

Three Pillars of Economic Development

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Agenda

1. Introduction
2. Paper
3. Questions

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1. **Introduction**
2. Paper
3. Questions

Introduction

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Introduction

Academic interests:

1. Local, regional economic development
2. Labour markets
3. Well-being and economic policy

Professional focus:

1. Workforce development
2. Labour markets
3. Forecasting

Thesis project:

How can we represent economic development such that:

- *Practitioners' core insight is visible: everything must connect for development to work*
- *We can predict when/how shocks will cascade through the whole system*
- *Policy levers show direct impacts and how they ripple through jobs, skills, well-being*
- *Local development becomes empirically tractable as a system, not just isolated factors*

Introduction

Paper 1: **Theoretic model and framework model**

1. Evidence from the field: when practitioners say "everything connects," here's what that looks like in practice
2. Why current approaches fail (both academic and practical)
3. What an ecosystem framework looks like conceptually
4. How it integrates existing findings

Paper 2: **Model and empirical validation**

1. Do ecosystem configurations predict development outcomes better than factor models?
2. Are interaction effects larger than main effects (as framework predicts)?
3. Can we identify causal mechanisms linking pillars?

Paper: **Policy analysis and forecasting**

1. What are binding constraints by ecosystem type?
2. What intervention sequences optimize development?
3. Can we build decision-support tools for policymakers?

Together, these papers move local economics from factor accumulation models to ecosystem dynamics

Three Pillars of Economic Development

Paper 1

1. Introduction
2. **Paper**
 - a. **The disconnect** (*Situation*)
 - b. **Academic fragments** (*Lit.*)
 - c. **Opportunity**
 - d. **Framework** (*Solution*)
 - e. **Next steps**
3. Questions



The disconnect: Problem state

Economic disconnects:

- Economic, societal, and political fracturing; disenfranchisement; regions left behind
- Environmental degradation threatening life and economic sustainability
- Economic development realities on the ground different from policy assumptions

Social disconnects:

- Well-being 'decoupling' despite GDP growth
- World happiness surveys showing drops in satisfaction, trust, and benevolence
- Welfare retrenchment leaving communities vulnerable

Systemic shocks exposing the disconnects:

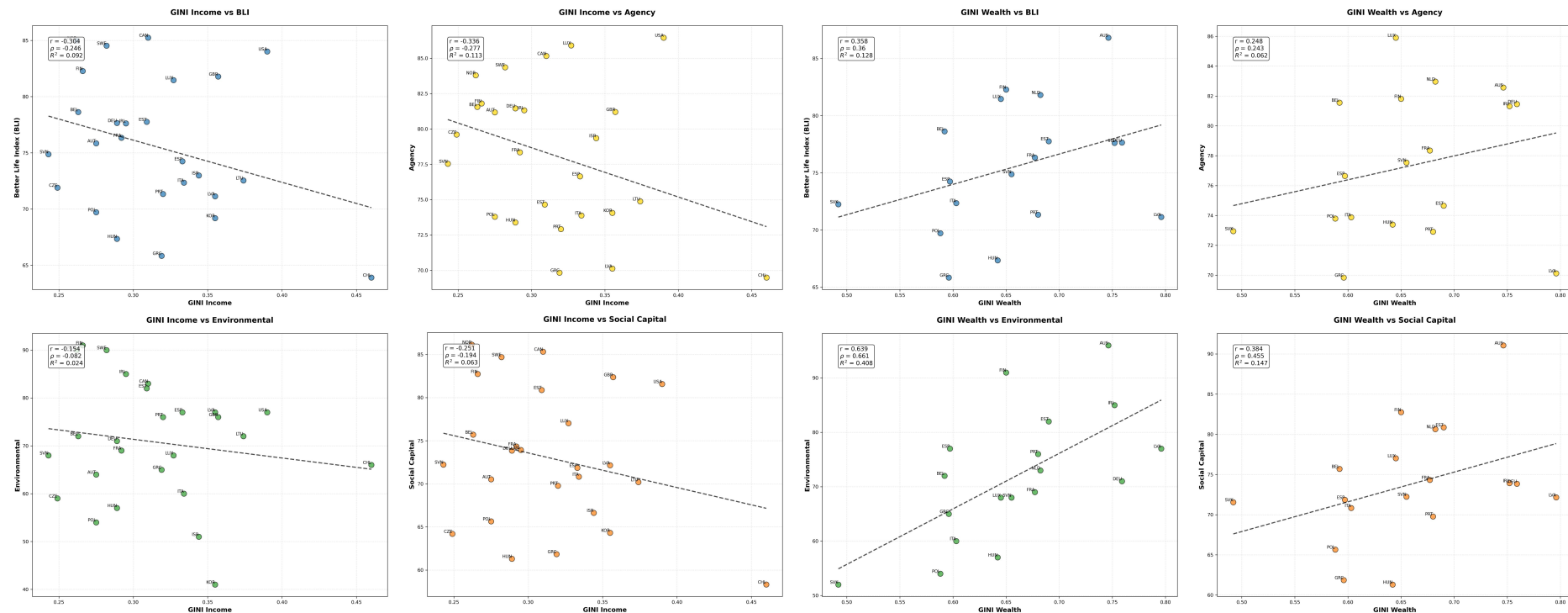
- AI disrupting labour markets faster than policy or regions can adapt
- Pandemics revealing which communities had resilient ecosystems and which didn't
- Digitisation widening gaps between digitally fluent connected and disconnected places

These are not separate problems, they are symptoms of the same underlying issue: we are missing the connections

The disconnect: Inequality policy weakly correlated

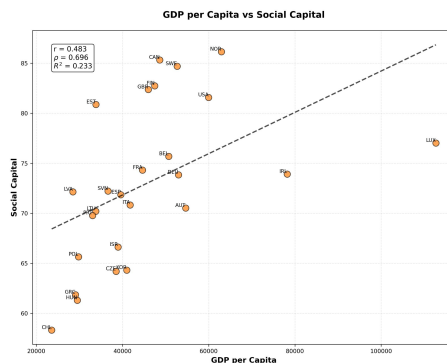
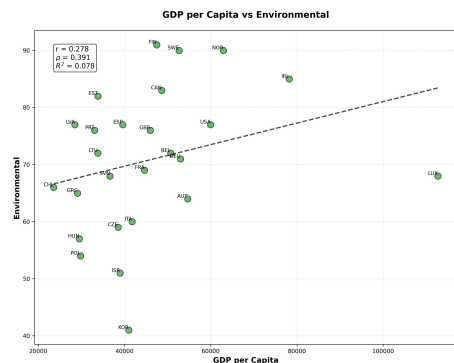
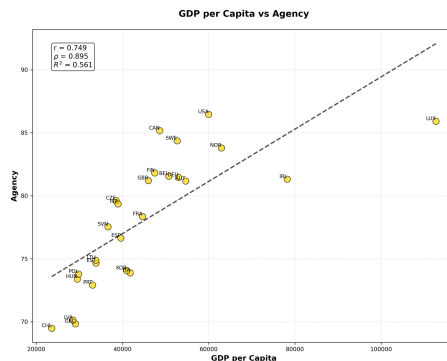
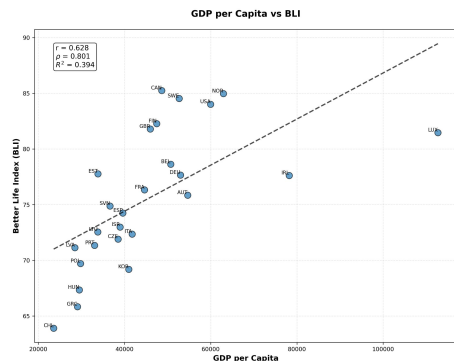
Inequality targeting (Gini- Income)

Inequality targeting (Gini- Wealth)



The disconnect: Prosperity more correlated, but...

Economic growth targeting (GDP/Capita)



OECD data, 2020, author's calculations

The decoupling problem (Snower & Lima de Miranda 2020):

- Social affiliation indicator diverged substantially from GDP trends in developed countries 2007-2017
- Individual empowerment declining with economic growth
- Material prosperity disconnected from social fabric and individual wellbeing

Beyond GDP (Stiglitz-Sen-Fitoussi 2009, among many others):

- Environmental costs excluded despite determining sustainability
- Income distribution masked by aggregates despite determining social stability
- Quality of life factors unmeasured despite affecting productivity

The human cost:

- 40% of OECD households vulnerable to 3-month income loss despite aggregate prosperity (OECD 2020)
- Deaths of despair increased 3x for middle-aged women without degrees despite economic recovery (Case 2020)



The disconnect: Place-based policies

Jobs for the Future work experience:



Workforce development occurs in an ecosystem, not in isolation

- Job training fails when participants lack stable housing, adequate transportation, childcare, weak employer partnerships, lack support networks
- Infrastructure developers: Roads don't spur growth without skilled workers to staff the businesses
- Education programmes: Skills don't translate to prosperity without jobs using them
- Innovation policy: R&D spending doesn't create growth without networks to commercialise it

The field knowledge is consistent: everything is connected, and connections matter more than individual strengths. But we have no theoretical framework that captures this systematically



The disconnect: Incomplete policy attempts

EU cohesion policy: €1,5 trillion spent

- Infrastructure built, education funded, R&D invested
- Many successes, but often done in isolation
- European Union remains fragmented regionally and nationally

Fabrizio Barca (2009) and (2011)

Well-being budgets from ~2020 (NZ, Denmark, Switzerland, Finland)

- Well-being budgets (NZ, Denmark, Switzerland) attempt holistic measurement
- But struggle with implementation without frameworks showing how dimensions interconnect
- Political vulnerability when not grounded in development theory (NZ PM: “not deserving a living”)

The pattern repeats globally: €1.5 trillion in infrastructure + education + R&D delivered infrastructure + education + R&D, but not sustained, local development. Individual investments succeeded; the ecosystem didn't connect.



The disconnect: Summary

Place-based practitioners on the field:

*Training * housing * transport * childcare * jobs = effective, sustainable workforce development*

*Pathways to education * support networks * social connection = trained regions*

*Access to basic needs * access to financial services * support networks * social connection = individual agency and regional resilience*

Current local and regional policy:

Economic policy: productivity and growth (assumes labour markets work)

Social policy: inequality reduction (separate from economic strategy)

Infrastructure policy: connectivity and capacity (separate from skills and social needs)

Well-being and place-based policies flounder without political will

Practitioners see the system. Policy treats the pieces. Theory explains the pieces. No formalisation of how the system works.



Academic fragments: Place and social capital

Stream 1: Place-based economics

- **Barca (2009)**: Territory as active development determinant, not passive context – place-based policy approach for EU cohesion
- **Iammarino et al. (2019)**: Regional inequality persists despite policy due to under-utilisation of local potential; "place-sensitivity" needed
- **Rodríguez-Pose (2018)**: "Revenge of places that don't matter" – spatial inequality drives political discontent
- **Austin, Glaeser & Summers (2018)**: US place-based policies for declining regions; spatial sorting creates agglomeration challenges

What's missing:

How place-based factors **systematically interact** with social structures and household-level capabilities to produce development

Stream 2: Social capital and networks

- **Putnam (1993)**: Italian regions with stronger civic traditions show better institutional performance and economic outcomes
- **Coleman (1988)**: Social capital exists "in structure of relations between actors," not as individual attribute
- **Chetty et al. (2022)**: Economic connectedness explains 43% of mobility variation; cross-class connections matter more than education or income
- **Granovetter (1973)**: "Strength of weak ties" – bridging networks enable information flow; bonding networks enable trust

What's missing:

How social capital **translates into** economic outcomes through labour markets and household resource access – the mechanisms



Academic fragments: Innovation and complexity

Stream 3: Innovation ecosystems

- **Cooke (2001)**: Regional Innovation Systems: innovation emerges from firm - institution - knowledge infrastructure interactions
- **Crescenzi & Rodríguez-Pose (2012)**: "Integrated framework" linking territorial assets, innovation inputs, socioeconomic conditions but focused on innovation only
- **Balland et al. (2019)**: Smart specialisation in EU: regions diversify into related activities based on existing capability structures

What's missing:

Connection to **household welfare and social foundations**. Innovation systems assume capabilities exist; don't explain how they form or who benefits

Stream 4: Complexity and resilience

- **Hidalgo & Hausmann (2009)**: Economic Complexity Index: product sophistication predicts growth better than governance or education
- **Martin & Sunley (2015)**: Regional resilience as "adaptive ability" emerging from system characteristics (resistance, recovery, re-orientation, renewal)
- **Boschma (2015)**: Regions as complex adaptive systems with co-evolving economic, institutional, social dimensions; path dependence through "related variety"

What's missing:

Operationalisable framework connecting micro-foundations (households, workers) to macro outcomes (regional growth, resilience)



Academic fragments: Integration gap

What existing literature gives us:

- Place matters for sorting, agglomeration, and institutional quality
- Social capital shapes civic engagement and economic mobility
- Innovation requires ecosystem interactions between firms, universities, government
- Complexity and path dependence create regional development trajectories

What is systematically missing:

- Framework integrating all four streams: each examines one dimension in isolation
- Testable predictions about ecosystem configurations: which combinations of place, people, economy give development?
- Micro-macro linkages: how do household conditions aggregate to regional outcomes?
- Policy guidance on complementarities: what order to invest? What combinations amplify effects?

Why integration has failed:

- Data limitations from lacking comprehensive multi-dimensional regional data (**Glaeser et al. 2018**)
- Models deliberately "reduced complexity" to isolate mechanisms (Triple Helix approach)
- Sectoral silos: EU policy remained "highly sectoral" despite ecosystem rhetoric
- Failed attempts: Smart Specialisation (RIS3) in Portugal/Spain showed "decreased R&D investment" and "extremely limited partner involvement"

Opportunity

Data availability

1. Regional-level well-being data (OECD, Eurostat)
2. Social capital metrics (ESS, World Values Survey)
3. Household panel data (EU-SILC, SOEP)

Methodological advances

4. Network analysis for measuring connectivity
5. Structural equation modeling for interaction effects
6. Machine learning for identifying ecosystem configurations

Accumulated evidence

7. 30+ years of EU cohesion policy variation
8. Natural experiments from shocks (financial crisis, COVID, automation)
9. Highly advanced literature on specific interrelations

Missing link

Systematic ecosystem framework that:

1. Integrates academic findings across domains
2. Formalizes practitioner insights about interconnection
3. Enables testing whether regions actually function as ecosystems
4. Guides policy towards system optimisation rather than factor accumulation

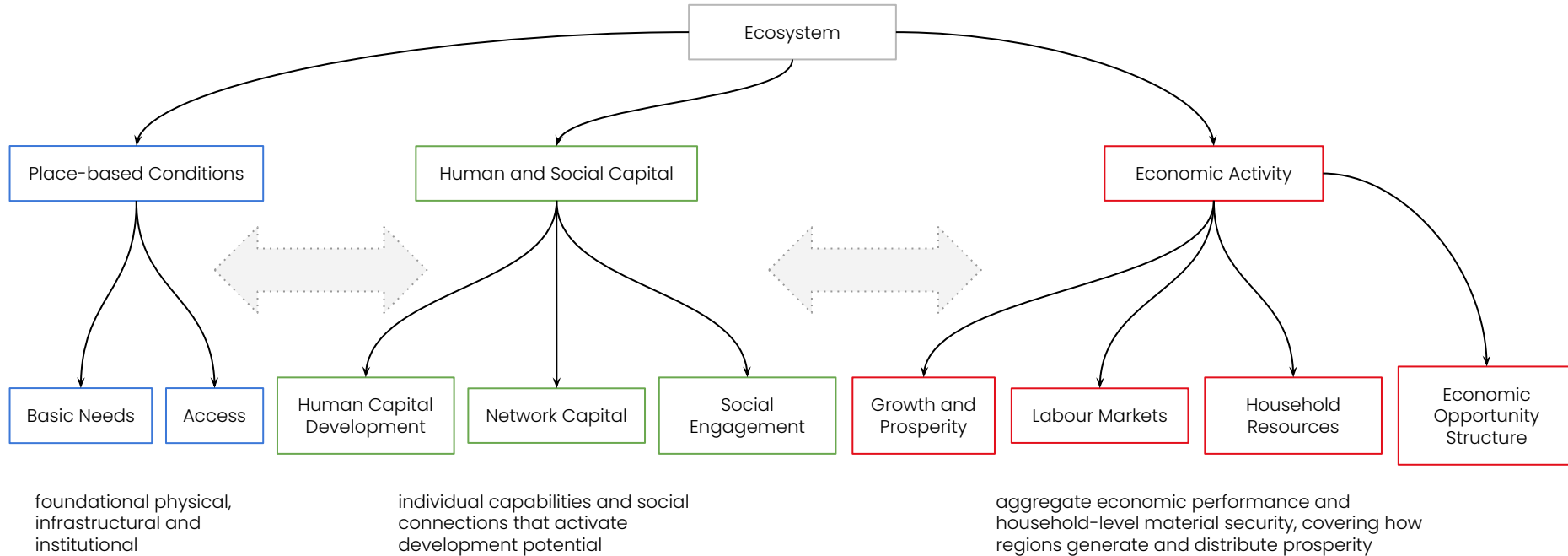
Proposal

Three-pillar ecosystem framework that:

1. Integrates place-based, social and human capital, and economic activity
2. Makes ecosystem dynamics empirically tractable through interaction effect testing
3. Connects household agency to regional prosperity through systematic pillar relationships
4. Guides policy on sequencing and complementarities, not just factor accumulation

People <-> Place <-> Prosperity

Framework



Development outcomes depend on interaction effects between pillars, not just factor accumulation within pillars

Testable implication: $\text{Development}(\text{max well-being}) = f(\text{PbC} \times \text{HSC} \times \text{EA})$, where interaction terms > main effects



Pillar I: Place-based conditions

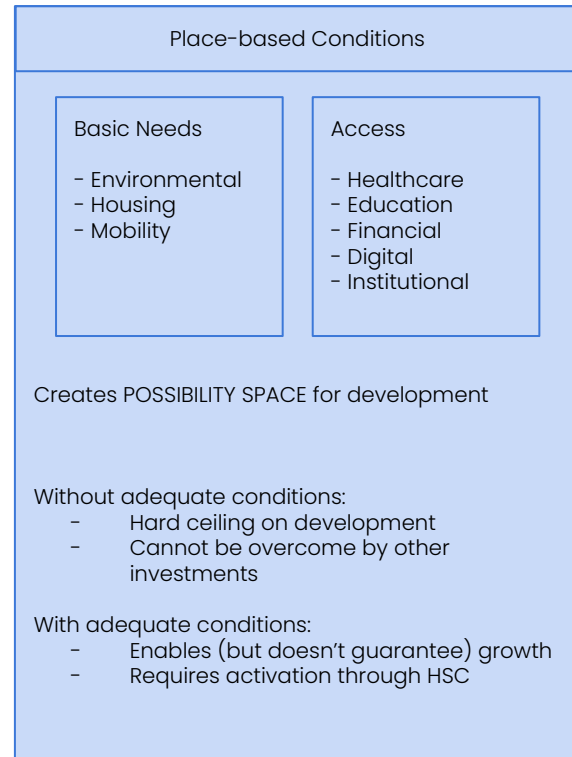
Captures: Barca (2009) territory as active development determinant not passive background AND field-derived practitioner insights

Basic Needs: fundamental physical conditions enabling life and economic participation

- Environmental quality (air/water quality, green space, climate resilience)
- Living conditions (housing adequacy, neighborhood quality)
- Core mobility (transport infrastructure, regional connectivity)

Access: availability of essential services and institutions

- Essential services (healthcare, education, financial services)
- Digital infrastructure (broadband, mobile networks)
- Institutional capacity (governance quality, administrative effectiveness)





Pillar I: Place-based conditions

Captures: Barca (2009) territory as active development determinant not passive background AND field-derived practitioner insights

Key mechanisms:

- Enables or constrains individual agency (Bilal & Rossi-Hansberg 2021: can't access jobs without transport)
- Shapes social network formation (housing stability → community ties)
- Determines which economic activities are feasible (infrastructure → firm location decisions)

Evidence:

- Infrastructure in Spain “relatively poor predictor of growth” when isolated (roads followed history, not growth needs)
- Regions below basic threshold showing constrained development **regardless of investments** (Di Cataldo & Rodríguez-Pose 2017)



Pillar II: Human and social capital

Captures: Mediates between place and prosperity - explains why similar infrastructure produces different outcomes

HC Development:

Individual capab.
enabling economic
participation

- Foundational education (early dev. quality, not just attainment)
- Skills dev. (learning engagement, not just credentials- Deming 2017)
- Learning transitions (lifelong learning pathways)

Network Capital:

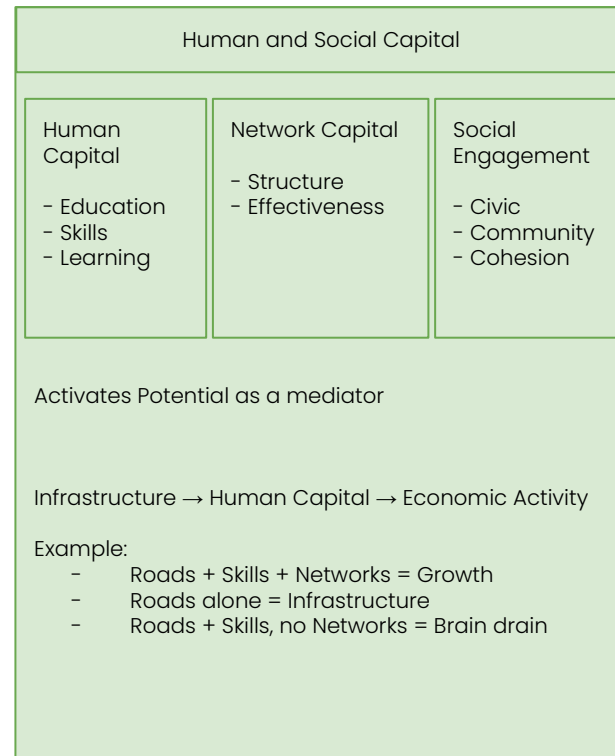
connection quality
facilitating info. flow and
opportunity access

- Network structure (professional connections, cross-group bridges- Burt 2004)
- Network effectiveness (resource access, opportunity identification)

Social Engagement:

institutional particip. and
community integration

- Institutional engagem. (civic particip., democratic involv.- Putnam 1993)
- Social integration (community belonging, support networks- Sampson 2018)
- Social cohesion (trust, collective efficacy- Easterly et al. 2006)



Pillar II: Human and social capital

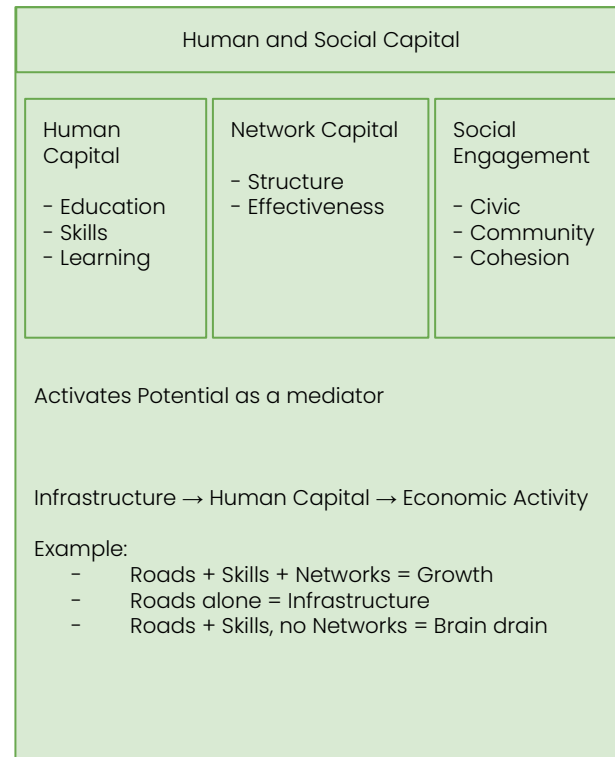
Captures: Mediates between place and prosperity - explains why similar infrastructure produces different outcomes

Key mechanisms:

- Activates infrastructural potential (good roads ≠ development without skilled workers to staff businesses)
- Enables collective action (addressing local problems requires local ties)
- Determines job-skill matching efficiency (Chetty et al. 2022: cross-class networks explain 43% of mobility variation)

Evidence:

- Education insufficient: Hanushek & Woessmann (2008) show **learning quality > attainment levels**
- Networks matter more than skills: Chetty finds 1 Standard deviation increase in cross-class connections = **20 percentile mobility increase**



Pillar II: Economic activity

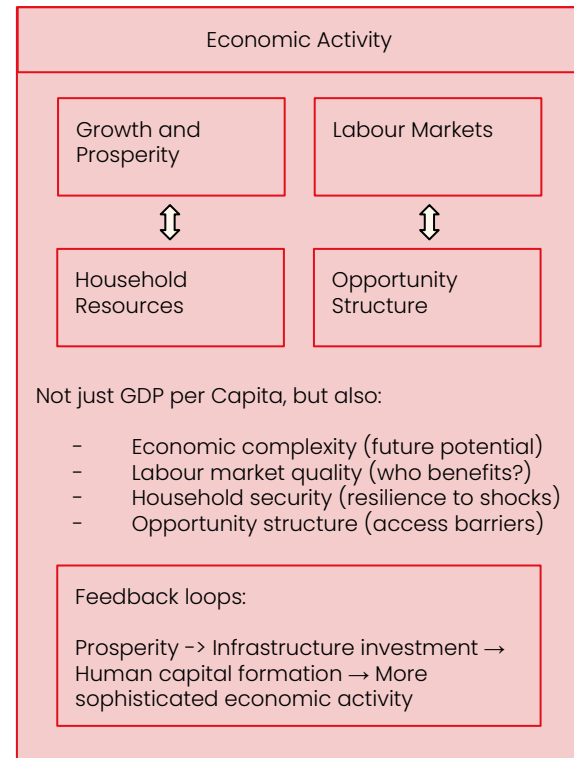
Captures: Both current performance AND structural characteristics determining future development potential

Growth and Prosperity: how effectively regions generate economic value

- Economic base (GDP, living standards, economic complexity- Hidalgo & Hausmann 2009)
- Productive efficiency (labour productivity, capital utilisation)
- Economic resilience (sectoral diversity, structural adaptability- Martin & Sunley 2015)

Labour Markets: how economic activity converts to household opportunity

- Employment structure (participation rates, job quality)
- Job quality (stability, advancement opportunities- Bilal 2021)
- Labour market dynamics (job-matching efficiency, market vitality)



Pillar III: Economic activity

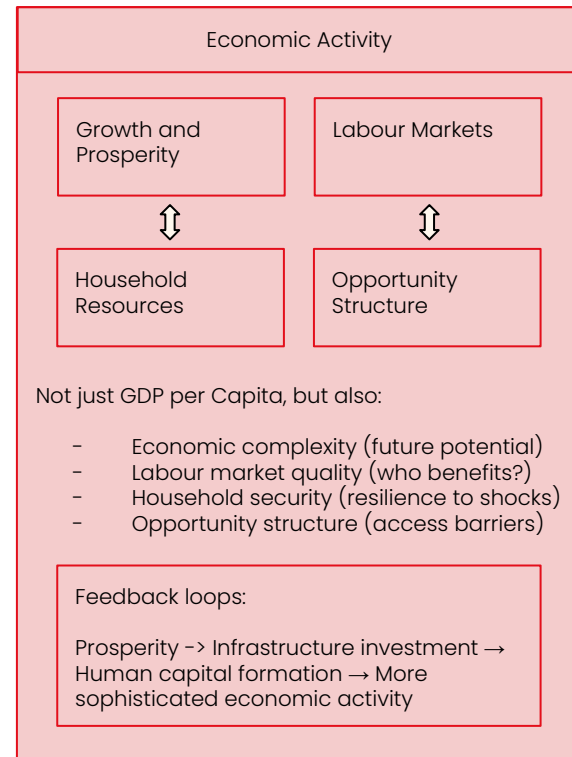
Captures: Both current performance AND structural characteristics determining future development potential

Household Resources: material security enabling participation

- Income security (levels, volatility, working poverty)
- Wealth structure (assets, financial inclusion)

Economic Opportunity Structure: conditions affecting household economic access

- Market access (employment opportunities, competition)
- Business dynamism (entrepreneurship barriers, growth conditions)



Pillar III: Economic activity

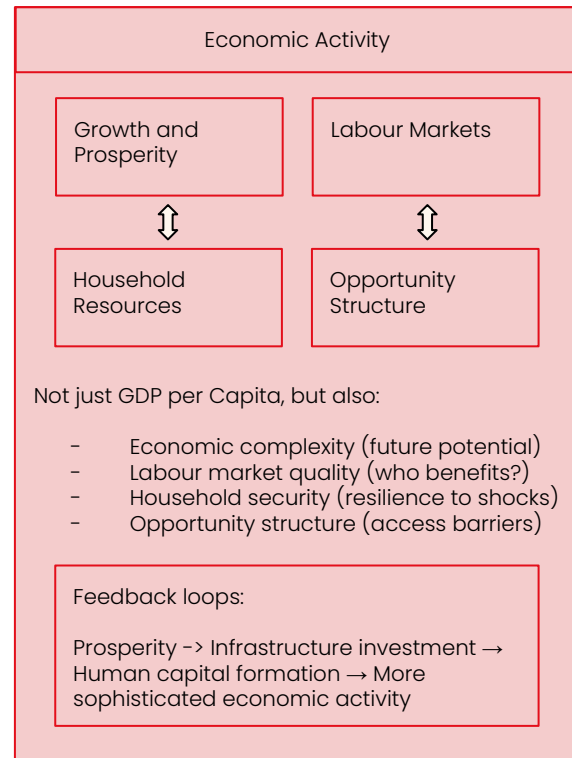
Captures: Both current performance AND structural characteristics determining future development potential

Key mechanisms:

- Reflects success of place-based capital interactions (jobs created from infrastructure + skills)
- Creates feedback loops (prosperity → better infrastructure → prosperity)
- Distribution matters (40% vulnerable despite aggregate prosperity- OECD 2020)

Evidence:

- **Economic complexity** predicts growth better than governance, education, or competitiveness (Hidalgo & Hausmann 2009)
- But complexity **requires** place-based conditions + human and social capital to develop



Framework Dynamics: Hypothesis

How the system works: Interaction > Factors

Traditional factor accumulation model:

$$\text{Development} = \alpha(\text{Infrastructure}) + \beta(\text{Human Capital}) + \gamma(\text{Social Capital}) + \varepsilon$$

Assumes factors are substitutable and additive

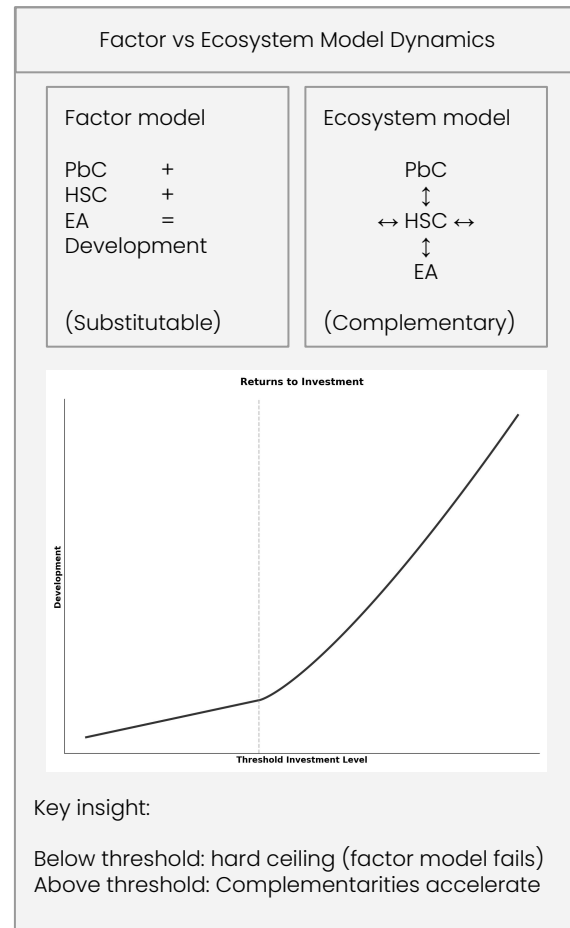
Ecosystem model:

$$\text{Development} = f(\text{PbC} \times \text{HSC} \times \text{EA}) + \text{interaction effects} + \varepsilon$$

Emphasises complementarities and system balance

Core predictions:

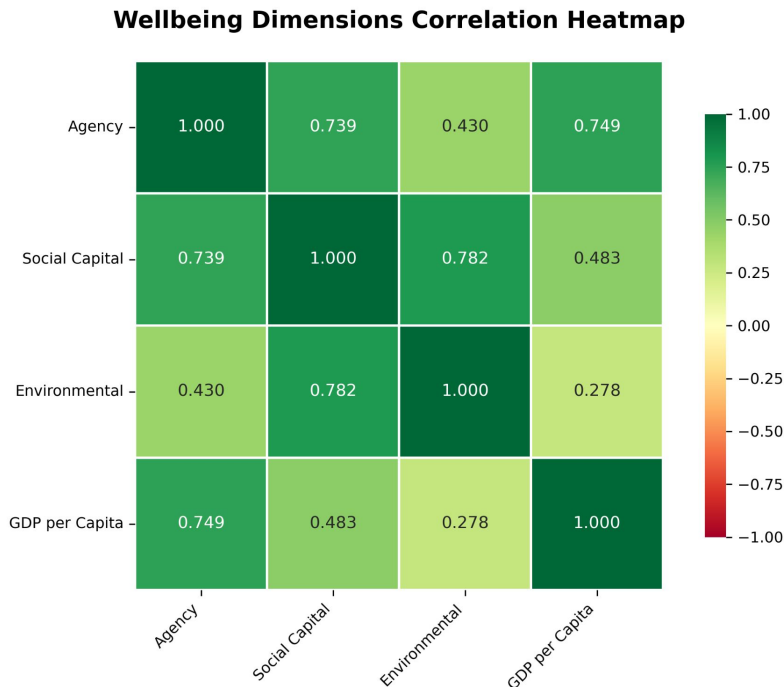
- **Interaction effects > main effects** (connections matter more than factors)
- **Balance matters more than total investment**
 - Non-linear returns (missing one pillar → collapse; all strong → superlinear growth)
 - Weakest pillar determines ceiling
- **Shock resilience depends on ecosystem balance** (COVID impact varied by configuration)



Next Steps: Preliminary validation

What this shows:

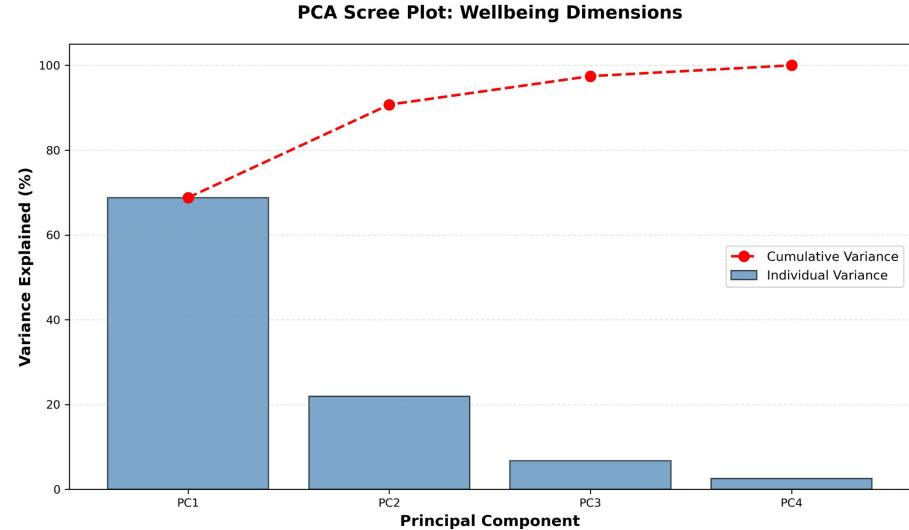
- Correlation matrix heatmap showing strong correlations suggesting:
 - Relationships among four key well-being dimensions reveals the interconnected nature of different well-being components.
 - Pillars move together (ecosystem hypothesis)
- Now need causal mechanisms
 - Test whether interaction effects drive outcomes (Paper 2)



Next Steps: Preliminary validation

What this shows:

- 69% of variance captured by one component: strong common factor
 - cumulative variance reaching over 90% with just two components. This suggests a strong underlying common factor connecting Agency, Social Capital, Environmental Quality, and GDP per Capita
- Consistent with ecosystem dynamics (one underlying development process). Now need to separate causes and outcome
 - Build structural models (Paper 2)





Next Steps: Paper 2– Research design

Empirical strategy relies on panel regression with interaction terms

Do interaction effects between pillars predict development better than factor accumulation?

Approach:

Model 1 (baseline):

$$\text{Well-being}_{rt} = \alpha + \beta_1(\text{PbC}_{rt}) + \beta_2(\text{HSC}_{rt}) + \beta_3(\text{EA}_{rt}) + \varepsilon$$

Model 2 (ecosystem):

$$\text{Well-being}_{rt} = \alpha + \beta_1(\text{PbC}_{rt}) + \beta_2(\text{HSC}_{rt}) + \beta_3(\text{EA}_{rt}) + \beta_4(\text{PbC}_{rt} \times \text{HSC}_{rt}) + \beta_5(\text{HSC}_{rt} \times \text{EA}_{rt}) + \beta_6(\text{PbC}_{rt} \times \text{EA}_{rt}) + \gamma_{rt} + \delta_{rt} + \varepsilon$$

Test:

- If $\beta_4, \beta_5, \beta_6 \gg \beta_1, \beta_2, \beta_3$, ecosystem model outperforms factor model

Where:

γ_{rt} = region fixed effects (controls for time-invariant heterogeneity)

δ_{rt} = time fixed effects (controls for common shocks)

Data:

- Eurostat data NUTS2 and NUTS3 level, methodology for data not available at NUTS3
- OECD regional data (2000–2020), ~300 European regions



Next Steps: Paper 2- Identification strategy

Problem: Reverse causality (prosperity $\rightarrow$ infrastructure), omitted variables (culture), selection (people sort into regions)

- Answers from my Omitted Variables doc

Solutions:

1. Panel fixed effects: Region FE control for time-invariant heterogeneity
2. Shock analysis: Natural experiments: Do interaction effects predict differential resilience?
 - a. Financial crisis (2008-2012): Which regions recovered faster?
 - b. COVID-19 (2020-2022): Which ecosystems proved resilient?
 - c. Automation shocks: AI adoption waves varying by sector and region
3. Instrumental variable: Historical instruments for social capital (Putnam-style), EU policy discontinuities for infrastructure

Robustness checks:

- Spatial econometrics (spillovers)
- Synthetic control methods
- Machine learning for heterogeneous effects



Next Steps: Paper 2– Expected contribution

Theoretical:

- First systematic integration operationalising Barca's (2009) place-based vision AND Chetty's (2022) network effects AND Hidalgo's (2009) complexity insights
- Testable ecosystem framework: interaction effects > main effects

Empirical:

- Quantify interaction effects: How much do complementarities matter?
- Identify binding constraints: Which pillar limits each region?
- Test resilience hypothesis: Do balanced ecosystems survive shocks better?

Policy:

- Guidance on intervention sequencing (what to fix first?)
- Decision-support tools for policymakers (simulating policy contributions)

Broader impact:

- Formalisation of practitioner insights

Thank you!

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Links

<https://publish.obsidian.md/oikosystem/Home>