

## Faculty Profile: Bulat Gafarov



Bulat Gafarov  
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Bulat Gafarov is an assistant professor with an appointment in the Department of Agricultural and Resource Economics at UC Davis. Bulat received his Ph.D. in economics from the Pennsylvania State University in August 2017.

Bulat's recent research in econometric theory has focused on developing new methods for inference in economic models with identification failure. His dissertation was focused on improving the computational and statistical properties of confidence sets for dynamic effects of structural shocks using time series data and for linear regression models with interval-valued data.

In related work, Bulat and co-authors Matthias Meier (University of Mannheim) and José Luis Montiel Olea (Columbia University) have developed a new statistical method to

quantify uncertainty in the response of a given time series (such as gross domestic product) to an unexpected disruption (such as an intervention by the Federal Reserve in the long-term treasury bond market).

The method makes it possible to quantify both uncertainties coming from the limited number of statistical observations and our ignorance about the specific instant reaction (or lack of it) of the time series to the shock. The method only assumes a direction, positive or negative, of this reaction. They use their results to assess the effects of the announcement of the Quantitative Easing program in August 2010. This research paper was published in *Journal of Econometrics*.

In current work, Bulat develops confidence sets for coefficients in a linear regression model with interval-measured outcome variable. Datasets of this kind are frequently encountered in income surveys and used, for example, to estimate effects of schooling on income. Interval measurements would typically result in interval estimates of the regression coefficients, which requires special statistical inference procedures.

It is challenging for the existing robust methods to tackle existing big datasets with a large number of control variables. Bulat proposes a new method to construct confidence sets for the effect of a regressor that is based on application of convex programming techniques. This technique enables a much bigger number of control variables to be included in the regression model.

Bulat grew up in Bashkortostan, one of the major oil-producing regions in Russia. Naturally, he was interested in natural resource markets, because

it affected life around him. He is excited to start new projects with his colleagues at UC Davis and apply his technical skills to answer challenging questions in resource economics.

Bulat is currently studying an unintended impact of environmental regulations on the market power of gasoline refineries that can potentially explain the price differential between California and the rest of the US. From 2000 until the Torrance refinery fire in early 2015, the differential went up and down, but on average there was no premium above what you would expect from tax differences and those other costs. According to some expert estimates, the extra payments since the Torrance refinery fire have cost California drivers about \$15 billion.

In addition to research, Bulat enjoys swimming, biking, and playing with his children.