

A Regional Economic Development Ecosystem Framework: Integrating Place, People, and Economy in European Regions

Conway

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Extended summary

This paper proposes a way of understanding regional economic development as an ecosystem rather than as a collection of separate factors. The motivation is a long-standing puzzle. Despite the cumulative investment of roughly 1.5 trillion euro of European cohesion funding since 1989, regional disparities across Europe have persisted and in several respects widened, and the gap between what aggregate economic indicators report and what people in those regions actually experience has grown rather than closed. A region can record acceptable output figures while its labour market, its civic life, and its sense of opportunity deteriorate. The wellbeing data record the same divergence at the level of people, with measures of social affiliation and individual empowerment moving apart from GDP per capita across developed economies (Lima de Miranda and Snower, 2020), and Case and Deaton (2015, 2017) documenting its sharpest end in rising deaths of despair. Conventional approaches, which examine physical infrastructure, human capital, or economic performance one domain at a time, are not well equipped to explain this, because the interdependencies between domains are precisely what they set aside.

The framework developed here organises regional development around three interacting pillars. **Place-based Conditions** are the territorial and institutional foundation. **Human and Social Capital** are the capabilities and connections that activate that foundation. **Economic Activity** is both the current outcome and the structural basis of future potential. The claim is not that these dimensions are new, nor that the literature has ignored the interactions between them. A substantial body of recent work, reviewed in Section 2, shows that those interactions are real: institutional quality conditions the returns to investment, bridging social capital conditions the returns to human capital, and so on. The difficulty is that this evidence is fragmented, established one pair of factors at a time, while the measurement traditions that do span several dimensions, such as the EU Social Progress Index and the Regional Competitiveness Index, score those dimensions side by side without

modelling how they act on each other. The contribution of this paper is to draw these strands together into a single framework that specifies the mechanisms through which the pillars interact, and that is built to be tested. Crucially, the framework is presented as a living system rather than a fixed taxonomy. Regions are coupled wholes that settle into stable but shiftable configurations, and they change as the world economy, demographics, and their own opportunities change. A region may move to a new equilibrium, through a shift into research and innovation for instance, that is not necessarily higher on output, simply a different stable state. The framework’s value is in capturing how those configurations hold and change, avoiding to fix regions to permanent categories.

What the literature already established, and where it stops, shapes the design for this framework. On the interaction side the evidence is rich but scattered: the returns to public investment depend on the quality of regional government (Rodríguez-Pose and Garcilazo, 2015), the economic return to bridging social capital is conditional on a region’s human capital (Muringani, Fitjar and Rodríguez-Pose, 2021), formal and informal institutions jointly drive diversification (Cortinovis et al., 2017), institutional quality is the dominant predictor of generalised trust (Charron, Dijkstra and Lapuente, 2014), and cross-class connectedness shapes mobility beyond individual characteristics (Chetty et al., 2022). Each of these establishes a real cross-domain mechanism, and each holds the rest of the regional system fixed while doing so. On the measurement side, the EU Social Progress Index, the Regional Competitiveness Index and the OECD regional well-being dashboard already describe regions on many dimensions at once, yet all of them score those dimensions side by side, with no account of how one acts on another. Between the two sits the gap this paper addresses: the mechanisms exist pairwise and the dimensions exist in parallel, but the system itself, territory, people and economy acting on one another, has not been assembled.

The framework is built to be tested, and the empirical companion to this paper does so on European regions at NUTS 2 level. The prediction it takes there is the framework’s own: a tightly coupled system looks one-dimensional in calm conditions, because its parts move together, and shows its separate parts only under stress, so in calm times the three pillars should collapse towards a single general factor of development, while under a shock the coupling should loosen selectively rather than uniformly. The companion finds exactly this pattern, a single dominant factor before the pandemic and a selective loosening of the human-and-social to economic link under it while the place-based foundation held, so the three pillars come through as a clean conceptual organisation and a reliable composite rather than three separable dimensions. Beneath that sits a stable four-tier typology of regions with a layer of cross-cutting syndromes, and the four types correspond to the development clubs of Iammarino, Rodríguez-Pose and Storper (2019) and the development traps of Diemer et al. (2022), behaving as basins of differing depth from which regions rarely climb and into which they far more easily fall. I read this as allostasis, in the sense my earlier work develops: a region’s configuration is the best stable setpoint its conditions allow, which is not the same as a good one, so a struggling region can be both stable and poor, and effort alone will not shift it. A static typology can tell where a region sits, but not how it got there or where it might go next, and that missing dimension, the paths between configurations, is what the rest of the dissertation seeks to explore: the companion measures this missing dimension and the final modelling paper seeks to explain.

As mentioned, this paper is the first of a sequence: it sets out the framework, while the empirical companion demonstrates it and reports the result that the structure is one of clubs and traps rather than of three separable dimensions. A third paper, drawing on a heterogeneous-agent model developed previously, formalises the dynamics that this framework describes: what holds a region in a given state, and what might tip it into another. The aim throughout is to make a novel, coherent and empirically defensible account of regional development as an interconnected system, built to respect and to bring together a literature that has so far addressed that system only in parts.

Introduction

The decoupling of wellbeing from prosperity

The framework’s point of entry is an anomaly that the standard account of development cannot absorb: across European and OECD populations, several independent measures of wellbeing have stagnated or fallen even as material wealth has risen. Lima de Miranda and Snower (2020) show that social affiliation and individual empowerment, the solidarity and agency dimensions of their ‘SAGE’ framework, moved apart from GDP per capita over 2007 to 2017. Conway (2020) embeds those wellbeing dimensions in a heterogeneous-agent macroeconomic model and finds that they decouple from consumption under shocks, so the divergence is structural rather than an artefact of any one measure. Inequality accounts for only part of it: the relationship between wellbeing and income inequality is loose, and wellbeing remains clearly separable from inequality alone across regions, so distributional correction does not close the gap. The OECD (2020) How’s Life survey reports that 7% of the OECD population records very low life satisfaction, that 15% of women and 12% of men feel more negative than positive on a given day, and that roughly 40% of households would fall into poverty after three months without income. Case and Deaton (2015, 2017) document the sharpest instance, a rise in midlife mortality among white Americans without a university degree, driven by deaths from drugs, alcohol and suicide that in the worst-affected states rose to rival other leading causes of death, even as aggregate output recovered. If development were a single unit, wellbeing could not fall while wealth rises. The decoupling is the first sign that development is made of interacting parts that can come apart, which is the question the framework is built to organise.

The persistence of regional disparities despite massive policy interventions

Since the formal establishment of Cohesion Policy with the Delors package of 1987 to 1988, the EU has allocated approximately 1.5 trillion euro cumulatively across six programming periods, rising from 63 billion euro in 1989 to 1993 to 392 billion euro in 2021 to 2027 (Prota, Viesti and Bux, 2020; European Commission, 2021). Yet regional disparities across Europe have persisted and in many cases deepened. By 2024, three years into the 2021 to 2027 programming period, only 5.1% of available cohesion funds had been absorbed (Schwab, 2024), an exceptionally low rate and well below the already problematic rates of previous periods. This implementation difficulty was compounded by regulatory delay: the legal framework was finalised only in June 2021, six months after the programming period had begun, an unusually late start (Schwab, 2024).

Disparities have not merely failed to close, they have widened along more than one axis. Regional gaps within member states have grown even where national economies converged, the pattern of left-behind regions inside prosperous countries, while the cross-country gap in levels remains the larger share of total disparity. As measured by the coefficient of variation of GDP per capita, regional disparities rose after the 2008 financial crisis and again during the pandemic. the gains of the early 2000s were erased on the eve of the Great Recession, and the divergence accelerated thereafter, driven mostly by between-country gaps during the 2020 shock (IMF, 2022).

Iammarino et al. (2019) document the formation of regional clubs with divergent and self-reinforcing development trajectories. Rodríguez-Pose (2018) sets out the political consequences of territorial inequality, with anti-establishment voting concentrated in economically marginalised regions. Similar investment levels produce very different outcomes across regions, so the persistence of divergence despite unprecedented intervention suggests that conventional accounts of regional development may

be fundamentally incomplete.

The limitations of single-domain approaches

Current approaches typically examine physical infrastructure, human capital, or economic performance in isolation, missing the interdependencies that determine actual outcomes. Southern Italy is the clearest illustration. Despite a 2021 to 2027 allocation of more than 30 billion euro from the ERDF and the ESF+, part of Italy’s total 42.7 billion euro in cohesion funding (European Commission, 2022), the North-South gap remains intractable: per capita GDP in the South stands at roughly 58% of that in the Centre-North, and the gap has returned to its post-war level over the very decades in which Cohesion Policy has operated (Fanti, Pereira and Virgillito, 2023; SVIMEZ, 2023). After decades of substantial investment, the South has not merely failed to converge but has declined in relative terms. The infrastructure-led approach that dominated Italian cohesion policy proved insufficient without the complementary institutional reform and capacity building that the framework developed here treats as inseparable from it.

The pattern recurs elsewhere. The returns to public investment in European regions are strongly moderated by the quality of regional government (Rodríguez-Pose and Garcilazo, 2015), and basic territorial conditions can act as gateways that constrain development regardless of other strengths (Di Cataldo and Rodríguez-Pose, 2017). These are interaction effects, yet most analyses treat the factors separately, which is precisely why they cannot account for why identical investments yield such different results.

The ecosystem imperative

This paper proposes an ecosystem framework that conceptualises regional development as emerging from the interactions between Place-based Conditions, Human and Social Capital, and Economic Activity. It builds on Barca’s (2009) place-based approach and extends it through systematic multi-dimensional integration, it incorporates Chetty et al.’s (2022) evidence that economic connectedness shapes mobility beyond individual characteristics, it extends Hidalgo and Hausmann’s (2009) economic complexity to include social and territorial activation, and it draws on Martin and Sunley’s (2015) account of regional resilience as a property that emerges from the interplay of a region’s parts.

The framework does not claim to be the first to recognise that these dimensions interact. Section 2 reviews a body of recent work, from Rodríguez-Pose and Ketterer (2020) to Muringani et al. (2021) and Cortinovis et al. (2017), that establishes such interactions empirically, although it does so one pair of factors at a time. Nor does it claim that the three pillars are three statistically separable dimensions of regional life, they are presented here as a conceptual organisation and a reliable composite, a reading the empirical companion bears out, since at the indicator level a single general factor of development fits the data better. They bring the scattered interaction evidence into one structure, and in the companion they yield a durable regional typology, a layer of cross-cutting syndromes, and a selective response to shock. The point of treating regions as integrated ecosystems is not novelty about the parts but what organising them together makes possible.

The nature of the contribution: a synthesis

This is a conceptual paper of the synthesis kind (Jaakkola, 2020): its task is to integrate fragmented and previously disconnected findings into a higher-order organisation, not to deduce a framework from prior axioms, since no unified prior account exists to deduce from. The three-domain organisation is offered by inference to the best explanation, as the most parsimonious structure that makes sense at once of three independent bodies of evidence:

- The decoupling puzzle set out above, which establishes that economy alone is not the whole of development and that the people-side and the territorial side must enter the account as distinct from output.
- The consensus of development practice, which treats place-based conditions, access, human capital and social capital as inseparable from economic outcomes. The three domains were abstracted from extended field engagement with mayors, workforce boards, credential associations and policymakers, in the manner of grounded theory (Glaser and Strauss, 1967; Flyvbjerg, 2001), and then disciplined against the literature.
- The pairwise interaction literature reviewed in Section 2, which finds the domains coupled but only two at a time, never assembled as a single system.

Independent multidimensional accounts of development and wellbeing reinforce this without settling it. They reject the single-output view and they reduce to a small set of interacting domains, which shows that a low-dimensional organisation is not idiosyncratic to this paper, although it does not by itself fix the number at three. The number three is therefore a parsimony choice: it is the smallest partition that keeps territory, people and economy distinct enough to specify mechanisms between them. Whether the cut is durable rather than arbitrary is an empirical question, and the companion takes it up.

Section 1: The Crisis of Conventional Regional Development Approaches

1.1 The Failure of GDP-Centric Models

GDP’s systematic blindness to crucial development dimensions **Opening:** Models built around GDP growth have come to misrepresent the regional development they are meant to summarise.

Evidence:

- The Stiglitz, Sen and Fitoussi Commission (2009) documented systematic exclusions: environmental degradation left unmeasured, income distribution masked by aggregates, quality-of-life factors ignored despite their effect on productivity
- Lima de Miranda and Snower (2020) show the decoupling empirically, with indicators of social affiliation and individual empowerment diverging from GDP in developed countries over 2007 to 2017, and in Conway (2020) I found the same separation inside a heterogeneous-agent model, where the wellbeing dimensions decouple from consumption under economic shocks rather than tracking it
- Sen (1999) reframed development as the expansion of freedoms

Closing: Single-dimension approaches are theoretically flawed in assuming that a complex multi-dimensional process can be understood through one factor at a time.

The human cost of economic reductionism **Opening:** The focus on output has obscured the deterioration of social fabric and individual wellbeing even in economically successful regions.

Evidence:

- Case and Deaton (2015, 2017): rising midlife mortality among white Americans without a degree, with deaths of despair rising to rival other leading causes of death in the hardest-hit states, even as aggregate output recovered
- The OECD (2020) survey data tell the same story from another angle, 15% of women and 12% of men experiencing more negative than positive feelings on a given day, and roughly 40% of households unable to withstand three months without income, all alongside aggregate prosperity gains

Closing: Material prosperity has become disconnected from the social and individual dimensions that make development meaningful for citizens.

1.2 The Inequality Paradox

Persistent disparities despite convergence policies **Opening:** Cohesion policies explicitly aimed at reducing disparities have produced paradoxical results, with gaps persisting or widening despite large investments.

Evidence:

- The 2021 to 2027 allocation of 392 billion euro, with national co-financing, represents the largest such commitment to date (European Commission, 2021)
- Persistent regional clubs form, with leading regions pulling ahead and lagging regions held in low-development equilibria (Iammarino et al., 2019)
- Absorption has been weakest in the largest beneficiary states, running lower in the 2021 to 2027 cycle than in 2014 to 2020 (European Parliament, 2024), and the 5.1% rate of 2024 (Schwab, 2024) is the contemporary expression of the paradox: funds committed faster than they can be turned into outcomes on the ground
- Where Central and Eastern European regions converged on the EU-15, the gains concentrated in capital and urban regions while less-developed regions caught up only slowly despite cohesion funding (Egri and Lengyel, 2023), this is itself evidence that transfers without complementary institutional and social conditions do not by themselves deliver convergence

Closing: Standard models cannot explain why convergence policies fail to produce convergence, which points to a misunderstanding of the mechanisms of development.

The multidimensional nature of inequality **Opening:** Regional inequalities manifest not only in income but across interconnected dimensions that reinforce one another.

Evidence:

- Educational attainment clusters spatially, and the newer digital divides follow the same geography, so new forms of exclusion land on top of existing disadvantage
- Network structures create persistent barriers to social mobility (Chetty et al., 2022)
- Regional GDP per capita ranges across the EU from well above to well below a third of the average, with the widest gaps inside member states

Closing: In essence, single-factor interventions fail because the inequalities they target operate as an interconnected system, with disadvantages compounding one another across dimensions.

1.3 The Wellbeing Crisis and Political Consequences

The rise of populism in left-behind places **Opening:** The political consequences of failed development approaches appear in the rise of anti-establishment movements concentrated in Europe's economically marginalised regions.

Evidence:

- Rodríguez-Pose (2018), *the revenge of the places that do not matter*: a correlation between long-run economic decline and anti-establishment voting. This is seen in the geography of the Brexit vote, the gilets jaunes, and the Five Star Movement aligns with regions of long-term decline.
- Dijkstra et al. (2020) find anti-EU sentiment strongest in regions combining poor government quality with economic stagnation

Closing: Political instability of this kind reflects deeper failures in how regional development has been conceived, failures that no purely economic metric would have flagged in advance.

The breakdown of social cohesion **Opening:** Beyond politics, the wellbeing crisis appears in the erosion of the social bonds and community structures that historically provided resilience.

Evidence:

- Putnam (2015), *Our Kids*, documents the widening opportunity gap and community breakdown in deindustrialised areas
- Single-person households and social isolation have risen across the EU over the past two decades (Eurostat regional statistics)
- Antonakakis and Collins (2014) link austerity to increases in suicide

Closing: Approaches that ignore the social dimension undermine their own foundations, since social breakdown constrains future development.

1.4 The Limitations of Current Place-Based Approaches

The promise and limitations of place-based policy **Opening:** Place-based approaches (Barca, 2009) are an advance over spatially blind policy, but implementation remains fragmented and theoretically underdeveloped.

Evidence:

- Barca (2009) called for integrated territorial approaches, yet cohesion policy maintains sectoral divisions, with the ERDF, ESF+ and Cohesion Fund operating separately despite affecting the same regions
- Coordination between infrastructure, human capital and business-support interventions remains limited
- Academic evaluation of cohesion-policy effectiveness is mixed, with estimates ranging from positive but short-lived effects to negligible or context-dependent ones

Closing: For place-based policy to deliver on Barca’s original ambition, it needs frameworks that capture how territory is embedded within broader social and economic systems, instead of treating place as one factor among many.

The need for systematic integration Opening: Current place-based approaches lack frameworks for understanding how territorial, social and economic factors interact as systems rather than as independent variables.

Evidence:

- Evaluations of Smart Specialisation find that implementation succeeds in regions with stronger governance and institutional capacity and struggles in lagging regions, producing uneven outcomes across Europe (Papamichail, Rosiello and Wield, 2023; Iacobucci, 2014)
- Despite substantial investment in research infrastructure, Poland’s R&D intensity was only about 1.4% of GDP in 2020 (Eurostat, 2021), and although it climbed to around 1.6% by 2023 it stayed below the EU average (Eurostat, 2024), which shows that financial transfers alone do not generate innovation capacity without complementary reform in education, institutions and business culture
- Science parks and innovation investments deliver limited returns where the supporting social networks are absent (Crescenzi and Rodríguez-Pose, 2012)

Closing: Effective place-based development requires ecosystem thinking that captures interdependencies between dimensions rather than optimising each separately.

Section 2: Toward Ecosystem Approaches

2.1 Why Integrated Approaches Have Not Succeeded Before

Historical barriers to integration Opening: Traditional approaches deliberately reduced complexity for analytical tractability, which limited the understanding of development as a whole.

Evidence:

- Models reduce the complexity of the dynamics at play to make essential mechanisms discernible, a tradeoff that constrained holistic understanding, and before the digital revolution a comprehensive multi-dimensional analysis was in any case technically infeasible
- EU regional policy was implemented through sectoral silos, with fragmented programmes failing to cohere, and coordination across the European Commission, national governments and regional authorities often produced policy incoherence

Closing: These constraints forced an oversimplification that missed the interdependencies essential to effective regional development.

Recent enabling advances Opening: The convergence of data, methods and institutional learning now makes integrated approaches feasible.

Evidence:

- New data sources allow regional analysis at previously unavailable granularity. This is seen also in multi-dimensional indices, network analysis and machine learning permit pattern recognition across many variables at once
- Tools such as Chetty et al.'s (2022) connectedness measures demonstrate fine-grained insight into mobility from large anonymised datasets

Closing: These advances enable the ecosystem approach that the analytical complexity of the problem previously made infeasible.

2.2 Early Systems Thinking in Regional Development

Regional innovation systems as precursor **Opening:** Cooke's (2001) regional innovation systems recognised early that innovation emerges from interactions between firms, institutions and knowledge infrastructure rather than from individual actors.

Evidence:

- Cooke (2001) defined the regional innovation system as clusters of innovating firms surrounded by suppliers and research institutions
- The emphasis fell on system properties: collective learning, institutional thickness, associative governance
- Applied across EU regions, the framework revealed the importance of regional specificity

Closing: Regional innovation systems demonstrated the value of systems thinking early on, although their focus remained on innovation and never widened to development as a whole.

Evolutionary economic geography **Opening:** Boschma (2015) and Martin and Sunley (2015) advanced ecosystem thinking through evolutionary approaches emphasising adaptation and resilience as system properties.

Evidence:

- Boschma (2015): regions as complex adaptive systems with co-evolving economic, institutional and social dimensions. Finding that path dependence operating through related variety, with new activities emerging from existing capabilities
- Martin and Sunley (2015): resilience as an adaptive capacity emerging from system characteristics rather than a single attribute

Closing: These approaches pointed toward integrated frameworks, but never operationalised them systematically across several development dimensions.

2.3 Network Approaches and Social Embeddedness

Social capital as a development factor **Opening:** Social capital research showed how relationships and community structures shape development beyond individual capabilities or resources.

Evidence:

- Coleman (1988): social capital residing in the structure of relations between actors rather than in individuals

- Putnam (1993): Italian regions with stronger civic traditions showing better institutional performance and economic development
- Granovetter (1973): the strength of weak ties, with different network types serving different economic functions

Closing: Social capital research exposed the inadequacy of purely economic accounts, yet it remained in need of integration with territorial and institutional factors of its own.

The breakthrough of economic connectedness **Opening:** Chetty et al. (2022) provided strong evidence that cross-class social connections affect economic mobility beyond individual characteristics.

Evidence:

- Economic connectedness correlates strongly with upward income mobility across US areas ($r = 0.69$ at ZIP-code level), and low-status children raised in high-connectedness areas would see adult incomes about 20% higher on average, an association that persists after controlling for racial composition, income and education
- The mechanisms run through information about opportunities, referrals and the transmission of norms

Closing: Network research thereby identifies a social activation mechanism for development, though it leaves open where the differences in network structure come from in the first place.

2.4 Territorial Innovation and Economic Complexity

Integrated territorial frameworks **Opening:** Crescenzi and Rodríguez-Pose (2012) developed an integrated framework linking territorial assets, innovation inputs and socioeconomic conditions.

Evidence:

- Innovation depends jointly on R&D, socioeconomic context and geography, with European regions more dependent on local conditions than US regions.
- Infrastructure quality moderates the effectiveness of R&D./
- The social filter concept: territories with appropriate social structures translate inputs into innovation more effectively.

Closing: Here too the potential of an integrated framework is clear, though the lens is innovation rather than development as a whole.

Economic complexity and regional capabilities **Opening:** Hidalgo and Hausmann (2009) and subsequent regional applications showed that the sophistication of productive structures predicts development trajectories better than traditional measures.

Evidence:

- Economic complexity predicts future growth better than governance, education or competitiveness measures alone
- The product space shows how regions diversify into related activities
- Balland et al. (2019) apply this to EU regions, arguing that smart specialisation requires understanding existing capabilities

Closing: Complexity approaches reveal structural determinants of development, and they gain their full meaning only once joined to the social and territorial dimensions through which capabilities accumulate.

2.5 The Ecosystem Gap in Current Literature

Existing multidimensional frameworks measure side by side **Opening:** Several established frameworks already describe European regions on multiple dimensions, so the contribution here is not multidimensionality as such. What these frameworks share is that they score dimensions alongside one another without modelling how the dimensions act on each other.

Evidence:

- The EU Social Progress Index (Annoni and Bolsi, 2020) ranks NUTS 2 regions on basic needs, foundations of wellbeing and opportunity, but deliberately excludes the economic dimension so as to complement GDP, and specifies no interaction between its components
- The EU Regional Competitiveness Index (Dijkstra, Annoni and Kozovska, editions 2010 to 2022) aggregates eleven pillars through a fixed weighting scheme, viewed through competitiveness rather than inclusive development, with no account of how the pillars condition one another
- The OECD regional well-being framework (Veneri and Murin, 2019) presents eleven dimensions as a dashboard with equal weights and no theoretical aggregation, a monitoring instrument rather than a generative model
- Camagni and Capello's (2013) territorial capital, operationalised by Fratesi and Perucca (2018), supplies a rich taxonomy of regional assets but as an endowment account rather than a specified structure of cross-dimensional interaction

Closing: These are measurement traditions, and valuable ones, but none states how territory, people and economy act on each other, which is precisely the question an ecosystem framework must answer.

The interaction evidence is real but gradual **Opening:** Separately from the measurement frameworks, a body of empirical work does model the interactions, but it does so one pair of factors at a time, never as a single system.

Evidence:

- Rodríguez-Pose and Ketterer (2020): improvements in institutional quality drive growth in lagging regions, and the effect is moderated by the structure of the local economy
- Muringani, Fitjar and Rodríguez-Pose (2021): the economic return to bridging social capital is conditional on a region's human capital, the two acting as partial substitutes in high-skill regions.
- Cortinovis, Xiao, Boschma and Van Oort (2017): formal and informal institutions jointly drive regional diversification, with a combined effect larger than either alone
- Charron, Dijkstra and Lapuente (2014): regional institutional quality is the dominant predictor of generalised trust, a direct pathway from the territorial to the social

Closing: Each of these isolates a single cross-term while holding the rest of the regional system fixed. The contribution of the present framework is to bring these scattered pairwise findings, and the side-by-side measurement traditions above, into one organisation that treats territory, people and economy as a single interacting system (and that the empirical companion then tests).

Section 3: The Regional Development Ecosystem Framework

3.1 Framework Architecture and Theoretical Foundations

The three-pillar structure Opening: The framework conceptualises regional development through three interconnected pillars, Place-based Conditions, Human and Social Capital, and Economic Activity, each necessary but insufficient alone.

Evidence:

- Basic territorial conditions act as gateways to development (Di Cataldo and Rodríguez-Pose, 2017)
- Social networks mediate between individual capabilities and economic outcomes, providing on-ramps, upward mobility, job prospects, and financial security (Chetty et al., 2022)
- Economic structures determine future possibilities (Hidalgo and Hausmann, 2009)
- Resilience emerges from multi-dimensional interaction rather than from any single dimension (Martin and Sunley, 2015)

Closing: Organising the indicators into three domains keeps the analysis clear, while the interactions between the pillars keep it faithful to how complex the system actually is. The boundaries are organisational, they are a way of grouping territory, people and economy for analysis, not a claim that the three are cleanly separable, and the companion paper finds that they are not.

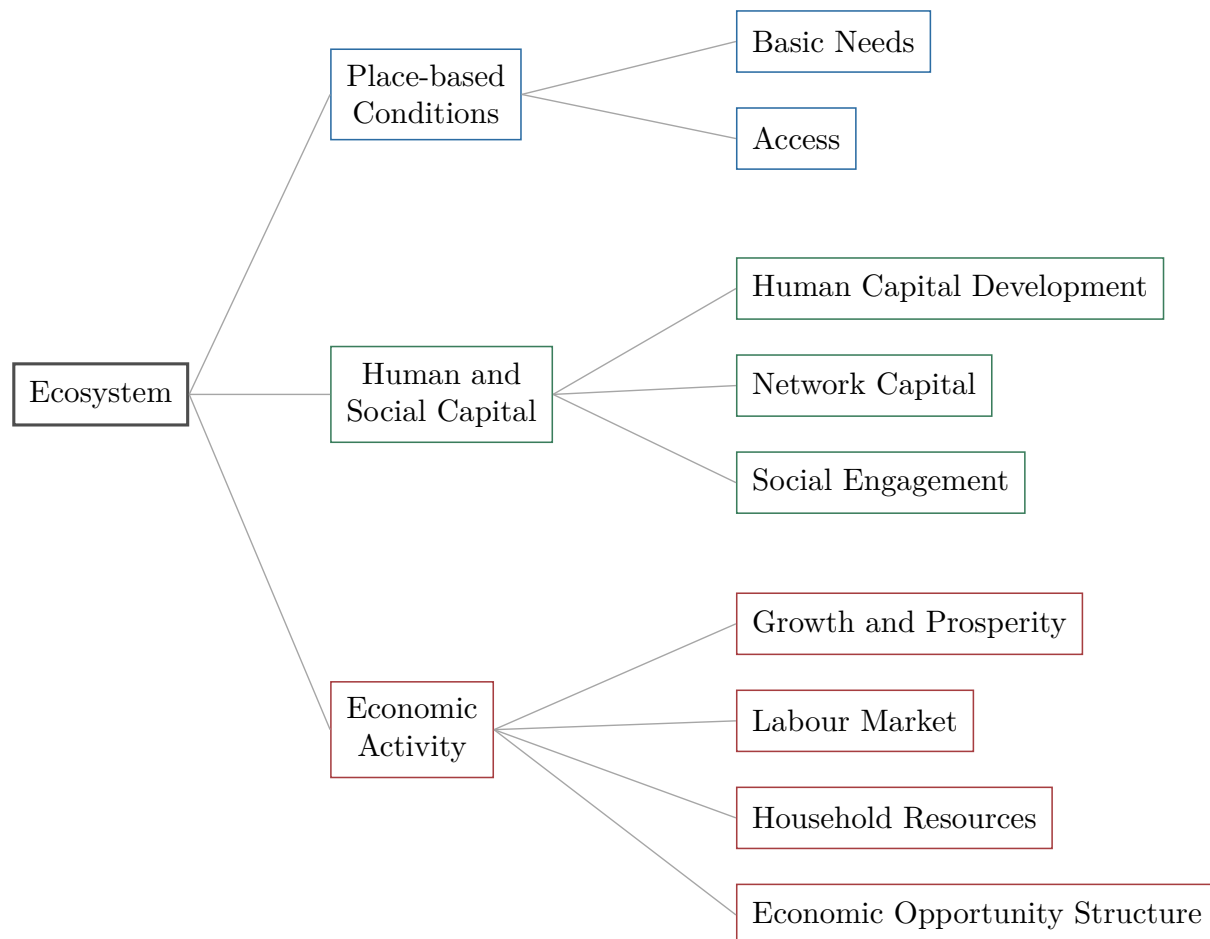


Figure 1. The three pillars and their sub-domains.

Why these three pillars **Opening:** The three-pillar structure reflects consistent evidence that development requires simultaneous progress across territorial, social and economic dimensions, with specific interaction patterns between them.

Evidence:

- Physical infrastructure without social activation yields limited returns (Crescenzi and Rodríguez-Pose, 2012)
- Human capital without economic opportunity produces brain drain, as documented across Eastern Europe, and also under-utilization of resources that form the talent in the first place
- Economic growth without institutional quality has been shown to be unsustainable, unreliable, and ineffectual (Rodríguez-Pose and Garcilazo, 2015)
- The complementarities between dimensions appear stronger than the substitution effects, so a deficit in any one can bind the whole system

Closing: The framework captures how a limitation in any dimension can become a binding constraint on the others. The three are not mutually exclusive boxes, and some indicators could be argued into more than one, institutional quality and household security being the clearest cases. Where a construct could sit in more than one pillar, it is assigned by its primary role in the mechanism map: a territorial or institutional foundation goes to Place, a capability or connection that activates that foundation goes to People, and a current outcome or a source of future productive potential goes to Economy. On that rule institutional quality is a Place foundation, household security an economic outcome, and knowledge infrastructure a Place asset that the economy draws on. They are the smallest grouping that keeps territory, people and economy analytically visible while letting the mechanisms between them be named. What justifies the partition, in the end, is what it yields, a durable typology and a usable mechanism map, and the domains need not be separable in the data for that to hold.

3.2 Place-based Conditions: The Territorial Foundation

Conceptual foundations **Opening:** Place-based Conditions are the physical, infrastructural and institutional environment that creates the basic possibility space for development.

Evidence:

- Barca (2009): territory as a persistent construction of interdependencies rather than mere geography
- Iammarino et al. (2019): place-specific factors creating spatial development traps, in which different regions can fall into, and have hard time getting out of
- The integration of formal and informal institutions, following Rodríguez-Pose's work on the institutional foundations of regional growth

Closing: Territory provides necessary foundations that require activation through social and economic mechanisms.

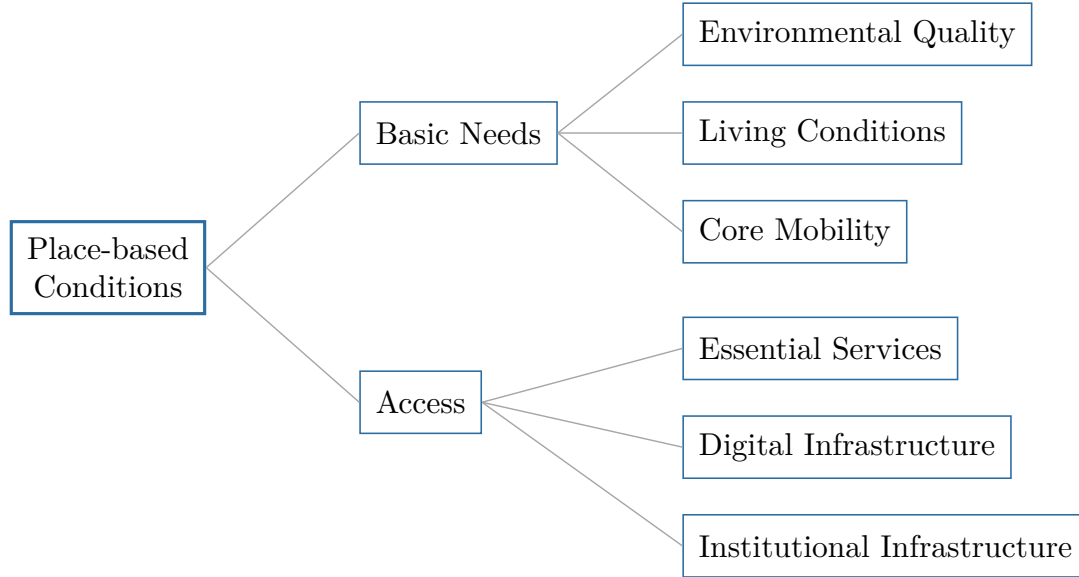


Figure 2. Place-based Conditions: sub-domains and components.

Basic needs and access Opening: Environmental quality, living conditions and access to services are gateway requirements without which other development processes cannot function.

Evidence:

- Regions below basic thresholds show constrained development regardless of other investment (Di Cataldo and Rodríguez-Pose, 2017)
- Environmental quality affects productivity and resilience through health
- Access to healthcare, education and digital infrastructure shapes the opportunity landscape, with core-periphery dynamics reinforcing spatial inequality (Tranos and Nijkamp, 2013)

Closing: Inadequate basic conditions impose ceilings on development that other investment cannot lift. ### Institutional infrastructure

Opening: Institutional infrastructure is the organisational capacity for governance and service delivery that determines how other investments translate into outcomes.

Evidence:

- The returns to public investment are strongly moderated by the quality of regional government (Rodríguez-Pose and Garcilazo, 2015)
- A strong bivariate association, on the order of 0.5 to 0.6, holds between the European Quality of Government Index and regional development, which the authors read as mutual reinforcement between governance and development rather than a one-way effect (Charron, Dijkstra and Lapuente, 2014)
- Knowledge infrastructure constrains innovation regardless of human capital (Balland et al., 2019)

Closing: In this sense institutional effectiveness acts as a multiplier, or a brake, on the impact of every other investment a region receives.

3.3 Human and Social Capital: The Activation Dimension

Bridging the individual and the collective **Opening:** Human and Social Capital are the capabilities and connections that activate territorial potential and mediate its translation into economic outcomes.

Evidence:

- The integration of Becker’s (1964) human capital with Coleman’s (1988) social capital as relational structure between those that inhabit a place
- Social connections strongly affect mobility beyond individual capability (Chetty et al., 2022)
- Civic traditions affect institutional performance and economic outcomes (Putnam, 1993), although not mobility only (Chetty et al., 2022)

Closing: Individual capabilities function most effectively through social mechanisms, which calls for integration rather than separate treatment.

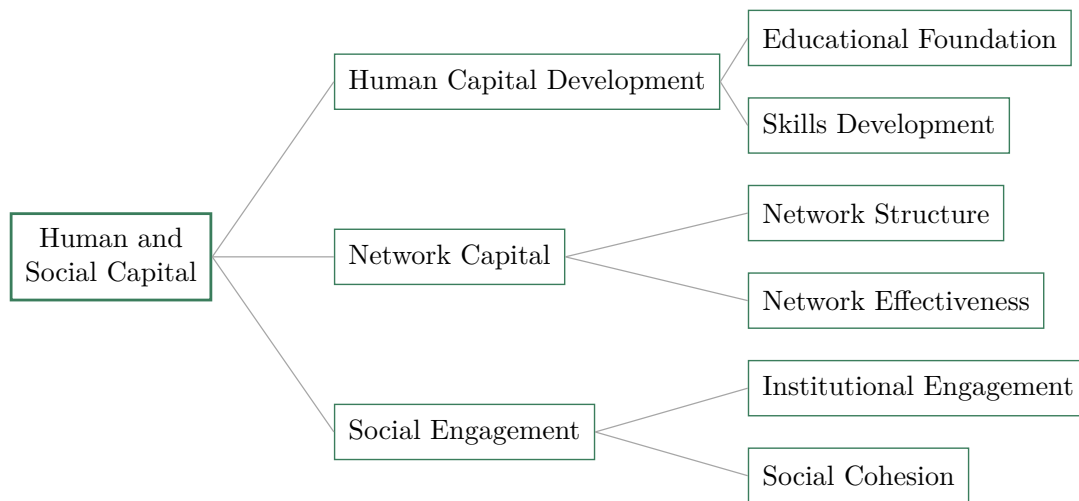


Figure 3. Human and Social Capital: sub-domains and components.

Human capital, networks and engagement **Opening:** The pillar spans the stock of skills, the architecture of connections, and the patterns of civic participation and trust.

Evidence:

- Cognitive skills matter more than years of schooling for growth (Hanushek and Woessmann, 2008), and regional human capital explains a substantial share of development differences (Genaioli et al., 2013)
- Network position shapes outcomes, with weak ties enabling opportunity discovery and brokerage yielding advantage (Granovetter, 1973; Burt, 2004)
- Institutional trust and civic engagement enable the collective action on which governance effectiveness depends (Charron, Dijkstra and Lapuente, 2014)

Closing: The capability stock, the network structure, and the engagement patterns together determine how effectively a region converts potential into outcomes.

3.4 Economic Activity: Outcomes and Future Potential

Beyond aggregate output **Opening:** Economic Activity captures both current performance and the structural characteristics that determine future potential, moving beyond GDP to multidimensional prosperity.

Evidence:

- The case for measures beyond production, including distribution and sustainability (Stiglitz, Sen and Fitoussi, 2009)
- Inequality affecting the duration of growth more than its level (Berg and Ostry, 2017)
- Household vulnerability persisting alongside aggregate prosperity (OECD, 2020)

Closing: Economic measurement must capture generative capacity and distributional outcomes alongside aggregate performance.

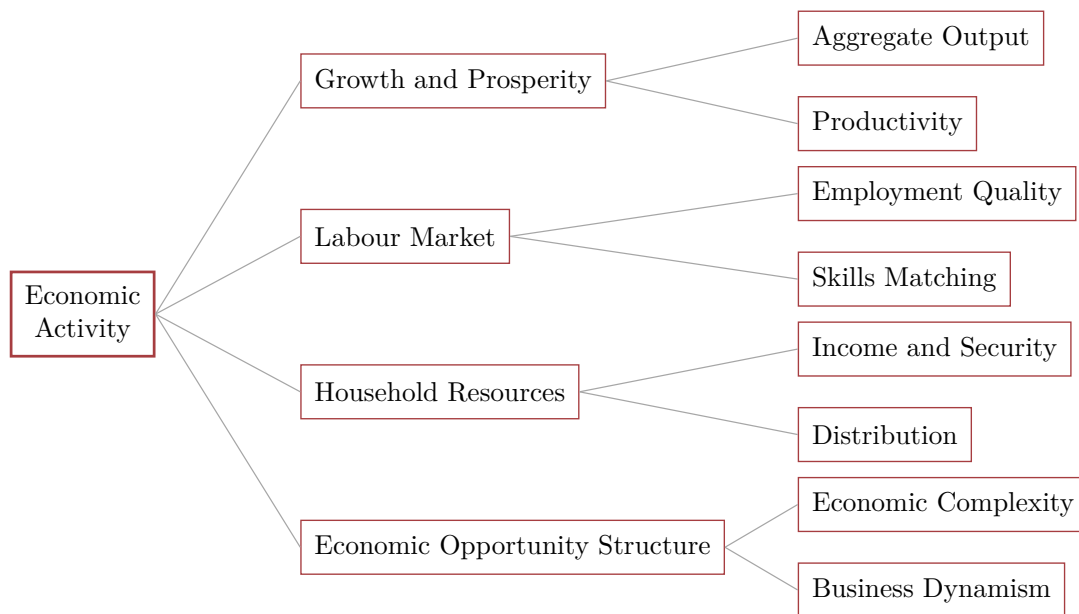


Figure 4. *Economic Activity: sub-domains and components.*

Complexity, labour markets and household resources **Opening:** The pillar spans the sophistication of the productive structure, the quality of the labour market, and the security of household resources.

Evidence:

- Economic complexity predicts growth better than traditional indicators (Hidalgo and Hausmann, 2009), with diversification depending on existing capabilities (Balland et al., 2019)
- Labour-market quality, not only the level of employment, shapes household prospects
- Household income and security diverge spatially through sorting, and neighbourhood conditions affect long-run outcomes (Chetty and Hendren, 2018)

Closing: Structural and distributional characteristics reveal development potential that aggregate output conceals.

3.5 Ecosystem Integration: How the Pillars Interact

What interconnection means in this framework Opening: The framework’s thesis is that regional development is a coupled, dynamic system whose structure becomes visible only under stress. While the system rests, its parts move together, so that it looks one-dimensional (i.e., a single ‘development’ factor), and it is only when a shock pulls those parts apart at different rates that the structure appears. This is what the word ecosystem is meant to capture, which the empirical companion paper tests in the following hypothesis: in calm conditions the pillars should not resolve into three separate factors but collapse towards a single general one, whereas under a shock the coupling should loosen selectively rather than uniformly.

Evidence:

- The interaction runs through three mechanism types: enabling, where territorial conditions create the possibility of capability and network formation, mediating, where human and social capital translate territorial potential into economic outcomes, and feedback, where economic outcomes reinforce or erode the foundation. Each has a named precedent in the piecemeal literature of Section 2 (Rodríguez-Pose and Ketterer, 2020; Muringani et al., 2021; Cortinovis et al., 2017; Charron, Dijkstra and Lapuente, 2014), which the framework draws together rather than replaces
- Were the pillars merely one underlying factor, they could not come apart selectively under stress, so a selective decoupling would mark them as distinct, were they truly independent, they would not move together so closely in calm times, so a pervasive correlation would mark them as coupled. The framework predicts both at once, and it is holding both together that separates a coupled system from either alternative

Closing: Interconnection, on this account, is a property of a coupled dynamic system, one that would move as one in calm conditions and come apart under stress. What should change is the covariance, not the level: under a shock the place pillar’s couplings to the other two should barely move even as the human-and-social to economic link loosens. There is a reason to expect that relation to give first. The people-to-economy link is the fast, behaviourally mediated coupling between activation and outcome, the one a demand shock acts on directly, whereas place-based conditions are a slow-moving stock of physical and institutional endowments that a short shock cannot quickly rewrite. A system-level reading of this kind adds what a single composite index, or a single pairwise study, cannot, and it is why I present the framework as a living system rather than a fixed taxonomy. The configurations it identifies are stable but able to shift, and the structure is dynamic as opposed to a permanent classification, which as the literature shows is unlikely given how much pairwise variation occurs throughout Europe’s regions.

Enabling, mediating and feedback in detail Opening: The framework states these mechanisms as a map of directed pathways between pillars. The matrix below is the testable set for the empirical paper: each cell names a pathway and its precedent, and the commitment the framework makes is to these pathways, not to the pillars themselves.

Pathway	Mechanism	What it says	Precedent
Place to People	enabling	infrastructure and institutions enable network formation and civic engagement	Tranos and Nijkamp 2013; Charron, Dijkstra and Lapuente 2014

Pathway	Mechanism	What it says	Precedent
Place to Economy	enabling, gateway	basic conditions and government quality gate the returns to investment	Di Cataldo and Rodríguez-Pose 2017; Rodríguez-Pose and Garcilazo 2015
People to Economy	mediating	human and social capital raises economic connectedness, which mediates access to economic mobility, and the return to R&D depends on local human capital	Chetty et al. 2022; Crescenzi and Rodríguez-Pose 2012
People to Place	feedback	civic capacity and trust sustain institutional quality	Putnam 1993
Economy to Place	feedback	the tax base funds the territorial foundation	this paper
Economy to People	feedback	high-productivity activity attracts and retains skills, and income funds capability formation	this paper

Closing: Specifying the mechanisms as directed pathways, rather than generic correlation, is what separates the framework from a composite index, and it is what lets the framework generate standing configurations of its own accord. The feedback pathways close loops, Economy to Place to People to Economy, so a configuration becomes self-reinforcing: a region whose enabling pathways are weak cannot turn investment into capability and stays in a low basin, whereas one whose loops are intact compounds its advantages. The clubs and traps that the regional literature has long described are, on this reading, the standing solutions of this pathway structure.

3.6 From framework to empirical demonstration

Opening: The framework is built to be tested, and the empirical companion evaluates it against European NUTS 2 data across a pre-pandemic and a post-pandemic period. The following four propositions are presented that define this test.

Evidence:

- That regional development is strongly and spatially structured, rather than a scatter of independent indicators
- That the three pillars are a useful conceptual organisation and a reliable composite, but not three statistically separable dimensions, at the indicator level a single general factor of development fits better
- That the framework yields a stable four-tier typology of regions and a layer of cross-cutting syndromes in which aspects of regional life move together

- That the system responds to shock in a structurally specific way, with the link between human and social capital and economic activity loosening under the pandemic while the place-based foundation holds

Closing: These four are the framework’s commitments, and the companion is where they meet the data. Its initial evidence is consistent with all four, the second in the qualified form given above, that the pillars are a reliable composite rather than three separable latents.

Section 4: Implications and the Road to Demonstration

4.1 What the framework changes about regional policy

Opening: Understanding regions as ecosystems shifts development policy from optimising individual factors to managing the configuration of a system.

Evidence:

- Diagnosis changes from a needs assessment of separate domains to an assessment of where a region sits in the configuration of all three pillars
- Intervention changes from transferable best practice to context-specific action on the binding constraint of a given region
- Coordination becomes a requirement rather than an aspiration, since the separate operation of the ERDF, ESF+ and Cohesion Fund works against the interdependencies the framework identifies
- Evaluation shifts from output metrics toward indicators of system health, including the strength of the couplings between pillars

Closing: The framework’s policy value is to be diagnostic: it points to which dimension is likely to be binding for a given configuration of the three pillars, instead of prescribing the same instrument everywhere. Admittedly it does not yet give a rule that maps each region-type to its binding pillar. What it changes, for now, is the question a diagnosis asks, namely from how much of each input a region lacks to which coupling is failing to turn those inputs into outcomes.

4.2 The typology as clubs and traps

Opening: A coupled system with self-reinforcing loops does not spread regions evenly along a single scale, it should settle them into a small number of stable configurations, some deeper and harder to leave than others. From this perspective the framework connects to an established line of regional economics.

Evidence:

- Those stable configurations are the development clubs of Iammarino, Rodríguez-Pose and Storper (2019), where the challenge at each tier is qualitatively different rather than a further step along one convergence path
 - The lowest of them is the development trap of Diemer et al. (2022), a long-run structural state they establish on decades of data, the framework reads it as the deepest basin, the one whose loops run hardest against reversal
- Closing:** This reframes the policy problem, because what looks like one ladder conceals two quite different failure modes. A region in a deep basin is held there by the very loops that would otherwise lift it, now running the wrong way, and

incremental funding does not move it unless it reaches the binding constraint. A leading region is less secure than its rank suggests, holding its position only while its loops stay intact and slipping when they loosen. Defending a strong region and lifting a trapped one are therefore separate tasks that call for separate instruments, and it is here that the framework does its real work as a diagnostic, matching the instrument to the basin rather than prescribing convergence everywhere. The stakes run heaviest at the bottom, where the trapped regions are also the places the discontent literature has tied to long-term decline (Rodríguez-Pose, 2018; Diemer et al., 2022).

4.3 From description to dynamics

Opening: The present paper sets out the framework, and the companion measures it, but neither can model the forces that hold a region in a basin or move it between basins. That is the task of the remainder of the doctoral project.

Evidence:

- The third paper formalises the dynamics as a heterogeneous-agent model, reusing the modelling apparatus I developed previously, with the regional types appearing as multiple equilibria and the central question being what tips a region from one basin to another
 - This connects the framework to the established economics of multiple equilibria, club convergence and development traps, of which the typology is the empirical shadow
 - A control-theoretic reading, in which a region is a state to be steered by policy as the control input, and a higher-order representation of the syndromes as a hypergraph rather than a network of pairs, are the natural formal languages for that work, though each requires data that two observed periods cannot provide
- Closing:** The framework sets out the landscape in a way that an empirical companion can effectively measure it, which then sets up a modelling paper to describe the dynamics and run scenarios. The main methods involved are control theory and hypergraph.

Conclusion

This paper has proposed an ecosystem framework that organises regional development around three interacting pillars and specifies the enabling, mediating and feedback mechanisms through which they act on one another. To be clear about the nature of the contribution: a substantial literature already establishes that the dimensions of regional development interact, one pair of factors at a time, and a parallel measurement literature already describes regions on several dimensions at once, so there is no discovery claim here. What this paper adds is the drawing of those scattered findings into a single organisation, conceptually specified and built to be tested, which the empirical companion then does.

The three pillars are a conceptual organisation and a reliable composite rather than three statistically separable dimensions, and their value lies in what they make visible: a typology of regional configurations, a layer of cross-cutting syndromes, and a structurally specific response to stress. The interconnection the framework asserts is specific and testable, the conjunction of strong coupling in normal times with selective decoupling under stress, a conjunction that neither a single underlying factor with stable loadings nor a set of independent parts can produce.

Read through the regional clubs and development traps of the existing literature, the typology the framework implies is a set of stable configurations into which regions settle, basins of differing depth.

That reading is the bridge from this conceptual paper to the empirical companion that demonstrates it, and onward to the dynamic model that will ask what holds a region in place and what might move it. The aim of these papers is not just about identifying a single decisive finding, it seeks to establish a coherent and defensible understanding of regional development as an interconnected system, built to respect a literature that has so far addressed that system only in parts, and crucially to bring those parts together.

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