Mobile Salary Payments in Afghanistan:
Policy Implications and Lessons Learned

November 2013

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In Collaboration with Roshan and the Central Asia Development Group (CADG)[1]

With Financial Support from the Center for Effective Global Action (CEGA), the CEPR Private Enterprise Development in Low Income Countries (PEDL), the Consortium for Financial Systems and Poverty (CFSP) and Empirical Studies of Conflict (ESOC)

[1] The authors wish to thank Karim Khoja, Altaf Ladak, Zahir Khoja, Fatima Popal, Liaquat Ali Shad and Nicholas Pugliese at Roshan and Raju Shaulis, Marijohn Sampson, Matthew Goldthwaite, and Afghani Barakzai at CADG for their dedication and assistance to this project. Greg Adams, Elizabeth Hastings and Shahim Kabuli provided excellent research assistance. All views expressed are those of the authors alone.

Executive Summary

Mobile Salary Payments hold great promise for improving the transparency, accountability and efficiency of regularized payments. By enabling employers to pay employee salaries using mobile money instead of cash, mobile salaries have the potential to dramatically reduce transaction costs while providing an instantaneous, auditable record of payment transactions. **This policy white paper provides a preliminary analysis of mobile salary payments using evidence from a randomized experiment in Afghanistan.** The study was conducted in seven provinces between August 2012 and March 2013, and was undertaken in collaboration with the Central Asia Development Group (CADG), a large Afghan-staffed development contractor, and Roshan, the country's largest mobile operator. Based on several independent data sources including face-to-face and phone surveys, administrative records, and transaction records from the operator, this study provides an independent analysis of mobile salaries with an emphasis on the implications for firms and bureaucracies in fragile economic environments.

This research brief summarizes four key findings from our study. First, we document major direct and indirect cost-savings for the employer from switching to Mobile Salary Payments, including a cross-subsidy to the mobile operator's voice business as a consequence of mobile salary payments. Second, we provide evidence that Mobile Salary Payments had an impact of the savings and communication behavior of employees: relative to their peers, those receiving mobile salary payments increase usage of the full range of mobile money services, including previously undocumented micro-savings behavior. Third, as is appropriate for a new technology, this report discusses the current challenges and limitations of mobile salary payments, including issues of agent liquidity and practical lessons for improving implementation. Finally, the concluding section discusses five policy implications for stakeholders interested in expanding the effectiveness of mobile salary payments, including the need to prioritize rollout in less remote areas, expand two-way payment flows such as bill payments and vendor payments, and develop value-added functions to provide employers and third-party funders with enhanced auditing capabilities.

Section 1: Introduction

Despite noteworthy developmental progress over the past decade, Afghanistan remains one of the world's most difficult economic environments and its population is among the poorest in the world. Both Afghan and foreign firms face immense challenges to conducting their daily operations, such as imperfect government control, rampant corruption, poor infrastructure and weak growth-supporting state institutions. In the lead up to the international transition in 2014, Afghanistan is also at a major turning point. Currently, about 90 percent of government expenditure is comprised by foreign aid, which also makes up a major share of the formal economy. As foreign troops withdraw, most experts believe these figures will dramatically decrease and progress may stall against poverty and persistent underdevelopment.

Private sector development is therefore essential to future economic growth in Afghanistan, along with the efficient delivery of ongoing aid programs.

For firms and other organizations operating in Afghanistan, the processing and disbursement of employee wages poses several unique challenges. While the majority of Afghan firms currently pay their employees in cash, this traditional system is plagued by inefficiencies resulting from: (i) an underdeveloped banking sector which reaches less than 5% of the population; (ii) ongoing public mistrust of formal banks following the 2011 Kabul Bank failure; (iii) leakage and graft of employee salaries by their supervisors; and (iv) high costs of currency transport, due to unreliable transport infrastructure and concerns of physical security. The net effect of these large transactional frictions has been to limit economic growth, creating a large demand for innovative technologies that can improve the transparency, accountability and efficiency of salary payment in Afghanistan.

Mobile phone networks, and Mobile Money systems in particular, have been suggested as a possible solution to several of the challenges of operating in cash. In Afghanistan, the number of mobile phones has increased from the low thousands in 2002 to over 17 million by 2013, and there are currently four private sector mobile operators and one state-owned mobile operator in the market. Starting with the prominent example of Kenya's M-Pesa system, mobile operator networks in many countries are providing a platform for mobile money transfers, where electronic financial transactions are authorized and delivered by phone-based interfaces. Roshan, the largest Afghan telecommunications operator, developed its M-Paisa mobile money platform in 2008 with the British multinational Vodafone, and now boasts over 1.2 million subscribers, though the number of active users is smaller.

In 2009, Roshan piloted a new Mobile Salary Payment (MSP) service that enabled the central government to directly pay the salaries of Afghan National Police officers. In the MSP system, the central office authorizes payments which are then instantly credited to the employees' mobile phone accounts. These mobile deposits may then be transferred to other mobile users, used as payment with registered vendors, or withdrawn as cash from a network of authorized agents. Anecdotal evidence suggests that this pilot project dramatically reduced leakage by reducing the incidence of ghost workers on the payroll, and by increasing the effective payment to participating officers by removing opportunities for diversion of funds. Similar opportunities for increased efficiency exist in the private sector, and in recent years a small number of firms in Afghanistan have begun to transition to Mobile Salary Payments.

This research brief summarizes the evidence and lessons learned from the careful study of one large firm's transition from cash-based to Mobile Salary Payments. Headquartered in Singapore, the Central Asia Development Group (CADG) is a private contractor that delivers engineering, aviation, agricultural services and development assistance to remote and challenging locations. In Afghanistan, CADG's flagship development initiative has been a USAID-supported Community

Development Program (CDP), primarily in the southern and eastern provinces of the country. CDP's primary objective is to provide labor-intensive community development projects to reduce the impact of economic vulnerability and increase support for the Government of the Islamic Republic of Afghanistan (GIRoA). The projects undertaken by the communities involved reconstructing municipal infrastructure, irrigation systems and valued public facilities such as schools and clinics. CDP's main beneficiaries are at-risk populations including unemployed men of combat age, internally displaced persons, those suffering from extreme poverty and other marginalized segments of Afghan society. In 2011, about a dozen of CADG's CDP staff in Kabul and Kandahar entered a small pilot of Roshan's Mobile Salary Payment system using the M-Paisa network. Salaries were authorized directly from CADG's Singapore headquarters using an online interface and delivered monthly to the participating employees by text message notification. Employees could use M-Paisa services to transfer money, purchase airtime and maintain a micro-savings balance, or cash out their account using the network of M-Paisa agents, who serve as "human ATMs" by exchanging electronic credit for Afghan currency. In 2012, CADG contacted Roshan to scale up their pilot program, at which time both organizations agreed to a more ambitious research study on the impacts of mobile salary payments on employee and firm operations.

With assistance from researchers at UC Berkeley, UC Los Angeles and University of Washington, the research study was launched in August 2012 with a randomized experiment involving 341 CADG CDP employees operating in seven provinces: Kabul, Kandahar, Helmand, Ghazni, Khost, Paktia and Paktika. The experimental sample included all CDP employees who worked in office locations with Roshan mobile coverage, and excluded the CDP security staff who were being transitioned to an alternative payment system under the Afghan Public Protection Force (APPF). Half of the employees in the experiment were randomly assigned to the mobile salary system, while the other half were paid by CADG's existing cash-based system to provide a valid comparison group during the study period. Completed in March 2013, the research study also collected administrative records, survey responses and mobile administrative data to analyze individual- and firm-level impacts. In May 2013, after the completion of the research study, CADG announced its decision to expand mobile salary payments into the control group of CDP employees as well.

Section 2: Mobile Salaries and Firm Operations

The most visible impact of mobile salary payments on CADG's operations has been a significant decrease in the recurrent costs of delivering salaries to CADG employees. Roshan's cost structure for mobile salary payments includes a one-time fixed setup fee (including the cost of registration, training, a new mobile handset and SIM) and a recurrent monthly disbursement fee that includes the full cost of financial transfer from the firm's bank account in Afghanistan to the individual employee's handset plus a one-time withdrawal fee (charged to the employer) so the employees are not charged for the first withdrawal from their M-Paisa accounts each month. With the exception of the one-time withdrawal each month, employees are subject to the regular M-Paisa tariff structure when using their mobile deposits.

During the research study, Roshan's setup fee was US$40 per employee and the recurrent disbursement fee was 150 Afghanis (about US$3 over study period) per employee-month. By comparison, CADG's existing cash salary disbursement system required monthly transfer costs of in excess of $10 per employee-month, including the bank fee and other transportation costs associated with moving cash across the country. Thus, the M-Paisa setup fee was recoverable within 6 months, after which time the firm realized a significant direct costs savings. In addition, the existing cash salary payment staff required significant financial oversight in both Kabul and the provincial offices, which CADG was able to reallocate in the switch to mobile salaries. CADG estimates suggest that while the time requirements on Singapore financial staff increased by 20% under mobile salaries, the time requirements on Afghanistan financial staff decreased by over 80%, resulting in a monthly indirect cost savings of about US$1,000.

In addition to CADG's financial savings, the research study produced significant evidence of a cross-subsidy to Roshan's mobile voice operations from the mobile salary product. As is common in many developing countries, Roshan operates on a pre-paid voice business model in which customers purchase airtime credits prior to initiating a call, and only the caller, not the called party, is charged for each call. In the CADG study, employees who were randomly assigned to the mobile salary payments groups made larger and more frequent airtime purchases each month and spent more in total on airtime, which is consistent with the lower transaction cost of being able to purchase mobile airtime using an M-Paisa account rather than travelling to visit an airtime vendor to purchase airtime in person. The average size of increased airtime purchase was approximately 100 Afghanis, or about $2 per month, which is a non-trivial amount to the mobile operator. This finding also suggests strategic implications for the mobile operator in reducing upfront adoption costs in order to increase the size of the user base on the mobile payment system that in turn are able to provide a cross-subsidy to the mobile voice business.

While a portion of the employer savings result from systemic increases in efficiency, much of the savings result from a shift in responsibility for transport costs from the employer to the employees and M-Paisa mobile money agents. While employees would receive cash salary transfers directly at their primary office location, under the mobile salary system they are often responsible for visiting the mobile money agent's location in order to cash out.[2] As mobile money agents were typically associated with local businesses with regular cash flow – such as bank branches, mobile phone vendors and grocery stores, which were not collocated with the employees' office location – employees experienced additional transaction costs in the form of transportation, travel time and waiting time in order to withdraw their

[2] For an additional negotiated fee, firms can have mobile money agent visit their office location on payday, which is particularly attractive option for employees in highly insecure areas.

salaries. In addition, the reliance on third-party agents to delivery salaries involved a very salient risk to employers, namely that the mobile money agent may not have sufficient liquidity to process all employee salaries when transfers are made. From an employer's perspective, salaries have been paid when employees are notified by mobile SMS that a deposit has been made to their account, but employees who are unable to withdraw their funds are unlikely to be satisfied. While survey data suggests this was not a very common occurrence in the CADG research study, it did represent a significant disruption to firm activities when it did happen. Overall, CADG employees receiving mobile salary payments reported about 10% of their mobile salary payments were not delivered on time, with the most common reason being agent liquidity, though approximately half of these issues originated from issues with a single agent in the Helmand province. In general, employees also reported that these issues had been resolved within 1-2 weeks. By comparison, about 1% of CADG employees in the cash payment group reported salary delays after the study started, and 6% of all employees reported salary delays under the cash system in the baseline data before the rollout of mobile salaries.

As described in Section 1, the experience of the Afghan National Police (ANP) with mobile salary payments motivates an alternative potential impact of mobile salary payments, namely on salary leakage. In the case of CADG, there was no evidence in the survey or administrative data that salary leakage was a significant problem prior to the mobile salaries intervention, and CADG employees did not report any significant changes in the salary amounts they received after the study began. Consistent with this lack of changes in effective wages, the survey data also does not suggest that employees were more motivated or worked harder as a consequence of receiving mobile salaries. An additional channel had been posited for how mobile salaries might impact firm operations, namely by allowing expansion to new areas were before cash transfers were prohibitively difficult. As noted above, the research study was limited to areas under Roshan's mobile network coverage, for example excluding CDP operations in the Zabul province. This suggests an important pre-condition for mobile payments is the existence of both mobile signal coverage and mobile agent presence. Also, during the research study, CADG's CDP program faced a reduction in the scope of the program leading to the closure of its Ghazni, Paktia and Paktika offices, which limited the opportunities to explore the impact on firm expansion decisions.

Section 3: Mobile Salaries and Employee Behavior

Given the employer's cost savings and the mobile operator's cross-subsidy, a central question for the research becomes how mobile salaries directly affect the welfare of CADG's employees in this research study. Mobile transaction data indicates that employees who received mobile salary payments dramatically increased their usage of the full set of mobile money services, including airtime purchases, mobile transfers, and mobile micro-savings. Of these, perhaps the most interesting finding relates to the use of mobile accounts for micro-savings. On average, each month employees left approximately 1500 Afghanis (about US$30) on their mobile account balance, or over 20% of the average monthly salary. Over the study period from August 2012 to March 2013, the cumulative balance on an employee's account averaged about 3400 Afghanis (about US$68), demonstrating that employees were engaged in long-term strategy decisions about when to save and when to withdraw. The study also documented heterogeneity in account usage patterns, for example employees with pre-existing bank accounts maintained larger M-Paisa balances, as did employees with larger salaries and employees who represented higher shares of their household's total income. By contrast, non-heads of household were the quickest to withdraw funds from the mobile accounts following the salary transfers.

The CADG research study also documents a surprising relationship between savings and perceptions of insecurity. As noted above, employees in the study were mainly located in insecure provinces in the south and east of Afghanistan, where the insurgency was a serious issue. Each month, the research team collected survey data from employees concerning their perceptions of local insecurity, specifically asking about the perceived likelihood of future insurgent-related violence in their area. The empirical analysis suggests that employees who believed that insurgent violence was more likely engaged in precautionary behavior, decreasing their mobile savings balances and increasing the amount of savings maintained in cash. This finding could be related to multiple factors, including difficulty accessing an agent during periods of insecurity, or the demand for liquidity given uncertainty over future consumption decisions. Future work will explore it in more detail.

Section 4: Challenges and Limitations to Mobile Salary Payments

In addition to the firm- and employee-level impacts discussed above, the CADG study provided a series of operational lessons that may prove helpful to other firms exploring mobile salary payments. First among these is the observation, noted above, that mobile network coverage and agent coverage are required before a mobile salary payment system can be implemented. While network coverage is generally determined by the operator's strategic plan and is thus hard to negotiate, agent coverage can adapt to demand. In the CADG study, for example, the Zabul CDP office and some smaller provincial satellite offices were excluded due to the absence of a reliable mobile signal and limits on employee travel. However in Paktia, Paktika and Helmand, where few mobile money agents existed prior to the study, CADG and Roshan agreed to onboard new mobile money agents. In practice, new agent recruitment often requires time and additional compensation in difficult areas, and may lead to early liquidity disruptions as described in the Helmand example above. Thus, employers seeking to expand mobile salary payments to new geographical areas need to carefully plan a rollout strategy that is consistent with operator infrastructure.

A second operational lesson relates to registration and verification procedures used in M-Paisa. A bulk advance registration system employed by Roshan addresses the know-your-customer regulations placed on mobile money operators in an efficient fashion. Photographs and biographical information can be provided in advance, allowing the pre-registration of SIM cards prior to the rollout in provincial offices. Still, existing employee registrations must be verified by local offices, as regular employee turnover can lead to out of date records and delay registration of new employees. From an employee perspective, being required to change to a new phone number due to advance registration and technology limitations can be disruptive, but the use of additional procedures to help transfer contacts can help ease the transition to a new mobile handset.

Third, careful planning is needed to ensure smooth roll-out and proper training of all employees enrolled in Mobile Salary Payments. Centralized trainings are more efficient and faster to implement but require employees to travel, which can be prohibitively expensive and disruptive to firm operations. For this reason, the CADG study opted for staggered rollout to the provincial offices with two provincial offices being added each month due to in-country travel considerations. During trainings, the CADG study instituted a system of test transfers and airtime purchases to confirm with each employee that their technology worked properly. In this context, it was readily apparent that the current M-Paisa language interface was not ideal, given the absence of Arabic script, though this is due to be replaced soon. By contrast, the interactive voice recognition (IVR) system appeared to work well. Finally, it is noteworthy that employees may have concerns regarding the security and visibility of their withdrawals, particularly if these may remove the privacy considerations of their employer's identity, which can be a serious consideration. Employees with sensitive jobs may prefer to have an agent visit their local office.

Fourth, as noted above, salary issues and agent liquidity represent a key challenge. In contrast to employers, employees do not consider their payment to be received until they have cashed out with a Mobile Money agent. This disjunction implies that employers may have completed the transfer but agents can still pose a delay. In areas where few agents operate, this issue can be intensified, as there is little competitive pressure and limited alternatives available. The absence of alternative uses for mobile money in remote areas, and the common practice of paying all local employees on the same day as opposed to a staggered payment cycle, can both serve to amplify the problem.

Finally, managing employee turnover and employee learning can be critical. In planning for employee turnover in the CADG study, the mobile handset stayed with the employer, while the SIM stayed with the employee, allowing them to continue to use the M-Paisa system after leaving CADG. The arrival of new employees presented more difficulty, with no system for registering and training new employees in place. The selection of a single employee in each office to serve as a mobile money focal point could help to manage this process. Combined with this function could be the important role of assisting employee learning over time. Survey data suggests some CADG employees had initial misperceptions about visiting mobile money agents that were quickly resolved after one or two interactions. More serious was ongoing confusion over M-Paisa tariff rates and the one-time monthly withdrawal fee by some employees, which could have been easily resolved through a local focal point.

Section 5: Key Take-Aways for Future Policy

Mobile salary payments hold great promise, and the increased efficiency and transparency of electronic transfers suggests the demand for such services will only increase over time. In this context, we offer the following five key take-aways for policy on mobile salary payments:

1. *Mobile transfers increase transparency and may reduce risk of salary capture.*
   The ability to audit payments and withdrawals in transaction data is a boon to centralized accounting, which firms like CADG may find useful to provide third-party funders with detailed transaction summaries. Mobile operators might consider developing this accounting function into an added-value service, which could be combined with forensic accounting to address the risk of salary capture.

2. *Network and agent coverage are required; this limits access in remote areas.*
   As noted above, mobile salaries can only function effectively in areas with both sufficient mobile network coverage and mobile money agent presence. Absent incentivized expansion to remote areas, Mobile Salary Payments will remain a technology for regions with more developed infrastructure.

3. *Agent liquidity requires serious attention, particularly at early stages.*
   Particularly in remote areas, agents face a coordination problem when withdrawals from the M-Paisa system far outweigh deposits. One potential solution is to break up the timing of salary payments within offices, which reduces the risk of rationing. Operator can also invest in technologies to create agent liquidity, such as bill payments by individuals and vendor payments by firms.

4. *Adoptions costs and tariffs deserve review and potential revision.*
   The evidence of a recurrent cross-subsidy to mobile operators voice businesses from mobile salary payments should influence the setup concerning fixed setup fees, which may be deterring uptake of the service. Also, the current tariff system may warrant revision to move transaction costs from transfers to withdrawals and thus help promote additional liquidity on the system with current users.

5. *Each user group is different, requiring adaptation and innovation over time.*
   As CADG and other firms and bureaucracies consider expanding the mobile salary system to new populations, it is worth noting that each user group is different. For short-term laborers, high adoption costs will be prohibitive, while for Afghan police officers, leakage as the more critical issue. Firms and operators should resist one-size-fits-all approach and pursue regular product innovation.