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► **To cite this version:**

Michael Barrett. Risksapes and the Scaling of Digital Innovation: Trajectory Dynamics of Mobile Payments in Times of Crisis. IFIP Joint Working Conference on the Future of Digital Work: The Challenge of Inequality (IFIPJWC), Dec 2020, Hyderabad, India. pp.17-20, 10.1007/978-3-030-64697-4\_3. hal-03450775

**HAL Id: hal-03450775**

**<https://hal.inria.fr/hal-03450775>**

Submitted on 26 Nov 2021

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# Risksapes and the Scaling of Digital Innovation: Trajectory Dynamics of Mobile Payments in Times of Crisis

Michael Barrett

Cambridge Judge Business School, University of Cambridge, Cambridge CB2 1AG

**Keywords:** Digital Innovation, Trajectory, Dynamics, Scaling, Risksapes, Climate change, Mobile Payments, Crisis

Over the last decade, a wave of crises – financial crisis, climate change, and COVID-19 pandemic, antiracism movement - have amplified and made visible the challenges of inequality in our society and global economy. In the West, the scale of covid-19 pandemic has made visible the inequality in access to healthcare by ethnic minorities. For example, black Americans are 3.5 times more likely to develop COVID-19 and to have a poor outcome from the infection while Latino Americans are almost twofold higher in that probability. In a developing countries context, the development and scaling of mobile payments have been deployed to address challenges of financial exclusion [9] to reduce inequalities associated with accessing financial markets. However, the trajectory of mobile payments as it scales across different geographical places is not uniform in addressing inequality of financial exclusion. Mobile technology are also being used to enable carbon payments to farmer networks in developing countries who are participating in reforestation programmes to help address the riskscape associated with the crisis of climate change. We propose that the conceptual merging of risksapes and scaling are useful in conducting practice-based studies which seek to contribute to our understanding of the challenges of inequality in contemporary contexts.

In this talk, I will explore the challenges (and opportunities) of using mobile payments to promote financial and social inclusion, as well as in supporting climate action in crises of sustainability. The role of mobile payments as a digital innovation in promoting economic and social development has garnered considerable attention [2] over the last decade. Studies have examined the quality of healthcare [4], access to financial services [11, 3,7] amongst many other areas of deployment. A central focus of the digital innovation literature has been on the characteristic nature of convergence (across digital platforms) and generativity (associated with reprogrammability) in enabling different forms of innovation across time and in different contexts. Studies have noted the potential of user innovation and new capabilities being incorporated after initial design [12, 13] in scaling the digital innovation [5]. At the same time, other studies [10] have recognized that there may be significant challenges in the scaling of digital innovation in addressing financial exclusion across different contexts.

In examining the empirical phenomenon of scaling the deployment of mobile payments for financial inclusion we draw on the concept of trajectory dynamics [9] to theorize the ways in which the innovation trajectory intermingles with and is transformed by interactions with local trajectories in a specific place. We discuss how this concept can be used to explore the challenges in scaling mobile payments across similar yet distinct developing country contexts. In so doing, we build on the insight that phenomena are shaped by different trajectories that

influence outcomes (Timmermans 1998), and suggest that place(s) has an important influence on the innovation trajectory [9]. Such trajectory dynamics emerge in and over time and place.

We discuss the wider implications of our findings for developing practice-based studies that explore the scaling of digital phenomena. Specifically, we suggest that the sociomaterial enactment of contemporary digital phenomena must account for the multiple, situated places where work is now being performed through emerging technologies, for example, the provision of correspondent banking services in remote locations [6]. With respect to mobile payments, [9] adopts a sociomaterial practice perspective to understand how a digital innovation (mobile money) was transformed in multiple and unexpected ways as it moved from a specific locale of development (in the UK) to distant places of implementation and use (different countries in sub-Saharan Africa) where it interacted with multiple different local conditions and practices. This enactment over time and in multiple places reconfigured both the specific digital innovation as well as the conditions of possibility for financial inclusion. The study highlights that while digital innovations are transferable across contexts, it is the active engagement of the innovation with local conditions that matter for the specific accomplishments that are enacted in practice. These insights underscore the criticality of asking where, when, and how specific digital innovations are developed, implemented and engaged with on the ground.

We discuss the different enactments of scale of mobile money in Kenya and Tanzania which yielded different trajectory dynamics in these developing country contexts despite the similarities of geography (neighbouring countries in sub-Saharan Africa), and which were expected to yield a similar scaling dynamic [10]. Furthermore, we reflect on and discuss the scaling of digital innovations in addressing different risksapes [1]. For example, in addition to addressing financial exclusion, mobile payments can enable social inclusion such as access to clean energy through business models that combine mobile loans and payments (e.g. M-Kopa). Furthermore, mobile money can help address climate change through the provision of carbon payments at scale across different places over time.

In addition to scaling, we suggest that practice-based studies should better account for risksapes which focus on the consequentiality of risk to account for crisis in contemporary society. Risk is more than just a concept which helps to rationalize future gains and losses, but also a concept which performatively shapes practice and space. While phenomena such as climate change may well be global in extent, their impacts are spatially differentiated. Risksapes include a scalar dimension of risk. More specifically, risksapes recognize the mutually constitutive relations between risk and space and can be understood as socially produced ‘temporalspatial’ phenomena. They are temporalspatial phenomena, because they combine the material and practice components of risk and relate them to space. They link the material dimension of physical threats, the discursive dimension of how people perceive and communicate risks, and the dimension of agency, i.e. how people are dealing with risk. We suggest that risksapes, like the nexuses of practice, are open and fluid, multiple and subjective. And they overlap, leading to the emergence of new combinations and dynamics of risk. Practice based studies which examine risksapes should therefore account for connections between risk, meaning, practice, time and space [8].

We propose that the conceptual merging of riskscapes and scale allows us to appreciate the consequentiality of risk in practice-based studies through its focus on the scalar negotiations of risk (Aalders 2018). Empirically, we draw on ongoing research which examines how mobile money may provide carbon payments to scale farmer networks. These farmers in developing countries are participating in climate action efforts globally through the development of reforestation networks. In so doing they are participating together with large corporations in the West to help address climate change as a quintessential crisis of our times. The case study examines how farmer networks through their reforestation projects are providing carbon offsets for organizations in the West who are aiming to achieve carbon neutrality.

In these carbon sequestration projects, mobile money is an important mechanism by which farmers can receive carbon payments for trees planted. Moreover, our study shows how mobile payments are also integral to the organizing of farmer network meetings, and are a critical enabler to scaling sustainable growth across farmer networks over time. While the use of mobile payments is important for facilitating the disbursement of financial resources to farmers in a timely manner it is not necessarily sufficient for responsible scaling. There are challenges and risks to scaling the reforestation program responsibly. For example, as a bottom up partnership guided by the local subsistence farmers, there is a need to assure a commitment to core values by keeping the farmers vision and needs central while reinforcing local leadership. Our ongoing study is also exploring the risks and challenges of ensuring timely payments which depend on effective quantification strategies and capabilities on the ground while depending on the volatile and unpredictability of carbon markets which are at an early stage of development.

In addition to these conceptual developments on riskscapes and scaling, we reflect on the practical challenges of conducting practice-based studies to examine the scaling of digital innovations. Specifically, we discuss the challenges of conducting practice-based studies to examine the rapid scaling of the digital innovation deployed in different places and over time, and in times of crisis characterized by evolving riskscapes.

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