

Analyzing employment trends through cell phone data

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Daniel Shoag, assistant professor. Credit: Kent Dayton

Policymakers now have another tool in their arsenal to help recognize and respond quickly to economic shocks. A new research study co-authored by Harvard Kennedy School Assistant Professor Daniel Shoag finds that call detail records (CDRs) from mobile phones can provide analysts with a fairly accurate understanding of localized or even regionalized employment and unemployment trends in close to real time. "Tracking employment shocks using mobile phone data" is published in the June 2015 issue of the *Journal of the Royal Society Interface*.

"Economic statistics are critical for decision-making by both government and private institutions. Despite their great importance, current measurements draw on limited sources of information, losing precision with potentially dire consequences," the authors write, citing erroneous

estimates of the contraction of the GDP in the fourth quarter of 2008 as an excellent case study. "The government statistics were wrong and may have hampered an effective intervention. As participation rates in unemployment surveys drop, serious questions have been raised as to the declining accuracy and increased bias in unemployment numbers."

Shoag and his co-authors examined three different sets of cell phone data – at the individual, community and provincial levels—in order to examine how the data matched job losses in [real time](#).

"We have demonstrated the ability of massive, passively collected data to identify salient features of economic shocks that can be scaled up to measure macroeconomic changes," the authors conclude. "These methods allow us to predict 'present' [unemployment rates](#) two-to-eight weeks prior to the release of traditional estimates and predict 'future' rates up to four months ahead of official reports more accurately than using historical data alone."

Shoag and his co-authors argue that "the ability to get this information weeks to months faster than traditional methods is extremely valuable to policy and decision-makers in public and private institutions...[and] just as important, the micro nature of these data allow for the development of new empirical approaches to study the effect of economic shocks on interrelated individuals."

More information: "Tracking employment shocks using mobile phone data." [DOI: 10.1098/rsif.2015.0185](https://doi.org/10.1098/rsif.2015.0185)

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