

## HKUST ECON Seminar

13 March, 2026, 3:00 – 4:30 pm

### **Heterogeneous Treatment Effects via Linear Dynamic Panel Data Models**

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#### **Abstract:**

We study the identification of heterogeneous, intertemporal treatment effects (TE) when potential outcomes depend on past treatments. First, applying a dynamic panel data model to observed outcomes, we show that an instrumental variable (IV) version of the estimand in Arellano and Bond (1991) recovers a non-convex (negatively weighted) aggregate of TE plus non-vanishing trends. We then provide conditions on sequential exchangeability (SE) of treatment and on TE heterogeneity that reduce such an IV estimand to a convex (positively weighted) aggregate of TE. Second, even when SE is generically violated, such estimands identify causal parameters when potential outcomes are generated by dynamic panel data models with some homogeneity or mild selection assumptions. Finally, we motivate SE and compare it with parallel trends (PT) in various settings with experimental data (when treatments are sequentially randomized) and observational data (when treatments are dynamic, rational choices under learning).