Higher financial incentives for crowdsourced delivery workers can improve service

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Targeted financial incentives can increase the service capacity of crowdsourced delivery workers without incurring additional costs for retailers, according to new research co-written by Yuqian Xu, a professor of business administration at the Gies College of Business at Illinois. Credit: University of Illinois at Urbana-Champaign

A new paper co-written by a University of Illinois expert who studies operations management says higher financial incentives can boost a host of metrics for crowdsourced delivery workers who act as the final link in the supply chain between retailer and consumer.

Yuqian Xu, a professor of business administration at Illinois, studied the online-to-offline crowdsourced platform, also known as the "Uber model" for package fulfillment, and found that a simple targeted incentive mechanism can increase service capacity without incurring additional costs.

The researchers investigated the impact of financial incentives on workers' working decisions in the crowdsourced delivery setting and the new paradigm of labor in the "last mile" delivery service where the retailer pays a third-party to deliver goods to consumers. Examples include Uber Eats for food delivery, Amazon Flex for package delivery or Shipt for grocery delivery.

"This kind of service is the future of work, and the freedom and flexibility that these jobs afford people have attracted more workers to join this industry," Xu said. "It's where the global workforce is trending. So you want to have a way to optimize or maximize their performance, and the way to do it is through better financial incentives."

To investigate the issue, Xu and her co-authors analyzed a unique data set from one of the leading online-to-offline platforms in China that provides professional delivery service for over 50 million users.

The researchers found that higher financial incentives increase the work probability, work time, delivery distance and delivery frequency of goods for workers.

Slightly decreasing the earnings of workers who were in the top 1%, 3%

and 5% of earners and redistributing that money to underpaid workers increased the underpaid workers' service capacity by 14.27%, 24.28% and 31.57%, respectively, according to the researchers.

"Those high-paid workers are still paid at the top 1%, 3% and 5% range on those particular days, so they will still be motivated to work, but we decreased how much they were overpaid and reallocated those extra earnings to underpaid workers, who will work with a little extra financial incentive—and their service capacity responded accordingly.

"The ultimate takeaway message for platform managers is that, by understanding the impact of financial incentives on worker behaviors, a simple targeted monetary incentive mechanism can improve service capacity significantly."

In addition, the researchers documented that "income-targeting behavior" is not observed in the crowdsourced delivery setting when compared with the ride-hailing setting.

"If you're a ride-share driver, you may have a certain amount of money that you need to make each day, week or month, and then you don't work much beyond that target," she said. "Crowdsourced delivery workers aren't motivated in the same way. A ride-share driver can only fulfill one order at a time and is likely to have higher operating costs—a bigger vehicle that requires more fuel, for starters. A delivery worker can fulfill multiple orders on a single trip with a smaller vehicle, which makes their work and income incentives different from ride-share drivers."

For businesses, the paradigm shift in labor represents a new challenge because "now you have less control of your workers," Xu said.

"In a traditional business setting, management pays a lot of attention to the demand side—they try to understand consumer behavior and then offer different products and services to consumers, because consumer demand is always uncertain," she said. "And in order to reduce the demand uncertainty, we do a lot of analysis of what consumers want. But now, because of this sharp increase in crowdsourcing platforms, workers have the flexibility to choose when and how often they wish to work, which adds uncertainty to the supply side of the equation."

Businesses that rely on short-term gig workers have to be aware of their worker capacity each day or even each hour level, but also keep an eye on quality control, Xu said.

"That will also be a big issue in the future because, again, businesses will have less control of their workers—and they'll have less control of the quality of service or even the quality of the workers that they're dealing with," she said. "Because you have on-demand workers, designing a screening system and then a monitoring service for workers like Uber did for their drivers will become even more important."

But the one factor that can moderate that uncertainty is rewarding good workers.

"Our findings can help crowdsourced delivery platforms better design their incentive mechanisms going forward," Xu said.

More information: Xu, Yuqian and Lu, et al, The Impact of Financial Incentives on Crowdsourced Delivery (October 27, 2019). Manufacturing & Service Operations Management, Forthcoming. Available at SSRN: ssrn.com/abstract=3476164

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