So you want to quit smoking: have you tried a mobile phone?

Julien Labonne \(^a\) & Robert S. Chase \(^b\)

\(^a\) Department of Economics, Oxford University, Manor Road, Oxford, OX1 3UQ, UK
\(^b\) The World Bank, 1818 H Street NW, Washington, DC, 20433, USA


To cite this article: Julien Labonne & Robert S. Chase (2011): So you want to quit smoking: have you tried a mobile phone?, Applied Economics Letters, 18:2, 103-106

To link to this article: http://dx.doi.org/10.1080/13504850903508309
So you want to quit smoking: have you tried a mobile phone?

Julien Labonne\textsuperscript{a,*} and Robert S. Chase\textsuperscript{b}

\textsuperscript{a}Department of Economics, Oxford University, Manor Road, Oxford OX1 3UQ, UK
\textsuperscript{b}The World Bank, 1818 H Street NW, Washington, DC 20433, USA

Using spatially coded data on mobile phone coverage and panel data from 2100 households in 135 communities of the Philippines, we estimate the impact of mobile phone ownership on tobacco consumption. Purchasing a mobile phone leads to a 17.1\% decrease in tobacco consumption per adult over the age of 15.

I. Introduction

Tobacco use kills 5.4 million people a year worldwide.\textsuperscript{1} This is more than the combined death toll of HIV/AIDS, malaria and tuberculosis.\textsuperscript{2} The health impacts of smoking are well established with about 70 000 articles linking smoking to a wide range of ailments (Chaloupka and Warner, 2000). As a result, governments have introduced policies to discourage smoking (e.g. tax increase on tobacco products).

In developing countries, a decrease in disposable income might have impacts on tobacco consumption similar to those of a tax increase, as the income elasticity of demand for tobacco is positive there (Chaloupka and Warner, 2000). As a result, the introduction of new goods competing with tobacco for scarce disposable income could lead to a decrease in tobacco consumption.

Recently, Charlton and Bates (2000) have suggested that, in developed countries, mobile phone use could play a role in reducing smoking, especially among cash-constrained teenagers. However, analyses of cross-sectional data undertaken in European countries appear to contradict this claim (Steggles and Jarvis, 2003). No analysis has been carried out in a developing country context where mobile phones are spreading rapidly. In addition, most mobile phone users in developing countries do not sign a contract for their communications but rather very regularly buy prepaid cards. This mimics the way cigarettes are purchased. Thus, communication expenditures might compete directly with tobacco expenditures.

This article uses spatially coded data on mobile phone coverage and household panel data to examine the impact of mobile phone ownership on tobacco consumption. Our results point to a large and robust negative impact of mobile phone ownership on tobacco consumption. Purchasing a mobile phone leads to a 17.1\% decrease in tobacco consumption per adult over the age of 15. We obtain similar results with Instrumental Variable-Two-Stage Least Squares (IV-2SLS).

II. The Data and Some Descriptive Statistics

Our analysis relies on household panel data collected in 135 villages of the Philippines. The first round of data collection took place in the fall of 2003 and the sample included 2400 households of which 2092 were reinterviewed in the fall of 2006. The data set contains detailed information on consumption patterns, mobile phone ownership, household structure, education achievements as well as asset and land ownership (Chase and Holmemo, 2005). Because consumption information was collected item by item, we can extract tobacco from total consumption. Over the survey period, mobile phone ownership spread quickly in the sampled communities. Indeed, although the
proportion of households owning a mobile phone in 2003 was 8.4%, it rose to 35.4% in 2006.

In addition, we use spatially coded data on mobile phone coverage. The GSM coverage maps are a compilation of coverage information provided by network operators. Coverage areas are aggregate, reflecting the combined coverage of operators and do not include information on the quality of service. We have access to the databases for 2002, 2003, 2004 and 2006. We use this information to create a village-level variable equal to the number of years since mobile phone service became available (in 2006).

Smoking is prevalent in our sample with 41.6% of households reporting some tobacco consumption in 2003. The average monthly tobacco consumption was about 31.2 Philippine Peso (PHP) per adult over the age of 15. This is equivalent to 1.24 packs of 20 sticks. This rose to 75.9 PHP (or about three packs) for households in which at least one member smoked in 2003. Overall, tobacco consumption represented 2.01% of their total budget. Results from \( t \)-tests and Kolmogorov–Smirnov tests (Table 1) indicate that there is no difference in the 2003 distribution of tobacco consumption between the households who purchased a mobile phone between 2003 and 2006 and those who did not.

### III. Estimation Strategy

Let \( \ln(C_{ijt}) \) be household \( i \)'s (log) per adult (over 15) tobacco consumption. It is determined by

\[
\ln(C_{ijt}) = \alpha \times M_{ijt} + \beta \times X_{ijt} + u_{ij} + v_{j} + w_{ijt} \quad (1)
\]

where \( \alpha \) and \( \beta \) are the coefficients to be estimated, \( M_{ijt} \) is a dummy equal to 1 if household \( i \) in village \( j \) owns a mobile phone at time \( t \), \( X_{ijt} \) is a vector of control variables that vary across households and time, \( u_{ij} \) is a time-constant household effect, \( v_{j} \) is an effect common across all households in village \( j \) at time \( t \) and \( w_{ijt} \) is the usual idiosyncratic error term.

We can eliminate \( u_{ij} \) by differencing Equation 1. Rewriting \( v'_{j} = (v_{j} - v_{j0}) \) and \( w'_{ij} = (w_{ij} - w_{ij0}) \) leads to

\[
\Delta \ln(C_{ij}) = \alpha \times \Delta M_{ij} + \beta \times \Delta X_{ij} + v'_{j} + w'_{ij} \quad (2)
\]

We will estimate Equation 2 through Ordinary Least Squares (OLS), include municipal or village dummies and compute SEs robust to arbitrary variance structure within villages. The vector \( X_{ijt} \) of control variables includes the number of household members working in the farm sector, the number of household members working in the nonfarm sector, the total number of household members, number of household members above 60, number of household members under 5, number of male household members above 15, household head age, years of education of the household head and of his/her spouse, household head’s spouse age as well as a dummy indicating whether the household owns land for purposes other than residence. In addition, to capture shocks experienced by the household over the period, we also include in Equation 2 a dummy equal to 1 if a household member migrated over the period, a dummy equal to 1 if a household member died over the period and a dummy equal to 1 if a household member suffered a serious illness over the period.

| Table 1. Comparing households with and without mobile phones in 2006 |
|-----------------|-----------------|-----------------|-----------------|-----------------|
|                  | Mobile phone    | No mobile phone | Equality means  | Equality distribution |
|                  | (1)             | (2)             | (3)             | (4)             |
| Monthly tobacco consumption (2003) per adult over 15 | 30.28 (2.31)    | 31.66 (1.57)    | 0.496 [0.620]   | 0.032 [0.763]   |
| Monthly tobacco consumption (2003) per male over 15  | 62.28 (5.02)    | 61.88 (3.36)    | -0.066 [0.946]  | 0.035 [0.692]   |

Notes: The SDs are in parentheses (columns 1 and 2) and the \( p \)-values are in brackets (columns 3 and 4). We exclude all households who owned a mobile phone in 2003.

---

3 According to WHO (2008), the price of a pack of 20 sticks for the most popular brand in the Philippines is 25 PHP.

4 The main results of the article are basically unchanged if we run our regressions with different age cut-off (e.g. 13 and 17). Results available upon request.
The decision to purchase a mobile phone is potentially endogenous. As a result, we will also estimate Equation 2 through 2SLS. We use two instruments: the length of time since mobile phone became available in the village and its interaction with the 2003 household-level value of our asset index. Results from Stock and Yogo (2005) tests indicate that our instruments are not weak, and results from over-identification tests are consistent with the validity of our instruments.

IV. Results

Mobile phone ownership leads to a sharp decrease in tobacco consumption. Specifically, our estimates (Table 2) indicate that households with a mobile phone ownership experience a 17.1% decline in tobacco consumption. This effect rises to 19.4% once we exclude households that owned a mobile phone in 2003. The significance of our estimates is confirmed when we estimate Equation 2 by IV-2SLS (Columns 2 and 4). Further, in results not reported here, we find that our estimates are numerically similar if we control for the 2003 levels of education or if we control for the 2003 (log) per adult tobacco consumption. Similarly using (log) per male over 15 tobacco consumption instead of (log) per adult tobacco consumption does not affect our results.

V. Conclusion

We explore the impact of mobile phone ownership on tobacco consumption. Using household panel data, we find that purchasing a mobile phone leads to a sharp decline in tobacco consumption. An interesting avenue for further analysis is to understand the role of social status in explaining this shift. Indeed, it might be that smoking used to be a signal for social status and this signal is slowly being replaced by mobile phone ownership and use.

Acknowledgements

We are grateful to Charles Kenny and Mark Williams for fruitful discussions that led to this article. We thank Damien de Walque, Gillette Hall, Ben Olken and Melody Tulier for helpful comments. We also thank Bhuvan Bhatnagar, Andrew Parker, Camilla Holmemo, Arsenio Balisacan, Rosemarie Edillon, Sharon Piza and all the staff of APPC without whom the field work would have been impossible. Shiel Velarde and Siobhan Murray provided extremely

Table 2. Access to mobile phones and per adult (over 15) tobacco consumption

<table>
<thead>
<tr>
<th></th>
<th>(1) OLS</th>
<th>(2) IV-2SLS</th>
<th>(3) OLS</th>
<th>(4) IV-2SLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A: full sample</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D mobile</td>
<td>-0.145  (0.057)*</td>
<td>-0.841 (0.488)**</td>
<td>-0.171 (0.063)**</td>
<td>-1.166 (0.527)*</td>
</tr>
<tr>
<td>F-stat for IV</td>
<td>11.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over-Id test (p-value)</td>
<td>0.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummies</td>
<td>Municipal</td>
<td>Municipal</td>
<td>Village</td>
<td>Village</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.13</td>
<td></td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>Panel B: only households w/o mobile phone in 2003</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D mobile</td>
<td>-0.156 (0.058)**</td>
<td>-0.374 (0.221)**</td>
<td>-0.194 (0.064)**</td>
<td>-0.483 (0.222)*</td>
</tr>
<tr>
<td>F-stat for IV</td>
<td>93.77</td>
<td></td>
<td>139.02</td>
<td></td>
</tr>
<tr>
<td>Over-Id test (p-value)</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummies</td>
<td>Municipal</td>
<td>Municipal</td>
<td>Village</td>
<td>Village</td>
</tr>
<tr>
<td>Observations</td>
<td>1801</td>
<td>1801</td>
<td>1801</td>
<td>1801</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.13</td>
<td></td>
<td>0.24</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Results from fixed-effect OLS (columns 1 and 3) and IV-2SLS (columns 2 and 4) regressions. The dependent variable is the household-level change (2003–2006) in the (log) per adult (over 15) tobacco consumption. Each cell is the coefficient on the variable $\Delta M_p$ from a different regression. The SEs (in parentheses) are Huber corrected and account for intra-village correlation. *, ** and *** denote significance at the 5, 10 and 1% levels, respectively.

Control Variables: All regressions include either municipal or village dummies. We also include the 2003–2006 change in household size, household head (and spouse) age, number of household members above 60, number of household members under 5, number of male above 15, household head education (in years), household head spouse education (in years) in a dummy indicating whether the household owns land for purposes other than residence, in the number of household members employed in the farm sector, in the number of household members employed in the nonfarm sector and a dummy equal to 1 if a household member migrated over the period, a dummy equal to 1 if a household member died over the period and a dummy equal to 1 if a household member suffered a serious illness over the period.

5 For more information on the index, please see Labonne et al. (2007).
valuable help accessing and using the GIS data sets. We are grateful to the Philippines Department of Social Welfare and Development for allowing us to use the data. Financial support from the Trust Fund for Environmentally and Socially Sustainable Development is gratefully acknowledged. All remaining errors are ours. The findings, interpretations and conclusions expressed in this article are entirely those of the authors and should not be attributed in any manner to the World Bank, to its affiliated organizations or to members of its Board of Executive Directors or the countries they represent.

References


