Towards a Theory of Co-evolutive Networked Territorial Systems: Insights from Transportation Governance Modeling in Pearl River Delta, China

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medium
New pathways for sustainable urban development in China's medium-sized cities

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Complex Urban Systems

Source : Wikipedia

Complex Systems Approaches in Science

→ Failure of reductionism already highlighted by Anderson in 1972 [Anderson, 1972]

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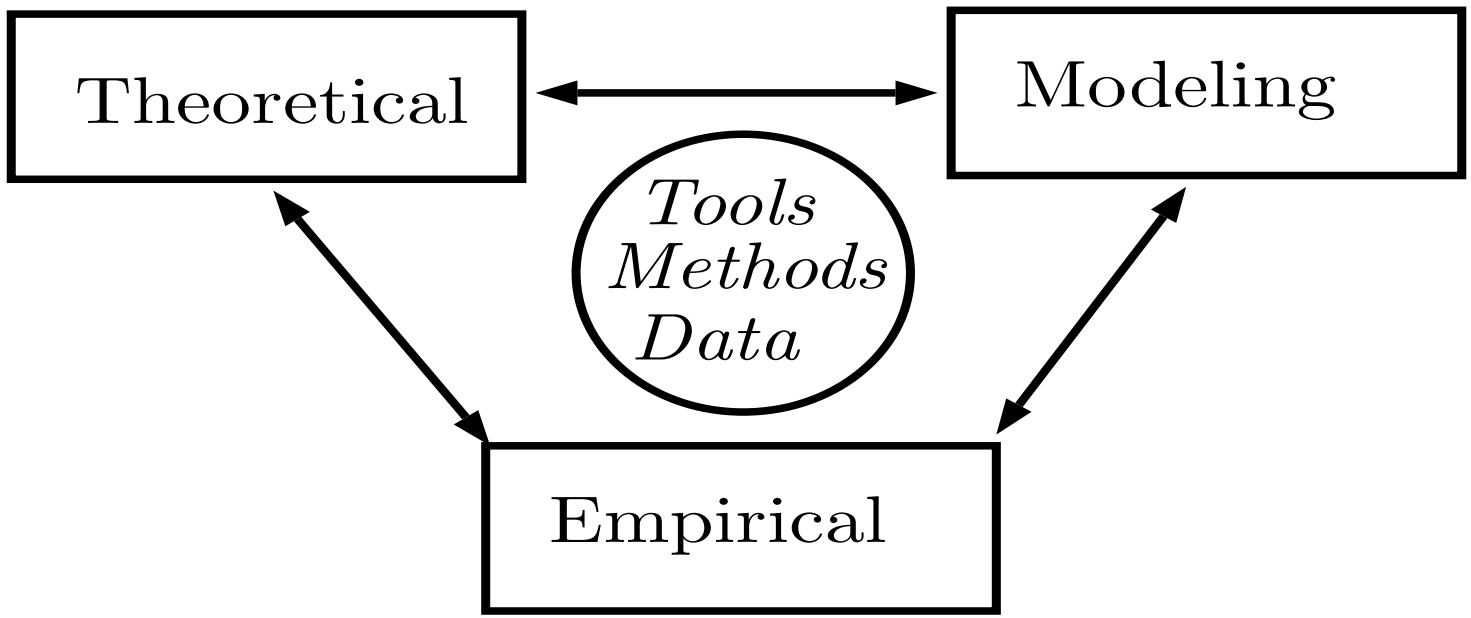
Theoretical and Quantitative Geography

Extended framework for TQG [Livet et al., 2010]



Meso-scale Coupled Growth

Meso-scale Urban Growth

Coupled Growth and Correlations

Macro-scale Growth and Network Necessity

Theory : Pillars

1. *Networked Human Territories* $\rightarrow$ Raffestin approach to territory combined with Dupuy theory of networks.
2. *Evolutive Urban Theory* $\rightarrow$ City Systems as complex Adaptive systems, applied to human settlements in general and thus territorial systems.
3. *Urban Morphogenesis* $\rightarrow$ Morphogenesis as autonomous rules to explain growth of urban form. Used as the provider of modular decompositions.
4. *Boundaries and Co-evolution* $\rightarrow$ Co-evolution as the existence of *niche*, consequence of boundary patterns.

Theory : Specification

- Previous def. of territorial systems
- Modular decomposition and stationarity : existence of scales
- Feedback loops between and inside scales yield weak emergence, thus complexity
- Morphogenesis gives modular decomposition and co-evolution
- **Main assumption.** Necessity of Networks : networks are necessary component of co-evolutive niches.

Conclusion

- All code and data available at
`https://github.com/JusteRaimbault/CityNetwork/tree/master/Models/Governance`

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References I


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