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Migration, Money Transfers, and Mobile Money: Evidence from Niger†

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Digital financial services, and mobile money (m-money) in particular, have generated considerable enthusiasm and hope for a reduction in remittance fees for the rural poor.[1] This is especially the case in Sub-Saharan Africa, where remittances account for 2.5 percent of the region's gross domestic product (World Bank 2018). Yet despite substantial volumes of remittances, transfer costs are among the highest in the world (World Bank 2018), thereby reducing the income available for migrants and recipient households.

M-money adoption in Sub-Saharan Africa, however, remains low and limited to specific countries (Vasudevan et al. 2016, UNCDF 2017) despite a rate of mobile ownership of over 67 percent. In Niger, our country of study, m-money adoption in 2017 was estimated at 9 percent (Demirgüç-Kunt et al. 2018).

We use data on the supply of and demand for money transfer services to better understand the low m-money adoption in Niger. Overall, we find that demand for sending and receiving remittances is substantial. Nevertheless, fewer than 3 percent of households use m-money despite relatively high rates of mobile phone ownership and the comparable costs of other transfer services. While rural households are willing to pay the cost of sending a transfer via m-money, there is significant heterogeneity by region, primarily correlated with access to agents. This suggests that one of the primary barriers to m-money adoption could be the agent network.

I. Migration and Remittances in Niger

Domestic, regional, and international migration play an important role in the welfare of West African households (Devillard, Bachi, and Noack 2015). In Niger, one of the poorest countries in the world, 50 percent of rural households had at least 1 seasonal migrant between 2009 and 2014, with slight variations by year and region.[2] The key destinations of migrants were urban areas within Niger, Nigeria, and the Ivory Coast. Between 2015–2017, remittances represented 3 percent of Niger's GDP in 2017.[3]

Niger is one of the most financially excluded countries in Sub-Saharan Africa, with one bank for every 100,000 people, based on estimates by Demirgüç-Kunt et al. (2018). Thus, households typically use informal systems to transfer remittances, namely the bus or friends and family members.

Despite low rates of financial inclusion, mobile phone ownership has increased markedly over the past decade, ranging from 60 percent to 90 percent of households. M-money was formally deployed in the country in 2009 (Aker et al. 2016), and currently there are multiple m-money providers.

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[1] See Yang (2011) for a review on the positive effects of remittances and a discussion of mobile-based remittance services.

[2] The household data in this section are derived from a panel dataset of 4,800 households across 368 villages located in 4 regions of Niger between 2009–2014. Each dataset was collected as part of four separate research projects targeting poor and low-literate households in remote rural areas (Aker, Ksoll, and Lybbert 2012; Aker et al. 2016, 2020; Aker and Ksoll 2019).

[3] Calculations from the World Bank's data bank for Niger (https://data.worldbank.org).

II. Data

To explore the patterns of m-money adoption in Niger, we use two primary datasets: a survey of all money transfer service providers in the country and a household survey on migration, remittances, and households' willingness to pay (WTP) for m-money.

A. *Money Transfer Services*

In 2017, we conducted a census of all money transfer service providers in Niger and interviewed key stakeholders within each company. The survey collected data on the type of company, the location of suboffices, documentation requirements, remittance destinations, and transfer costs. Overall, 45 money transfer services were identified, primarily dominated by transport companies (36 percent), banks (27 percent), international domestic money transfer providers (11 percent), domestic money transfer providers (11 percent), and mobile network operators (7 percent), the latter of which provides m-money services. With the exception of the transport companies, all of the providers send and receive transfers outside of Niger, yet only transport companies and m-money providers have agents in rural areas.

B. *Household Survey*

The second dataset is a survey of 460 households across 30 villages in 3 regions of Niger (Dosso, Maradi, and Zinder) in 2017. All regions are located in the same agroclimatic zone and have similar migration rates. Within each region, we identified 161 villages that were part of adult education research between 2009–2016 and stratified by region, subregion, and prior treatment status to randomly select 10 villages within each region. Within each village, we surveyed 15 households.[4]

The survey collected data on households' migration patterns as well as amount, frequency, and cost of remittances. We also elicited households' beliefs about the location and costs of different money transfer services.[5] A key aspect of the survey also involved eliciting households' WTP for m-money using a modified version of the incentivized Becker–Degroot–Marschak (BDM) mechanism. By eliciting WTP rather than willingness to accept, we implicitly focused on the respondent's role in sending the transfer.

The enumerator first showed the respondent how m-money worked and described its attributes. In the first stage, the respondent was presented with a sequence of hypothetical prices for the cost of sending 500 CFA (one US dollar) to a recipient chosen by the respondent who lived outside of the village.[6] For each price, the respondent was asked to indicate whether he or she would be willing to pay that amount on that day to use m-money to send the transfer. In the second stage, a price was randomly drawn from those on the list. If the respondent's maximum WTP was greater than or equal to the drawn price, the m-money service was sold at the drawn price; otherwise, no sale took place. Ninety-one percent of respondents agreed to play the game and paid the drawn price if they won.

Given the nature of the m-money product, we modified the standard BDM mechanism. Recognizing that households may not have needed to send money the day the game was played, and that we could not provide vouchers to send money at a later date, we offered to send the 500 CFA to the recipient chosen by the respondent. Thus, the respondent was responsible for paying the transfer fee, not the actual transfer.

In theory, the mechanism should induce a truthful revelation of the respondent's maximum WTP if he or she fully understands the game and product and has no deceptive intentions. In our context, the game could provide a lower bound of the demand at each price, as the respondent's true maximum WTP could lie in between two of the price options. Yet, since our modified version

[4] Eleven percent of the intended respondents were not located or refused to be interviewed, leaving a sample of 406 households.

[5] To elicit beliefs, respondents were presented with the following scenario: "Suppose that you wanted to send 10,000 CFA to a person in another village using money transfer mechanism X (i.e., bus, domestic transfer company, m-money). Where would you need to travel to send this money, how much would it cost to send 10,000 CFA, would the recipient receive the 10,000 CFA and how long would it take?"

[6] We decided to use the price list, rather than allow open-ended responses, after multiple pilots. The prices included 0, 10, 20, 25, 40, 50, 60, 75, 90, 100, 250, and 500 CFA.

of the BDM mechanism provides a small transfer, the game might provide an upper bound on true WTP. We discuss this in more detail below.

III. Results

A. *Summary Statistics*

Table 1 shows household summary statistics. Consistent with data from the panel surveys, 54 percent of households had at least 1 seasonal migrant, with an additional 17 percent of households with a permanent migrant. Sixty-eight percent of households had received remittances over the past year, primarily via a friend or family member (74 percent), domestic money transfer provider (34 percent), or bus (8 percent). Only 3 percent of households used m-money. Overall, the total fees paid by the *recipient* represented 9 percent of the value of the transfer, similar to average costs in Sub-Saharan Africa. However, this does not capture the full value paid by the *sender*, whose transfer costs, on average, amount to 46 percent of the transfer.

B. *Money Transfer Costs*

How do the costs reported by households compare with those reported by the money transfer providers? In order to assess this, we focus on the experiences of remittance senders within our sample. While 68 percent of households in our sample reported receiving transfers, approximately 30 percent of households also sent transfers, using many of the same methods.

Figure 1 compares the "official" costs of sending money (as reported by the money transfer providers) with costs reported by remittance senders.[7] While transfer costs depend upon the amount sent and destination, our analysis focuses on domestic transfers for the last transfer made, which averaged $33.

Three things are worth noting. First, the official fees for m-money and domestic transfer companies are similar in magnitude. Second, the fees that senders pay are higher than the official rates, with the greatest gap for m-money (the bus has no official fees). Yet, the costs for m-money are estimated off of a few individuals. Third, across all three mechanisms, respondents believe that m-money is the cheapest way to send money. Overall, trust in these systems is high, with almost 90 percent of respondents believing

Table 1—Household Summary Statistics and Beliefs

Panel A. Summary statistics	
Household owns a mobile phone	0.84
	(0.37)
Household has at least one temporary migrant	0.54
	(0.50)
Household has a permanent migrant	0.17
	(0.38)
Household received transfer in the past year	0.68
	(0.47)
Domestic money transfer	0.37
	(0.48)
Bus	0.08
	(0.27)
Friend/family member	0.74
	(0.44)
M-money	0.03
	(0.17)
Panel B. Beliefs about transfer companies	
Belief about cost to send 10.000 CFA via bus	847.29
	(342.60)
Believe that recipient will receive intended amount via bus	0.97
	(0.16)
Money will arrive the same day or next day via bus	0.87
	(0.34)
Closest bus agents are in urban areas	0.40
	(0.49)
Belief about cost to send 10.000 CFA via domestic money transfer	736.33
	(347.60)
Recipient will receive intended amount via domestic money transfer	0.96
	(0.19)
Money will arrive the same day or next day via domestic money	0.99
	(0.12)
Closest domestic transfer agents are in urban areas	0.75
	(0.43)
Cost to send 10.000 CFA via m-money	662.22
	(345.90)
Believe that recipient will receive intended amount via m-money	0.93
	(0.25)
Money will arrive the same day or next day via m-money	0.97
	(0.16)
Closest agents are in urban areas	1.00
	(0.00)

Note: This uses the full sample of 406 households, although the observations for each indicator vary.

[7] The sample for the household's reported fees is based off of those who sent remittances (i.e., $N = 122$), of whom 87 percent used a family or friend via the bus system and 1 percent used m-money. These fees focus on the last transfer made. Questions about belief were asked to the entire sample ($N = 406$).

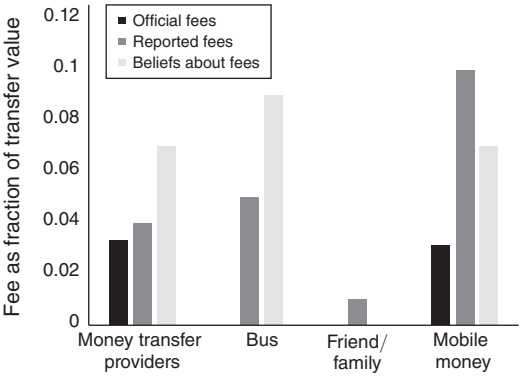

Figure 1. Comparison of Official versus Reported Fees for Domestic Transfers (less than $1,000)

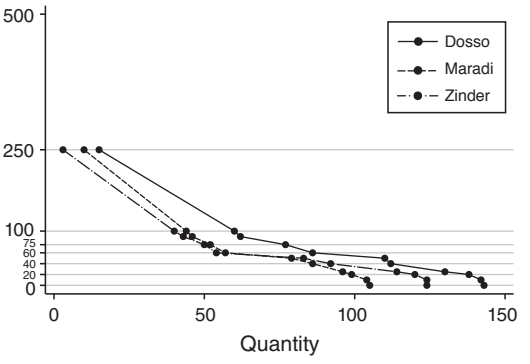

Figure 2. Willingness to Pay to Transfer 500 CFA via M-Money

that the full amount sent would be received within 1–2 days (Table 1). While 40 percent of respondents believe that they could send money via the bus to a rural area, almost all respondents believe that m-money agents can only be found in urban areas.

C. *WTP for M-Money*

The region-specific inverse demand curves for m-money are shown in Figure 2. Approximately half of the sample is willing to pay the actual cost of sending 500 CFA via m-money, with an average WTP of 76 CFA ($0.15).[8] There is substantial between-region variation in demand: at any price, more respondents in Dosso are willing to pay for the transfer than respondents in either of the other two regions. This is despite the fact that average migration rates and mobile phone ownership are similar across regions.

To better understand sources of variation in WTP, we regress maximum WTP on binary variables for region, gender, and other correlates of demand (Table 2). Average WTP by a male respondent in Dosso who had never heard of m-money is 88 CFA ($0.18). Female respondents exhibit lower WTP than male respondents. Mean WTP is still higher in Dosso and lowest in Zinder.

A key question is whether these results substantially overestimate respondents' WTP for m-money due to the income transfer. However, we do not believe this is driving the results. First, average WTP is 15 percent of the transfer value, in line with households' prior beliefs about the cost of m-money and only 3 percent higher than the actual cost. Second, if respondents treated this as a pure income transfer, we might expect a larger proportion of households to accept the 250 or 500 CFA prices. Yet no respondent accepted the highest price, and only 7 percent of the sample accepted the 250 CFA price. Finally, the transfer had to be made to a person outside of the village, and it would have been costly to transfer the 500 CFA back because of the fees involved and given respondents' beliefs about the proximity of m-money agents.

D. *The M-Money Infrastructure*

The previous results suggest that rural households in Niger have a need for money transfer services. If this is the case, why isn't m-money used more frequently by migrants and their households?

One potential constraint is the m-money agent network in rural areas. Across the three regions, there are few agents in general, with the highest agent density in Dosso (with agents in 12 locations) and the lowest in Zinder (with agents in 3 locations). This variation in agent density is consistent with regional variation in WTP. The limited infrastructure not only increases households' costs of accessing an agent but also suggests there is less competition, which could allow agents to charge higher prices than the official fees.

[8] The actual cost of sending 500 CFA via m-money varies between 20–60 CFA, depending upon whether the individual is sending money to another m-money user or to a mobile phone number, known as "code envoi."

Table 2—Determinants of Willingness to Pay for M-Money

	(1)	(2)
Maradi	−0.51	1.18
	(10.27)	(10.80)
Zinder	−16.96	−14.99
	(8.37)	(8.98)
Female	−9.16	−10.51
	(6.26)	(6.27)
Ever heard of mobile money	7.57	6.60
	(6.41)	(6.68)
Household has migrant		4.79
		(6.80)
Household has mobile phone		8.38
		(9.01)
Received transfer in past year		−7.32
		(8.38)
Sent transfer in past year		−3.37
		(6.14)
Observations	371	370

Note: All regressions cluster s.e. at the village level and correct for heteroskedasticity.

IV. Conclusion

Existing research shows that digital financial services can reduce the cost of transferring money between individuals and businesses in Sub-Saharan Africa as compared with traditional money transfer systems (Jack and Suri 2014, Aker et al. 2016). M-money is failing to take off in West Africa at rates similar to those in East and southern Africa despite remittances being a crucial part of the West African economy. Our study shows that rural households in Niger seem willing to pay some positive price for m-money. We find variation by region, which is correlated with the agent density. We interpret this as suggestive evidence that agent infrastructure might be a potential driver of demand, which has also been identified as a constraint in the region (Vasudevan et al. 2016). More research, however, is needed.

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