**PhD studentship (Full-time)**

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| Institution | Xi’an Jiaotong-Liverpool University, China |
| School | School of Mathematics and Physics |
| Supervisors | Principal supervisor: Professor/Dr Jiajun Liu (XJTLU)  Co-supervisor: Professor/Dr Linglong Yuan (UoL)  External supervisor: Professor/Dr Yang Yang (Nanjing Audit University) |
| Application Deadline | Open until the position is filled |
| Funding Availability | Funded PhD project (world-wide students) |
| Project Title | **Interplay of Heavy-tailedness and Tail dependence in extreme systemic risks: from static to dynamic evaluation** |
| Contact | Please email Jiajun.Liu@xjtlu.edu.cn (XJTLU principal supervisor’s email address) with a subject line of the PhD project title.  The principal supervisor’s profile is linked here:  https://www.xjtlu.edu.cn/zh/study/departments/academic-departments/department-of-financial-and-actuarial-mathematics/department-staff/academic-staff/staff/jiajun-liu |

**Requirements:**

The candidate should have a first-class or upper second-class honours degree, or a master’s degree (or equivalent qualification), in Mathematics, Probability and Statistics, Applied Mathematics, Actuarial Science, Financial Mathematics or other related majors.

Evidence of good spoken and written English is essential. The candidate should have an IELTS score of 6.5 or above, if the first language is not English. This position is open to all qualified candidates irrespective of nationality.

**Degree:**

The student will be awarded a PhD degree from the University of Liverpool (UK) upon successful completion of the program.

**Funding:**

The PhD studentship is available for three years subject to satisfactory progress by the student. The award covers tuition fees for three years (currently equivalent to RMB 80,000 per annum). It also provides up to RMB 16,500 to allow participation at international conferences during the period of the award. The scholarship holder is expected to carry out the major part of his or her research at XJTLU in Suzhou, China. However, he or she is eligible for a research study visit to the University of Liverpool up to six months, if this is required by the project.

**Project Description:**

Although the integration of global markets leads to increasing economic efficiency and growth, extreme risk or crisis can spread from one market to another in a very short period of time. The global financial crisis in 2007-2009 revealed the great extent that systemic risk may imperil the stability of one insurance/financial system as a result of distress on any other system. Therefore, measuring systemic risk is an inevitable task for risk managers and regulators.

The concept of [systemic risk](https://www.sciencedirect.com/topics/mathematics/systemic-risk) was established and developed in banking and finance in the mid-1990s, and since the global financial crisis of 2007–2008 it has become an important research topic, but mainly in banking and finance. Various measures of systemic risk have been proposed in the literature, to name a few, the Marginal Expected Shortfall (MES), the Systemic Expected Shortfall (SES) of Acharya et al. (2017), the Systemic Risk Measure (SRISK) of Brownless and Engle (2017), the CoVaR of Adrian and Brunnermeier (2016) and the joint Marginal Expected Shortfall (JES) of Ji et al. (2021). Nevertheless, what makes the study of systemic risk too difficult to reach a settlement has already been mentioned above, including the global extent of the crisis, the extreme size of the losses, and the complicated interdependence structure of insurance/financial institutions. Recently, Asimit and Li (2018) and Liu and Yang (2021) developed an asymptotic study of systemic risk measures. Precisely, they consider various conditional risk measures, each of which has an interpretation in terms of systemic risk, and they derive asymptotic estimates for them in extreme regions, where extreme value theory plays a crucial role. Their results show that these systemic risk measures are sensitive to the tail dependence of the underlying risks. In this project, we will propose a flexible systemic risk measure to tailor a pair of risks with extensive dependence structures in both statical and dynamic systemic risk models. The interplay of extremes and tail dependence structures is proposed to be illustrated by asymptotic analysis, intensive numerical studies and an empirical study with the financial market data.

For more information about doctoral scholarship and PhD programme at Xi’an Jiaotong-Liverpool University (XJTLU), please visit

<https://www.xjtlu.edu.cn/en/admissions/global/entry-requirements/>

<https://www.xjtlu.edu.cn/en/admissions/global/fees-and-scholarship>

**How to Apply:**

Interested applicants are advised to email Jiajun.Liu@xjtlu.edu.cn (XJTLU principal supervisor’s email address) the following documents for initial review and assessment (please put the project title in the subject line).

* CV
* Two formal reference letters
* Personal statement outlining your interest in the position
* Certificates of English language qualifications (IELTS or equivalent)
* Full academic transcripts in both Chinese and English (for international students, only the English version is required)
* Verified certificates of education qualifications in both Chinese and English (for international students, only the English version is required)
* PDF copy of Master Degree dissertation (or an equivalent writing sample) and examiners reports available