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**DOCTORAL STUDIES** Massachusetts Institute of Technology (MIT)  
 PhD, Economics, Expected completion June 2022  
 DISSERTATION: Essays in Econometrics: Controlling for Unobserved Heterogeneity

## DISSERTATION COMMITTEE AND REFERENCES

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**PRIOR EDUCATION** University of New South Wales (UNSW) 2012  
 Bachelor of Economics (Honours) and Finance

**CITIZENSHIP** Australia, United Kingdom **GENDER** Male

**FIELDS** Econometrics

**TEACHING EXPERIENCE** 14.380 Statistical Methods in Econometrics (graduate) 2018, 2019  
 Teaching Assistant to Professor Anna Mikusheva  
 14.381 Applied Econometrics (graduate) 2019

	Teaching Assistant to Professor Josh Angrist	
	14.382 Econometrics (graduate)	2018, 2019
	Teaching Assistant to Professor Whitney Newey	
	14.385 Nonlinear Econometrics (graduate)	2018
	Teaching Assistant to Professor Alberto Abadie	
<b>RELEVANT POSITIONS</b>	Reserve Bank of Australia, Financial Systems Group, Senior Analyst	2012-2016
	Research Assistant to Professor Whitney Newey	2018-2019
	Research Assistant to Professor Anna Mikusheva	2018
<b>FELLOWSHIPS, HONORS, AND AWARDS</b>	MIT Department of Economics Jerry A. Hausman Graduate Dissertation Fellowship	2020
	Graduate TA of the Year	2019
	University Medal, Economics Honours, UNSW	2012
	Scientia Scholarship, UNSW	2008
<b>PROFESSIONAL ACTIVITIES</b>	Referee, Journal of Applied Econometrics	
<b>PUBLICATIONS</b>	<p><b>The Role of Collateral in Borrowing, <i>Reserve Bank of Australia RDP</i> (2021).</b> (with Nicholas Garvin and José-Luis Peydró)</p> <p>We study the role of collateral in credit markets under stress. Australian interbank markets at the time of the Lehman Brothers failure present a unique platform for identification, because the collateral is liquid and homogenous across borrowers (unlike in retail credit markets), the shock is large and exogenous (unlike in countries with bank failures), and there is comprehensive administrative collateralized and uncollateralized loan-level data. After the exogenous shock, uncollateralized borrowing declines for ex ante riskier borrowers while collateralized borrowing increases for borrowers ex ante holding more high-quality collateral. Moreover, riskier banks with sufficient high-quality collateral substitute from uncollateralized to collateralized borrowing. In aggregate, collateralized borrowing expands substantially, predominantly collateralized against second-best (but still high quality) collateral, while interest rates on loans against first-best collateral fall substantially, indicating scarcity of the most liquid safe assets. This liquid asset demand encourages collateralized lending, contrary to cash hoarding.</p>	
<b>RESEARCH PAPERS</b>	<p><b>Estimating Nonlinear Models on Network Data with Unobserved Heterogeneity (Job Market Paper)</b></p> <p>This paper considers estimation of a directed network model in which outcomes</p>	

are driven by dyad-specific variables (such as measures of homophily) as well as unobserved node-specific parameters that capture degree heterogeneity. I develop a jackknife bias correction to deal with the incidental parameters problem that arises in fixed estimation of the model. The jackknife approach is easily adaptable to different models, including binary and non-binary outcome variables, and allows estimation of average effects. I also show how it can be used to bias-correct fixed effect averages over functions that depend on multiple nodes, e.g. triads or tetrads in the network; as an example, I implement specification tests for strategic interactions across dyads, such as reciprocity or transitivity. In an application, I estimate a gravity model for import/export relationships across countries.

### **The Higher-order Efficiency of Jackknife Bias Corrections in Panel Models** (with Jinyong Hahn)

We derive higher-order variance expressions for both the full-sample jackknife of Hahn and Newey (2004) and the split-sample jackknife of Dhaene and Jochmans (2015) in a static panel data model. The split-sample jackknife is shown to have larger higher-order variance. This difference in higher-order variances can be important in practice, particularly in settings where the time-series dimension  $T$  is not large. In addition, the remaining bias (after bias correction) is larger for the split-sample estimator.

## **RESEARCH IN PROGRESS**

### **Estimating Linear IV Models with Many Endogenous Regressors**

Empirical researchers may wish to estimate models in which a number of variables are potentially endogenous. For example, many endogenous regressors naturally arise when endogenous treatment variables are interacted with covariates to capture heterogeneity in treatment effects. This paper extends existing results on linear IV estimation by considering asymptotics under which the number of endogenous regressors is allowed to grow with the sample size. I derive consistency and asymptotic normality results for the jackknife IV (JIVE) estimator of Angrist et al. (1999), as well as the heteroskedasticity robust k-class style estimators (including the HLIM and HFUL) of Hausman et al. (2009). In simulations, the HFUL estimator is shown to outperform others in models with both many endogenous regressors and many instruments.