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Comment

Comment on Apiors, E.K.; Suzuki, A. Mobile Money, Individuals' Payments, Remittances, and Investments: Evidence from the Ashanti Region, Ghana. *Sustainability* 2018, *10*, 1409

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Abstract: Using primary, individual-level survey data for Ghana, Apiors and Suzuki find, among other things, that mobile money use is not dependent on financial status and that mobile money users save more. This note argues that both conclusions have validity issues.

Keywords: mobile money; financial inclusion; saving; Ghana

1. Introduction

In a recent article, Apiors and Suzuki [1] examine, first, the socio-economic characteristics of mobile money users in Ghana and, second, the impact of mobile money use on a range of financial transactions conducted by individuals, including the amount that they save. In doing so, Apiors and Suzuki use primary survey data obtained from 577 respondents (338 users and 169 non-users) in the Ashanti region.

Unfortunately, for two of Apiors and Suzuki's research questions there is a clash between the hypothesis and the way it is tested, so that the conclusion is, in fact, incorrect. I discuss each question in turn.

2. Financial Status and Mobile Money Use

Apiors and Suzuki's Hypothesis 1 reads [1] (p. 3): "Higher financial assets contribute to participation in mobile money" and is justified as follows: "Mobile money as a financial inclusion tool may enable people to increase their participation in the formal economy and thereby help them improve their lives. However, *one needs to be able to afford a phone* and a SIM card . . . " [1] (p. 3; emphasis added).

This gives the impression that the hypothesis applies to and will be tested for, the general population of Ghana; that is, with a sample that includes individuals who do not own a phone. However, in their survey Apiors and Suzuki filter on mobile phone ownership [1] (p. 6): "Our target was adults who were at least 18 years of age and owned a mobile phone. This approach was taken because having a mobile phone is a requirement to have access to mobile money, ..."

Apiors and Suzuki then determine, by means of probit and logit regressions, "the kind of people using mobile money" [1] (p. 7) and find, in Table 3 on p. 12, that *ln*(Financial assets) has no significant impact on mobile money use (0/1). They therefore reject H1 and conclude that "participation in mobile money is not dependent on the financial status of an individual" [1] (p. 12). This conclusion appears in more or less the same wording in the Abstract, in the Introduction (on p.-3) and in the Conclusions (on p. 21) and is even more strongly worded in the Discussion: "there is *equal access* to mobile money *by all segments of society* with respect to financial assets" [1] (p. 20; emphasis added).

Clearly, this conclusion is too strong, as it overlooks that individuals who do not own a mobile phone have been excluded from the sample and as there is strong evidence in the literature that the poor are less likely to own a mobile phone; see, for example, [2] for the case of Kenya. The conclusion should have read: '*among mobile phone owners*, participation in mobile money is not dependent on the financial status of an individual.'

To sum up my first criticism, Apiors and Suzuki's H1 is on the level of the total population, their test is on the level of the subset of mobile phone owners but their conclusion is again on the level of the total population.

3. Mobile Money Use and Savings

As mentioned, Apiors and Suzuki also examine how mobile money use impacts individuals' financial behaviour. In particular, they hypothesise that mobile money users send and receive greater volumes of domestic payments and remittances (H3) and invest more in business and capital assets (H4).

Where savings are concerned, H4 is justified by referring to the TBILL4ALL product launched in 2016 by Ecobank Capital Advisors together with Mobile Telecommunications Network (MTN), the largest mobile network operator in the country [3]. Apiors and Suzuki [1] (p. 4) explain that, with this service, starting from as little as 5 cedis (USD 1.30) "a mobile money user could purchase a government security bond that could earn interest of 13–17% per year." Later in the article, when presenting their results, they also proffer a more general argument: "Since mobile money provides easy access to a savings device and easy savings in general, it is possible that mobile money has provided access to an easy savings mechanism for users and hence they are saving more" [1] (p. 18).

To test H4 (and H3), Apiors and Suzuki estimate a regression of the following form [1] (p. 7):

$$Y_i = \alpha_0 + \beta_1 MM_i + X_i'\delta + u_i \quad (1)$$

where Y_i is the outcome (in our case: *ln*Savings, with savings defined as "total value of money saved in the last 12 months"), MM_i is a dummy that equals 1 if an individual "has ever used mobile money to undertake any transaction", X_i is a vector of individual-level control variables and u_i is the error term [1] (p. 23). The test then consists in examining whether β_1 is significantly different from 0. Because MM_i may be endogenous, Apiors and Suzuki employ propensity-score matching and inverse propensity-score weighted regressions. In line with H4, they find a significant and positive relationship between mobile money usage and Total Savings; see model (4) in Table 8.

However, unfortunately, there is again no 1-1 correspondence between the hypothesis and the test. The essence is that the *MM* dummy, which looks at mobile money *use*, does not measure what it is supposed to, namely 'having access (1/0) to a savings device on one's mobile phone.' Being a *user* of mobile money, as defined by Apiors and Suzuki, is not enough for such access; one needs to *own* a mobile money *account*.

Indeed, while it is possible to send money to a person who does not have a mobile money account (albeit at a higher cost), in order to be able to save on the phone—and earn interest—one needs to register one's SIM card as a mobile wallet [1] (p. 3) [4] (p. 64–65). Paragraph 10(5) of the Electronic Money Issuers Guidelines issued by the Bank of Ghana [5] requires mobile money operators to pass on, each quarter, the bulk of the interest accrued on the pooled e-money float to customers but only to holders of a mobile money account [1] (p. 6).

A similar remark can be made concerning the ability to purchase Treasury Bills with the TBILL4ALL service. Stronger still, for this service one not only needs a mobile money account, one needs an *MTN* account, as Ecobank currently only offers TBILL4ALL on the MTN platform [4]. (Note that MTN, together with Fidelity Bank, also offers a Y'ello Save Account that earns 12 percent. But this was only just launched at the time when Apiors and Suzuki collected their data. For this product, too, one needs an MTN mobile money wallet).

In other words, the *MM* dummy—which, to repeat, captures whether an individual has ever *used* mobile money—substantially overestimates the number of respondents who have access to a mobile savings device. As can be seen in Apiors and Suzuki's Table 2, only 54 percent of the mobile money users in their sample actually own a mobile money account [1] (p. 10). Apiors and Suzuki do not mention just how many have an MTN mobile wallet (and could thus buy Treasury Bills) but Bank of Ghana data show that at end-2017 the total number of TBILL4ALL clients was a mere 7676 for the entire country [4] (p. 59). Bank of Ghana data also show that at end-2017 only 46 percent of the registered mobile money accounts were active—with 'active' defined as an account that "transacted at least once in the 90 days prior to reporting" [4] (p. 59).

The bottom line is that a substantial share of the 'mobile money users' in Apiors and Suzuki's sample did not, in fact, have access to a mobile savings device. An even larger share was not in a position to purchase Treasury Bills on their phone. For these respondents, the higher Total Savings relative to non-users can thus not possibly have come from such financial behaviour, contrary to what Apiors and Suzuki suggest in their justification of H4 (see above) and reiterate in the Discussion: " . . . , an active *user* with a higher financial asset is also more likely to [. . .] put more money on the mobile wallet to earn more quarterly interest, or invest in treasury bills" [1] (p. 20; emphasis added); and also: "The higher total savings by *users* could be explained by participating in mobile money providing access to a convenient saving mechanism. Hence, mobile-money *users* can save on phones easily and have easy access to the liquidity of savings and more flexible control over their finances" [1] (p. 21; emphasis added).

There are several (non-exclusive) alternative explanations for the positive relationship between mobile money usage and Total Savings in model (4) in Table 8. There could be reverse causality, the result could be driven by the mobile money account holders among the users, or perhaps the link is of a more indirect nature, in that users without a mobile money wallet may have been able to save more because they received greater volumes of remittances, as model (4) in Table 7 would seem to suggest. It would be interesting for future research to disentangle these explanations. To that end, Apiors and Suzuki could replace their dummy for mobile money use in model (4) of Table 8 by a dummy for mobile account ownership; or, if possible, for ownership of an active account. In addition, in model (4) of Table 7 they could use a variable with three categories (does not use mobile money; uses mobile money but does not have an account; owns a mobile money account) in order to see whether there is also a significant positive impact on the volume of remittances received for the middle category.

4. Conclusions

Apiors and Suzuki's answers to two of their research questions have a validity problem. For Hypothesis 1 there is an issue of external validity: a result for the subset of mobile phone owners is incorrectly generalised to the total population. For the savings part of Hypothesis 4, the problem is one of internal validity: the dummy for mobile money use does not correctly capture access to a mobile savings device.

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