in this study.

Table 4.3 MoMoPay usage and tax perceptions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Low compliance costs	Audit probability (%)	Trust govt.	Satisfied pub. serv.	Fair system	Fairer now	Never justify evasion
MoMoPay	-0.00 (0.02)	-0.49 (1.73)	0.03** (0.01)	0.06 [^] (0.02)	0.03 [^] (0.01)	0.02 (0.02)	0.02 (0.03)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of Y	0.34	23.70	0.11	0.19	0.13	0.25	0.58
R-sq.	0.137	0.158	0.049	0.068	0.045	0.162	0.121
N	1065	1059	1065	1065	1065	1028	1025

Note: ^{*} $p < 0.10$, ^{**} $p < 0.05$, ^{***} $p < 0.01$. The outcome variable is an indicator variable for whether the merchants perceive that specific aspect of the tax system. The main regressor is whether the merchant is a MoMoPay user. See section 3 for more details.

Source: Authors’ own.

In sum, this evidence tends to indicate that MoMoPay exempted merchants show more positive perceptions than non-users, but mostly at a higher and broader level, and related to general support of the government. They are more satisfied with the e-levy policy, but, apart from the threshold, mostly with the broader policy aspects of it, such as the feasibility of its policy goals and recent policy amendments. Similarly, they tend to trust the government more. They are more likely to believe the tax system is fair, although they do not show strong positive opinions on the fairness of the e-levy itself. More practical tangible aspects, such as the actual introduction of the e-levy and its tax rate, or more politically sensitive ones, such as perceived transparency on how e-levy revenue is used, do not show different agreement levels between users and non-users. Interestingly, the regressions show a more important role of political aspects than mere knowledge of the e-levy design as drivers of agreement. Further research, ideally better measuring politically sensitive perceptions, is needed to capture the political elements behind this evidence, and how political support translates into agreement with tax policies.

5 Conclusions and policy recommendations

In this study we evaluate the role of the e-levy exemption for merchant payments in the context of Ghana. Our research unveils three principal findings. First, discernible patterns emerge wherein enterprises that are larger, banked, and using the internet in their business exhibit an increased propensity to adopt the merchant-specific payment service, aligning with

heightened awareness of the e-levy exemption. MoMoPay merchants strategically leverage this service to mitigate transaction costs and benefit from other characteristics of the service. Conversely, non-adopters reveal encountering procedural difficulties with MomoPay registration, or remain oblivious to the existence of this service and its attendant benefits.

Second, our investigation underscores the stimulative impact of the e-levy exemption on reliance on cash and MoMo personal accounts, evidenced through self-reported usage levels before and after the e-levy implementation. Nonetheless, cash retains its primacy in transactions, resilient to the influence of the exemption policy. MoMoPay users, after exemption, rely less on their personal accounts, as expected. MoMoPay users discern a conscious effort by consumers to evade the e-levy, strategically aligning with exempted businesses and potentially bolstering merchant profitability.

Finally, our analysis reveals a robust association between engagement with the exempted service and a positive agreement index encompassing various facets of the e-levy. Moreover, exempted merchants demonstrate higher levels of trust in government, satisfaction with public service provision, and perceived fairness in the tax system. However, consensus on practical dimensions, such as the e-levy's inception and tax rate, or politically sensitive considerations, like transparency in e-levy revenue allocation, manifest no discernible variance between users and non-users.

As stated in section 3.2.5, we briefly reiterate that the study bears some limitations, due to the nature of our data. First, relying on survey data for understanding payment method usage introduces potential recall bias. Second, we might incur social desirability bias for subjective questions on perceptions on the tax system, and more broadly on government. Nevertheless, our study indicates sufficient variation in perception outcomes, suggesting truthful responses. Third, our sampling strategy, based on random selection based on registration with the Ghana Revenue Authority (GRA) as criteria, deviates from an ideal scenario due to privacy regulations. Self-reported GRA registration may introduce biases, capturing non-registered businesses. The inability to link respondents to a taxpayer identification number prevents measuring the links between electronic payment adoption and tax behaviour. Moreover, lack of access to administrative data from telecommunication companies weakens the impact estimation strategy. Another study on e-levy effects, utilising this data, supports our findings and affirms the exemption's effectiveness (Carreras et al. forthcoming).

Nevertheless, we offer significant policy recommendations based on our findings. First, fiscal strategies aimed at promoting the adoption of digital payments must recognise and address the practical barriers confronting merchants when embracing this technology. Our analysis reveals that smaller enterprises are less inclined to adopt. Financially-included businesses, with existing banking relationships and a familiarity with the internet, are more likely to do so. Crucially, both consumer and merchant awareness of the exemption policy emerges as a factor correlated with adoption. Thus, even with a fiscal exemption in place, disadvantaged entities may not reap its benefits. Moreover, section 2 highlights the multiple – potentially cumbersome and challenging – steps that a merchant has to deal with to meet the requirements for receiving the exemption for merchant payments. The lack of comprehensive understanding of the law, the benefits and the process to be eligible, matched with practical difficulties of retrieving the necessary documents, might prevent the exemption for merchant payments from achieving its goal of formalising small businesses for tax purposes.

These results resonate with the recent literature challenging the common binary and evolutionary conceptualisation of 'formalisation' (Gallien et al. 2023; Gallien and van den

Boogaard 2023). These contributions challenge the idea that entities can be fully 'formal' or fully 'informal', highlighting how businesses and individuals might instead have a 'formal' relationship with some state actors and not with others. This is due to the fact that formalisation actually consists of entities establishing different linkages with state and non-state actors – like providers of digital financial services and the tax administration in this case. Entities face structural barriers depending on the institutional and administrative processes of formalisation in question, and the broader context in which the process is meant to take place. Moreover, they question the idea that formalisation of entities is a logical, evolutionary process. Entities face at least two sets of costs when formalising for tax purposes, and these are reflected in our results. First, compliance costs, such as monetary costs (fees and travelling to the various offices), time spent in appointments and travels, and the psychological burden, might prevent small businesses from becoming more formal (Mascagni et al. 2019; Yesegat et al. 2017). Second, registration for tax purposes might imply additional tax payments, which for small businesses might represent a considerable burden (Gallien et al. 2021).

Consequently, exemption policies should be complemented by targeted strategies to eliminate these barriers and minimise compliance costs. In the case of this study, these should focus on the processes of business registration, identification and tax registration, which smaller taxpayers seem to find an obstacle. Moreover, initiatives such as sensitisation campaigns and educational programmes on the exemption could play a vital role in fostering adoption of MomoPay and the exemption for merchant payments. Also, broader national efforts to enhance internet familiarity and connectivity could positively impact adoption, given that merchant accounts operate as digital services. Finally, it is important to note that the improved firm-level benefits from tax formalisation and the merchant payments exemption, in this case, might fail to materialise.

Second, governments must acknowledge the persistent dominance of cash, and the challenges associated with its substitution. Despite the strengthening of digital tool usage through exemption measures in Ghana, cash remains the preferred method of transaction among merchants. This reliance on cash could be influenced by a general population preference, exacerbated by the imposition of the new tax on mobile money. Relying on nationally representative household data, Abounabhan et al. (forthcoming) argue that the first coping strategy against the e-levy has been to use cash. To address cash-centric habits governments should consider consumer-oriented incentives, such as providing mobile money or bank accounts (including debit cards) free of charge. Experience from Mexico suggests that customer-centric strategies can stimulate the adoption of electronic payments on the supply side as well – from merchants – fostering a virtuous cycle of digital financial inclusion (Higgins 2022).

Third, governments should carefully analyse the factors driving agreement with, and positive perceptions of, fiscal policies. In Ghana, the correlation between using exempted merchant accounts and higher agreement underscores merchants' appreciation of the policy. However, dissent from female and more educated merchants warrants closer examination by the government. The broader positive perceptions of the tax system among exempted merchants suggest potential spillover effects of a targeted tax policy on broader perceptions of the government and the tax system. Governments should recognise that favourably received tax policies can contribute to more positive attitudes and opinions. Also, it is fair to say that citizens who do not have direct exposure to the exemptions of the e-levy, or generally have less understanding of it than the specific population of merchants, might have worse perceptions of the tax. Abounabhan et al. (forthcoming), a study based on a nationally

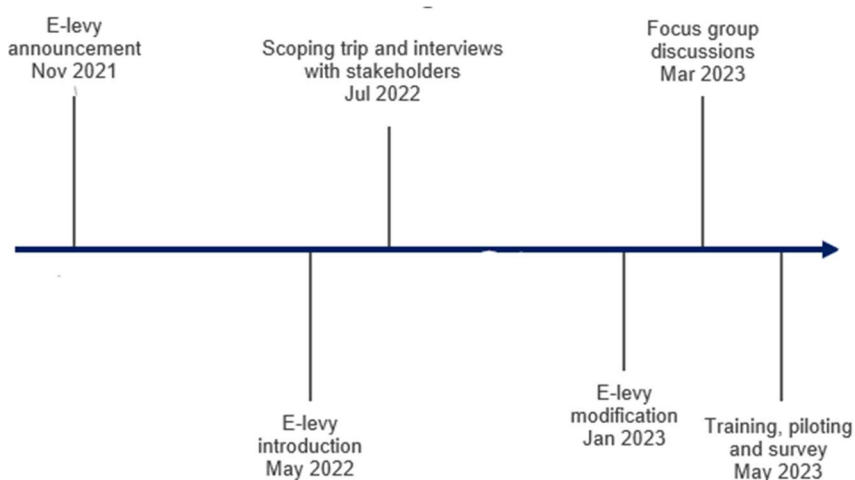
representative survey of households in Ghana, find that knowledge of the e-levy and its exemptions is very limited, a reason that could motivate the broad disagreement with it. Careful policy considerations should be made around how to promote agreement with a tax policy, explaining the benefits of it, and making it intelligible to the general public.

Finally, consideration needs to be made of the potential impact of increased reliance on electronic payments on tax administrations, especially in terms of revenue generation. In this sense, governments need to address challenges relating to access to electronic payment data. The reluctance of telecommunication providers and banks to share this data due to often-justifiable privacy concerns,²⁹ coupled with stringent data-sharing regulations, poses a significant hurdle. Even when access is granted, as in Ghana, the effective utilisation of this data for enforcement and targeted audits remains uncertain. Quite tellingly, MoMoPay users do not perceive a higher probability of audit, despite the promise of better enforcement behind the fostering of digital payments. To fully unlock the potential of this new data, regulatory frameworks for data sharing need to be revisited, accompanied by investment in analytical skills and resources within tax administrations. This approach is crucial for tax administrations to harness the benefits of electronic payments in revenue generation.

²⁹ This reluctance is also motivated by the lack of collaborative participation between governments and telecommunication companies during the e-levy implementation process. Telecom companies felt they were left out of the debate, as mere spectators, and felt frustrated by this lack of coordination.

Appendix

Appendix Figure 1 Timeline of e-levy implementation and research



Source: Diagram produced by the authors.

Appendix Table 1.a Sample summary statistics, pooled

Variable	Obs.	Mean	Std. dev.	Min	Max
Female	1065	0.37	0.48	0.00	1.00
Married	1065	0.65	0.48	0.00	1.00
Higher education	1065	0.38	0.49	0.00	1.00
Accra	1065	0.20	0.40	0.00	1.00
Ashaiman	1065	0.12	0.32	0.00	1.00
Ayawaso	1065	0.20	0.40	0.00	1.00
La-Nkwantanang	1065	0.20	0.40	0.00	1.00
Okaikwei	1065	0.20	0.40	0.00	1.00
Tema	1065	0.08	0.28	0.00	1.00
Less than 5 employees	1062	0.86	0.35	0.00	1.00
Books of account	1050	0.78	0.41	0.00	1.00
Business uses internet	1065	0.45	0.50	0.00	1.00
Business trades online	1065	0.42	0.49	0.00	1.00
Business has bank account	1040	0.67	0.47	0.00	1.00
Monthly sales (GH¢)	952	330,632	8,107,964	0.00	250,000,000
Informal before registration	1020	0.55	0.50	0.00	1.00
GRA reg year	1037	2015	7.81	1970	2023

Source: survey data as described in section 3.1.

Appendix Table 1.b Sample summary statistics, by MoMoPay ownership

	No MoMoPay		Yes MoMoPay		Difference
	Mean	Obs.	Mean	Obs.	
Female	0.39	535	0.34	530	0.05*
Married	0.66	535	0.63	530	0.04
Has higher educ.	0.32	535	0.45	530	-0.12***
Accra	0.20	535	0.20	530	0.00
Ashaiman	0.11	535	0.12	530	-0.01
Ayawaso	0.20	535	0.20	530	-0.00
La-Nkwantanang	0.20	535	0.20	530	-0.01
Okaikwei	0.20	535	0.19	530	0.01
Tema	0.09	535	0.08	530	0.01
Less than 5 employees	0.91	534	0.80	528	0.11***
Books of account	0.73	531	0.83	519	-0.11***
Internet	0.34	535	0.55	530	-0.21***
Online trading	0.33	535	0.52	530	-0.19***
Bank account	0.57	522	0.78	518	-0.21***
Monthly sales (GH¢)	45,288.36	484	625,731.01	468	-580,442.65
Informal before reg.	0.58	516	0.53	504	0.04
Reg. year	2014.67	520	2015.35	517	-0.68
<i>N</i>	1,065				

Source: survey data as described in section 3.1.

Appendix Table 2 Focus group discussion script

Key issues and follow-up questions	Rationale and logic for additional questions and guidance
<p>How do you (the FGD participants) use mobile money and other electronic money transfers in your everyday lives?</p> <ul style="list-style-type: none"> Do you use only MoMo or also other electronic payments? Which ones? How often do you use them? When do you use them? Can you give some examples of what purposes you use digital payments for? Which purposes do you consider the most important? Why? What did you do before you used digital payments for these purposes? 	<p>A broader introductory question on mobile money usage. The follow-up questions are looking for specific examples beyond just money transfer or savings, and to understand why and for what purpose these transactions are being used. Are there transactions that have become particularly important in their lives, or ones for which there is no alternative? Are there transfers that are tied to social or cultural obligations that have implications beyond economic need?</p>
<p>Do you know what the e-levy is? What do you know about it? How did you first learn about it? And how did you continue to learn about it?</p>	<p>This question is meant to objectively understand what people know about the e-levy and how they received information around it. If participants indicate multiple sources of information, we ask which sources were the most and least helpful. We made sure to capture especially incorrect information and misperceptions around the e-levy.</p>
<p>After the e-levy came in in 2022, have you changed or adapted your DFS usage behaviour in any way?</p> <ul style="list-style-type: none"> Are you using DFS more or less now? For what purposes are you using them more/less? Are there any areas of your life in which the e-levy has had a particularly strong effect? 	<p>We made sure this question was as open as possible, to factor in adaptation strategies we have not considered (this also includes shifts between mobile money and banking). Follow up questions encouraged participants to explore impacts that extend beyond mobile money usage and paint a broader picture within economic, political and social behaviour frames.</p>
<p>Did the e-levy exemptions lead to change in your behaviour?</p> <ul style="list-style-type: none"> For non-merchants: Did the e-levy exemption change where you normally buy things? Or how you use mobile money? For merchants: Did you see any changes in your client's behaviour due to the e-levy and its exemptions? Do you 	<p>Follow up to previous question focusing on merchants' exemptions.</p>

think the merchant exemption is enough incentive to register with the GRA? Why or why not?

<p>What were your reactions when you first heard about the e-levy?</p> <ul style="list-style-type: none"> • What did you think about it? Did you think there would be good sides or bad sides to it? • How did you feel? Was there an instance or aspect that was particularly emotional for you? • Do you think the same now as you did when you first heard about it? • Has your perception changed in any way? (If so) Why? (Or) Why not? 	<p>Follow-up questions tried to paint a picture of perceptions with specific examples of what exactly was the reason behind their reaction. If not naturally brought up by the participants, facilitators referred to moments of policy change with the e-levy, most importantly the recent change in rate. We made sure to frame the question in a way that allows for both positive and negative reactions.</p>
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Note: Make sure to follow up with the most recent reactions to the latest change in policy if not brought up naturally.

<p>In your view: How does the e-levy fit into the overall situation of the country?</p> <ul style="list-style-type: none"> • Think about issues like inflation, national debt, and so on. Do you see the e-levy connected to these in any way? • Why do you think the government imposed the e-levy? Do you believe it was reasonable? • Would you have preferred the government use other means to achieve the same goals? Which ones? 	<p>Follow-up questions are to focus on participant's knowledge of the rationale for the e-levy. We did not correct participants about any incorrect information as it was important to assess how much knowledge around this topic actually exists. We made sure to follow up on how they perceive the e-levy policy in relation to Ghana's problems and possible solutions.</p>
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<p>Do you think the e-levy is a fair or unfair tax?</p> <ul style="list-style-type: none"> • Why? In what ways is it fair or unfair? • Who in society do they think the e-levy burdens most or least? 	<p>Follow-up questions should ask for concrete examples of what participants consider fair/unfair taxes. We asked them to elaborate on their criteria for fairness, and what elements of the e-levy fit into being fair/unfair.</p>
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What, in your view, makes a tax fair or unfair? Are there any taxes you see as particularly fair, or are happy to pay?

<p>What changes would you like to see to improve the e-levy?</p> <ul style="list-style-type: none"> • If the government were to redesign taxes on mobile money, and you (the participants) were allowed to decide how, what would you change? • Would you like the government to keep the e-levy, remove it, or change it? 	<p>Follow-up questions should ask for specific examples with comparison to other taxes in the country or other taxes they are aware of. The more detailed participants are about rates, length of policy, revenue use, etc., the better. We used the flow from the previous question to inform how follow-up questions were asked.</p>
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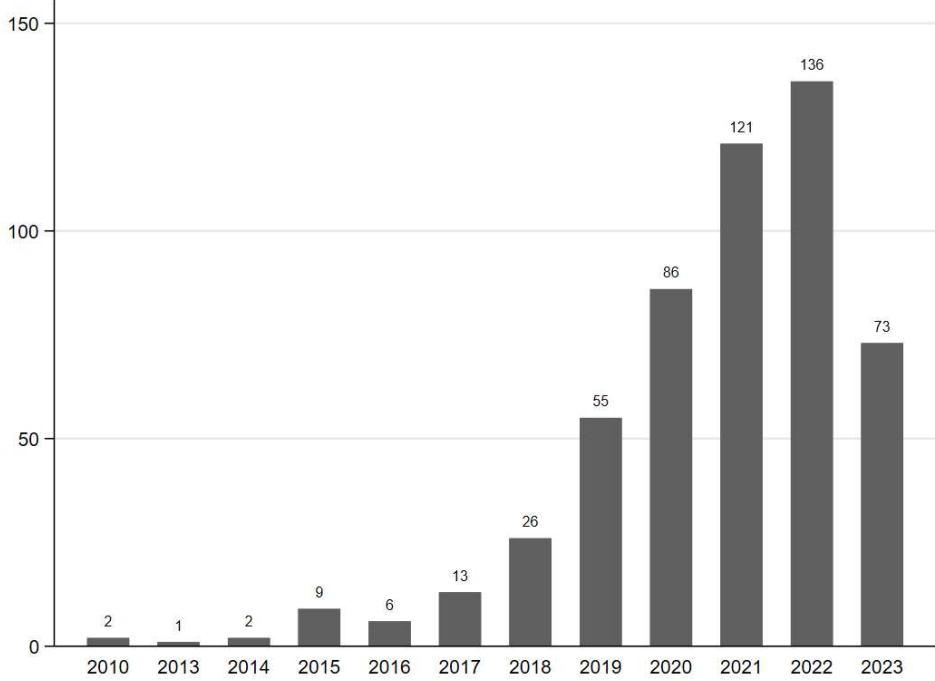
Source: Authors' own.

Appendix Table 3 Focus groups

Geographical areas	Focus group identifiers	Participant considerations	No. of focus groups
Greater Accra	<ul style="list-style-type: none"> • 1 group of (urban) students • 1 group of (urban) formal workers • 1 group of (urban) informal workers • 1 group of (rural) farmers • 1 group of (rural) non-agri workers <p>PLUS:</p> <ul style="list-style-type: none"> • Merchants • 1 group only of women 	<p>Inclusive of different genders, age, and MoMo users/non-users, political affiliation, merchants/nonmerchants</p>	7
Eastern Region	<ul style="list-style-type: none"> • 1 group of (urban) students • 1 group of (urban) formal workers • 1 group of (urban) informal workers • 1 group of (rural) farmers • 1 group of (rural) non-agri workers <p>PLUS:</p> <ul style="list-style-type: none"> • Merchants • 1 group only of women 	<p>Inclusive of different genders, age, and MoMo users/non-users, political affiliation, merchants/non-merchants</p>	7

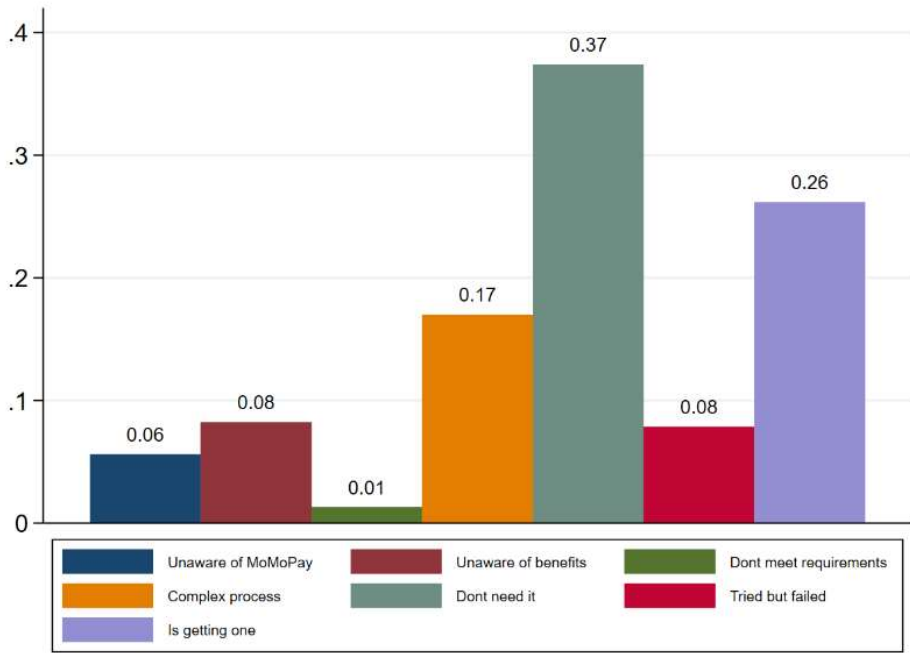
Source: Authors' own

Appendix Figure 2 Year of adoption of MoMoPay (N=535)



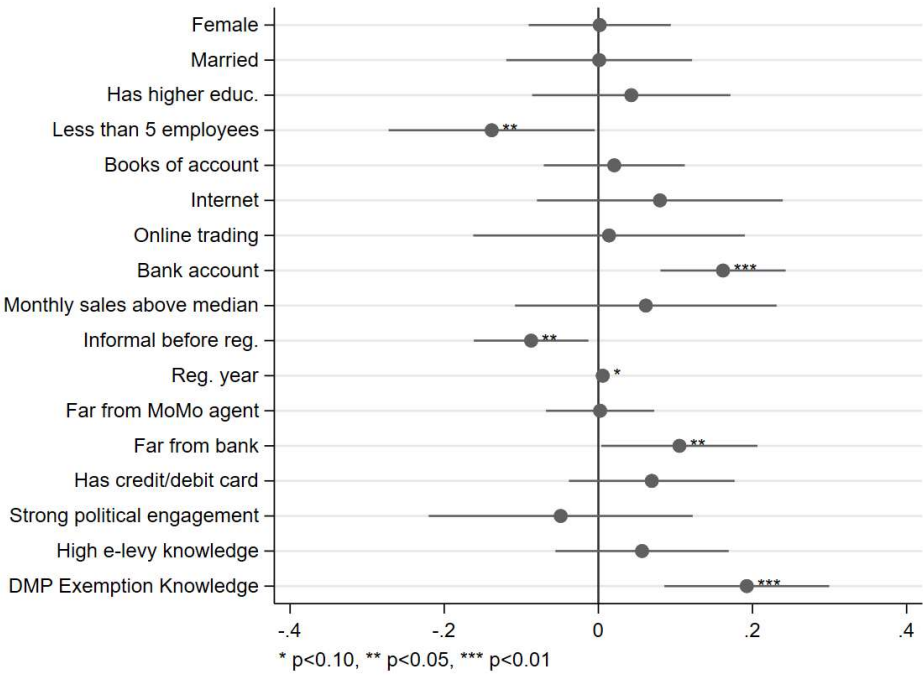
Source: Survey data as described in section 3.1.

Appendix Figure 3 Reasons for not using MoMoPay (N=535)



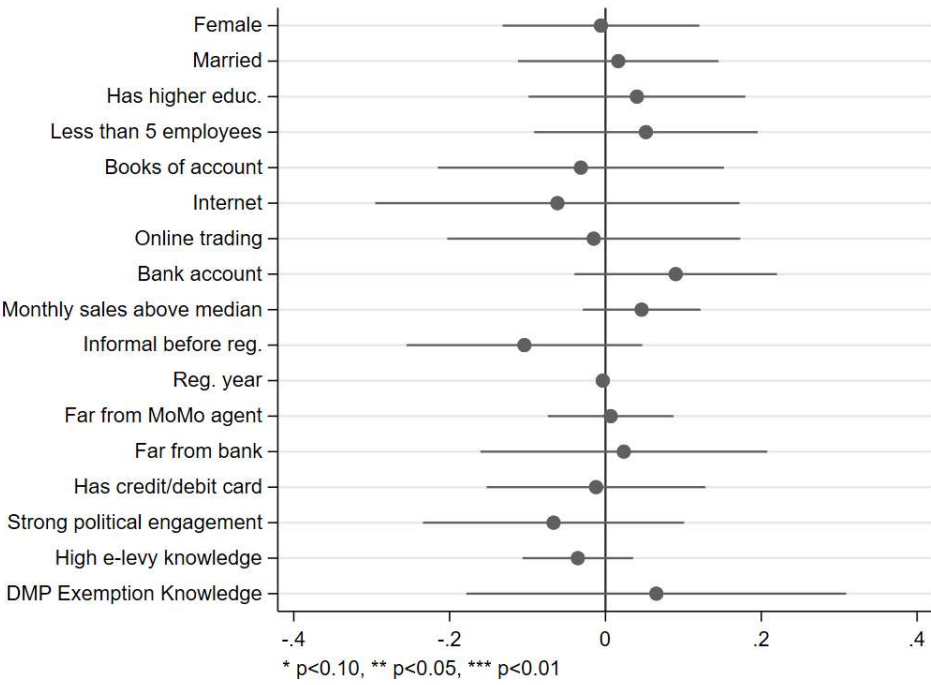
Source: Survey data as described in section 3.1. Note: data is derived from survey question 'Previously, you have declared that you do not have a Momo business account. Why did you not obtain a Momo business account?'

Appendix Figure 4 Drivers of MoMoPay adoption, excl. those registered for but not using MoMoPay



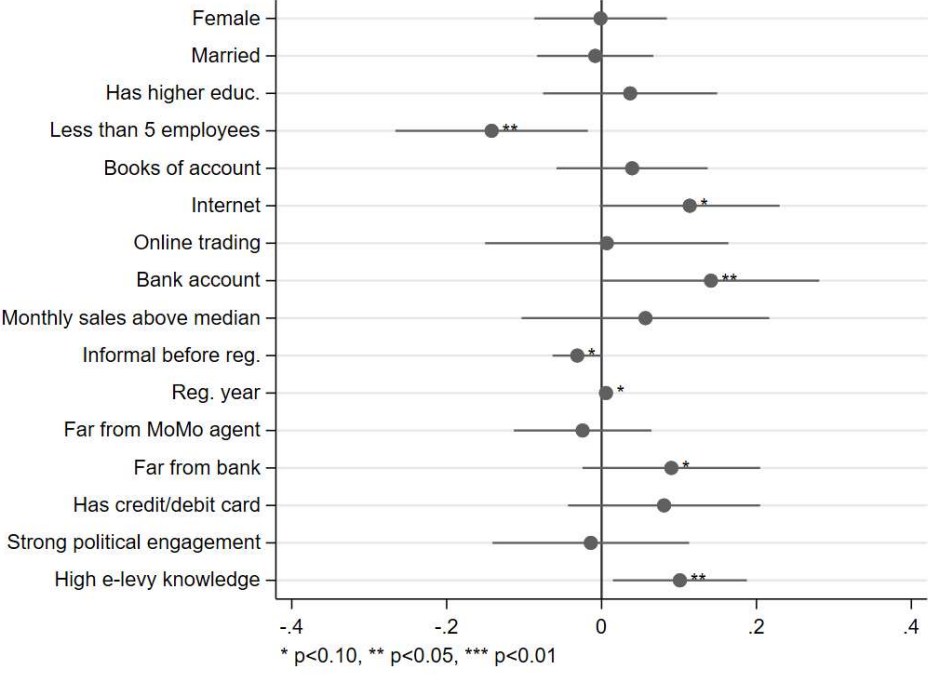
Note: Data derived from survey question 'Do you have a mobile money merchant/business account for your business?'. The outcome is a 0-1 indicator variable for accepting MoMoPay from clients. Coefficients are extracted from the multivariate OLS regression 1, as described in section 3.
 Source: Authors' own from survey data

Appendix Figure 5 Drivers of MoMoPay actual usage, conditional on registration



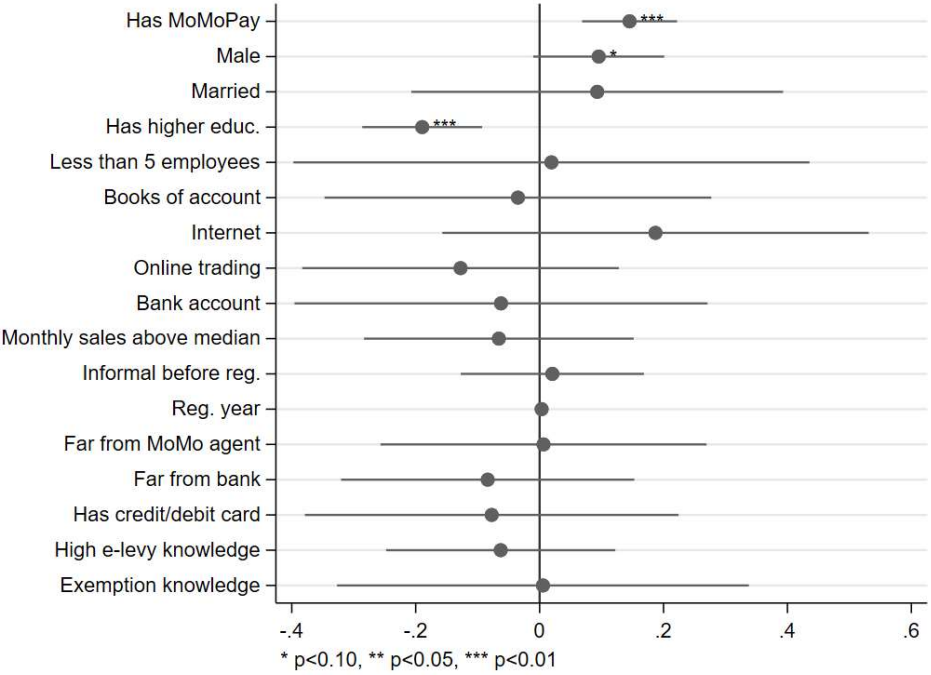
Note: Data derived from survey question 'Do you have a mobile money merchant/business account for your business?'. The outcome is a 0-1 indicator variable for accepting MoMoPay from clients. Coefficients are extracted from the multivariate OLS regression 1, as described in section 3.
 Source: Authors' own from survey data

Appendix Figure 6 Drivers of MoMoPay actual usage, excl. exemption-specific knowledge



Note: Data derived from survey question 'Do you have a mobile money merchant/business account for your business?' The outcome is a 0-1 indicator variable for accepting MoMoPay from clients. Coefficients are extracted from the multivariate OLS regression 1, as described in section 3.
 Source: Authors' own from survey data

Appendix Figure 7 MoMoPay usage and e-levy agreement index, excl. politics



Note: Data derived from survey question 'Do you have a mobile money merchant/business account for your business?' The outcome is a 0-1 indicator variable for accepting MoMoPay from clients. Coefficients are extracted from the multivariate OLS regression 1, as described in section 3.
 Source: Authors' own from survey data

Appendix Table 4 Mobile money use cases by MoMoPay usage

	No MoMoPay		Yes MoMoPay		Difference
	Mean	Obs.	Mean	Obs.	
Airtime	0.86	494	0.81	518	0.05**
Receive	0.97	494	0.96	518	0.01
Send	0.93	494	0.90	518	0.03*
Bills	0.13	494	0.18	518	-0.05**
Biz payments	0.26	494	0.25	518	0.01
Deposit	0.51	494	0.53	518	-0.02
Withdraw	0.62	494	0.58	518	0.04
Savings	0.07	494	0.10	518	-0.03*
Ecommerce	0.09	494	0.10	518	-0.01
Pay in store	0.11	494	0.10	518	0.01
Accepts cash	0.99	535	0.99	530	0.00
Accepts MoMo pers.	0.69	535	0.07	530	0.61***
Accepts card	0.05	535	0.09	530	-0.04***
Distance MoMo agent	2.62	533	2.63	525	-0.01
Distance bank	9.87	514	10.52	513	-0.65
N	1,012				

Note: Data derived from survey question 'What do you use mobile money services for?'

Source: Authors' own from survey data

Appendix Table 5 MoMoPay usage and e-levy tax perceptions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Introduction	Rate	Threshold	Fair	Transparent	Believe goals	Policy change
MoMoPay	0.00	0.03	0.05**	0.00	0.03	0.05*	0.05**
	(0.03)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. variable	0.26	0.20	0.17	0.17	0.06	0.21	0.17
R-sq.	0.105	0.085	0.099	0.077	0.053	0.065	0.095
Observations	1,052	1,052	1,052	1,052	1,052	996	1,052

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The outcome variables are seven survey items to measure perceptions on and agreement with several aspects of the e-levy, as described in section 3.

Source: Authors' own from survey data

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