Hans H. Ruthenberg-Graduierten-Förderpreis 2020/

Hans H. Ruthenberg Award for Graduates 2020

Roberto Villalba "The 'Uberization' of agricultural mechanization services: The case of EM3 Agri Services in Rajasthan, India", University of Hohenheim, 2019

Supervisor: Prof. Dr. Regina Birner

Summary

Mechanization plays a crucial role in agricultural development, however, access to it remains limited for many smallholder farmers from developing countries who cannot afford to buy machinery. In India, farm power has considerably increased in the last decades, transforming the national agricultural machinery market into one of the most dynamic around the world. Nonetheless, only 45 percent of the national agricultural activity is mechanized. The provision of tractor services remains largely unorganized and is mainly dominated by large farmers and government custom hiring centers with limited scale and reach. Hiring local private contractors is usually an alternative for accessing mechanization, but in many cases, tractor owners are reluctant to provide services to smallholders because working with them entails high transaction costs. Moreover, accessing mechanization services can be difficult during specific farming windows because of the high seasonality of farming. Considering these challenges and emulating the innovative nature of models from the Sharing Economy, such as Uber, several start-ups and some machinery manufacturers have developed new business models based on ICT tools that intend to facilitate the access of smallholder farmers to mechanization. Accordingly, this trend has been coined the 'uberization' of tractor services. Although receiving a lot of attention in the agricultural development arena, these models have not been rigorously studied and their potential is still to be proved.

Using the case of EM3 Agri Services, a pioneer Indian start-up that provides tractor services on a pay-per-use basis, the research aims to analyze how the 'uberization' models can increase the access of smallholder farmers to mechanization services. The findings identify the main features of the 'uberization' business models, their effect on transaction costs, and to which extent they can enhance access to mechanization services for smallholder farmers. For this, a mixed-method approach was used, in which quantitative data was collected through a survey of 101 households who' used mechanization services in two districts of Rajasthan, where EM3 users and non-users were canvassed. Qualitative data was collected through 26 interviews with key stakeholders and tractor owners, 2 net mapping exercises, and 2 focus group discussions. The household-level data were analyzed using the transaction costs theory, which allowed assessing the main attributes of the transactions by aligning them with the different contractual arrangements available for mechanization services in the study area, which included EM3 Agri Services, private contractors, farmer groups, and informal sharing.

Four main attributes of the mechanization services transactions were assessed: i) Asset specificity: the extent to which the machinery's operation is limited to certain crops or activities; ii) Uncertainty: the influence of timeliness and availability on the outcome of the transaction; iii) Frequency: the regularity of transactions between the farmers and the tractor owner; and iv) Group activities: whether farmers require group activities to access the machinery. The qualitative data allowed identifying and analyzing the key challenges of the 'uberization' models, which were assessed using the New Institutional Economics framework for governance challenges.

The fieldwork and analysis of the business model indicate that EM3 operates through a franchise-based and pay-per-use model which in one year has successfully established a network of 29 partly subsidized Custom Hiring Centers (CHC) across Rajasthan. Before establishing a CHC, EM3 usually evaluates the potential of the area and determines if the business model could generate a win-win situation for the farmer, the tractor owner, and the company. Based on the operation of these centers and the stakeholders involved in the provision of mechanization services, four key results emerged from the analysis.

First, the franchise-based and pay-per-use model has allowed to set up a more formal provision of machinery services in the region. Farmers can now hire the service through a call center or by stepping in one of the franchises centers and can select and book the machinery they need. Moreover, most of EM3's mechanization providers are local private contractors, input distributors, and micro-entrepreneurs who can now manage their own business and improve their livelihoods.

Second, despite the innovative model implemented by EM3, the potential impact of the digital platforms in increasing the access to mechanization services is still to be proved. In fact, although much attention has been given to EM3's business model in India because of its mobile-tool-based nature, the digital platform that is supposed to match the farmers with the mechanization providers is still not operating. Despite being inspired by the Uber idea and the potential of ICT tools, the 'uberization' of tractor services faces typical challenges of agricultural mechanization such as the spatial dispersion and small size of the farms. In addition, the limited access to mobile phones by the farmers, which in the study area reaches 27 percent among smallholder farmers, indicates a different scenario than the one faced by Uber in urban areas.

Third, the analysis of the transaction costs for EM3 reveals mixed results. The analysis shows that the scheme set up by EM3 offers its users a higher availability rate of machinery and shorter times in finding the provider as well as waiting for the service (reduced uncertainty). This suggests that farmers who hired EM3's services had a timelier service provision than those who hired other mechanization providers. Moreover, the analysis shows that transaction costs arising from group activities are lower among EM3's franchisees. This indicates that farmers who hired EM3 did not require to spend time pooling together with neighboring farmers to add up an area of land that would be attractive to the mechanization provider. However, when compared with the other contractual arrangements, EM3's users seem to face higher transaction costs arising from frequency. This limits the creation of trust ties between farmers and tractor owners and can be attributed to the developing stage of the company and its franchisees.

In addition, the analysis of the governance challenges shows that the model strongly relies on a 40 percent subsidy for new machinery provided by the state government, which incentivizes micro-entrepreneurs to participate in the business model under a binding contract to provide a

minimum amount of work hours per year. Although the government's support for the financing of new machinery plays a crucial role in increasing the farm power availability in the study areas, the study shows that it also plays a disruptive role for the dynamics of the ‘uberization’ of mechanization services and it remains uncertain whether the model would be financially sustainable without government support.

The study concludes that models such as the ‘uberization’ have high potential to reduce some of the problems that farmers face to access machinery, such as reducing the uncertainty in the transactions, easing the payment options, and matching the supply and demand more efficiently and in real-time. Nonetheless, they do not seem to offer a solution for some key market failures. In fact, aspects such as the digital gap faced by farmers in developing countries, the deficiency of advanced machinery, and the lack of training among the operators cannot be solved by the installment of digital platforms. Hence, based on the case of EM3 in India, the research demonstrates that while the ‘uberization’ of tractors is bringing a more structured and innovative provision of mechanization services, it should not be depicted as the panacea to the challenges that the access to mechanization services usually entails and that future initiative should not neglect the impact of analog and local-based solutions.

Reference:

Villalba, R. (2019). The 'Uberization' of agricultural mechanization services: The case of EM3 Agri Services in Rajasthan, India (Unpublished Master thesis). University of Hohenheim, Stuttgart, Germany.