POLICY BRIEF

How Does Adoption of Mobile Money Technology Affect Child Labour and School Enrolment?

Joseph B. Ajefuand Falecia Massacky

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Abstract

This paper analyses the impact of adoption of mobile money services on child labour and educational outcomes in Tanzania using an instrumental variables strategy. We identify heterogenous impacts across child's gender and age, and we find a positive and significant effect of mobile money adoption on educational outcomes, but the results reveal a negative and significant impact on child labour in the farm and households. Moreover, using mediation analysis, we identify remittances and education expenditure as the potential pathways through which mobile money adoption affects child labour and educational outcomes.

Overall, the results suggest that policies that increase mobile money adoption can be effective in improving child educational outcomes and lead to a decline in the incidence of child labour.

Introduction

The expansion in access to mobile phones in Sub-Saharan Africa, among many of its benefits, led to the introduction of mobile money services, which has had a major boost to financial inclusion, and particularly mobile money adoption among many households across the region. Mobile money services provide the platform that allows individuals and households to send or receive money cheaply, quickly, and safely around the country using mobile phones, thereby increasing financial inclusion of the unbanked poor households previously inhibited by poor infrastructure and high transaction costs. This can have significant effect in facilitating access to sending and receiving of remittances (Riley, 2018; Jack and Suri, 2011, Jack and Suri, 2016; Munyegera and Matsumoto, 2016). A growing number of studies have found other benefits associated with the use of mobile money services to include facilitating of savings and borrowings, empowering the poor to smooth consumption and insuring households against negative income shocks (Riley, 2018; Munyegera and Matsumoto, 2016). The highlighted benefits of mobile money services lend credence to its poverty-reducing effect among households in many developing countries (Jack and Suri, 2014; Jack and Suri, 2016).

This paper examines the effect of household's adoption of mobile money on child labour and educational outcomes in Tanzania using data from the Tanzania National Panel Surveys. Moreover, we identify the various channels through which mobile money adoption by households affects child labour and educational outcomes. To the best of our knowledge, this paper is the first to examine the impact of mobile money services on child labour and educational outcomes in the context of Tanzania. The motivation for this paper stems from both theoretical and empirical evidence, which posit that incidence of child labour and children's low educational outcomes in developing countries are largely associated with poverty of households and credit market imperfections (Basu and Van, 1998; Baland and Robinson, 2000; Ranjan, 2001; Beegle, Dehejia and Gatti, 2006; Bandara, Dehejia and Lavie-Rouse, 2015).

Many poor households in developing countries engage in child labour as a source of income that can bring succor and alleviate the pangs of poverty (Basu and Van, 1998). Existing evidence lends credence to a positive association between informal risk sharing and child labour and low school enrolment in developing countries. Households affected by negative income shocks due to exposure to drought, flood, loss of employment, loss of farmland, pest invasion on farm, economic or financial crisis, and death or illness of family head often result to the use of informal risk

sharing mechanisms such as child labour and withdrawal of children from school as buffers against negative income shocks (Fafchamps, 1999; Portner, 2001; Dercon, 2002; Beegle, Dehejia and Gatti, 2006; Ajefu, 2017).

In many developing countries, policies aimed at reducing child labour, boosting school enrolment and grade attainment have been on the front burner of development discourse for many years. Despite these efforts put forward by the government and interested institutions, both national and international, evidence shows that child labour and low school enrolment are widespread (ILO, 2017). For instance, in 2016, out of the 152 million in child labour, Africa ranks highest both in the percentage of children in child labour – one-fifth – and the absolute number of children in child labour – 72 million (ILO, 2017). These dynamics are likely to be driven by poverty, and imperfect credit and insurance markets, which are prevalent in developing countries (Beegle, Dehejia and Gatti, 2006; Bandara, Dehejia and Lavie-Rouse, 2015; Skoufias, Rabassa and Olivieri, 2011). Mobile money adoption is likely to have implications on child labour and education outcomes based on its poverty-reducing effect on households, and risk-sharing and relaxing of credit constraints through the receipt of remittances. However, there has been limited policy discussion on the causal link between financial inclusion and child labour and educational outcomes in the context of developing countries.

The methodology of this paper entails the use of instrumental variables strategy in which distance to the nearest mobile agent and availability of mobile money agents in the community are used as instruments. The objective of the project is twofold: (i) to investigate the impact of mobile money on child labour and educational outcomes in Tanzania; and (ii) to investigate the potential channels through which mobile money impact child labour and educational outcomes. In this objective, we examine the mitigating effect of mobile money on the relationship between weather shocks and child labour and education outcomes. Accordingly, this paper addresses the following research questions. Does the use of mobile money services affect child labour and educational outcomes? If so, what are the potential channels through which mobile money affects child labour and educational outcomes? Does the use of mobile money services have mitigating impacts on weather shocks against child labour and educational outcomes? This paper is based on the following hypotheses: (1) households mobile money adoption affects child labour and educational outcomes; (2) the use of mobile money mitigates the effect of weather shocks on child labour and educational outcomes.

This paper contributes to a growing literature on mobile money adoption and household's outcomes in developing countries (Mbiti and Weil, 2013; Munyegera and Matsumoto, 2016; Jack and Suri, 2014; Jack and Suri, 2016; Ky, Rugemintwari and Sauviat., 2018). While these existing studies focus on the effects of using mobile money on household's welfare, risk-sharing against negative income shocks, and

savings behaviour, this paper contributes to the existing literature by exploring not only the impacts of using mobile money on child labour and educational outcomes in Tanzania, but also the various pathways or mechanisms through which using mobile money services affects child labour and educational outcomes. Similar to studies such as Alcaraz, Chiquiar and Salcedo (2012), Bargain and Boutin (2015), and Caudros-Menaca and Gaduh (2020), we identify remittances as a potential channel through which mobile money adoption affects child labour and educational outcomes. The relevance of this paper is underscored in the detrimental costs of child labour on physical health, mental well-being and crowding out of leisure of children. It can also lead to reduced human capital accumulation, which often has deleterious consequences on labour market prospects (Fallon and Tzannatos, 1998; Ravallion and Wodon, 2000; Baland and Robinson, 2000; Ranjan, 2001).

The findings of this paper are summarized as follows: using an instrumental variable strategy in which we use the availability of mobile money agents in the community, and distance to nearest mobile money agents as instruments for mobile money adoption, we find that mobile money adoption has a positive impact on school enrolment or attendance but leads to a decline in different forms of child labour. We identify heterogeneous impacts of mobile money adoption on child labour and educational outcomes by gender and age of children.

Further, the results show that mobile money adoption has greater impact on boys' school attendance compared to girls' school attendance. Precisely, mobile money adoption increases the likelihood of school enrolment for boys by 59 percentage points while girls' school enrolment is increased by 47 percentage points. We also find differential effects of mobile money adoption between boys and girls on the various dimensions of work-related activities. Mobile money adoption leads to greater decline in farm work and domestic work for girls compared to boys. These discrepancies could stem from the existing imbalance in domestic-related tasks between boys and girls among households in developing countries. Further, we find disaggregated effects based on age cohorts of the children. Mobile money adoption has greater effect on school enrolment for children aged 5-11 years compared to 12-17. However, the negative effect of mobile money on child labour activities is higher for children aged 12-17 years compared to 5-11 years.

In exploring the potential channels or pathways through which mobile money services affect child labour and education, we consider receipt of remittances, risk-sharing from health shocks and household education expenditure as the possible channels in our analysis.

Background on Tanzania

This paper focuses on Tanzania because it provides a compelling context to investigate the impact of mobile money on child labour and educational outcomes. Tanzania has witnessed a significant increase in the use of mobile money across its population since the introduction of mobile money in 2009. As of March 2018, there were six mobile money service providers in the market: Vodacom's M-Pesa, Tigo Pesa, Airtel Money, Ezy Pesa, Halotel Money, and TTCL (Tanzania Invest, 2019). Another motivation for focusing on Tanzania can be linked to the fact that it is one of the early adopters of mobile money services in sub-Saharan Africa and the growth of mobile money services in the country over time since then (Aaron, 2017). The proximity of Tanzania to Kenya, where mobile money was first introduced, also contributed to the growth in the adoption of mobile money services in Tanzania; as such, Tanzania is currently catching-up with its neighbour in terms of the number of users and the volume of mobile money transactions (CGAP, 2016). As a result of increase in financial inclusion in Tanzania lately, the country has witnessed rising figures in the receipt of remittances by individuals and households (Utouh and Mutalemwa, 2015).

In Tanzania, child labour is a pervasive phenomenon and children are engaged in hazardous tasks such as fishing, mining, quarrying, and domestic work. Some of these are described as worst forms of child labour, with an estimated 29.3% (3.5 million) children aged 5 to 14 engaged in child labour. It can be considered as a fairly "average" country for sub-Saharan Africa. According to UNICEF (and following the ILO definition of child labour), 29% of children between the age of 5 to 14 provide labour, as against 28% for all Sub-Saharan Africa and 26% for Eastern and Southern African countries. Therefore, Tanzania is a country with intermediate levels of child labour for Sub-Saharan Africa, but high levels of child labour compared to other world regions (UCW, 2010). Further, in Tanzania, about 20% of working children reported that their labour activities prevented them from learning correctly, and 20% have already suffered a work-related injury (Dumas, 2013).

Climate change has been identified as a factor that can significantly contribute to the incidence of child labour and low school enrolment. In recent years, Tanzania has witnessed a rise in temperatures, which has resulted in the likelihood of intense rainfall events, droughts, and floods. Specifically, Tanzania has recorded increasing variability in rainfall, with large differences in amounts and seasonality from year to year. In addition, the northeast and much of the southern parts of Tanzania have witnessed increasing cases of dry spells in recent years (Future Climate for Africa, 2017).

Data sources

The three waves of data for this paper are drawn from the Tanzania National Panel Surveys (TNPS), which are: the 2010/11, 2012/13 and 2014/15. The TNPS is a national representative survey conducted by the National Bureau of Statistics of Tanzania in collaboration with the World Bank Living Standards Measurement Study-Integrated Surveys on Agriculture (LMSA-ISA). The survey collects detailed information on individual, household, and community level characteristics. The panel nature of the TNPS allows for the same households to be interviewed over time.

The TNPS tracks 3,265 baseline households from the 2008/2009 waves and all the split-offs of these households over time. Across the four waves, the attrition rate of households is 4.8%. The survey has about 96% recapture rate across the wave 1 to 3. In the second wave of data collection, the number of panel households increases to 3,924; in the third wave, to 5,010 households, but declines in the fourth wave to 3,352. The fourth wave was refreshed, and it was not possible to identify the attrition rate for the entire wave three in relation to wave four of the TNPS. The attrition was done for the extended panel households, which was about 860 households, and it corresponds to an attrition rate of 8%. In the analysis of this paper, we use an unbalanced panel from three waves of the survey (2010/11, 2012/13, and 2014/15). The full sample comprises 18,631 children between the age of 5 to 17.

Following Bandara et al. (2015), and Cuadros-Menaca and Gaduh (2020), the dependent variables of interests include both binary and continuous variables for school enrolment, child labour, farm work in the last 7 days and domestic or home chores in the previous day. In addition, we use as outcomes measures that capture hours worked in the last 7 days prior to the survey for wages, household-owned businesses, and household-run farming and hours per week spent on the household tasks of collecting firewood or fuels and water. The National Panel Survey of Tanzania contains detailed data on education and time-use of each household member of age 5 and above. However, we restrict our analysis to children between the age of 5 and 17 years. The control variables used include child age, dummy for male child, household size, dummy for male-headed household, dummy for married household head, age of household head, household completed at least primary education, dummy for electricity, log of distance to nearest government primary school, and log of distance to nearest government secondary school.

Conclusion

There has been a boost to the financial inclusion status of households in Tanzania since the introduction of mobile money. The adoption of mobile money has myriad benefits, including overcoming gaps in financial inclusion of the unbanked poor, facilitating saving, borrowing, empowering the poor to smooth consumption, and insuring households against income shocks. These benefits are likely to be correlated with poverty reduction for the adopters of mobile money. In this paper, we explore the variation in the adoption of mobile money across households over time to examine the causal impact of mobile money adoption on child labour and educational outcomes in Tanzania.

The objective of this paper is to examine the causal impact of mobile money adoption on child labour and school enrolment, and we also identify the pathways or mechanisms through which mobile money adoption impacts on child labour and schooling in Tanzania. Further, this paper reveals how the impact of mobile money adoption varies by gender and age of children. To establish a causal relationship between mobile money and child labour (educational outcomes), we use an instrumental variables estimation approach, in which household's distance to the nearest mobile money agent and availability of mobile money agent in the community are used as instruments for mobile money adoption. We use causal mediation analysis in which we identify remittances and education expenditure as the potential mechanisms or pathways through which mobile adoption affects child labour and educational outcomes.

From the results of this study, we provide evidence in support of a negative (positive) relationship between mobile money adoption and child labour (school enrolment) in Tanzania. We also find heterogenous effects of mobile money on child labour (education outcomes) by child's age and gender, respectively. We, therefore, find higher effects for boys compared to girls on the impact of money mobile adoption on school enrolment, but we find lower effects for boys compared to girls on labour market activities. The effects are identified through mechanisms or pathways such as drought shocks, remittances, and education expenditure. The results reveal that the adoption of mobile money is positively related to the receipt of remittances and educational expenditures by households. Moreover, we find statistically significant evidence for the mitigating effect of mobile money on the relationship between drought shocks, and child labour (educational outcomes). The results in gender differences in the impact of mobile money on child labour and schooling speaks to the prevailing gender inequality in many developing countries, especially in Tanzania. These findings are important from policy standpoints and would require the design and implementation of other programmes that would support mobile money adoption to have gender-neutral outcomes of the impacts of mobile money adoption across developing countries.

The paper contributes to the literature on child labour and educational outcomes by providing new evidence from the analysis of the relationship between mobile money and child labour (educational outcomes) in Tanzania using an instrumental variable estimation approach. The results suggest that, to curb child labour and improve educational outcomes in developing countries, policy makers should take into cognizance the financial inclusion of households such as the adoption of mobile money. Further research would be required to investigate whether the extent or frequency of usage of mobile money matter on child labour and schooling outcomes. Do the results of the effects of mobile money adoption on child labour and schooling change with intensity or frequency of usage? We are unable to provide answers to this question from the analysis because we have limited information on mobile money adoption provided by the Tanzanian National Panel Surveys. However, empirical findings to this question will enhance the discussions of the implications of mobile money usage in developing countries.

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