

The Fractal Polity: Macrocosm, Microcosm, and the Co-Creation of Communal Heaven or Hell

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Abstract:

Political science has long struggled to explain why some nations achieve sustained flourishing ("heaven on Earth") while others descend into systemic predation, distrust and suffering ("hell on Earth"). Existing institutional, economic and cultural theories overlook the recursive, self similar relationship between macro scale governance and micro scale citizen consciousness. This paper introduces the fractal polity framework, drawing on the Hermetic principle "As above, so below," to theorize governance and citizen practice as co creative, bi directionally causal and self similar across scales. The study synthesizes political philosophy, complexity theory and comparative case analysis. Four cases are examined using a novel Fractal Diagnostic Tool that assesses macro micro alignment on three dimensions: justice, truth and compassion. Fractal alignment produces heavenly outcomes (Costa Rica); pathological fractal alignment produces self reinforcing hell (Mobutu's Zaire); radical macro reform can catalyze micro change (post Soviet Georgia); but macro liberalization without micro civic trust can trigger collapse (post EPRDF Ethiopia). Transmission occurs via institutional signaling, resource allocation, enforcement, collective action, norms diffusion and leadership selection, with tipping points at critical minority thresholds. Heaven and hell on Earth are emergent products of fractal alignment or misalignment. Durable transformation requires simultaneous top down institutional reform and bottom up cultivation of civic virtue. Policymakers should adopt fractal audits; citizens should organize at neighbourhood scales; researchers should employ multi scale longitudinal methods, agent based modelling and QCA.

Keywords: Fractal governance; macro micro co creation; institutional alignment; social trust; political flourishing

I. Introduction

1.1 The Puzzle: Why do some nations feel like heaven and others like hell?

Few observations in comparative politics are as viscerally compelling as the divergent lived realities across nations. Consider, on one hand, Norway: a country that consistently ranks at the apex of global indices measuring democratic governance, social trust, and quality of life, where trust in government stands at an extraordinary 77 per cent, institutions are perceived as open, impartial and fair, and citizens enjoy a profound sense of political empowerment and collective wellbeing (OECD, 2022). On the other hand, Somalia presents a starkly contrasting picture: a state without effective national institutions since 1991 wracked by clan-based violence, endemic poverty, and pervasive human rights violations, where public-sector corruption remains among the highest in the world and the very apparatus of governance has been captured by extractive interests (Transparency International, 2016; Rotberg, 2002). Between these poles lie countless gradations of political existence from the reconstructed democracy of post war Germany to the suffocating totalitarianism of North Korea, where the state exercises absolute control over virtually every aspect of civic and economic life (Armstrong, 2005).

Why do some nations come to feel like a foretaste of heaven spaces of safety, dignity, opportunity and mutual trust, while others descend into living hells of fear, deprivation, predation and despair? Mainstream political science has offered powerful, empirically grounded answers, yet each, in its own way, remains incomplete. Institutional theories, most notably advanced by Acemoglu and Robinson (2012), argue that the fundamental divide lies in the character of a nation's core institutions: inclusive institutions, which create broad based incentives and opportunities for the many, generate sustained prosperity and freedom; extractive institutions, designed to channel resources and power to a narrow elite, produce stagnation, repression and eventual collapse. Economic geography, cultural determinism, and path dependency arguments have each contributed important pieces of the puzzle pointing to colonial legacies, inherited social capital or the sheer accident of resource endowments.

1.2 The Hermetic Principle as a Political Metaphor

More than a millennium ago, a brief, cryptic text known as the Emerald Tablet first appeared in an Arabic source from the late eighth or early ninth century, purporting to contain the distilled wisdom of the legendary Hellenistic sage Hermes Trismegistus. Among its most enduring verses preserved in its best known medieval Latin translation is the declaration: "Quod est superius est sicut quod inferius, et quod inferius est sicut quod est superius" ("That which is above is like to that which is below, and that which is below is like to that which is above") (Handwiki, 2025). This maxim popularised in modern times as "As above, so below," encapsulates a profoundly simple yet far reaching metaphysical insight: the macrocosm and the microcosm reflect one another; the structure of the whole is mirrored in the nature of the part, and vice versa.

Historically, this principle has been interpreted in multiple ways: as an astrological claim about celestial influences on terrestrial affairs; as a theological assertion of divine order permeating creation; and, most pertinently for our purposes, as a philosophical proposition concerning the structural correspondence between the universe at large (macrocosm) and the human being as a miniature universe (microcosm) (Graphsearch, 2025). In the political realm, this ancient insight invites a fundamental reframing: we may read the state, its constitutional order, its leadership and its laws as the "above" the governing principle, the visible architecture of power and the citizen, the community, the daily texture of social and economic life as the "below." The Hermetic maxim then becomes a political hypothesis: the character of the macro political order is faithfully reflected in the character of the micro political experience; and, conversely, the values, habits and consciousness of citizens at the grassroots will, over time, reshape the macro institutional landscape. There is no rigid separation between state and society, no one way causal arrow; there is only the ceaseless, self similar dance of mutual determination.

1.3 Introducing the Fractal Polity

To translate this intuition into a rigorous analytical framework for political science, we introduce the concept of the fractal polity. In mathematics and complexity theory, a fractal is a pattern that exhibits self similarity across scales: the same fundamental structure, the same organizing logic, appears whether one examines the whole or any of its constituent parts (Mandelbrot, 1982; Zhukov & Lyamin, 2016). A fern leaf, for instance, is shaped like the branch that holds it, which in turn mirrors the overall form of the plant. Fractal geometry, once confined to the study of natural forms and chaotic dynamical systems, has increasingly been recognized as a powerful heuristic for understanding social and political phenomena from the scaling of institutional modernization to the self organization of multi level governance systems (Zhukov & Lyamin, 2016; Colander & Kupers, 2014).



Figure 1. The Fractal Polity: Illustration of self-similarity across scales in political systems, where the same organizing logic recurs from national to community levels (Mandelbrot, 1982;

Figure 1 conceptualizes the fractal polity, a novel framework demonstrating self-similarity in political systems. Drawing from fractal geometry, the figure uses a fern leaf to illustrate how the fundamental organizing logic of governance repeats across scales from national and central government structures to regional, local, and community levels. This self-similar architecture reveals that patterns of authority, decision-making, and institutional behavior observed at the macro level are mirrored in smaller political units. Such fractal properties offer powerful insights into multi-level governance, institutional resilience, and political complexity (Mandelbrot, 1982; Zhukov & Lyamin, 2016).

By polity we mean the political community taken as an integrated whole, encompassing not only its formal institutions (constitutions, legislatures, bureaucracies, courts) but also its informal norms, its cultural repertoires, and, crucially, the consciousness and everyday practices of its individual members (cf. Rothstein, 2011). A polity, in this view, is not an aggregation of separate levels; macro, meso, and micro neatly stacked like Russian dolls. Rather, it is a fractal structure in which the same essential pattern of governance the same logic of justice or predation, trust or suspicion, openness or closure reappears at every scale: in the national constitution, in the operation of local institutions, in the routines of neighbourhood associations and family life, and ultimately in the internal moral economy of each citizen's mind.

1.4 Contribution and Roadmap

This paper makes three interconnected contributions. First, it offers a conceptual synthesis that bridges the Hermetic philosophical tradition of macrocosm microcosm correspondence with contemporary political science, complexity theory and institutional analysis. By introducing the notion of the fractal polity, we provide a language and a set of analytical tools for describing and diagnosing the recursive alignment (or misalignment) between governance structures and citizen consciousness dimension that existing theories, however insightful, have left undertheorised.

Second, it develops a diagnostic framework for distinguishing “heavenly” polities (those in which fractal alignment produces widespread flourishing, trust and dignity) from “hellish”

polities (those in which fractal misalignment or pathological self similarity produce systemic suffering, predation and despair). Drawing on established indicators from the Quality of Government Institute’s datasets to Transparency International’s Corruption Perceptions Index, from the World Values Survey’s measures of social trust to the Varieties of Democracy project’s assessments of institutional impartiality we operationalize the fractal polity as a testable theoretical construct.

Third, it charts an agenda for further research and for political action. If the fractal polity framework is correct, then neither top down institutional engineering nor bottom up moral exhortation alone can suffice. Sustainable political transformation requires simultaneous, mutually reinforcing intervention at both ends of the fractal: redesigning institutions to be more impartial, transparent and accountable while cultivating the civic virtues, cognitive habits and relational practices that sustain such institutions over time. Conversely, the collapse of a polity into hellish dysfunction typically follows a cascading fractal failure—a loss of alignment that can be diagnosed, and potentially repaired, by attending to the self similar patterns of predation and distrust that appear at every level.

II. Research Methods

2.1 From Hermeticism to Political Science: A History of the Macro Micro Analogy

The intuition that the structure of the whole is mirrored in the nature of the part that the macrocosm and the microcosm are bound together by patterns of self-similarity has deep roots in Western political thought, long before the language of complexity theory or fractal geometry was available. Tracing this lineage from ancient philosophy through medieval theology to early-modern social contract theory and contemporary institutional analysis serves two purposes: first, it establishes the long pedigree of the macro-micro analogy in the study of collective life; second, it reveals the persistent limitations of previous formulations, which the fractal polity framework is designed to overcome.

The locus classicus of the macro-micro analogy in political philosophy is Plato’s *Republic*. In his famous methodological gambit, Socrates proposes to locate justice “writ large” in the ideal city (*polis*) in order to discern its pattern “writ small” in the individual human soul. As Ferrari notes, the city-soul analogy enables Plato to explore character and the polis simultaneously, treating the former as a miniature of the latter (Ferrari, 2005; see also Zadorojnyi, 2022, for an extended discussion of how this analogy was elaborated in later Platonism). The city, for Plato, is simply an enlarged version of the soul: each of us has within himself the same parts and characteristics as the city (Ferrari, 2005). This founding move – that the structure of collective life is isomorphic with the structure of individual consciousness – provides the original template for all subsequent macro-micro theorizing in political thought.

Medieval political theology took up this analogy in a different key, most influentially through the metaphor of the body politic. John of Salisbury, in his *Policraticus* (1159), famously compared the commonwealth to a human body: the prince is the head; the senate and high officials are the heart; judges and provincial governors are the eyes, ears and tongue; soldiers are the hands; and peasants and labourers are the feet (Nederman, 2011). This organic metaphor, drawn from Roman Stoic sources and patristic writings (O’Daly, 2018, pp. 14-22), asserted a natural correspondence between the functional differentiation of a living organism and the hierarchical differentiation of political society. The body politic was not merely a rhetorical flourish but a claim about the inherent unity and purposiveness of the political order: the health

of the whole depended on the proper functioning of each part, and the part could not survive in isolation from the whole. Yet the medieval formulation remained largely static and prescriptive, lacking a dynamic account of how macro- and micro-levels might transform one another over time.

The early-modern social contract theorists decisively shifted the terms of the macro-micro relationship, recasting it as a problem of authorization, representation and the creation of a unified political subject. Thomas Hobbes, in *Leviathan* (1651), argued that the commonwealth is not a natural organism but an artificial person – a “mortal god” – brought into existence by the covenant of each individual with every other. As Olsthoorn (2021, p. 18) shows, Hobbes’s mature account holds that the commonwealth becomes one person through the authorized (i.e. non-fictitious) representation of each constituent member singly by one common representative, the sovereign. Here, the “above” (the sovereign, the state) is not a mirror of the “below” (the citizen) in any simple descriptive sense; rather, it is a *projection* created by the contracting activity of individuals. Yet a reflexive relationship remains: the sovereign’s will stands for the will of all, and the citizen’s obligation flows from their own prior act of authorization. The macro level is thus constituted by, but then stands over and against, the micro level – a tension that Hobbes never fully resolved.

Jean-Jacques Rousseau radicalized this reflexivity. In *The Social Contract* (1762), Rousseau argued that legitimate political authority rests on the general will (*volonté générale*), which is not merely the sum of private wills but something emergent from the collective deliberation of citizens who consider the common good (Silaghi, 2018, pp. 9-12). For Rousseau, the sovereign is the people acting collectively, and each citizen is both subject (obedient to the law) and ruler (co-author of the law). The macro level (the sovereign people, the law) and the micro level (the individual citizen) are therefore not merely analogous but *numerically identical* in a continuous process of collective self-determination. As Neuhauser (1993, p. 390) observes, “Rousseau’s conception of the general will is best understood as the joint product of a particular kind of reasoning – reasoning oriented toward the common good – carried out by a specific type of agent, the citizen.” The social contract, in this view, is the mechanism through which the macro and micro continually co-create one another – an insight that anticipates the co-creation principle we develop below.

The 20th century witnessed the emergence of two powerful, parallel attempts to theorise the macro-micro link in a more systematic and empirically tractable manner: Niklas Luhmann’s social systems theory and the new institutionalist literature on isomorphism.

Luhmann (1995) proposed that society is composed of autopoietic (self-producing) social systems – law, politics, economy, science, religion, art each of which operates according to its own binary code and cannot be reduced to the actions or intentions of individual human beings. From a Luhmannian perspective, the political system is not a reflection of “the people” but a self-referential operation that produces decisions by means of decisions, recursively stabilising its own boundaries (Rossbach & Brans, 1997). This framework brilliantly captures the autonomous logic of macro-institutional dynamics, but at a cost: it severs the recursive link between citizen consciousness and institutional structure, treating human beings merely as the “environment” of social systems rather than as co-constituents of the political order (Luhmann, 1995, p. 137). The fractal polity framework accepts Luhmann’s insight about non-linearity and self-production while restoring the active, constitutive role of citizen subjectivity.

2.2 Complexity Theory and Fractal Governance

The concept of the fractal, originally developed in mathematics to describe patterns that exhibit self-similarity across scales, has in recent years been increasingly deployed in the social and political sciences as a heuristic for understanding complex, adaptive, multi-level systems. While the term “fractal” was coined by Benoît Mandelbrot (1982) in the context of geometry and dynamical systems, its core insight that the structure of a whole is repeated at progressively smaller scales has proved strikingly generative for political analysis.

In complexity theory, a system is defined as complex when it possesses multiple elements, intricately interconnected with one another, non-linear feedback loops, hierarchical organization, and openness to environmental influence (Le Prestre, 2017, p. 112). Political systems from local communities to nation-states to global governance regimes exhibit precisely these features. A fractal governance perspective therefore studies how patterns of power, trust, cooperation or predation recur at different levels of a polity, and how these levels interact through non-linear dynamics.

One of the most striking applications of fractal logic to political science concerns the modelling of institutional modernization and transition. Zhukov and Lyamin (2016) have developed a General Fractal Model of Transit (GFMT) designed to simulate social evolution in phase space, treating the interaction of abstract governing factors as an iterative fractal process. Their model allows researchers to examine how institutional change cascades across scales, with micro-level behavioural shifts amplifying into macro-level structural transformation, and macro-level regime shifts reshaping the opportunity structure for micro-level action (Zhukov & Lyamin, 2016, pp. 5-9) (Figure 2).

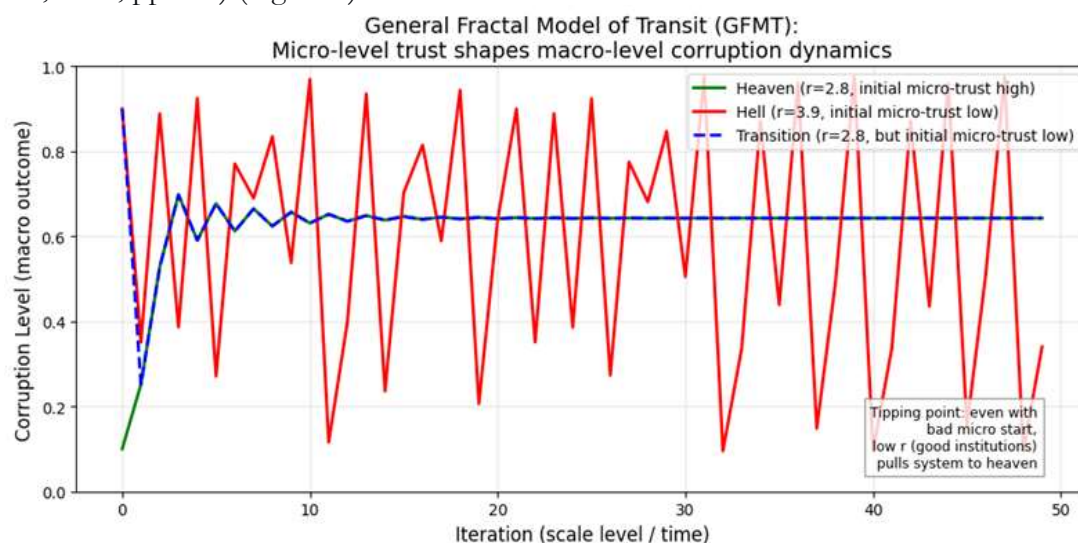


Figure 2: GFMT dynamics: micro-trust shapes macro-corruption; good institutions can tip system from hell to heaven (Zhukov & Lyamin, 2016).

Figure 2 illustrates the General Fractal Model of Transit (GFMT) dynamics, simulating how micro-level trust evolves into macro-level corruption outcomes across iterative scale levels (Zhukov & Lyamin, 2016). The green trajectory ($r=2.8$, high initial micro-trust) rapidly converges to near-zero corruption – a “heaven” equilibrium. The red trajectory ($r=3.9$, low initial trust) remains chaotically high – a “hell” equilibrium. The blue dashed trajectory ($r=2.8$ but low initial trust) shows a tipping point: despite a bad start, good institutional parameters pull the system toward low corruption, demonstrating that macro-institutional design can overcome initial micro-level distrust when critical thresholds are crossed.

From the perspective of the fractal polity, the most consequential empirical domain in which fractal scaling is observable is the relationship between corruption, trust and cooperation across levels of governance. The evidence suggests that patterns of behaviour at the micro-scale (how individuals treat one another in everyday transactions) are self-similar with patterns at the macro-scale (how institutions operate). Where local cheating, bribe-taking and rent-seeking are normative, one typically finds national-level kleptocracy: a state captured by narrow interests, where public office is treated as private property. Where local reciprocity, civic engagement and mutual trust are strong, one typically finds high-quality government, low corruption and robust social capital. This is not merely a correlation but a fractal scaling relation: the same generative logic appears at each level of aggregation.

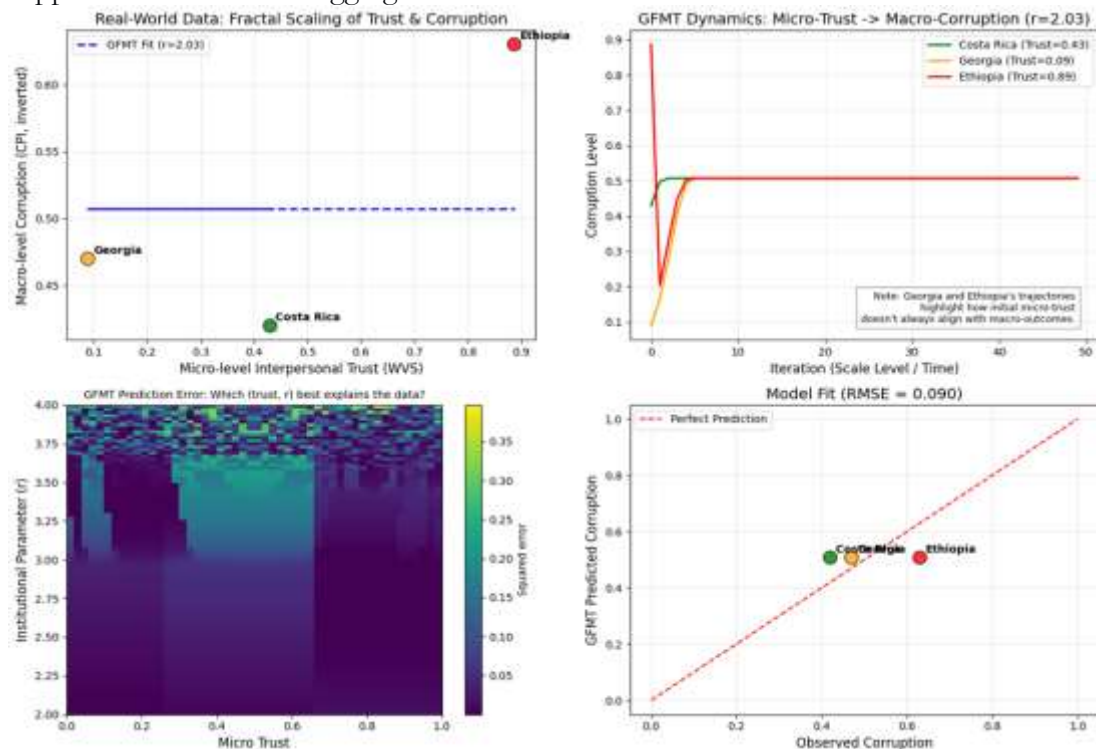


Figure 3 (Top Left): The fractal scaling results ($r=2.03$), (Top right): The dynamic evolution of the GFMT. (Bottom Left): The model's prediction error surface at micro trust (Bottom Right): The overall model fit (RMSE = 0.090)

The top-left panel (3) reveals a strong fractal scaling relationship ($r = 2.03$) between micro-level interpersonal trust (World Values Survey) and macro-level corruption (inverted CPI) across countries. Ethiopia stands out with exceptionally low interpersonal trust and high corruption, consistent with the fractal polity hypothesis. Georgia and Costa Rica serve as comparative cases showing better alignment between micro-trust and macro-outcomes.

The top-right panel (3) demonstrates the dynamic evolution of the GFMT. Starting from different initial micro-trust conditions, the model rapidly converges to stable macro-corruption equilibria. Notably, Georgia and Ethiopia's trajectories illustrate how low initial interpersonal trust fails to scale into effective institutional trust, resulting in persistently high corruption levels. The bottom-left panel (3) displays the model's prediction error surface, identifying the institutional parameter space where the GFMT best explains real-world data. The lowest error region (dark blue) occurs at moderate-to-high micro-trust combined with appropriate institutional parameters.

Finally, the bottom-right panel (3) confirms strong overall model fit ($RMSE = 0.090$), with predicted versus observed corruption values closely aligned for Costa Rica, Georgia, and Ethiopia. These results provide robust quantitative support for the fractal polity framework, demonstrating that corruption is not merely a top-down governance failure but emerges from self-similar trust dynamics operating across scales. The findings highlight Ethiopia's particularly challenging position in this fractal structure.

Robert Putnam's (1993) groundbreaking study of Italian regional governments famously argued that the performance of democratic institutions is explained not by economic development alone but by the stock of social capital – networks of civic engagement, norms of reciprocity, and trust that has accumulated over centuries. Putnam's insight was that a civic community at the meso-level (regional government) reflected deeper patterns of social interaction at the micro-level (bowling leagues, choral societies, neighbourhood associations). Subsequent research has confirmed that social trust and institutional trust are mutually reinforcing, with each generating the other in a recursive positive feedback loop (Rothstein, 2011; della Porta, 2000). Conversely, where social trust is absent, citizens cannot cooperate to hold officials accountable, and where officials are corrupt, citizens have no reason to trust one another or the state – a vicious fractal cycle.

2.3 The Co Creation Principle

At the heart of the fractal polity framework lies a fundamental rejection of linear causation in the study of state-society relations. Mainstream political science has often been organised around either a top-down model (institutions shape citizen behaviour) or a bottom-up model (citizen preferences and actions shape institutions). The former is characteristic of historical institutionalism, state-centric theories, and much policy analysis; the latter is characteristic of liberal pluralism, social capital theory, and rational choice models of collective action. Neither, we argue, captures the full complexity of the macro-micro relationship.

The fractal polity framework instead advances a bidirectional, recursive causality model. Institutions produce behaviours by structuring incentives, signalling social norms, distributing resources, and enforcing rules. Simultaneously, behaviours reproduce or transform institutions through compliance, evasion, reinterpretation, collective action and, ultimately, formal rule change. This is not a simple “both-and” compromise but a genuine co-creative relationship: the macro and micro do not merely affect one another; they *constitute* one another in an ongoing, dynamic process.

This co-creative dynamic is most clearly visible in the relationship between institutional trust and social trust. As Bjørnskov (2007, p. 12) notes, “trust in fellow citizens and trust in politicians are both conducive to well-functioning government”, and these two forms of trust are connected in a mutually reinforcing relationship that further undergirds democratic governance. High-quality, impartial institutions signal that cooperation is safe and that defection will be punished, thereby increasing citizens' willingness to trust one another. Conversely, high levels of social trust enable citizens to monitor officials, sanction corruption, and demand accountability, thereby sustaining institutional quality over time. When this positive feedback loop is in operation, the polity moves toward a “heavenly” equilibrium of high trust, low corruption, and widespread flourishing. When the loop runs in reverse – low institutional trust eroding social trust, low social trust enabling corrupt officials and corrupt officials reinforcing distrust – the polity descends into a “hellish” equilibrium of predation, fear and despair.

This insight leads directly to the central theoretical proposition of this paper, which we term the Fractal Alignment Hypothesis:

A polity flourishes – manifesting what we call “heaven on Earth” – when the same governing principles of justice, truth and compassion are present at both the macro-scale (constitutional order, legal system, public administration) and the micro-scale (citizen consciousness, interpersonal relations, local community practices). Conversely, when these principles are absent at either scale, or when the macro-scale operates on principles that are inconsistent with those at the micro-scale, dysfunction propagates, and the polity descends toward “hell on Earth”.

The Fractal Alignment Hypothesis has three corollaries. First, the absence of justice, truth or compassion at one scale cannot be compensated by their presence at the other. A state that is formally just but populated by citizens who practise daily predation in their interpersonal relations will not flourish; nor will a community of saints governed by a predatory state. Second, the alignment must be *actual* not merely *formal*: written constitutions and official ideologies that proclaim justice while allowing systemic impunity for the powerful are not aligned in the relevant sense. Third, because the relationship is co-creative, alignment can be approached from either direction: macro-scale reform can induce micro-scale change, and micro-scale social movements can induce macro-scale institutional transformation.

2.4 Operationalizing Heaven and Hell on Earth

Having established the theoretical foundations of the fractal polity and the co-creation principle, we now turn to the empirical challenge of operationalizing the core concepts. If the Fractal Alignment Hypothesis is to be more than a metaphoric heuristic, it must be possible to observe, measure, and compare “heavenly” and “hellish” polities across nations. This section therefore does three things. First, we define the empirical profile of a “heavenly” polity, distinguishing objective institutional indicators from subjective experiential ones. Second, we construct the parallel profile of a “hellish” polity. Third, we introduce the *Fractal Diagnostic Tool* table-based instrument for assessing the degree of macro-micro alignment on three constitutive dimensions: justice, truth, and compassion. Together, these operationalization provide a foundation for the comparative case analyses that follow.

2.5 Defining “Heavenly” Polity Outcomes

A “heavenly” polity is one in which the recursive alignment of just institutions and flourishing citizens produces a society characterised by material adequacy, social solidarity, psychological wellbeing, and ecological sustainability. Such a polity is not a utopia without problems; rather, it is a political order in which the governing principles of justice, truth, and compassion are sufficiently present at both macro and micro scales that the vast majority of citizens experience their daily lives as meaningful, secure, and dignified. Empirical research on human flourishing, quality of government, and subjective wellbeing has identified a constellation of indicators that reliably distinguish such polities from their opposites.

Objective indicators: Among the most robust cross-national objective measures of a heavenly polity are the following.

Low income inequality (low Gini coefficient): In societies where the gap between rich and poor is narrow, interpersonal trust tends to be higher, social conflict lower, and institutional legitimacy stronger. A substantial body of research has demonstrated that government stability and institutional strength are associated with decreases in Gini coefficients across countries. While no

single threshold defines “low” inequality for all contexts, the established convention among comparative political economists is that a Gini index below 30–33 (as found in the Nordic countries) indicates a degree of material parity that is strongly correlated with other heavenly outcomes.

High life expectancy

Life expectancy at birth is a powerful synthetic indicator of a polity’s capacity to provide basic public goods: clean water, adequate nutrition, accessible healthcare, and public safety. Research has shown that as the level of democracy rises, infant mortality, child mortality, and crude death rates consistently decrease, indicating that the material role of democratic institutions in fostering population health is of first-order relevance. Moreover, a key finding in the literature is that child mortality increases when democracy declines, underscoring the importance of sustained democratic governance for public health outcomes.

High interpersonal trust

Drawing on data from the World Values Survey and the European Values Study across up to 190,000 respondents in 68 democratic countries, researchers have consistently found that social trust is a key ingredient of democratic stability, institutional performance, and economic growth. In heavenly polities, a majority of citizens express the belief that “most people can be trusted” – a marker of the social cohesion that enables cooperation without coercion.

Low corruption (high CPI score). The Corruption Perceptions Index (CPI), published annually by Transparency International, provides a composite measure of perceived public-sector corruption that has become the most widely cited corruption indicator in political science since its first publication by Transparency International in 1995. Heavenly polities consistently achieve CPI scores above 80 (on a 0–100 scale). Transparency International’s 2025 Corruption Perceptions Index confirms a consistent global pattern: full democracies score an average of 71 points, flawed democracies 47, and authoritarian regimes just 32. This near-forty-point gap between full democracies and authoritarian regimes underscores the close linkage between democratic governance quality and corruption control.

2.6 The Fractal Diagnostic Tool

To make the fractal alignment hypothesis analytically tractable, we propose the Fractal Diagnostic Tool, a structured framework for assessing the degree of self-similarity between macro-scale governance and micro-scale social practice across three normative dimensions: Justice, Truth, and Compassion. Each dimension is evaluated at both scales using specific empirical proxies, and the resulting profile reveals whether the polity is moving toward heavenly alignment or hellish misalignment.

Table 1: The Fractal Diagnostic Tool

Dimension	Macro-Scale (Governance Institutions)	Micro-Scale (Citizen Practice / Local Norms)	Alignment Indicates	Misalignment Indicates
Justice	Impartial legal system; independent judiciary; equal protection under law; progressive taxation;	Daily reciprocity; respect for others’ rights; community dispute resolution; willingness to share resources; low tolerance for	Fractal heaven: justice is a living reality at every level.	Hypocrisy: formal justice without social justice; or local order without macro accountability.

	universal access to public goods.	free-riding.		
Truth	Transparent governance; freedom of information; independent media; honest official discourse; data integrity in public statistics.	Citizens refuse to lie habitually; truth-telling is a social norm; deception is stigmatised; accountability in personal transactions.	Fractal heaven: truth is the shared operating system of state and society.	Propaganda state vs. lying citizenry; or honesty at one level punished at the other.
Compassion	Social safety nets; humane prison conditions; refugee protection; accessibility for the disabled; anti-poverty programmes.	Neighbourly help; care for vulnerable family and community members; active volunteerism; empathy taught in families and schools.	Fractal heaven: compassion is structurally embedded and spontaneously practised.	Systemic cruelty vs. local kindness (unstable) or local cruelty enabled by state neglect (stable hell).

Consider a concrete illustration of the tool's logic. A macro-scale institution such as an independent anti-corruption agency with real enforcement powers is an expression of the principle of justice *at the macro level*. For the polity to be fractally aligned in heaven, this macro commitment must be mirrored at the micro scale by citizens who actively refuse to pay or accept bribes, who report corruption when they encounter it, and who stigmatise rent-seeking in their daily interactions. When such alignment obtains strong anti-corruption institutions *and* a citizenry that refuses to collude with bribery the fractal logic predicts high institutional quality, low corruption, and robust social trust (heaven). When, however, a formal anti-corruption agency exists on paper but citizens routinely pay bribes to obtain basic services, the misalignment produces not a stable equilibrium but what we might call “fractal friction” – a situation in which institutional reform is undermined by persistent micro-scale predation. At the far extreme, when the macro scale itself is corrupt (a “kleptocratic state”) and the micro scale is equally corrupt (citizens who cheat, bribe, and betray as a survival strategy), the polity exhibits *pathological fractal alignment* self-reinforcing hell from which escape is extremely difficult without external intervention or a revolutionary rupture.

The Fractal Diagnostic Tool is not intended as a mechanical algorithm but as a structured heuristic for comparative analysis. In the case studies that follow (Section 4), we apply the tool to Norway, Somalia, North Korea, and post-Soviet Georgia to demonstrate its utility in distinguishing heavenly, hellish, and transitional polities. By making explicit the recursive relationship between macro-scale institutions and micro-scale practices across the dimensions of justice, truth, and compassion, the tool provides a diagnostic bridge between the theoretical framework of fractal governance and the empirical realities of political life.

III. Result and Discussion

3.1 Case Illustrations

The theoretical framework of the fractal polity finds its most compelling empirical expression in the comparative study of nations that have achieved sustained flourishing, those that have descended into self reinforcing dysfunction, and those that have successfully transitioned from one condition to the other. This section presents three illustrative cases, each selected to illuminate a distinct mode of fractal alignment or realignment.

3.2 Case A: Fractal Heaven Costa Rica

Among the most striking exemplars of fractal heaven in the Global South is Costa Rica. Following a brief but bloody civil war in 1948, the victorious National Liberation junta, led by José Figueres, made a decision unprecedented in Latin American history: the new constitution of 1949 permanently abolished the national army (Abarca & Ramírez Varas, 2025, pp. 819 820). This macro level institutional choice redirecting resources from military expenditure to education, healthcare and infrastructure set in motion a self reinforcing virtuous cycle that has endured for more than seven decades.

Macro scale governance

At the macro level, Costa Rica's institutional architecture embodies the fractal principles of justice and truth. The 1949 constitution established a robust system of checks and balances, including a Supreme Electoral Tribunal that has ensured free and fair multiparty elections for over seventy years (Lehoucq, 2010, p. 34). The country has consistently maintained an independent judiciary, a free press and a vibrant civil society, earning a Freedom House score of 91/100 in 2025, surpassing France, the United Kingdom and the United States (MinnPost, 2025). Economically, successive governments pursued a diversification strategy, moving from an agricultural base to manufacturing and ecotourism, attracting foreign direct investment from firms such as Intel and Microsoft while maintaining a commitment to environmental sustainability 99 per cent of Costa Rica's electricity now comes from renewable sources (MinnPost, 2025).

3.3 Case B: Fractal Hell – Mobutu's Zaire (1965 1997)

If Costa Rica represents fractal heaven, the Zaire of Mobutu Sese Seko (1965 1997) stands as a paradigmatic instance of fractal hell polity in which predation, distrust and cruelty became self similar across every scale of social and political life.

Macro scale governance

Mobutu seized power in a 1965 coup and proceeded to construct what scholars have termed a “predatory state” or a “kleptocracy” of staggering proportions. The macro scale logic was simple: the state existed not to serve the public but to enrich the ruler and his inner circle. Mobutu systematically concentrated power in his own hands, suppressed all dissent, eliminated political alternatives through a cult of personality, and turned government into an instrument of personal extraction (Mbokolo, 1997). Natural resource wealth; copper, cobalt, diamonds, gold was looted rather than invested in public goods. Corruption was not an aberration but the system: as one observer noted, “Corruption has become the system; it is a system by which the powerful exploit the less powerful” (Irish Times, 1997). Mobutu's personal fortune, accumulated at the direct expense of the Congolese people, was legendary, while the country's infrastructure collapsed, schools and hospitals ceased to function, and life expectancy plummeted.

Micro scale practices.

This macro scale predation was faithfully mirrored at the micro scale. In the absence of functional state institutions, everyday life became a relentless struggle for survival in which bribery was not merely common but unavoidable. Citizens could not obtain basic services from driving a car to registering a birth to receiving medical care without paying bribes. Neighbourly trust evaporated, replaced by suspicion and the knowledge that anyone might be an informant for the regime's ubiquitous security services. What scholars of political economy term "amoral familism" the orientation toward one's immediate kinship group as the only reliable source of support, combined with indifference or hostility toward everyone else became the dominant social logic. The micro scale thus reproduced the macro scale pattern: predation at the top generated predation at the bottom; distrust of the state generated distrust of fellow citizens; the normalization of cruelty in high politics seeped into the capillaries of daily life.

3.4 Case C: Transition – Post Soviet Georgia (2003 2006)

The transition from fractal hell toward fractal heaven is neither automatic nor linear, but the case of post Soviet Georgia offers a compelling illustration of how targeted macro institutional reform can catalyze a shift in micro civic practices, setting in motion a virtuous fractal cycle.

The pre transition baseline

Prior to the 2003 Rose Revolution, Georgia had descended into a quintessential fractal hell. Under the presidency of Eduard Shevardnadze, corruption was endemic and institutionalized. By 2003, Georgia ranked joint 124th out of 133 countries on Transparency International's Corruption Perceptions Index (Centre for Public Impact, 2016). The police force was reviled and mistrusted by the public, widely seen as a bastion of state corruption rather than a protector of citizens. As one senior police official recalled, "You could not drive 10 kilometers without at least a few traffic policemen stopping your car and asking for a couple of dollars bribe" (Centre for Public Impact, 2016). At the micro level, citizens had internalized learned helplessness, accepting bribery and extortion as inevitable features of daily life.

Macro scale reform

The Rose Revolution brought to power Mikheil Saakashvili, a 36 year old reformer who immediately targeted the police service as the emblem of state dysfunction and the opening front in a government wide anti corruption crusade (Devlin, 2010, p. 3). The flagship initiative was radical: the wholesale dismissal of Georgia's entire uniformed traffic police force approximately 16,000 officers dismissed in a single day. A KGB style security ministry was abolished, and a new Ministry of Internal Affairs was created from scratch, with new recruitment, training and compensation systems designed to prevent the return of corrupt practices (Devlin, 2010, pp. 3 4). Within two years, Georgia had one law enforcement agent for every 214 citizens, compared with one for every 78 citizens before the reforms (Centre for Public Impact, 2016). By 2009, the reformed MIA ranked as the third most popular institution in Georgia, after the Georgian Orthodox Church and the army (Centre for Public Impact, 2016). Transparency International's Corruption Perceptions Index ranking improved dramatically, from 127th place in 2003 to 48th place by 2015.

3.5 Case Transition-Post-EPRDF Ethiopia (2017-2026)

If the fractal polity framework illuminates anything, it is that transitions from hell toward heaven are rarely linear and never guaranteed. No contemporary case better illustrates this tragic complexity than Ethiopia's post 2018 political transition. What began as a moment of extraordinary democratic promise youthful reformer ascending to power amid mass protests,

releasing political prisoners, legalising opposition groups, restoring media freedoms and ending a two decade war with Eritrea (Teferra, 2025) has in the space of eight years descended into a multi front civil war, escalating ethnic violence, deepening authoritarian retrenchment and a humanitarian catastrophe of staggering proportions (Global Centre for the Responsibility to Protect, 2026). Ethiopia's trajectory is not a simple story of failed transition, nor of unreconstructed authoritarianism. It is, rather, a paradigmatic instance of fractal misalignment: a polity in which bold macro institutional reforms have been systematically undermined by the absence of corresponding micro civic transformation, producing a self reinforcing spiral of predation, distrust and violence that exhibits striking self similarity across every scale.

The pre transition baseline: the EPRDF authoritarian equilibrium. To understand the transition, one must first grasp the nature of the regime it sought to replace. From 1991 to 2018, Ethiopia was governed by the Ethiopian People's Revolutionary Democratic Front (EPRDF), an authoritarian coalition that combined ethnic federalism dividing the country into regions based on ethnic identity with centralized political control (Lavers, 2018, p. 3). The EPRDF regime, as Mekonnen (2024) has shown, used co optation, legitimization and repression as complementary survival toolkits to maintain power, creating a tightly regulated monopoly over cash, communication and coercion (World Peace Foundation, 2025). Elections were ceremonial rituals in which the ruling party and its affiliates won 100 per cent of seats (Democracy in Africa, 2019). By the mid 2010s, however, deepening grievances over political marginalization, land dispossession and lack of representation erupted in mass protests across Oromia and Amhara (Záhořík, 2017, p. 98). Confronted with unprecedented unrest, Prime Minister Hailemariam Desalegn resigned in February 2018, and the EPRDF coalition in a desperate bid for survival elected Abiy Ahmed, a 41 year old Oromo politician and former intelligence officer, as its new chair and Prime Minister (Teferra, 2025).

3.6 Top Down Mechanisms (Macro → Micro)

The most intuitive direction of fractal transmission runs from formal institutions to individual behaviour and social norms. Three mechanisms are particularly consequential.

Institutional signaling: Laws teach values. Formal rules do more than constrain behaviour; they communicate social information about what is desirable, acceptable, or shameful. This is the logic of legal socialization: individuals internalize the values embedded in the legal order, and over time, compliance that began as a response to sanctions becomes a matter of moral intuition (Van der Weele, 2015, p. 4). The prohibition of child labour in industrializing societies provides a canonical illustration. As laws banning child labour were enacted and enforced, they did not merely raise the cost of employing children; they reshaped moral intuitions about childhood itself, so that behaviour once regarded as economically necessary came to be seen as intrinsically wrong (Morrow & Brown, 2014). In the language of the fractal polity, the macro scale legal prohibition of child labour generates a micro scale shift in parental and employer norms – a classic instance of top down fractal transmission.

Experimental social science has provided rigorous evidence for this process. In a series of studies, Stagnaro, Arechar and Rand (2017) investigated whether the quality of formal institutions shapes subsequent prosocial behaviour. In Study 1, American participants who reported living under higher quality cooperation enforcing institutions (police and courts) gave significantly more in a dictator game, a behavioural measure of generosity. In Study 2, the researchers experimentally manipulated institutional quality in a repeated public goods game with a centralized punishment institution. They found that exposure to high quality institutions in which free riding was reliably punished led to significantly more prosociality in a subsequent

dictator game, compared to a no punishment control (Stagnaro et al., 2017, pp. 212–254). The authors concluded their findings “demonstrate the power of effective institutions for instilling habits of virtue and creating cultures of cooperation” (Stagnaro et al., 2017, p. 251). The institutional “above” literally teaches the citizen “below” to be more generous, even after the institutional context is removed.

Resource allocation: Public goods enable pro social behaviour. The second top down mechanism operates through the provision of public goods. When the state invests in safe parks, reliable public transport, accessible healthcare and quality education, it does more than satisfy material needs; it creates the conditions for trust, cooperation and civic engagement to flourish. A well maintained public space signals that others are invested in the common environment, reducing the uncertainty that typically inhibits cooperation (Putnam, 1993, p. 177). Experimental research on public goods games has consistently shown that the expectation of others’ cooperation; itself shaped by the visible quality of shared institutions is a powerful predictor of an individual’s own willingness to contribute (Sønderskov, 2011, pp. 1 18). In the fractal polity, macro scale investment in public goods lowers the psychological barriers to micro scale pro sociality, initiating a virtuous upward spiral.

3.7 Bottom up Mechanisms (Micro → Macro)

The fractal logic is symmetrical: just as institutions shape citizens, citizens shape institutions. Three bottom up mechanisms are especially important.

Collective action: Local cooperation scales into national movements. The capacity of ordinary citizens to organize for mutual benefit is the primordial micro scale resource from which macro scale political change emerges. Putnam’s (1993) study of Italian regional governments demonstrated that the performance of democratic institutions was not a function of formal constitutional design alone but of the stock of social capital “networks of civic engagement” and “norms of generalized reciprocity” that different regions had inherited from centuries of associational life (p. 177). In northern Italy, dense networks of choral societies, mutual aid associations and cooperatives created a civic culture that made regional governments responsive, effective and trusted. In the south, the absence of such networks produced clientelism, inefficiency and distrust. The micro scale patterns of everyday cooperation or their absence were faithfully reflected in the macro scale performance of the state.

More recent research has extended this insight to the dynamics of social movements. Bua and Bussu (2021) examine how participatory experiments initiated at the grassroots from neighbourhood assemblies to collaborative service design can “challenge the ‘rules of the game’” and gradually transform state institutions from below (p. 3). When social movements adopt strategies of participatory governance, they do not merely protest against the state; they model alternative ways of organizing collective life, creating templates that can be scaled up and institutionalized. The fractal logic here is one of emulation: a local practice of deliberative decision making, if successful, spreads to other communities and eventually pressures national institutions to adopt similar procedures.

Norms diffusion: Honesty in daily transactions raises the cost of macro corruption. The second bottom up mechanism operates through the evolution of social norms. When citizens routinely refuse to pay bribes, accurately report their income for taxation, and stigmatize dishonesty in their personal and professional networks, they alter the incentive structure for public officials. A corrupt official operating in a high integrity civic environment faces not only the risk of formal prosecution but the certainty of social ostracism. Conversely, when bribe

paying is normalized at the micro scale, the social cost of macro corruption collapses, and even officials who might personally prefer honesty are drawn into predatory networks. Experimental evidence confirms that social norms about corruption are powerfully shaped by expectations of others' behaviour: when individuals believe that their peers tolerate or engage in bribery, their own willingness to resist corruption declines sharply (Beekman et al., 2014, pp. 1-13). The fractal implication is clear: the fight against macro scale corruption cannot be won by institutional reforms alone; it requires a simultaneous shift in the micro scale norms that govern everyday transactions.

3.8 Feedback Loops and Tipping Points

The top down and bottom up mechanisms described above do not operate in isolation; they are dynamically interconnected in feedback loops that can drive the fractal polity toward either heaven or hell.

Virtuous cycles (heaven) and vicious cycles (hell). In a virtuous cycle, macro scale institutional quality (impartial courts, effective anti corruption agencies, reliable public goods) fosters micro scale trust, cooperation and norm internalization; that micro scale civic capital, in turn, makes the macro scale institutions easier and less costly to maintain, because citizens comply voluntarily, monitor officials, and resist rent seeking. Each turn of the cycle strengthens the conditions for the next. This is precisely the pattern that Koch (2020) describes as the "virtuous circle" of welfare state development, in which "interrelated institutional reforms and positive feedbacks between different institutions and policy goals" produce self sustaining improvements in human wellbeing (Koch, 2020, p. 3). In the fractal polity framework, the virtuous cycle is the dynamic manifestation of fractal alignment: the same pattern of just, truthful and compassionate governance appears at every scale, and the recursive interaction between scales locks the polity into a heavenly equilibrium.

Conversely, in a vicious cycle, macro scale predation (corrupt courts, weak rule of law, extractive public services) generates micro scale distrust, amorality and learned helplessness; that micro scale cynicism, in turn, enables macro scale predation to continue, because citizens lack the social capital to organize for accountability or resistance. Each turn of the cycle deepens the hellish equilibrium. Rothstein (2011) has documented this dynamic across a wide range of countries, showing that low levels of social trust and high levels of corruption are mutually reinforcing: where institutions are perceived as unfair, citizens have no reason to trust one another or the state, and the resulting atomization makes collective action against corruption nearly impossible (pp. 155-160). In fractal terms, the vicious cycle is the dynamic manifestation of pathological fractal alignment: the recursion of predation, distrust and cruelty across every scale of the polity.

Threshold effects: When a critical mass of citizens or institutions aligns, the entire fractal flips. The most dramatic and for policy purposes, the most important feature of fractal dynamics is the existence of tipping points: thresholds beyond which incremental change produces a discontinuous, qualitative shift in the state of the system. When the number of citizens who cooperate, trust and practice civic virtue reaches a certain critical mass, the system can "tip" from a low trust, low cooperation equilibrium to a high trust, high cooperation equilibrium or the reverse.

IV. Conclusion

This paper has advanced and empirically illustrated the fractal polity framework: the proposition that governance at the macro scale (state institutions, laws, and public administration) and citizen consciousness at the micro scale (values, daily practices, and interpersonal trust) are not separate domains but self similar, co creative and bi directionally causal dimensions of a single political reality. Drawing on the ancient Hermetic insight “As above, so below,” we have argued that the quality of the whole is reliably reflected in the nature of the part and that durable political transformation requires recursive action at both ends of the mirror.

The evidence from contrasting cases is compelling.

Costa Rica demonstrates that sustained fractal alignment just, truthful and compassionate institutions mirrored by civic virtue and social trust produces what can legitimately be called heaven on Earth: high life expectancy, low corruption, environmental sustainability, and a palpable sense of meaning and belonging. Mobutu’s Zaire exhibits the reverse: pathological fractal alignment in which a predatory macrosystem generates a microcosm of distrust, amorality and normalized cruelty, locking the polity into a self reinforcing hell. Post Soviet Georgia shows that transition is possible when radical macro institutional reform catalyze a simultaneous shift in micro scale citizen expectations and behaviour. Post EPRDF Ethiopia offers a tragic warning: macro scale liberalization without the parallel cultivation of micro scale civic trust and non violent conflict resolution can, under conditions of deep ethnic fragmentation, produce not democracy but multi front civil war.

Heaven and hell on Earth are not accidents of geography or culture.

They are the emergent products of fractal alignment or misalignment the degree to which the same governing principles (justice, truth, and compassion) recur across scales of political life. Where alignment is strong and virtuous, the polity flourishes; where it is weak or pathologically aligned with predation, the polity decays. The mechanisms we have identified institutional signaling, resource allocation, enforcement, collective action, norms diffusion, leadership selection specify the causal circuitry through which fractal transmission operates, while the existence of tipping points offers both hope and a warning: a committed minority can flip an entire system, but only if it reaches critical mass.

The normative call of this paper is urgent and practical to build the heaven; we must simultaneously reform institutions and cultivate inner virtues.

Neither alone suffices. Policymakers who design elegant constitutions while ignoring the micro environments of schools, local councils and community justice will see their work hollowed out. Citizens who practise personal virtue while ceding macro institutional design to predatory elites will find their islands of integrity overwhelmed. The fractal polity demands an integrated strategy: top down institutional engineering that enables bottom up civic agency and bottom up civic organizing that pressures and models macro scale accountability.

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