

# Megacities as Complex Adaptive Systems of Systems (CASoS)

## Megacities:

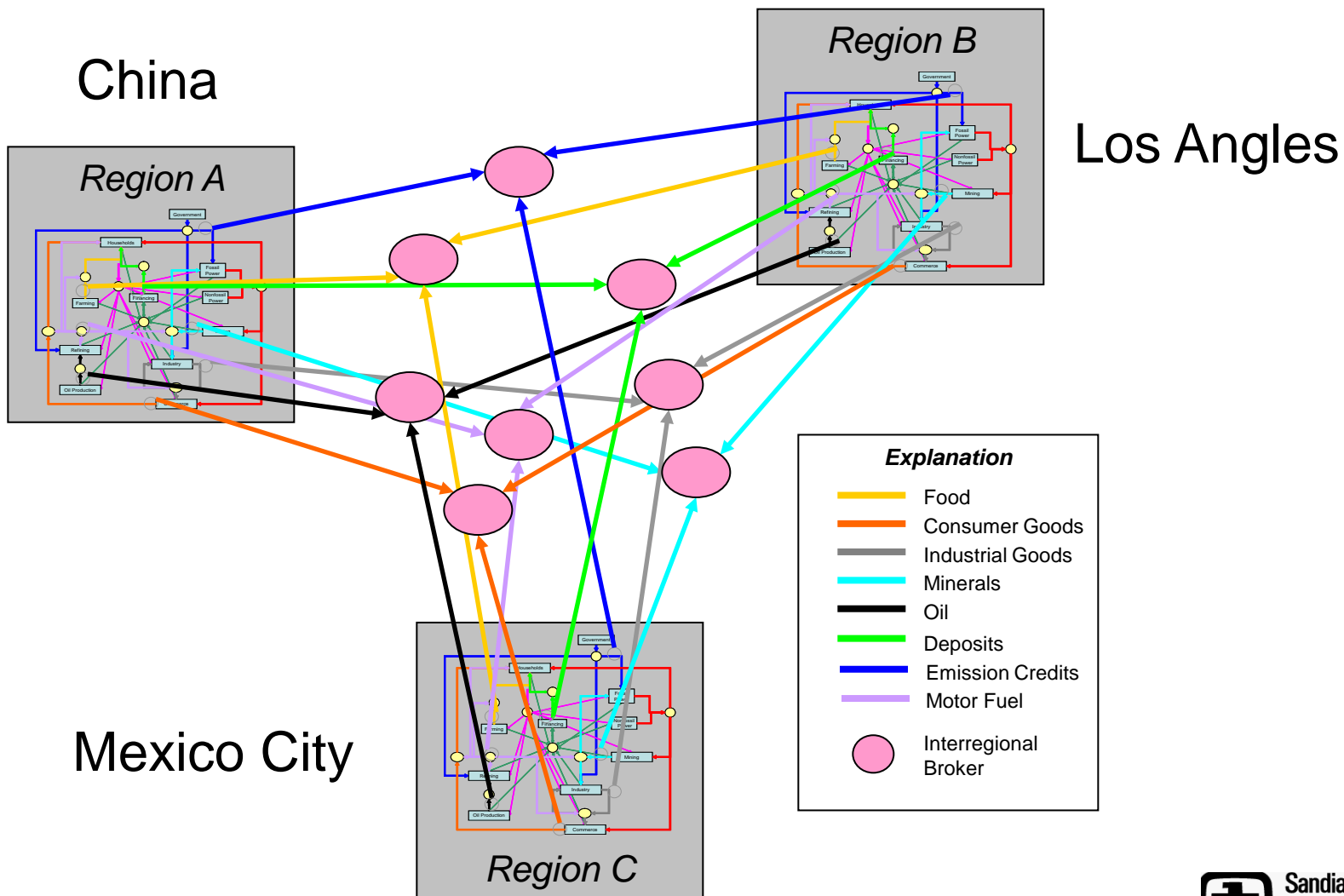
- Are **Complex**: composed of many parts whose interaction via local rules yields **emergent structure (networks) and behavior (cascades)** at larger scales
- **Grow and adapt** in response to local-to-global **policy**
- **Contain people** and are designed to meet their evolving needs
- Are interdependent “**systems of systems**”



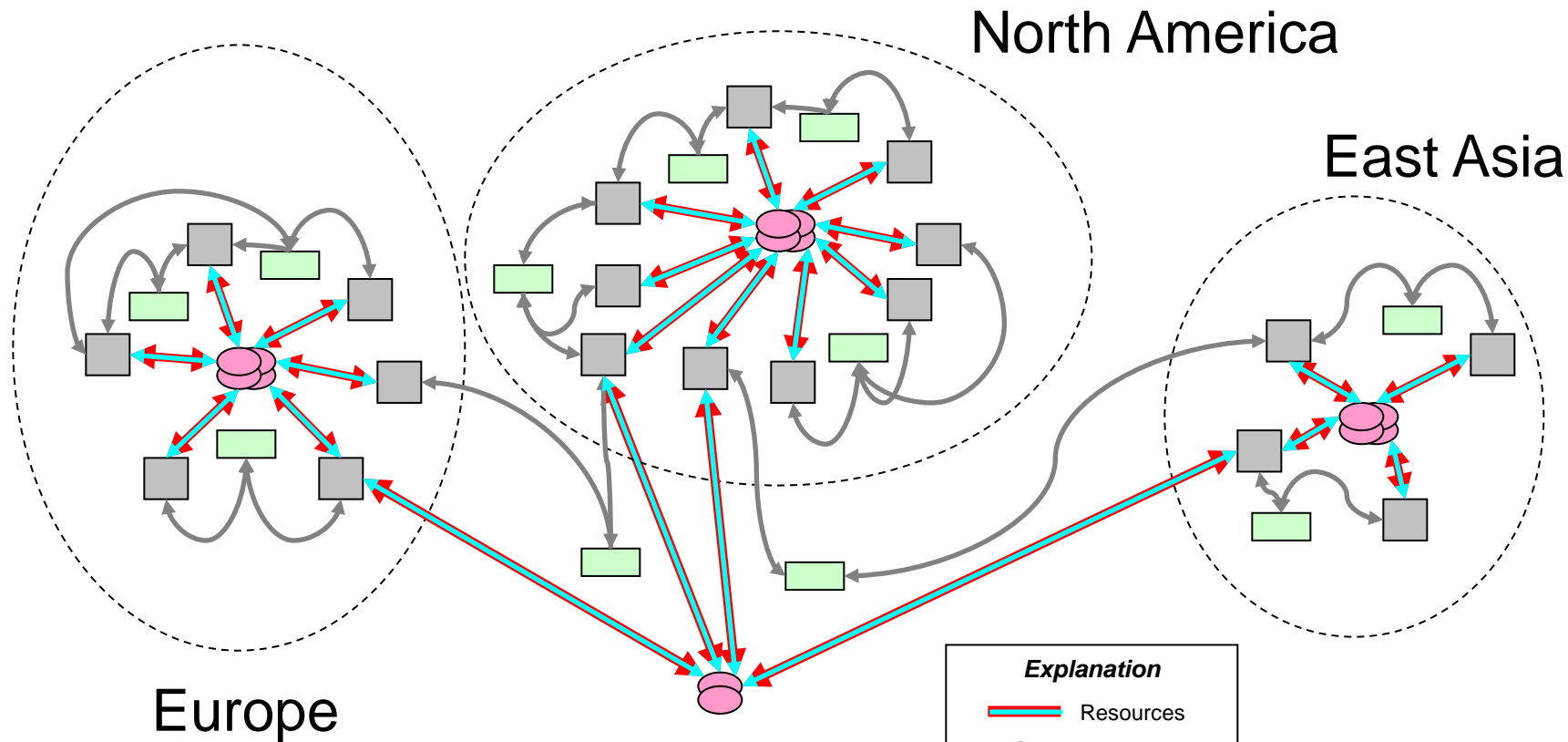
Megacities are -

**Complex Adaptive  
Systems of Systems:  
CASoS**

# Megacities form hubs within regions, these hubs connect to form a Global network: a SYSTEM OF SYSTEMS of SYSTEMS

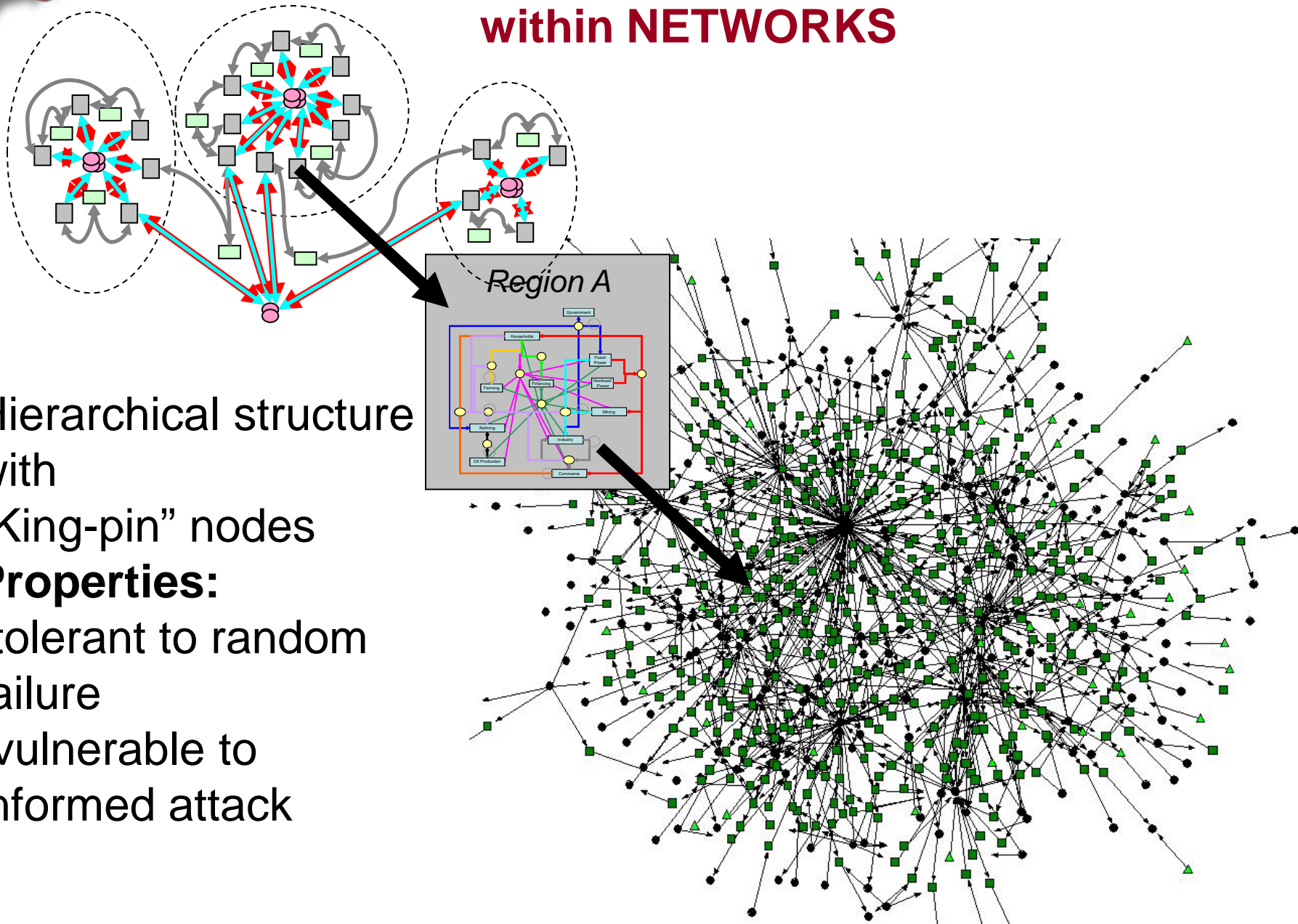


# ... That form a Global Ecology of Interdependency



Explanation	
	Resources
	Information/Control
	Multiregional Entities
	Interregional Broker

# At all scales, NETWORKS within NETWORKS within NETWORKS



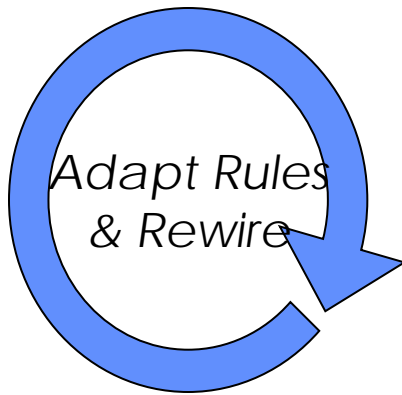
Hierarchical structure with

“King-pin” nodes

## Properties:

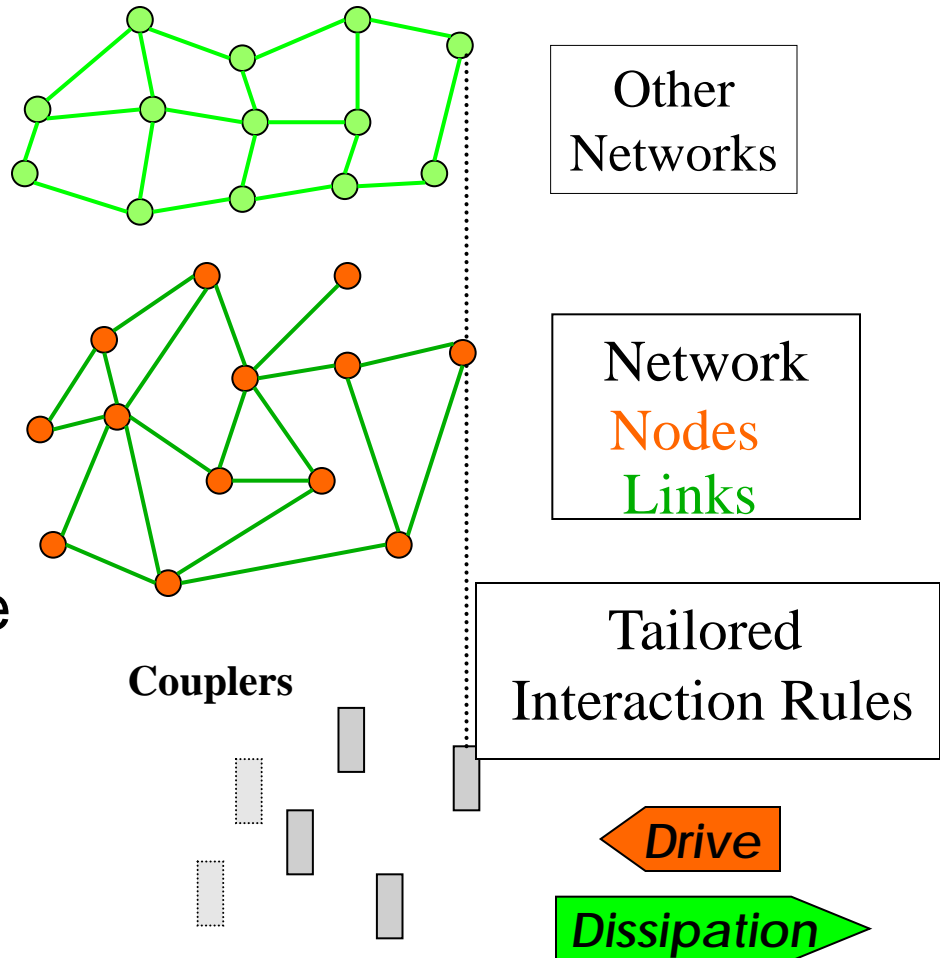
- tolerant to random failure
- vulnerable to informed attack

# A Conceptual Lens for Modeling/Thinking



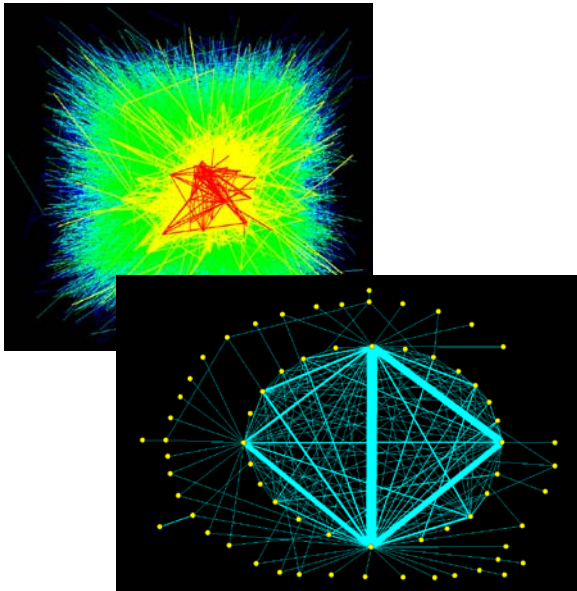
Use to:

- Understand interdependencies
- Predict and Mitigate disruptions
- Design enabling technologies
- Design policy to Guide Evolution of Megacities

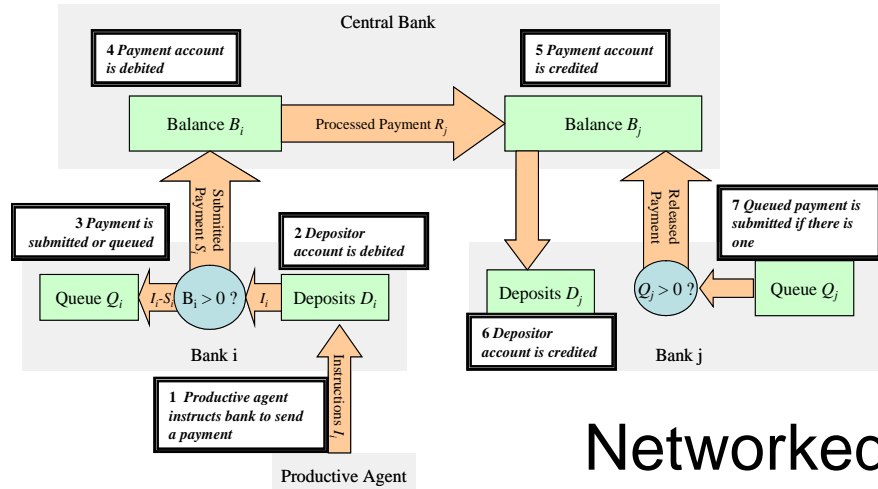




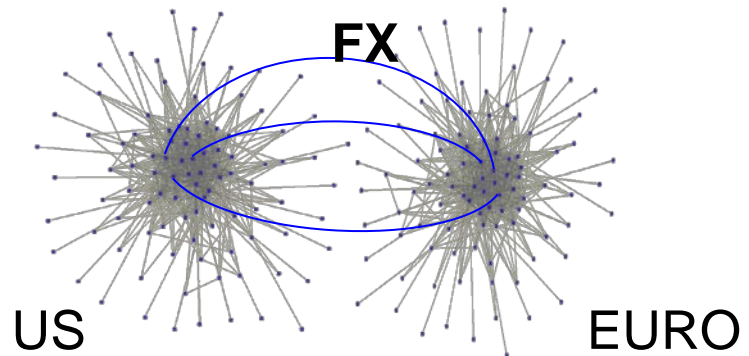
# Example Application: Interdependent Payment Systems



Payment system topology



Networked ABM



Global interdependencies