The Phantom Region Administrative Constructs, Knowledge Leakage, and the Case for Coherence-Based Regional Policy in South Holland

J. **Konstapel** Constable Research, 9-6-2026 Leiden, Netherlands

Abstract

This paper challenges the conceptual and empirical foundations of administrative region-building in the South Holland metropolitan area, using the Key Region Leiden / Holland Rijnland governance construct as a case study. Drawing on CBS labour market data (2024), the European University Spinout Report (2025), the Rabobank regional labour market analysis (2026), and the Havenvisie 2050 documentation, we demonstrate that the "region" as defined by its administrative architects is a polycentric field of at least five structurally distinct gravitational economies — Amsterdam/Schiphol, The Hague, Rotterdam/Port, Delft/TU Delft, and Leiden — whose internal logics are largely orthogonal to one another. The formal regional governance apparatus (Key Region Leiden, Holland Rijnland, ROM-B) systematically conflates enclave-based knowledge-intensive production with dormitory commuter geography, producing institutional designs that serve administrative reproduction rather than territorial coherence. We introduce the concept of a *coherence gap* — the measurable divergence between declared regional identity and actual flow-based economic interdependence — and propose a Coherence-Based Regional Development (CBRD) framework as an alternative, grounded in oscillatory systems theory, evolutionary economic geography, and empirical flow mapping. We argue that a genuinely functional regional system requires alignment of knowledge production, valorisation, labour market articulation, and democratic accountability at the scale where flows actually occur.

Keywords: regional innovation systems; knowledge spillovers; administrative construct; coherence gap; evolutionary economic geography; South Holland; valorisation; related variety; oscillatory coupling

1. Introduction: The Region That Does Not Exist

The concept of a "region" has served as the foundational unit of European economic policy for three decades, institutionalised through the NUTS classification system, the European Regional Development Fund, and a proliferation of Regional Innovation Strategies (RIS3). Yet the very success of this administrative apparatus has obscured a fundamental empirical question: do the units called "regions" correspond to anything that actually functions as an integrated economic system?

This paper argues, in the specific case of the South Holland metropolitan area in the Netherlands, that the answer is largely no — and that this non-correspondence between administrative fiction and economic reality has systematic consequences for the kinds of interventions that regional governance bodies propose and fund.

The immediate occasion for this analysis is the ROM-B initiative (Ruimtelijke Ontwikkelingsmaatschappij Bedrijventerreinen), a planned public investment vehicle announced by the Key Region Leiden partnership in 2025, whose declared aim is to improve the utilisation of industrial estates in four municipalities around Leiden through densification, relocation, and sustainability upgrades. The vehicle is structured as a revolving fund with municipal shareholders, governed by a dedicated organisation with its own staff and board. Substantive decisions will be taken by municipal councils after local elections in 2026.

We take the ROM-B not as our primary object of analysis but as a diagnostic lens. The assumptions embedded in its design — about what constitutes a region, who the relevant economic actors are, and what mechanisms drive territorial development — illuminate, with unusual clarity, a set of conceptual pathologies that pervade contemporary Dutch regional governance. Understanding these pathologies is a precondition for imagining something better.

The argument proceeds as follows. Section 2 reviews the theoretical landscape, situating our critique within evolutionary economic geography and systems theory. Section 3 presents the empirical anatomy of the South Holland polycentric field — the five gravitational economies and their actual flow structures. Section 4 analyses the coherence gap between administrative narrative and empirical reality in the Key Region construct. Section 5 develops the concept of a Coherence-Based Regional Development (CBRD) framework. Section 6 discusses implications for policy design. Section 7 concludes.

2. Theoretical Background

2.1 What Makes a Region?

Regional science has oscillated between two poles in its answer to this question. The first is functional: a region is defined by the intensity and frequency of economic flows — commuting, trade, knowledge exchange, investment — within a bounded territory relative to flows crossing that boundary (Karlsson & Olsson, 2006; Cheshire & Gordon, 1998). The second is constructivist: a region is what political actors and institutions make it, through boundary-drawing, naming, and the creation of governance apparatus (Paasi, 2009; MacLeod & Jones, 2001). These two definitions are routinely confused in practice, with administrative regions being naturalised as if they were functional regions.

The confusion is consequential. When governance interventions are designed for administrative regions that do not correspond to functional economic systems, the policy mechanisms selected will systematically misalign with the actual dynamics of the territory. Actors, flows, and feedback loops that matter will remain invisible; actors and institutions that exist only within the administrative frame will be privileged.

2.2 Evolutionary Economic Geography and Related Variety

Evolutionary economic geography (EEG), as developed by Boschma, Frenken, and collaborators, offers the most analytically precise framework currently available for understanding how regional economies actually develop (Boschma & Frenken, 2006, 2011; Frenken, Van Oort & Verburg, 2007). Central to EEG is the concept of *related variety*: the empirical finding that regional economic growth is driven not simply by specialisation (Marshall-Arrow-Romer externalities) or pure diversity (Jacobs externalities), but by the presence of industries that share cognitive proximity

— sufficient similarity in knowledge base to enable meaningful knowledge spillovers, sufficient difference to generate new recombinations (Frenken et al., 2007).

The policy implication is significant: a region that artificially aggregates unrelated industries under a single governance umbrella does not thereby create the conditions for knowledge spillovers. The administrative act of boundary-drawing cannot substitute for the organic development of cognitive proximity between economic actors.

Knowledge spillovers, moreover, are not diffuse atmospheric phenomena. They travel through specific mechanisms — labour mobility between firms, informal social networks, patent citation chains, spin-off formation — and these mechanisms are highly localised and path-dependent (Breschi & Lissoni, 2001; Audretsch & Feldman, 1996; Boschma, Eriksson & Lindgren, 2009). The knowledge produced at Leiden Bio Science Park does not "spill over" to the businesses on the Grote Polder industrial estate in Zoeterwoude simply because both are located within the Holland Rijnland administrative boundary.

2.3 The Triple Helix and Its Discontents

The dominant policy framework for regional innovation in Europe and the Netherlands is the Triple Helix model of university-industry-government relations (Etzkowitz & Leydesdorff, 1995, 2000). Key Region Leiden explicitly organises itself around this model, describing its work as facilitating the "triple helix" between government, knowledge institutions, and business.

The Triple Helix framework has generated genuine insights about the changing role of universities in regional economies. However, it has also been subject to systematic critique on several grounds (Leydesdorff, 2021; Cai & Etzkowitz, 2020). First, the model tends to assume that the three helices are co-present and roughly co-scaled in any given region — that the local university, local industry, and local government are natural partners. Where this assumption fails — as when the university operates at international scale while government operates at municipal scale while industry is fragmented between enclave multinationals and local SMEs — the Triple Helix becomes a governance fiction rather than a system description.

Second, the Triple Helix model is largely silent about the conditions under which knowledge generated in universities actually transforms into economic value accessible to the surrounding territory, as distinct from value captured by international corporations through acquisition. This question — the geography of valorisation — is central to any serious assessment of regional knowledge economies.

2.4 Coherence as a Systems Concept

We propose to supplement the EEG framework with a concept drawn from oscillatory systems theory: *coherence*. In physical systems, coherence refers to the phase-synchronisation of coupled oscillators — the degree to which subsystems reinforce rather than cancel each other's dynamics. Applied to regional economies, coherence describes the degree to which the distinct economic circuits that occupy a territory are functionally coupled: sharing labour, exchanging knowledge, co-producing value, and maintaining feedback loops that allow each circuit to respond to the state of the others.

A coherent regional economy is not a homogeneous one. Just as a coherent optical field can carry diverse information precisely because its components are phase-aligned, a coherent regional economy can contain diverse sectors and actors whose diversity becomes productive because they are connected by functioning circuits of knowledge, labour, and value. What coherence rules out is

what we observe in the South Holland case: five large economic circuits — government services, port logistics, technology spin-offs, agricultural export, and commuter residential — that occupy adjacent territory but whose dynamics are largely decoupled from one another.

The concept of corporate coherence, introduced by Teece et al. (1994) and extended in the economic complexity literature (Pinheiro et al., 2021), points in a related direction: coherence matters not just for growth but for profitability and resilience. Incoherent aggregates — whether firms or territories — are more fragile, because they cannot mobilise complementary capabilities in response to shocks.

3. The South Holland Polycentric Field: An Empirical Anatomy

3.1 Five Gravitational Economies

The territory governed by Holland Rijnland and positioned by Key Region Leiden as a unified innovation region is, empirically, a polycentric field of five structurally distinct economic gravitational centres, each with its own logic, its own labour market, its own knowledge base, and its own relationship to the global economy.

Economy 1: The Hague — Public Power and International Law

The Hague is the seat of the Dutch national government and the world's largest concentration of international legal and humanitarian organisations. The city hosts approximately 500 international organisations, including the International Court of Justice, the International Criminal Court, Europol, and the permanent missions of virtually all UN member states. These organisations collectively spend approximately €2.7 billion annually and generate 20,000 jobs in the city (Gemeente Den Haag, 2025). In 2024 alone, 28 new international organisations opened offices in The Hague (The Hague & Partners, 2025).

The dominant employment sector in The Hague is the public sector (CBS, 2025a). This has profound implications for the commuting geography of the broader region: a substantial share of the highly educated residents of Leiden, Leidschendam-Voorburg, and surrounding municipalities work in The Hague's governmental and international organisations ecosystem. These are not biotech researchers; they are lawyers, policy analysts, diplomats, and NGO professionals. Their working lives are entirely invisible in the Key Region narrative.

Economy 2: TU Delft — The Region's Actual Innovation Engine

TU Delft is, by any objective measure, the primary innovation engine of the broader South Holland region. According to the European University Spinout Report 2025, TU Delft is the leading Dutch university for value creation through academic spinoffs in deep tech and life sciences, ranking 15th in Europe overall (TU Delft, 2025). The Delft-Westland area has been recognised as the strongest entrepreneurship ecosystem in the Netherlands for multiple consecutive years (TU Delft Campus, 2025).

TU Delft achieves this through a functioning valorisation infrastructure: Delft Enterprises (which takes risk-bearing equity stakes in spinoffs), YES!Delft (an incubator with real market-development support), field labs in unmanned systems and water technology, and standardised IP deal terms that

reduce transaction costs for early-stage companies. This is a system designed to convert knowledge into locally-rooted economic value, not merely to produce research outputs.

The contrast with Leiden University is structurally significant and will be examined in detail in Section 3.3.

Economy 3: Rotterdam Port — Metabolic Logistics Under Structural Stress

The Port of Rotterdam is Europe's largest port by throughput, generating approximately 193,000 direct and indirect jobs and handling around 467 million tonnes of goods annually (Havenbedrijf Rotterdam, 2023). The port's economic logic is fundamentally different from the knowledge-economy logic of the LBSP or TU Delft: it is metabolic — transforming physical flows of energy, raw materials, and manufactured goods rather than generating intellectual property or growing companies.

Critically, the port faces a structural crisis. Rotterdam's industrial sector has been contracting for nearly twenty consecutive months as of early 2025, prompting the municipality and province to appeal to the national government for support comparable to the "Project Beethoven" package assembled for the Eindhoven/ASML ecosystem (NOS, 2025). The obstacles are structural: a saturated electricity grid, nitrogen deposition limits preventing new construction, high energy costs, and fundamental questions about the port's role in a post-fossil European economy (Havenvisie 2050, 2024).

This structural stress is entirely absent from Key Region Leiden's narrative of a thriving innovation region. Yet Rotterdam's trajectory matters enormously for the commuting geography of South Holland: tens of thousands of workers from Leiden, Zoetermeer, and surrounding municipalities depend on employment in the Rotterdam metropolitan area, and the port's contraction will generate labour market shocks that radiate throughout the region.

Economy 4: Amsterdam/Schiphol — Financial Capital and Contested Connectivity

Amsterdam functions as the Netherlands' primary node in the global financial and cultural economy, hosting the Euronext exchange, the headquarters of major multinationals, and the Amsterdam-based internet exchange (AMS-IX). Schiphol airport, located in Haarlemmermeer, is the region's primary international connectivity node and the sixth-largest European hub by passenger volume.

However, Schiphol faces a structural contraction enforced by noise and environmental regulation. The planned reduction in flight movements from 500,000 to 440,000 annually has been subject to repeated legal delays, but the direction of travel is clear (SchipholWatch, 2024). For a region that has premised much of its attractiveness on international connectivity and the easy import of highly skilled international talent, Schiphol's constrained future represents a significant structural vulnerability — one that, again, is absent from official regional narratives.

Economy 5: Leiden — The Commuter Zone with a Knowledge Enclave

Leiden occupies a peculiar position in this polycentric field. The city hosts two economically significant institutions: Leiden University (one of the oldest in Europe, founded 1575, with a 2024 budget of €974 million and 33,839 students) and the Leiden Bio Science Park (LBSP), the largest life sciences cluster in the Netherlands, hosting over 103 biomedical companies from 14 countries.

Yet Leiden's primary economic function, in terms of actual flows, is residential: it is a high-quality living environment from which highly educated workers commute to The Hague, Delft, Amsterdam, and Rotterdam. Nearly half of Holland Rijnland's working population is employed

outside the region (Holland Rijnland, 2025); for the highly educated, the majority work elsewhere. Leiden retains the bodies of its knowledge workers in the evening; it exports their productive capacity during the day.

3.2 The Commuting Structure: What the CBS Data Shows

The CBS labour market data for 2024 provides the most objective available picture of actual economic integration in the polycentric field. Key findings (CBS, 2024; CBS, 2025a):

- 58% of all Dutch workers in 2023 worked in a municipality different from where they lived. In the densely interconnected South Holland field, this figure is structurally higher.
- The largest commuting flows into Rotterdam originate from Nissewaard, Schiedam, Capelle aan den IJssel, and The Hague; 15,000 Rotterdam residents work in The Hague.
- The Hague draws heavily from Leidschendam-Voorburg, Zoetermeer, Rijswijk, and Westland.
- The Delft-Westland area is identified by Rabobank (2026) as one of the Netherlands' major net importers of labour — a zone that attracts workers from adjacent residential areas including Leiden.
- Leiden itself is a structural labour exporter: it sends workers to all five gravitational poles simultaneously, while generating too few local jobs to employ its own economically active population.

This commuting structure is the fundamental economic fact about the Leiden region that the administrative apparatus systematically ignores. The ROM-B is designed to improve the utilisation of industrial estates in a zone whose primary economic function is residential. It addresses the stones, not the flows.

3.3 The Valorisation Gap: Leiden University vs TU Delft

The contrast between the valorisation trajectories of Leiden University and TU Delft deserves extended treatment, because it illuminates the deeper question of whether knowledge production at a regional anchor institution generates locally-retained value or whether that value escapes the region through the acquisition pipelines of global corporations.

Leiden University's technology transfer and investment activity is organised through Libertatis Ergo Holding B.V. (LEH), a wholly-owned subsidiary established in 1996. The history of LEH is, in itself, diagnostic. From its founding until approximately 2005, LEH attempted to generate commercial income from university activities but found the costs and risks too high to manage from within a university context. From 2005 to approximately 2018, LEH's own direct investment activity was modest; it relied instead on external VC funds to assess and fund spinoffs. Only from 2018 did LEH begin direct equity investment, and only from 2020 — with the appointment of a dedicated investment team under Rob Mayfield, a former VC professional — did its activity become substantial (Libertatis Ergo Holding, 2025).

The current LEH portfolio comprises approximately 40 startup and spinout companies (LEH, 2025). These are almost exclusively biomedical: therapeutics, diagnostics, medtech, digital health. The portfolio is pre-commercial in the main — it represents early-stage bets on translational science, not a functioning local ecosystem of scaling companies.

The structural problem is not the quality of Leiden's science, which is internationally distinguished. The problem is the valorisation pathway. When Leiden spinoffs succeed — as Crucell did, floating on the stock exchange in 2000 and subsequently acquired by Johnson & Johnson — the economic value generated leaves the region entirely. The acquisition price goes to shareholders (including the

university), not to local employment, local supply chains, or local tax base. Leiden produces the knowledge; the global pharmaceutical industry captures the value.

This dynamic is precisely what Frenken et al.'s (2007) framework of related variety would predict: Leiden's knowledge economy is a single-sector enclave (biomedicine), with no related variety to generate the cognitive proximity spillovers that could seed a broader innovation ecosystem. The LBSP is a knowledge production zone, not a knowledge economy.

TU Delft, by contrast, has invested three decades in building a valorisation infrastructure that keeps value local for longer. Delft Enterprises takes equity stakes that give the university and the local ecosystem ongoing participation in the companies it seeds. YES!Delft provides the market-development support that converts technical knowledge into commercial traction. The result is a portfolio of deep-tech companies — in areas from quantum sensing to water technology to unmanned systems — that are building employment and supply chains in the Delft-Westland area before they are eventually acquired or listed. The value residence time is longer; the local multiplier effect is correspondingly greater.

The contrast is further sharpened by the national funding context. Leiden University's College van Bestuur has recently warned that the national government's austerity measures — including the elimination of starter grants and cuts to the Fonds voor Onderzoek en Wetenschap — threaten the university's capacity to sustain its research base, and that the coalition's emphasis on technical and exact sciences may further marginalise Leiden's historic strength in humanities and social sciences (Universiteit Leiden, 2026). These pressures compound an already-weak valorisation trajectory.

3.4 Rotterdam's Structural Crisis and Its Regional Implications

The Port of Rotterdam's crisis deserves more attention than South Holland's regional governance bodies have given it. The port's industrial sector has contracted for nearly twenty consecutive months; its leadership has publicly appealed for national intervention comparable to the ASML support package; and the structural obstacles — grid capacity, nitrogen limits, energy costs, fundamental questions about fossil fuel processing — are not amenable to short-term resolution (NOS, 2025; Havenvisie 2050, 2024).

The port directly and indirectly employs 193,000 people in the Netherlands (Havenbedrijf Rotterdam, 2023). A significant fraction of these are drawn from the commuting hinterland that extends to Leiden, Dordrecht, and Gouda. A structural contraction in port employment generates labour market shocks that will arrive in municipalities that have made no provision for them, because their regional governance framework does not encompass Rotterdam.

This is the coherence gap in its most acute form: two of the five gravitational economies of South Holland — Rotterdam and Leiden — are positioned within a single administrative geography (the Province of South Holland, the Metropoolregio Rotterdam Den Haag), yet their governance apparatus treats them as essentially separate systems. The Rotterdam shock will arrive in Leiden's housing market and social services long before it registers in Key Region Leiden's strategic planning.

4. The Coherence Gap: Administrative Narrative vs Economic Reality

4.1 What Key Region Leiden Claims

Key Region Leiden presents itself as a coherent innovation ecosystem, characterised by three major knowledge clusters (Leiden Bio Science Park, NL Space Campus, Unmanned Valley), a triple-helix governance structure, and a strategic ambition to be "the best place in the world to work and live for innovators" (Key Region Leiden, 2025). Its statistical self-presentation leads with headline figures: over 2 billion euros of economic contribution from the LBSP; 500+ million from NL Space Campus; 80,000 employees and students in innovation.

These figures are real. The interpretive framework they are embedded in is misleading.

4.2 The Structural Misrepresentations

Misrepresentation 1: The clusters are a regional engine

The evidence reviewed in Section 3 indicates that only the LBSP functions as a genuine innovation motor for the region, and even there the value-capture pathway routes through international pharmaceutical acquisition rather than local reinvestment. NL Space Campus and Unmanned Valley are better described as demonstration platforms or policy showrooms: they attract attention and may seed some local activity, but they are not generating the kind of deep-rooted, related-variety spillovers that would constitute a functioning innovation ecosystem.

The Agglomeratiekracht Holland Rijnland study (Holland Rijnland, 2025) is candid on this point: "despite the presence of space and drone clusters, high-tech is not a leading sector in Holland Rijnland; the region is not specialised here and job growth is slower than the Dutch average." Only the Bioscience cluster constitutes a genuine innovation motor; the others are followers.

Misrepresentation 2: The region is an economic unit

As demonstrated in Section 3, the territory governed by Holland Rijnland is a residential and commuting geography whose population produces economic value primarily in other jurisdictions — The Hague, Delft, Amsterdam, Rotterdam. The region retains the housing stock, the schools, the social services, and the voting addresses of its economically active population while exporting the productivity. This is the fundamental political economy of a dormitory region, not an innovation region.

Misrepresentation 3: The ROM-B addresses real constraints

The ROM-B is designed to improve utilisation of industrial estates through densification, relocation, and sustainability upgrades. The actual constraint on regional economic development is not the physical configuration of industrial estates; it is the absence of functioning knowledge-to-value pipelines, the structural labour market mismatch between the knowledge produced in the region's universities and the skills demanded in its local labour market, and the political decision to treat a commuter geography as if it were an integrated economic system.

Improving industrial estates will not change the fact that half the region's highly educated workers commute elsewhere. It will not create the related-variety conditions for knowledge spillovers. It will not build the valorisation infrastructure that Leiden University has systematically deferred for thirty years.

4.3 Quantifying the Coherence Gap

We define the *coherence gap* as the divergence between (a) the degree of economic integration asserted by regional governance discourse and (b) the degree of integration measurable in actual flows of labour, knowledge, capital, and goods. Operationally, a high-coherence region would show:

- High internal commuting rates (workers employed close to where they live)
- Strong intra-regional knowledge spillovers (patent citations, labour mobility between related firms)
- Valorisation pathways that retain value locally for extended periods
- Related variety across firms and sectors that enables cross-sectoral knowledge exchange
- Democratic and civic accountability structures that align with the economic geography of the region

The South Holland polycentric field scores poorly on all five dimensions. Internal commuting rates are low (CBS, 2024). Knowledge spillovers are enclave-specific and sector-specific, not regional. Valorisation pathways export value through international acquisition. Related variety between biomedicine, public administration, port logistics, and agriculture is negligible. And the governance boundary of Holland Rijnland does not correspond to any coherent economic geography.

5. Coherence-Based Regional Development: A Framework

5.1 Principles

A Coherence-Based Regional Development (CBRD) framework begins from the premise that territorial economic development policy should be designed around the actual flow structures of the territory, not around administrative boundaries. This requires, as a first step, empirical mapping of the flows that actually constitute economic life in the territory: commuting flows, knowledge transfer flows (publication co-authorship, patent citations, labour mobility between firms), capital flows (investment, trade), and social flows (civic participation, associational life).

On the basis of this flow map, four principles guide intervention design:

Principle 1: Align governance to flows, not flows to governance. The unit of governance should be determined by where flows actually constitute a functional system, not by the inheritance of municipal boundaries or the ambitions of regional marketing organisations. Where this requires new inter-municipal or inter-provincial cooperation structures, these should be built. Where it requires abandoning existing structures that do not correspond to functional geographies, these should be reformed.

Principle 2: Build valorisation infrastructure that retains value locally. The primary failure of Leiden University's relationship to the regional economy is not scientific quality — it is valorisation architecture. The lesson from TU Delft and from comparable cases (KU Leuven, University of Oxford, ETH Zürich) is that value retention requires risk-bearing investment vehicles, not just licensing offices or impact matrices. The university must have skin in the game — equity stakes that align its interests with the long-term development of locally-rooted companies.

Principle 3: Address cognitive proximity, not physical proximity. The ROM-B addresses the physical configuration of industrial space. The actual constraint is cognitive: the knowledge produced at the LBSP and at Leiden University has no organic pathway to the businesses on the Dobbewijk or the Grote Polder, because those businesses operate in sectors (construction, logistics, retail, installation) whose knowledge base is cognitively distant from life sciences research. Bridging cognitive distance requires deliberate intermediation — applied research centres, MBO-

university boundary institutions, sector-specific technology transfer — not better industrial estate management.

Principle 4: Make the informal economy and the MBO-sector visible and legible. The South Holland regional governance apparatus is constitutively blind to two categories of economic actor: the informal and gig economy (self-employed workers, platform workers, micro-businesses, migrant enterprises), and the MBO-sector workforce. These are not marginal categories — they constitute the majority of economic activity in most of the municipalities in the region. Their exclusion from governance structures is not an oversight; it is the structural expression of a governance apparatus designed by and for the triple-helix actors (universities, large firms, municipalities) who control it.

5.2 Flow-Based Regional Typology

On the basis of the empirical analysis in Section 3, we propose a flow-based typology of the five gravitational economies and their functional relationships:

Type A — Value Generators: TU Delft/Delft Enterprises, LBSP/LEH. These are the territories where knowledge is produced and (partially) converted into economic value. Policy should focus on strengthening the valorisation pipeline and increasing the value-retention time.

Type B — Value Appropriators: International pharmaceutical and deep-tech acquirers (J&J, Shell, multinational aerospace). These are external to the region but appropriate the primary economic value generated by Type A actors. Policy should focus on creating governance mechanisms that condition public investment in Type A actors on value-retention obligations.

Type C — Labour Aggregators: Leiden, Zoetermeer, Katwijk. These territories provide housing and social infrastructure for workers whose productive activity occurs elsewhere. Policy should focus on labour market articulation — connecting the skills of resident workers to the employment opportunities in the gravitational centres to which they commute.

Type D — Structural Employers: The Hague (government and international organisations), Rotterdam (port, petrochemical, logistics). These are the actual employment centres for the majority of the region's highly educated workforce. Policy should focus on the resilience and transition of these employment bases, particularly in view of Rotterdam's structural stress.

Type E — Disconnected Sectors: Greenport/bulb growing, greenhouse horticulture. These sectors have their own labour markets (primarily international agricultural labour), their own supply chains (global commodity markets), and their own knowledge base (agricultural science). They are included in "the region" by administrative fiat but have no organic connection to the knowledge economy narrative.

5.3 Institutional Architecture

A CBRD framework for South Holland would require institutional architecture organised around three levels:

Level 1 — Flow Monitoring: A permanent, publicly accessible observatory of economic flows in the polycentric field, drawing on CBS microdata, patent databases, corporate registration data, and labour market surveys. This observatory would generate the empirical foundation for policy decisions, replacing the current system in which strategic decisions are made on the basis of PR statistics and bestuurlijk self-presentation.

Level 2 — Valorisation Infrastructure: A genuinely risk-bearing investment vehicle for knowledge-intensive spinoffs from Leiden University and LUMC, modelled on Delft Enterprises but with a broader sectoral remit and with explicit value-retention conditions (minimum employment tenure, local supply chain obligations, IP ownership retention up to defined development milestones). This vehicle should be capitalised by the Province of South Holland and the national government, not by municipalities that lack the financial scale to bear technological investment risk.

Level 3 — Labour Market Articulation: A boundary institution between the MBO and HBO/WO levels that translates the knowledge produced in the region's universities into skills and competencies accessible to the region's SME and service-sector employers. This is the missing link in the South Holland knowledge economy: the channel through which university-generated knowledge reaches the 90% of regional businesses that are not life science companies or deep-tech spinoffs.

6. Discussion: Why Administrative Fictions Persist

The analytical question that our empirical findings raise is not merely normative — it is explanatory. If the administrative region is as demonstrably disconnected from economic reality as we have argued, why does it persist? Why does Key Region Leiden continue to describe itself as a coherent innovation ecosystem? Why does the ROM-B proceed as if improving industrial estate utilisation were the binding constraint on regional development?

The answer, we suggest, lies in the political economy of regional governance apparatus. Administrative regions are not simply descriptive devices; they are resource mobilisation vehicles. The existence of a designated "region" with a recognised governance body is the precondition for accessing EU Structural Funds, national co-investment programmes, and provincial development budgets. The statistical narrative of a thriving innovation region — 2 billion in LBSP economic contribution, 80,000 innovation workers, top-5 European life sciences cluster — is not primarily directed at analytical understanding; it is directed at Brussels and The Hague, where decisions about fund allocation are made.

This dynamic is not specific to Holland Rijnland; it is the structural logic of European regional governance. Regions compete for funding by constructing the most compelling narrative of their innovation potential, regardless of whether that narrative corresponds to functional economic reality. The result is a systematic inflation of regional identity claims and a systematic suppression of empirical analysis that would complicate those claims.

Grabher's (1993) concept of "lock-in" in regional development is relevant here. Lock-in is not merely technological or industrial; it can be institutional and cognitive. The Key Region Leiden apparatus has developed a repertoire of cognitive frames — triple helix, innovation region, knowledge economy — that filter what can be seen and therefore what can be done. The ROM-B is precisely a locked-in response: a real-estate intervention that reproduces the institutional frame (municipalities investing in physical infrastructure) while leaving the underlying economic structure unchanged.

Breaking this lock-in requires, as Hassink (2005) argued, not just new policy instruments but new cognitive frames. The CBRD framework proposed here is as much a conceptual intervention as a policy proposal.

7. Conclusion

This paper has argued three things.

First, the administrative "region" known as Holland Rijnland / Key Region Leiden does not correspond to a functional economic system. It is a polycentric field of five structurally distinct gravitational economies — The Hague, TU Delft/Delft, Rotterdam/Port, Amsterdam/Schiphol, and Leiden — whose internal dynamics are largely orthogonal to one another and whose governance apparatus serves administrative and resource-mobilisation purposes more than developmental ones.

Second, the knowledge production institutions of the Leiden area have, despite their international scientific distinction, largely failed to generate locally-retained economic value. Leiden University's valorisation infrastructure was underdeveloped for three decades and remains narrow and sector-specific. Its primary valorisation pathway — biomedical spinoffs acquired by international pharmaceutical corporations — exports value systematically. This contrasts sharply with TU Delft's mature innovation ecosystem, which retains value locally for significantly longer.

Third, the dominant policy response — exemplified by the ROM-B — addresses physical infrastructure rather than the cognitive, institutional, and flow-based failures that actually constrain territorial development. Industrial estate improvement is not irrelevant, but it is profoundly insufficient in the absence of valorisation infrastructure, labour market articulation, and governance structures that align with actual economic flows.

The Coherence-Based Regional Development framework proposed here offers an alternative orientation: one grounded in empirical flow mapping, focused on value retention and cognitive proximity, and honest about the difference between the administrative region and the territory.

The honest conclusion is unsettling: the region that Key Region Leiden governs, promotes, and invests in does not, in any economically meaningful sense, exist. What exists is a residential geography, a set of world-class but valorisationally weak research institutions, several economically powerful but structurally stressed employment centres, and a governance apparatus that has learned to speak the language of innovation regions fluently enough to secure continued public investment. Building a genuine regional economy from these materials is possible — but it requires, first, seeing what is actually there.

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Word count: approximately 8,200 words (main text). Prepared for submission to Regional Studies, Papers in Regional Science, or Cambridge Journal of Regions, Economy and Society.

The author declares no competing interests. This research received no external funding.