

Open PhD position for CSC scholarship candidates 2014

<u>Department/Institute:</u>	School of Business and Economics / Institute of Statistics and Econometrics
<u>Subject area:</u>	Statistics
<u>Name of Supervisor:</u>	Prof. Dr. Timo Schmid
<u>Number of open positions:</u>	1
<u>Project title:</u>	Imputation methods for missing data in the context of small area estimation

Project description:

The challenging problem, for example in the case of educational or business data, lies on the one hand in missing values and on the other hand in small sample sizes. Because of this, the methods in use need to combine multiple imputation as well as small area methods. The multiple imputation methods are based on a Bayesian approach whereas small area methods, especially the empirical best linear unbiased predictor (EBLUP), follow a Frequentist mindset. In a first step, these methods can be investigated in simulation studies using R (cf. <http://www.r-project.org>). Thereby special attention will be drawn to the interaction of small area and multiple imputation methods and how these techniques need to be combined. Up to date, there are no relevant results in the scientific community concerning this issue. Relevant research questions are:

- Which effect does the Bayesian multiple imputation method have on the Frequentist small area method?
- And how does the Bayesian multiple imputation method act on the Bayesian small area method (hierarchical or empirical Bayes methods)?

On the basis of the gained simulation results new estimation methods will be derived which combine multiple imputation and small area estimation. Afterwards, the proposed estimators can be investigated in extensive model-based simulations. This will allow the investigation of different possibilities to apply small area estimation strategies even in the case of small sample sizes within the panel.

Language requirements:

Information for candidates in which languages a doctoral thesis can be written. If English is possible, please also indicate if in addition German language proficiency is required and at which level.

Doctoral thesis can be written in English or German. Candidate should have an excellent level of English as demonstrated by internationally accepted standards (i.e. TOEFL or Cambridge). German is not required but candidate should be willing to acquire working knowledge of German during course of study

Academic requirements:

Please specify which subject areas are suitable and if a Bachelor's degree is sufficient for a full time doctorate.

The most important formal qualification for being able to do a PhD/doctorate here is a very good higher education degree in **Economics, Statistics or Mathematics** (Economics as minor subject) that is recognized in Germany. Generally, that is a degree equivalent to a **German Master** completed after eight semesters of study. A Bachelor's degree is not sufficient for a full time doctorate. Some knowledge in survey statistics and a computer language like R are helpful. All research projects must meet the highest standards on issues of research ethics and plagiarism.

Further information:

Information on the professor:

I have a Master's degree in mathematics with economics as minor subject. Afterwards I finished my PhD (Supervisors: Prof. Dr. Ralf Münnich (Trier, Germany) and Prof. Dr. Ray Chambers (Wollongong, Australia)) in statistics in 2012 and changed to the Freie Universität Berlin. My research fields are small area estimation, robust methods, spatial statistics and imputation of missing data. My team consists of 3 PhD students and me. We are all working in the field of small area estimation, so there is a good basis for collaborations and discussions. We will be happy if a PhD-student from China will join us.

Further information are available at

<http://www.wiwiss.fu-berlin.de/institute/iso/Schmid/Team/index.html>

Path to a PhD:

The traditional individual path to a PhD/doctorate remains the most common here. A professor supervises a PhD/doctoral student who works on his subject in consultation with the professor, but largely independently. This form of PhD/doctoral study offers a great deal of flexibility, but demands a high degree of personal initiative and responsibility. How long a traditional individual doctorate takes depends on your own time schedule and the duration of your work contract. Three to four years are normal. Depending on the subject area of your thesis, your research can be conducted alone or together with other researchers.

Next steps:

Please submit your complete application at first to the Beijing Office for evaluation before you get in contact with me.