

# Innovation Networks Analysis

An ecological point of view over social phenomena

# Outline

- Data Science (Math, Statistics)
- Network Theory
- Ecology (polinizator-plant bipartite networks)
- Economics

# Motivation

- Complex network relationships between VC-VC and accelerators-VC (co-investment)
- Limited application of network theory to VC-VC and VC-accelerator relationships

# Macro RQ

- How do network structures emerge between venture capitalists and accelerators, and what patterns govern their investment relationships?

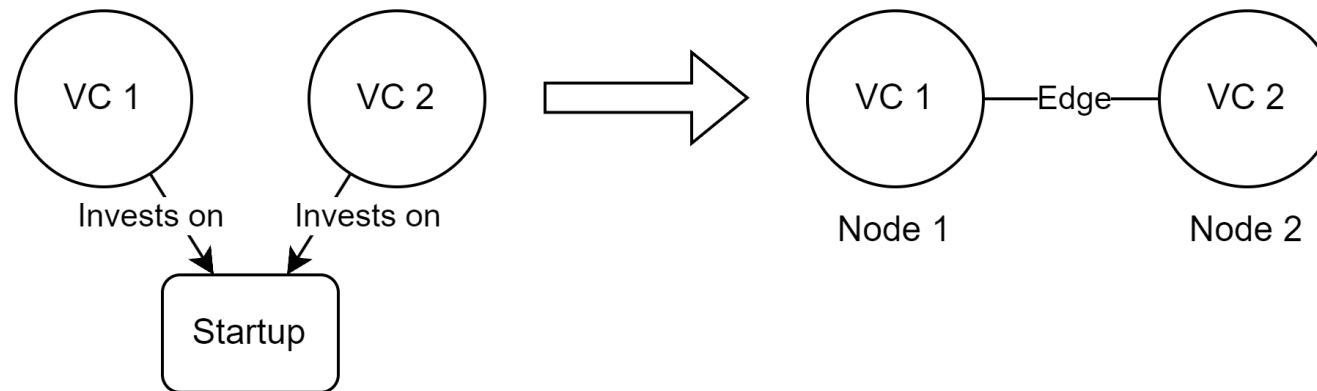
# Relevant Topics

- Data Science (Math, Statistics)
- Network Theory
- Ecology (polinizer-plant bipartite networks)
- Economics

# Methodology

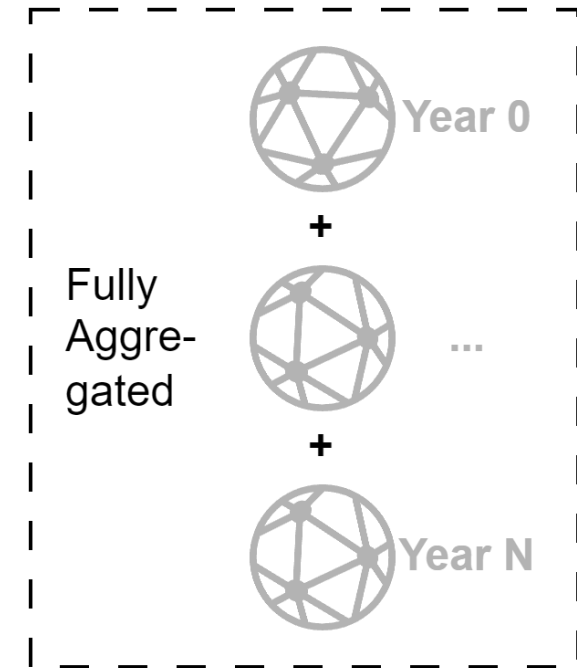
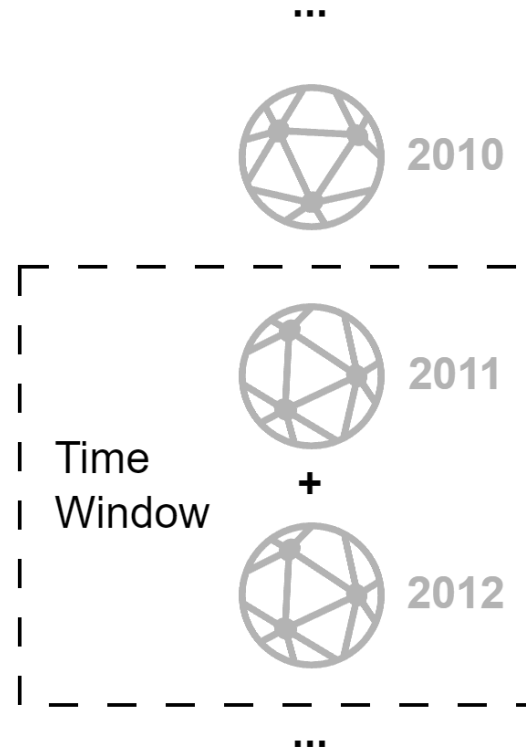
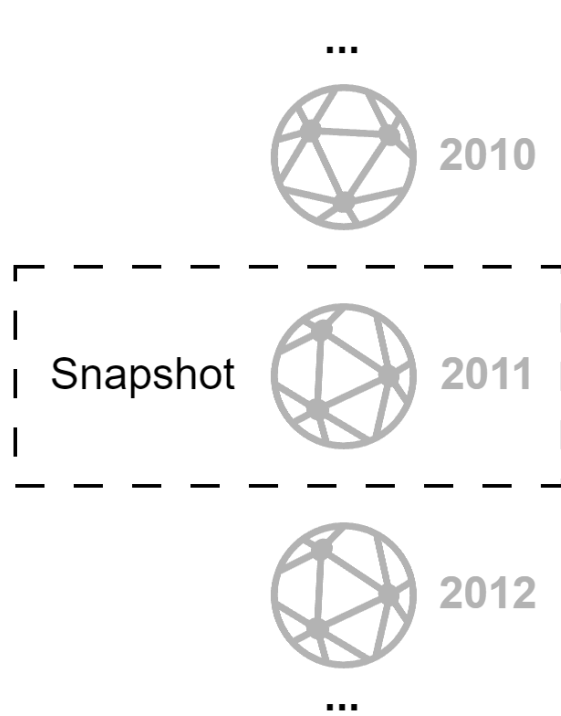
- Get data from Crunchbase
- Clean data (Matthijs and Theo methods)
- Build network (Acc-VC and VC-VC) and get metrics
- Analyze results through economics and ecology lenses

Number of edges  
Number of nodes  
Connectance / density  
Modularity / components  
Nestedness (bipartite case)



# Metodology

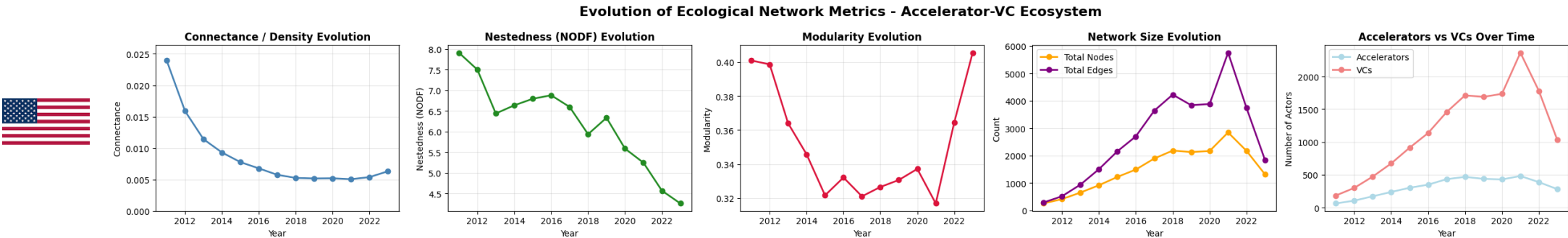
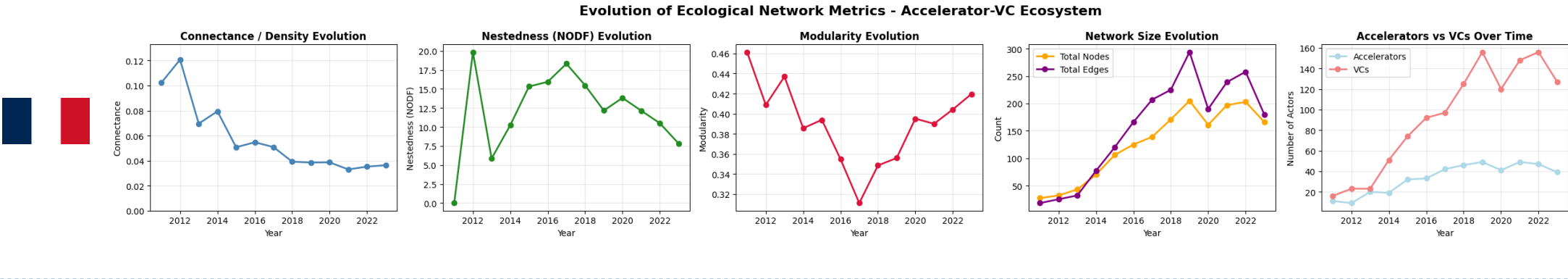
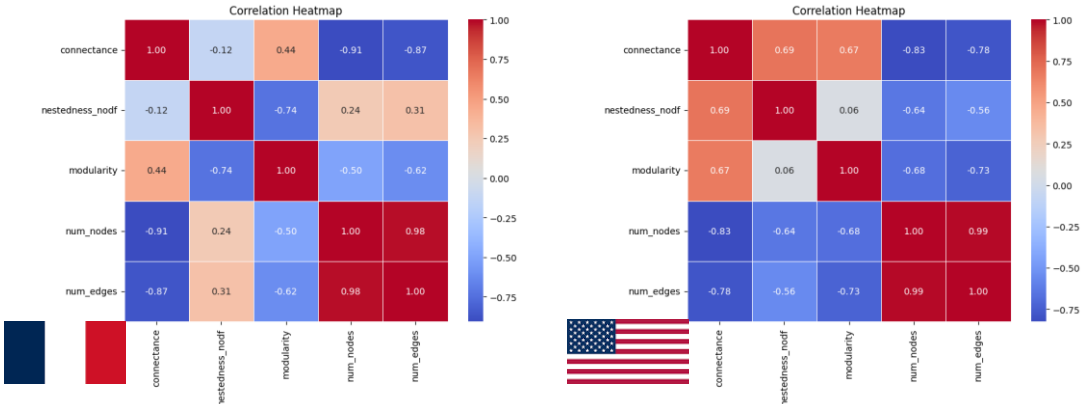
➤ 3 distinct approaches...



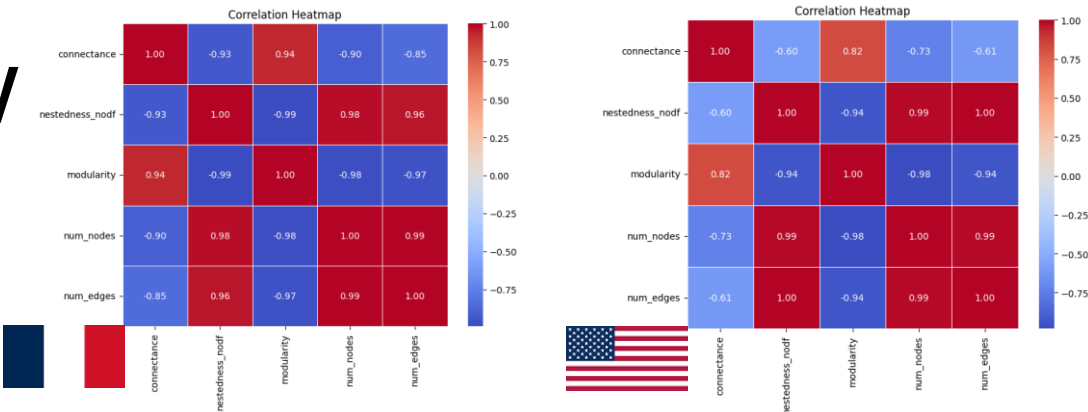
# Results – ACC-VC Network



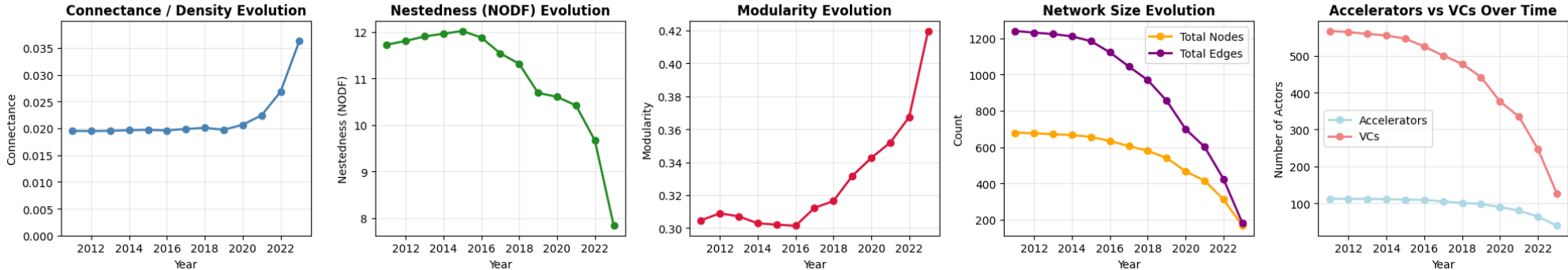
# ACC-VC - Snapshots



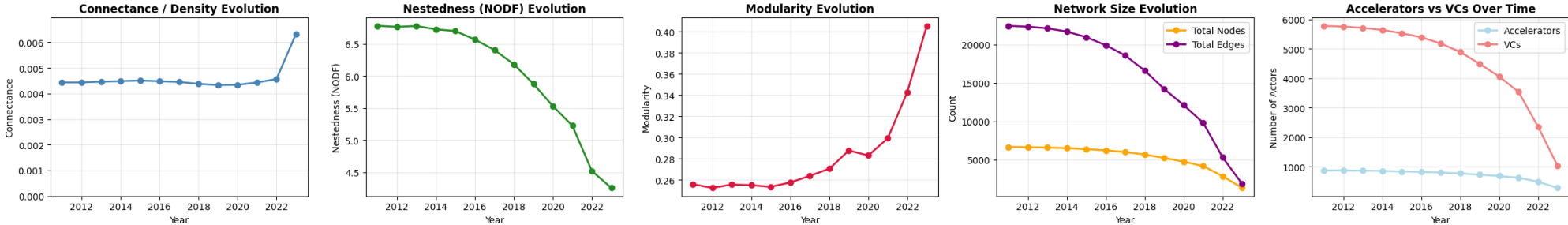
# ACC-VC – Time Window (5 years)



Evolution of Ecological Network Metrics - Accelerator-VC Ecosystem



Evolution of Ecological Network Metrics - Accelerator-VC Ecosystem



# ACC-VC – Fully Aggregated



Nodes: **744** (117 acc + 627 VCs)  
Edges: **1352**  
Density: **0.018**  
Components: **12**

Connectance: **0.018**  
Nestedness (NODF): **11.0**  
Modularity: **0.302**



Nodes: **6936** (889 acc + 6047 VCs)  
Edges: **23295**  
Density: **0.004**  
Components: **35**

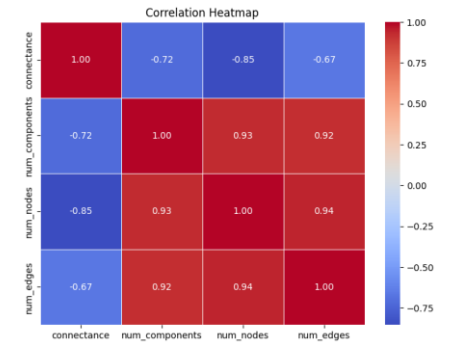
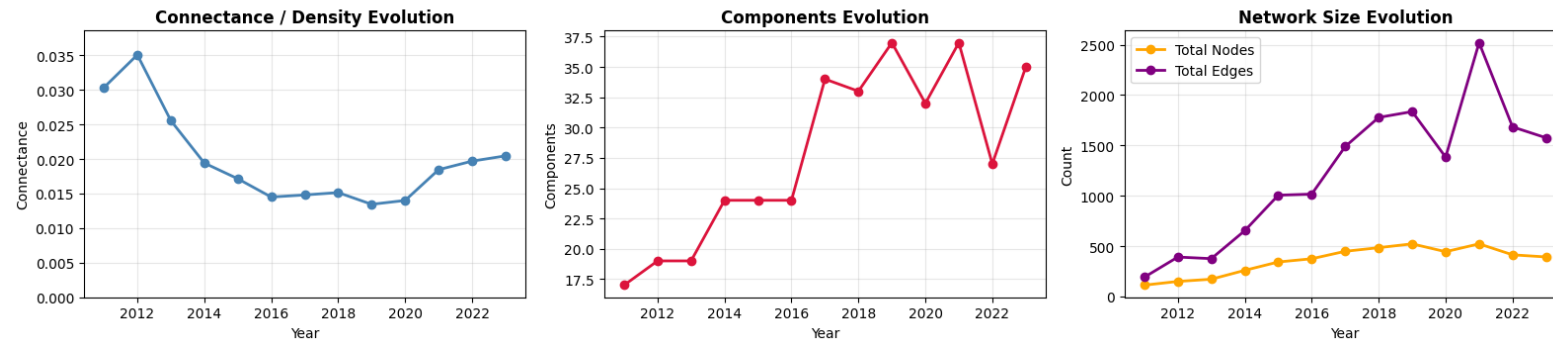
Connectance: **0.004**  
Nestedness (NODF): **6.6**  
Modularity: **0.246**

# Results – VC-VC Network

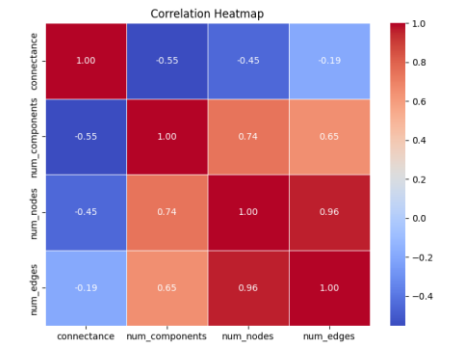
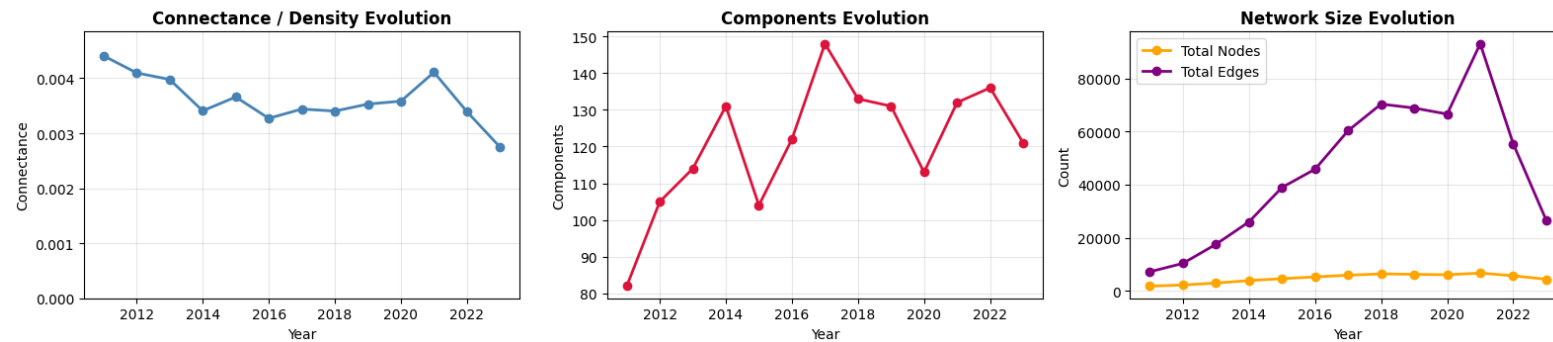
# VC-VC - Snapshots



Evolution of Ecological Network Metrics - Accelerator-VC Ecosystem

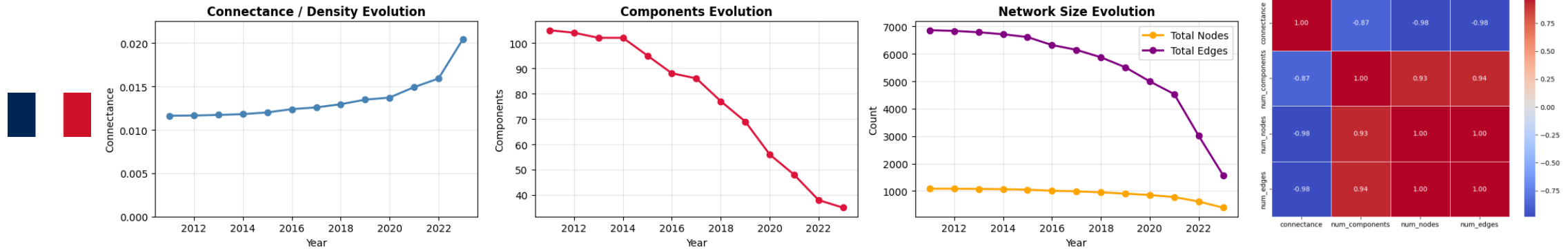


Evolution of Ecological Network Metrics - Accelerator-VC Ecosystem

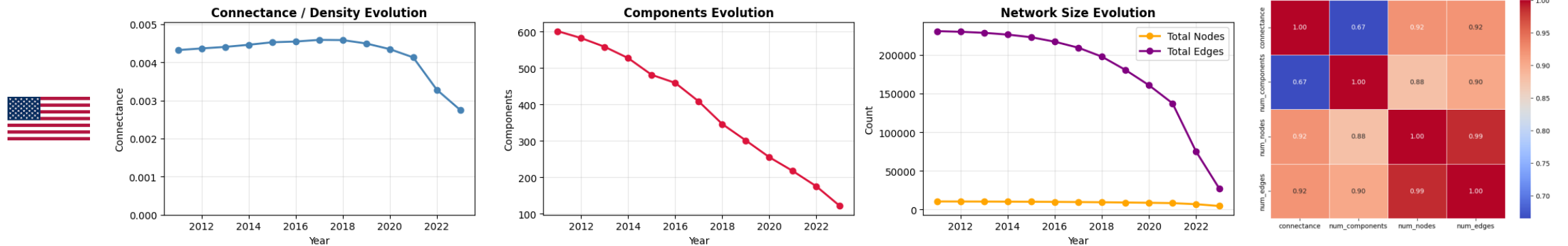


# VC-VC – Time Window (5 years)

Evolution of Ecological Network Metrics - Accelerator-VC Ecosystem



Evolution of Ecological Network Metrics - Accelerator-VC Ecosystem



# VC-VC – Fully Aggregated



Unique VCs: **1,180**  
Partnership edges: **7,360**  
Connected components: **125**  
Density: **0.0105**



Unique VCs: **11,095**  
Partnership edges: **238,737**  
Connected components: **750**  
Density: **0.0038**