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Does mobile telephony spur growth? Evidence from Indian states

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ABSTRACT

Using data on Indian states during 2001–2012, the paper analyses the impact of mobile telephony on economic growth. Using advanced panel data techniques, the evidence suggests that mobile telephony exerts a positive and statistically significant impact on growth. The magnitude of the response differs across states with high and low mobile penetration. Additionally, mobile telephony is observed to exert a significant impact on financial inclusion and especially on the loan behavior.

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1. Introduction

Few technological advances have come to dominate the debate on public policy in recent times as information and communications technology (ICT). Within the realm of ICT, the advancements in mobile telephony and internet have been rapid and furious. According to *Statista*, a leading statistics company, globally, the number of internet users has increased from 413 million in 2000 to 2.5 billion in 2012. Likewise, the total subscriber base has reached 3.2 billion in 2012 and aided by multiple devices or use of multiple subscriber identification modules (SIMs) to access the best tariffs, the number of mobile phone users has increased 7 billion in 2012, with a major chunk of this increase taking place in emerging economies (*GSM Association, 2013*). Coupled with technological advancements, this revolution has not only re-shaped the way people think and analyse, but in a much broader sense, transformed the way they work and communicate.

In tandem with these global advancements, the experience of India has been nothing short of phenomenal. To illustrate, the number of mobile users in India has increased from 5.5 million in 2000 to nearly 500 million in 2012 (*Internet Stat Live.com*). Likewise, the mobile internet subscriber base has grown from around 3 million subscribers in 2000 to reach 150 million by early 2007, registering an average growth of 700% over a 7-year period (*International Telecommunications Union, 2012*). It has since increased to over 850 million by 2012. Coupled with the fact that a fifth of the global population without bank accounts resides in India (*Demircuc Kunt, Klapper, Singer and Van Oudheusden, 2015*), this brings to the forefront the relevance of mobile telephony as a tool for enhancing financial inclusion.

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The low levels of financial inclusion in relation to the large number of mobile phone subscribers makes it imperative to investigate whether an expansion of mobile phone deployment in general can contribute to greater financial inclusion.

Research has documented that the some of the major barriers to financial inclusion include costs, distance and documentation (World Bank, 2014). Illustratively, high costs and fees charged tend to raise the costs of making small transactions, impeding access. Besides, distance is an equally important consideration: low branch penetration raises overall transactions costs and hinders access. In addition, onerous documentation requirements might compel workers with no formal proof residence or credit history to be excluded from the formal financial system. The challenges of such financial exclusion can be manifold, ranging from credit constraints to greater vulnerability to adverse shocks (Claessens, 2006), lower investment (Chakrabarty, & Pal, 2013) as well as the perpetuation of income inequality and poverty (Beck, Demirguc Kunt, & Levine, 2005; Demirguc Kunt, Beck, & Honohan, 2008; Demirguc Kunt & Levine, 2008).

In this context, innovative use of mobile telephony can be a game changer. To exemplify, mobile telephony makes it possible to seamlessly manage a large volume of small-ticket transactions, making it easier to provide these services in a cost-effective manner (Faye, & Triki, 2013). Besides, greater mobile penetration can provide a fillip to rural development since it allows dispersed families to stay in touch, which reduces vulnerability and isolation. Better information flows through mobiles mitigates information asymmetries for the farmer, improving bargaining power and thereby making the development of economic activities that are non-agricultural possible (Andrianaivo, & Kpodar, 2012). As a greater number of people come within the fold of formal finance, the size of the financial sector increases, which in turn contributes to economic growth (Levine, 2005; Mehrotra & Yetman, 2015).

The paper has a two-fold purpose. First, we investigate the effects of mobile penetration on economic growth in major Indian states during 2001–2012. Secondly, we expand the analysis further by analysing whether financial inclusion is one of the channels through which mobile phone penetration affects economic growth.

We make three contributions to the literature. First, the paper augments the thin literature on the impact of mobile telephony on economic growth at the sub-national level for a leading emerging economy. Most studies of this genre are in the nature of cross-country studies (Andrianaivo, & Kpodar, 2012; Waverman, Meschi, & Fuss, 2005). There are few studies in this area for India. In an early exercise, Kathuria, Uppal and Mamta (2009) employed data on Indian states during 2000–2008 and found that mobile penetration exerts a statistically significant impact on economic growth. More recently, using both qualitative and quantitative methods, Gupta and Jain (2012) provide evidence that handset price, perceived usefulness and mobility being among the key factors driving the demand for rural telephony. They conclude that once mobile is penetrated deeply in rural India, the levels of financial inclusion can increase. These studies are either at the aggregate level or even if they combine both aggregate and disaggregated data, employ an information base that is of dated vintage.

Second, the paper belongs to the literature that explores the sub-national effects of greater banking outreach and the role played by mobile telephony in this regard. Although several studies for India have focused on the finance-growth interface (Burgess, & Pande, 2005; Topalova, 2008), few studies identify the relevance of mobile telephony in impacting economic growth, especially at the sub-national level.

Finally, the study belongs to a broader literature which examines the role of ICT policies in influencing economic growth. The literature, both for India (Aghion, Burgess, Redding, & Zilibotti, 2008; Besley & Burgess, 2004; Imbert & Papp, 2015; Muralidharan, Niehans & Sukthankar, 2014; Sarma & Pais, 2011) and elsewhere (Jack & Suri, 2011; Lee, Lavendis & Gutierrez, 2009) have identified important effects of varied legislations on growth performance. Whether and to what extent some of these legislations interact with mobile penetration to influence economic growth has not been examined earlier and this is one of the important aspects being addressed in the paper.

India provides a compelling case among emerging markets to study this aspect in some detail. First, akin to the US and other large economies such as Brazil, Germany and Malaysia, India is a federal polity comprising of states with their own democratically-elected government. With widely divergent size (the largest state is nearly 12-times the size of the smallest, in terms of area) and the uneven distribution of population (the largest state by population was fourth largest by area in 2005), it remains a moot question as to how the impact of mobile telephony would differ across states (Ghosh, 2015). Second, notwithstanding the high mobile penetration, there remains substantial divergence across states. According to the Telecom Regulatory Authority of India (2008, 2012), in 2012, the total wireless phones in Madhya Pradesh was 52 million as compared to over 70 million in Maharashtra. Third, the levels of financial inclusion also differ markedly across states. According to CRISIL (2012), Kerala ranked high on financial inclusion with a score of 80.4 (out of a maximum of 100) in 2012; in contrast, Bihar was lowly placed with a score of 25.5 during the same period. There is a broad consensus among policymakers that the growth needs to be more inclusive and broad-based, if its benefits are to permeate all segments of the population (Planning Commission, 2008; RBI, 2015). With the growth in brick-and-mortar branches plateauing given the significant upfront costs, mobile financial services can function as a substitute for bank branches, creating opportunities for people living in far-flung areas to reap the benefits of formal finance.

The reminder of the analysis unfolds as follows. Section 2 reviews the relevant literature, followed by a discussion of the database. Subsequently, we highlight the empirical framework, followed by a discussion of the results, including robustness checks (Section 5). The final section concludes.

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