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# The price sensitivity of mobile use among low income households in six countries of Asia $\stackrel{\text{\tiny $\%,\%$}}{\to}$

### Sangamitra Ramachander<sup>\*,1</sup>

Wolfson College, University of Oxford, Linton Rd., Oxford OX2 6UD, UK

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#### ABSTRACT

The private sector in developing countries is increasingly interested in extending mobile telephony services to low income and rural markets that were previously considered unprofitable. Determining the right price is a central challenge in this context. Despite known limitations, the Contingent Valuation (CV) method, which elicits information on the Willingness to Pay (WTP), is a useful guide to pricing decisions. The present study draws on data generated using the CV method to examine whether mobile use is sensitive to small declines in the current per-minute price of use for low income households in six countries of Asia: Bangladesh, India, Pakistan, Philippines, Sri Lanka, and Thailand. A Heckman model is used to correct for the sample selection problem arising from the study of mobile phone owners alone. We find that demographic criteria, including income, are not significant in explaining whether usage is responsive to price fall, although they appear important in determining mobile phone ownership. Instead, subscription to multiple service providers has an important association with the price sensitivity of use: Those with multiple SIM cards are likely to increase usage when price falls whereas those who report that they would not switch service providers are unlikely to do so. The study further finds that consumption would increase among those with a more diversified use of mobile services (to participate in competitions and to access government services) and among more 'limited' users (those who attach a greater importance to the emergency uses of the phone). Overall the findings suggest that there exists a latent demand for mobile minutes among low income households that can be tapped through a small reduction in price. However, given the relatively low profit margins in these markets and the ability of users to switch between service providers quickly and at low cost, competing on price could threaten the long term survival of firms. Non-price strategies would therefore be important for firm survival and sustainable service delivery.

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Correspondence address: 3A, Cedar Park, 4th Main Road, Kottur Gardens, Chennai 600085, India.

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E-mail address: sangamitra@gmail.com

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#### 1. Mobile telephony in low income markets

Mobile phones have received considerable attention in the media, research and policy spheres for their rapid diffusion in developing countries over the past decade. The fastest growth in mobile subscriptions is in the developing world, with the penetration rate more than doubling from 23% to 57% between 2005 and 2010 (ITU, 2010). There are several reasons cited for such growth. First, regulatory reforms favoring greater competition have driven down the price of use. Second, the introduction of 'pre-paid' SIM cards<sup>2</sup> has increased uptake among low income users, as eligibility requirements and paperwork are minimal. Further, pre-paid use reduces financial commitments as there is no monthly fee and incorporates flexibility as usage volumes can be low and staggered based on needs. Specific additional features often associated with prepaid use – such as the Calling Party Pays (CPP) form of billing, where incoming calls are effectively free, the transferability of SIMs (allowing multiple SIM cards to be used with a single phone) and asymmetric inter-connection rates that make calling from a mobile phone to a fixed network cheaper than from a fixed phone to a mobile network – have further encouraged use (Kalba, 2008). In some parts of Africa and Latin America, the mobile has reached areas where fixed line telephones remain unavailable and the absence of a 'fixed line legacy' is argued to have favored adoption (Hamilton, 2003).

While the growth in subscription has been remarkable, private actors face a number of challenges in serving low income and rural areas. Among these is the need to find a price that is affordable to this market segment while also making economic sense for service providers.<sup>3</sup> Estimation of the WTP typically involves asking prospective customers whether or not they would be willing to purchase a commodity or service at various hypothetical prices. This approach, known as the 'Contingent Valuation' (CV) method, is controversial because it relies on people's 'stated' rather than 'revealed' preferences (actual observed choices). While the potential sources of bias associated with the method remain a source of debate,<sup>4</sup> its use is inevitable in certain contexts, such as when firms want to learn about the likely adoption of a 'new' product or service or when governments want to estimate the response to proposed policies that are outside the range of variability in existing data (Portney, 1994).

The present study draws from data generated using the CV method to analyze whether the consumption of mobile telephony services among low income or 'Bottom of the Pyramid' (BOP) households is responsive to small declines in the current per-minute price of use. The data derives from LIRNE*asia*'s third 'Teleuse at the Bottom of the Pyramid' (Teleuse@BOP3) survey, involving representative samples of BOP users in Bangladesh, India, Pakistan,<sup>5</sup> Philippines, Sri Lanka,<sup>6</sup> and Thailand.<sup>7</sup> The study follows the socioeconomic classification (SEC) used in market research to define BOP. The SEC comprises five groups – A to E – defined based on the level of education and occupational status of the chief wage earner of the households.<sup>8,9</sup> People between the ages 15 and 60 were considered. Of the groups, D and E are together referred to as the BOP. The BOP definition roughly equates to the 'less than USD 2/day' poverty definition in terms of their corresponding population shares in each country. A detailed description of the sampling strategy is provided in the appendix. The dataset comprises 9540 respondents, who had used (not necessarily owned) any type of phone in the preceding three months of the survey.

With the growing private sector interest in serving low income markets, an understanding of the price sensitivity of mobile use would be of interest to service providers. Equally, ensuring wide access to mobile telephones has gained policy support as mobiles can serve as a platform to extend services that are important for social and economic development, besides basic tele-communications, in areas that are otherwise difficult to access. The findings would therefore also be of policy interest.

The rest of the paper is organized as follows: Section 2 briefly describes the CV method as employed in this study; Section 3 presents the analytical framework; Section 4 offers descriptive statistics for the variables in the analysis and considers the extent of non-response in the survey and its implications; Section 5 discusses the results from the estimation and Section 6 concludes with a summary of findings.

<sup>&</sup>lt;sup>2</sup> Subscriber Identification Modules (SIMs) are the chips placed in mobile phones, which carry basic information such as the telephone number of the user, the name of the service provider and calling rates. In the case of pre-paid SIM cards, a certain amount of credit (or associated 'talk time') is loaded and drawn down based on usage. Once consumed, a further amount must be 'topped up'. Top ups often have an expiry period.

<sup>&</sup>lt;sup>3</sup> Sen (2010) notes that unlike many other services, mobile service providers in developing countries generally enter low income markets for simple business reasons and are able to achieve 'social good' while pursuing purely business interests.

<sup>&</sup>lt;sup>4</sup> See for example Diamond, Peter A., and Jerry A. Hausman. 1994 Contingent valuation: is some number better than no number? *Journal of Economic Perspectives* 8 (4): 45–64.

<sup>&</sup>lt;sup>5</sup> The sample excludes tribal areas in Pakistan.

<sup>&</sup>lt;sup>6</sup> The sample excludes the North and East.

<sup>&</sup>lt;sup>7</sup> The sample excludes Bangkok (since the D & E populations there are very small).

<sup>&</sup>lt;sup>8</sup> We implicitly address any differences in the country samples that could arise on account of the qualitative basis of classification (occupational status and education) by including a country-level investigation of the variables in our analysis.

<sup>&</sup>lt;sup>9</sup> In the case of the Philippines, only SEC E was used as the SEC E proportion was found to be more in line with the less than USD 2 per day definition than the SEC D and E taken together.

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