

The Rule-of-Law Capital, Growth, and Development

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This paper studies the intricate relationship between investments in the rule-of-law capital and physical production capital within a dynamic model of optimal growth and development. It highlights the mutual influence between institutional changes, such as those in the rule of law, property rights, and legislation systems, and economic performance over time and across different nations. Notably, it sheds light on how the escalating expenses associated with upholding the rule of law, coupled with the swift erosion of rule-of-law capital, can impede long-term economic growth and development. Conversely, the escalating costs and rapid depreciation of physical capital accumulation can significantly undermine the rule of law. In particular, overlegislation is harmful for both the rule of law and economic development. By elucidating these dynamics, this paper offers insights into the complex interplay between legal institutions and economic prosperity.

Key Words: Rule of law; Rule-of-law capital; Growth; Development.

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1. INTRODUCTION AND MOTIVATIONS

The rule of law is a foundational principle ensuring that all individuals, institutions, and entities are subject to laws that are publicly announced, uniformly upheld, independently interpreted, and aligned with international human rights norms. It signifies that every citizen is bound by the law, rejecting the notion of any individual, including rulers, being exempt from legal accountability, such as by claims of divine authority.¹The

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¹<https://www.uscourts.gov/educational-resources/educational-activities/overview-rule-law>: According to the website of the United States Courts, the U.S. Constitution is the nation's fundamental law. It codifies the core values of the people. Courts have

rule of law serves as the linchpin for safeguarding private property rights and economic freedom due to several reasons. Firstly, it provides the essential legal framework for defining, acknowledging, and upholding property rights. These rights encompass the legal entitlements and safeguards that individuals and entities possess over various assets, spanning from tangible properties like land and real estate to intangible assets such as intellectual property and personal possessions. A robust rule of law ensures that property rights are clearly delineated, legally acknowledged, and efficiently enforced through impartial adjudication and legal remedies.

Secondly, the rule of law acts as a bulwark against arbitrary actions by state authorities, ensuring that individuals' property rights remain shielded from unauthorized seizure, confiscation, or expropriation. By establishing legal protections against governmental overreach and unlawful takings, it helps uphold individuals' autonomy, economic stability, and dignity, thereby fostering trust in the security and reliability of property rights.

Thirdly, a robust rule of law cultivates legal certainty and predictability, offering individuals and businesses confidence in the stability of legal norms, property rights frameworks, and contractual agreements. The certainty provided by the legal system empowers individuals to make informed decisions regarding property ownership, investment, and economic endeavors, thus mitigating uncertainty and risk in transactions and stimulating economic growth and prosperity.

Lastly, the rule of law establishes accessible, impartial, and efficient mechanisms for resolving disputes and enforcing property rights. Through courts, tribunals, and alternative dispute resolution channels, individuals have avenues to seek redress, enforce contractual obligations, and safeguard their property interests against infringements, fraud, or breaches of trust.

Property rights are deeply intertwined with individual liberties and freedoms, encompassing the essential entitlement to possess, utilize, enjoy, and dispose of property without unjustified interference or coercion. The rule of law plays a crucial role in safeguarding property rights as fundamental liberties, shielding individuals from arbitrary deprivation of their possessions and upholding their autonomy and dignity. In instances where property rights or individual liberties are infringed upon, the rule of law provides

the responsibility to interpret the Constitution's meaning, as well as the meaning of any laws passed by Congress. The Federalist # 78 states further that, if any law passed by Congress conflicts with the Constitution, "the Constitution ought to be preferred to the statute, the intention of the people to the intention of their agents."

"Nor does this conclusion by any means suppose a superiority of the judicial to the legislative power. It only supposed that the power of the people is superior to both; and that where the will of the legislature, declared in its statutes, stands in opposition to that of the people, declared in the Constitution, the judges ought to be governed by the latter rather than the former. They ought to regulate their decisions by the fundamental laws, rather than by those which are not fundamental."

legal recourse and channels for pursuing justice and restitution. Consequently, the rule of law serves as the cornerstone for fostering economic growth and development.

Over time, the rule of law is intimately intertwined with a dynamic set of laws that undergo internal evolution. This signifies that legal institutions adjust and evolve alongside the development of the economy and societies. As societies evolve and undergo transformations, their legal frameworks adapt to address emerging challenges, meet evolving needs, and reflect shifting societal values. This inherent process ensures that the rule of law remains pertinent and efficient in governing society, mirroring its continuous growth and advancement. It emphasizes the interconnected nature of legal systems with the broader socio-economic environment in which they function, underscoring the significance of adaptability and responsiveness in upholding the integrity and credibility of the rule of law. Consequently, we adopt a dynamic model that analyzes the concurrent evolution of the rule of law and economic development. Specifically, we consider institutions such as the rule of law and property rights as endogenous variables, meaning that they are treated as elements that change over time within the model. This approach allows us to explore how changes in these institutional factors interact with economic development processes, providing insights into their reciprocal relationship.²

We want to emphasize that our study is timely. According to the World Justice Project (WJP), its Rule of Law Index 2023 reveals a concerning erosion of the rule of law in the majority of countries this year, impacting over 6 billion people. Since 2016, authoritarian trends have contributed to a global rule of law recession, affecting 78% of countries. Notably, Fundamental Rights have experienced the most significant decline, decreasing in 77% of countries between 2016 and 2023. While authoritarian trends continue in 2023, there is a slowdown, with fewer countries experiencing declines compared to previous years. However, declines in the functioning of justice systems are spreading, particularly in providing timely and accessible justice, with Civil Justice being the most affected factor this year. WJP emphasizes the persistent rule of law recession characterized by executive overreach and human rights violations, exacerbated by the Covid pandemic. Over the past seven years, there has been a notable decline in Constraints on Government Powers in 74% of countries, indicating weakened checks on executive power. Although the authoritarian trend persists globally, it has slowed down for the second consecutive year, with

²For more institutional factors, see Zhan and Zou(2024), Liang and Zou(2024), Zhan and Zou(2025), Sun and Zou(2025), Liang and Zou (2025)

a smaller majority of countries experiencing overall rule of law declines in 2023 compared to previous years.³

1.1. The rule-of-law capital and its investments

The historical progression of the rule of law entails a continuous accumulation of what can be termed as the rule of law capital. This unfolds through various stages: It begins with the establishment of foundational legal principles rooted in justice, fairness, and accountability, often derived from philosophical, religious, and cultural traditions. Societies then invest in creating institutional frameworks such as courts, legislative bodies, law enforcement agencies, and regulatory institutions to interpret and enforce laws consistently. Over time, legal precedents and case law accumulate, shaping the legal landscape and providing guidance for interpretation and decision-making. Legislative reforms adapt legal frameworks to evolving contexts, while ensuring judicial independence and integrity remains vital for upholding the rule of law. Investment in legal education and professionalism enhances the capabilities of legal professionals, and technological innovations offer opportunities to improve efficiency and accessibility. Promoting public awareness and participation fosters accountability and transparency, while international cooperation addresses transnational challenges. Continuous adaptation and improvement are essential, requiring ongoing mechanisms for legal reform, feedback, and oversight to uphold principles of justice and fairness, ultimately aiming to maintain social order and promote rights within societies.

The multifaceted nature of rule-of-law capital is evident and indispensable for nurturing favorable investment climates and facilitating sustainable economic growth and development. Each aspect plays a pivotal role in achieving this objective: Clearly defined constraints on government powers instill confidence in property rights protection and curb arbitrary state interference, thereby promoting long-term investment and entrepreneurial activity. Reduced levels of corruption mitigate investment risks by fostering fair competition, transparent regulations, and equitable access to opportunities, thereby reducing uncertainty and transaction costs. Transparency and accountability in government operations discourage rent-seeking behavior and enable informed decision-making by investors. The protection of fundamental rights, including property, contract enforcement, and intellectual property rights, establishes a stable legal framework for economic

³The WJP Rule of Law Index is the world's leading source of original, independent rule of law data. Its rigorous methodology draws on expert and household surveys to measure rule of law in 142 countries and jurisdictions, covering 95% of the world's population. Each country's score is an average of eight factors: Constraints on Government Powers, Absence of Corruption, Open Government, Fundamental Rights, Order and Security, Regulatory Enforcement, Civil Justice, and Criminal Justice.

transactions, ensuring protection against arbitrary infringements. Maintaining order and security through effective law enforcement and public safety measures creates a conducive environment for business operations, free from disruptions or threats of violence. Access to efficient and impartial civil and criminal justice systems resolves disputes, enforces contracts, and deters criminal activities, further enhancing investor confidence and upholding the integrity of the legal framework. By upholding these dimensions of the rule of law, countries can foster an environment conducive to investment, entrepreneurship, and economic prosperity, attracting capital to jurisdictions with robust rule of law, reliable institutions, and respected property rights.

Investing in rule-of-law capital involves both direct funding for judicial systems, law enforcement, and legal services, as well as indirect costs like those stemming from litigation and regulatory compliance. Additionally, investments in public education and awareness campaigns are crucial for promoting understanding and adherence to legal principles. This investment encompasses not only financial resources but also the development of institutions, legal frameworks, and cultural values that uphold and respect principles of law and order. Overall, investing in rule of law is essential for fostering societal stability, fairness, trust, and economic and social development.

The accumulation of rule-of-law capital is vital for a well-functioning market economy, ensuring that contracts are upheld, property rights are respected, and transactions occur transparently. This fosters an environment conducive to economic activity, innovation, and competition, benefiting both consumers and producers. Additionally, the rule of law is essential for maintaining a constitutional order, preventing unchecked power from dominating governance. It establishes legal constraints that hold rulers accountable and ensure that they operate within the bounds of the law, regardless of their popularity or method of attaining power. Ultimately, the rule of law dictates that all individuals in public office must adhere to legal standards and can only exercise authority within the confines of the law, promoting accountability and preventing arbitrary rule.

1.2. A very brief, selected history of the accumulation of the rule-of-law capital

The development and accumulation of rule of law capital in ancient Jerusalem, Greece, and the Roman Republic played crucial roles in shaping the legal and institutional frameworks of these societies. In ancient Jerusalem, the rule of law was deeply intertwined with religious and moral codes, particularly through the Ten Commandments and other legal statutes found in the Torah. The Hebrew Bible provided a foundation for legal principles that emphasized justice, fairness, and accountability before a divine

authority. Legal institutions such as courts and judges were established to interpret and enforce these laws, ensuring order and stability within the community.

Similarly, in ancient Greece, the concept of the rule of law emerged within the context of democratic governance and philosophical inquiry. The city-states, such as Athens, developed legal systems based on written laws, including the famous legal code of Draco and later the reforms of Solon. These laws aimed to establish equality before the law, protect individual rights, and regulate social and economic life. Legal institutions such as courts and assemblies were established to administer justice and resolve disputes, while philosophers like Plato and Aristotle contemplated the nature of justice and its role in society.

In the Roman Republic, the development of the rule of law was marked by the gradual evolution of legal institutions and principles. The Twelve Tables, enacted in the 5th century BCE, represented the earliest attempt to codify Roman law and establish legal rights for citizens. Over time, the Roman legal system expanded and became more sophisticated, with the development of legal concepts such as the *ius civile* (civil law) and *ius gentium* (law of nations). Legal institutions such as the Senate, magistrates, and courts played crucial roles in administering justice and upholding the rule of law throughout the republic.

Investments in the rule of law capital in these ancient societies took various forms, including the establishment of legal codes, the creation of legal institutions, and the promotion of legal education and awareness. These investments were essential for maintaining social order, resolving disputes, and protecting individual rights and liberties. They laid the groundwork for the development of more complex legal systems in later periods and contributed to the enduring legacy of the rule of law in Western civilization.

The accumulation of the rule-of-law capital in Britain is a rich historical journey marked by key milestones and transformations. Here is an overview of how the rule of law evolved in Britain:

Medieval Roots: The foundations of the rule of law in Britain can be traced back to the medieval period. During this time, principles such as the supremacy of law over arbitrary power and the protection of individual rights began to take shape. The Magna Carta of 1215, although primarily aimed at curbing the powers of the monarch, laid down fundamental principles of justice and due process that became integral to the rule of law.

Common Law Tradition: One of the defining features of the British legal system is its common law tradition. Common law, based on judicial precedent and custom rather than statutory law, played a crucial role in shaping the rule of law in Britain. Judges interpreted and applied legal

principles developed over time, ensuring consistency and predictability in the legal system.

The Petition of Right (1628): The Petition of Right was another milestone in the development of the rule of law in Britain. It asserted parliamentary authority over the king and reaffirmed the principle that the monarch was subject to the law. The petition sought to restrict arbitrary royal power and uphold individual liberties, laying the groundwork for constitutional governance.

Glorious Revolution (1688): The Glorious Revolution marked a significant shift in British politics and the rule of law. The deposition of King James II and the ascension of William III and Mary II to the throne affirmed parliamentary sovereignty and constitutional monarchy. The Bill of Rights of 1689 further entrenched the principles of limited government, the rule of law, and individual rights.

Emergence of Constitutionalism: The 18th and 19th centuries saw the consolidation of constitutional principles and the gradual expansion of civil liberties in Britain. Landmark legal cases, such as *Entick v Carrington* (1765) affirming the right to privacy, and *Somerset's Case* (1772) challenging the legality of slavery, underscored the growing recognition of individual rights and freedoms.

Parliamentary Sovereignty: The principle of parliamentary sovereignty became a cornerstone of British constitutional law. Parliament, as the supreme legislative body, held the authority to enact and amend laws, subject to constitutional constraints and judicial review. This principle ensured that laws were made through democratic processes and were consistent with constitutional norms.

Modern Legal Reforms: In the 20th and 21st centuries, Britain witnessed further legal reforms aimed at enhancing the rule of law and protecting individual rights. Legislation such as the Human Rights Act 1998, which incorporates the European Convention on Human Rights into domestic law, and the Constitutional Reform Act 2005, which established the Supreme Court as the highest court in the UK, reflect ongoing efforts to uphold the rule of law.

Thus, the accumulation of the rule-of-law capital in Britain reflects a gradual evolution characterized by a commitment to principles of legality, accountability, and individual rights. From its medieval origins to modern legal reforms, the British legal system continues to uphold the rule of law as a cornerstone of democratic governance and civil society.

In the United States, the accumulation of the rule-of-law capital is a complex and multifaceted process shaped by historical events, legal principles, and constitutional traditions:

Founding Documents: The rule of law is deeply embedded in the founding documents of the United States, including the Declaration of Indepen-

dence, the Constitution, and the Bill of Rights. These foundational texts establish the principles of limited government, separation of powers, and individual rights, laying the groundwork for the rule of law.

Constitutional Framework: The US Constitution serves as the supreme law of the land, delineating the structure of government and the allocation of powers between the federal government and the states. The Constitution establishes key institutions such as the executive, legislative, and judicial branches, each with defined roles and responsibilities to ensure checks and balances.

Judicial Review: A fundamental aspect of the rule of law in the US is judicial review, the power of the courts to interpret the Constitution and invalidate laws or executive actions that are inconsistent with its provisions. The landmark case of *Marbury v. Madison* (1803) established the principle of judicial review, affirming the authority of the judiciary to uphold the Constitution.

Civil Liberties and Rights: The protection of civil liberties and individual rights is central to the rule of law in the US. The Bill of Rights, the first ten amendments to the Constitution, safeguards fundamental freedoms such as freedom of speech, religion, and assembly, as well as due process and equal protection under the law.

Legal Precedent: The US legal system relies on the common law tradition and the principle of *stare decisis*, or the respect for precedent. Courts consider prior decisions when adjudicating cases, ensuring consistency, predictability, and the gradual development of legal principles over time.

Expansion of Rights: Throughout US history, the interpretation and application of the rule of law have evolved to encompass broader definitions of equality and justice. Landmark Supreme Court decisions, such as *Brown v. Board of Education* (1954) ending racial segregation in schools, and *Obergefell v. Hodges* (2015) recognizing same-sex marriage, reflect the expanding scope of constitutional rights and protections.

Challenges and Controversies: The application of the rule of law in the US has not been without challenges and controversies. Issues such as executive authority, civil liberties during times of national security crises, and access to justice for marginalized communities continue to be debated and adjudicated in the courts.

Legal Reforms and Social Movements: Legal reforms and social movements have played a significant role in advancing the rule of law in the US. From the civil rights movement of the 1960s to ongoing efforts to reform criminal justice systems and promote equal justice under law, grassroots activism and legal advocacy have been instrumental in shaping legal norms and institutions.

1.3. New investments in the rule-of-law capital

Investments in the rule-of-law capital take various forms, spanning funding for legal institutions, initiatives promoting access to justice, and efforts to fortify legal frameworks. Here's a breakdown of potential investments:

Legal Aid Programs: Providing financial support to legal aid organizations offering free or low-cost legal assistance to individuals unable to afford representation.

Judicial Training and Capacity Building: Investing in training programs and resources to enhance the skills and knowledge of judges, prosecutors, and legal professionals.

Court Modernization and Infrastructure: Allocating funds for modernizing court systems through technology upgrades, infrastructure enhancements, and the implementation of case management systems.

Legal Education and Awareness Campaigns: Supporting initiatives that raise legal literacy and awareness of rights among the populace through workshops, educational materials, and public campaigns.

Anti-Corruption Efforts: Investing in measures such as independent anti-corruption agencies, transparency enforcement, and ethical standards promotion within government institutions.

Strengthening Legal Frameworks: Providing backing for legislative reforms and capacity-building initiatives aimed at reinforcing legal frameworks, including the development of laws upholding the rule of law and human rights.

Promotion of Alternative Dispute Resolution: Investment in mechanisms like mediation and arbitration to facilitate efficient resolution of legal disputes outside traditional court systems.

Support for Civil Society Organizations: Funding civil society groups engaged in advocacy, monitoring, and civic engagement to promote accountability, transparency, and the rule of law.

International Cooperation and Technical Assistance: Collaborating with international partners to offer technical support, capacity building, and expertise in legal reform and governance strengthening.

Data Collection and Research: Investing in data collection efforts and research projects to evaluate the efficacy of rule of law initiatives, pinpoint areas for improvement, and guide evidence-based policymaking.

1.4. Overlegislation, the rule of law, and freedom

While it is challenging to provide an exhaustive list of overlegislation in the US and Europe due to the vast number of laws and regulations enacted at various levels of government, however, some examples of areas where critics argue there is overlegislation or regulatory burdens include:

Environmental Regulations: Environmental laws and regulations, while necessary for protecting natural resources and public health, can sometimes

become burdensome for businesses and individuals due to their complexity and scope.

Financial Regulations: The financial sector is heavily regulated in both the US and Europe, with laws governing banking, securities trading, insurance, and other financial activities. Critics argue that some of these regulations are overly complex and hinder innovation and economic growth.

Healthcare Regulations: The healthcare industry is subject to numerous laws and regulations aimed at ensuring patient safety, quality of care, and access to services. However, compliance with these regulations can be costly and time-consuming for healthcare providers and organizations.

Labor Laws: Labor laws and regulations govern various aspects of the employer-employee relationship, including wages, working conditions, and employee benefits. Critics argue that excessive labor regulations can stifle job creation and economic competitiveness.

Taxation Laws: Tax codes in both the US and Europe are extensive and can be challenging to navigate for individuals and businesses. Complex tax laws and regulations may create compliance burdens and discourage investment and entrepreneurship.

Data Privacy and Internet Regulations: With the increasing importance of data privacy and cybersecurity, governments have enacted laws and regulations to protect consumer information and regulate online activities. However, these regulations can sometimes be overly prescriptive and burdensome for businesses, particularly small startups.

Zoning and Land-Use Regulations: Zoning laws and land-use regulations govern how land can be developed and used in both urban and rural areas. While these regulations serve legitimate purposes such as promoting public safety and orderly development, they can also be overly restrictive and impede economic growth and housing affordability.

Intellectual Property Laws: Intellectual property laws protect inventions, creative works, and trademarks, but they can also be complex and subject to abuse by patent trolls and copyright holders seeking to stifle competition and innovation.

Bruno Leoni emerged as a prominent advocate of the free-market approach to law and freedom in the latter part of the 20th century, drawing inspiration from thinkers like Bastiat (2012) and rivaling Hayek (1944, 2007, 2022) in intellectual rigor. Leoni's (1991) analysis probes deeply into the intricate relationship between law and freedom, revealing how legislators often compromise crucial principles such as stability, universality, and impartiality, with the state being identified as the primary threat to the traditional liberal concept of the rule of law. As Leoni's ideas matured, his work evolved into a comprehensive exploration of legal history, offering valuable insights into the symbiotic connection between law and thriving free-market economies. Alongside Friedrich Hayek and Milton Friedman,

Leoni contends that overlegislation poses a significant peril to the rule of law. Hayek (2022) emphasizes the necessity of clear, predictable rules equally applicable to all citizens to safeguard individual liberty, whereas Leoni critiques the rigidity of legislation and champions the adaptive nature of common law. Leoni likens reliance on legislation to central planning, arguing that legislators lack the comprehensive knowledge required to effectively govern complex social interactions. Similarly, Friedman cautions against excessive regulation, warning that it stifles entrepreneurship, distorts market incentives, and undermines individual autonomy. Collectively, these perspectives underscore the imperative of limiting government intervention and adopting a more restrained approach to lawmaking to preserve the rule of law and promote economic freedom.

We now turn our attention to set up a formal dynamic optimization model of physical capital and the rule-of-law capital accumulation in section 2. We use special functions to derive the implications of our model in sections 3 and 4. We conclude this paper in section 5.

2. THE DYNAMIC MODEL

Let R be the rule-of-law capital, r be the new investments in upholding and maintaining the rule of law, O be an index of overlegislation, c be consumption, and k be production capital. The utility function of the representative agents is $u(c, r, R, O)$, and the production function is $f(k, r, R, O)$. An increase in R and r leads to more utility and production because (i) the rule of law provides a stable and predictable legal framework within which representative agents produce and consume. When laws are clear, consistently enforced, and applied impartially, it reduces uncertainty and risk for economic actors. This fosters confidence in the legal system and encourages investment, innovation, and entrepreneurship, ultimately leading to higher levels of production and utility; (ii) the rule of law ensures the protection of property rights, which is fundamental to economic activity. Secure property rights incentivize individuals and businesses to invest in assets, undertake productive activities, and engage in trade and commerce. When property rights are respected and enforced, it encourages capital formation, fosters economic growth, and enhances overall utility by allowing individuals to benefit from their efforts and investments; (iii) upholding the rule of law includes enforcing contracts and agreements entered into by parties. Strong contract enforcement mechanisms provide assurance to businesses and individuals that their agreements will be honored, reducing the risk of default and enabling mutually beneficial transactions to occur. This facilitates economic exchange, promotes trust and cooperation among market participants, and contributes to increased utility and production. In the absence of the rule of law and property rights integrated into both

the utility and production functions, securing access to consumption goods becomes a formidable challenge. Without the rule of law, societal stability and order are compromised, impeding the efficient production, distribution, and accessibility of goods and services. Moreover, the absence of clearly defined property rights can trigger conflicts over resource ownership and utilization, exacerbating the scarcity of consumption goods. Thus, ensuring the enjoyment of consumption goods necessitates the establishment of robust legal frameworks safeguarding property rights, promoting equitable trade practices, and upholding social order. These measures foster an enabling environment for economic activities, facilitating the production and distribution of goods, and thereby empowering individuals to access the consumption goods they require and desire.

On the other hand, overlegislation, O , characterized by an excessive proliferation of laws and regulations, has adverse effects on utility and production because (i) overly burdensome regulations impose compliance costs on businesses and individuals, diverting resources away from productive activities. Compliance with complex and onerous regulatory requirements often requires significant time, effort, and financial resources, reducing efficiency and hindering productivity gains; (ii) excessive regulation can create uncertainty and ambiguity regarding legal requirements and expectations, making it challenging for businesses to plan and make investment decisions. Uncertainty about future regulatory changes can deter entrepreneurship and capital investment, leading to suboptimal resource allocation and lower levels of production and utility; (iii) overregulation can erect barriers to entry into markets and inhibit innovation and competition. Regulatory burdens disproportionately affect small businesses and startups, limiting their ability to compete with larger incumbents and stifling dynamism and entrepreneurship. Reduced competition and innovation can impede productivity growth and dampen consumer welfare.

The agents accumulate the rule-of law capital and production capital, respectively, as follows,

$$\frac{dR}{dt} = r - \delta_R R - \beta O,$$

$$\frac{dk}{dt} = i_k - \delta_k k = f(k, r, R, O) - c - pr - \delta_k k,$$

where δ_R and δ_k are the depreciation rates of the rule-of-law capital and production capital, respectively; p is the price of new investment in upholding and maintaining the rule of law. The initial stocks of the rule-of-law capital and production capital are given by $R(0) = R_o$ and $k(0) = k_o$, respectively.

In particular, we notice that the equation

$$\frac{dR}{dt} = r - \delta_R R - \beta O,$$

which explicitly states the adverse effect of overlegislation, $\beta(> 0)$, on the spontaneous formation of the rule-of-law capital. Overlegislation can have several adverse effects on the formation of the rule-of-law capital for obvious reasons: (i) Excessive legislation can lead to a complex and convoluted legal framework, making it difficult for individuals and businesses to understand their rights and obligations. This complexity breeds uncertainty about the law, undermining trust in the legal system and hindering the formation of rule-of-law capital; (ii) Overlegislation may result in laws that are inconsistent or contradictory, creating confusion and undermining the coherence of the legal system. When laws conflict with one another or with established legal principles, it erodes confidence in the rule of law and weakens the foundation of rule-of-law capital; (iii) Overlegislation places a strain on legal institutions responsible for interpreting and enforcing the law. Courts, regulatory agencies, and law enforcement bodies may struggle to cope with the volume and complexity of laws, leading to delays, inefficiencies, and uneven enforcement. This undermines the effectiveness and legitimacy of legal institutions, diminishing the rule-of-law capital; (iv) Excessive regulation can contribute to a culture of non-compliance and disregard for the law. When individuals perceive laws as arbitrary, burdensome, or unjust, they may be more inclined to circumvent or challenge them, undermining the authority of the legal system and eroding respect for the rule of law; (v) Overlegislation can deter individuals and businesses from engaging with the legal system or participating in civic life. The perceived complexity and unpredictability of the legal environment may discourage people from seeking legal recourse or participating in democratic processes, weakening the social fabric and diminishing the vibrancy of civil society; (vi) Excessive regulation diverts resources away from productive activities and innovation towards compliance and administrative overhead. Businesses may expend significant time, effort, and financial resources navigating regulatory requirements, detracting from investments in research, development, and growth. This misallocation of resources undermines the efficiency and effectiveness of the economy, hindering the formation of rule-of-law capital.

The optimal control problem associated with the accumulation of rule-of-law capital and physical production capital can be formulated as follows:

$$\min_{\{c, r, R, k\}} \int_0^\infty e^{-\rho t} U(c, r, R, O) dt,$$

$$s.t. \quad \frac{dR}{dt} = r - \delta_R R - \beta O, \quad (1)$$

$$\frac{dk}{dt} = f(k, r, R, O) - c - pr - \delta_k k, \quad (2)$$

where, once more, c refers to the consumption of the representative agent, k stands for the production capital, R represents the rule-of-law capital, and r denotes the new investments in upholding and maintaining the rule of law. These are the four endogenous variables of the dynamics system. c and r are control variables, while k and R are state variables. The level of overlegislation, O , and the price of new investments in the formation of rule-of-law capital, p , are assumed to be exogenously given. The structure parameters include: ρ , the subjective time discount rate; δ_R , the depreciation rate of rule-of-law capital; β , the degree of the adverse effect of overlegislation on the accumulation of rule-of-law capital; δ_k , the depreciation rate of production capital.

The utility function is assumed to be continuously differentiable. The representative agent derives utility from consumption, new investment in the rule of law, the stock of rule-of-law capital: $U_c > 0$, $U_r > 0$, $U_R > 0$, indicating that utility increases with respect to c , r and R . $U_{cc} < 0$, $U_{rr} < 0$, $U_{RR} < 0$, indicating that marginal utility decreases with respect to c , r and R . As we have argued above, $U_O < 0$, indicating that overlegislation reduces utility, and $U_{OO} > 0$, indicating that the marginal disutility from overlegislation is increasing. It is assumed that the production function is also continuously differentiable. The single homogeneous output is produced with the use of production capital, new investment in the rule-of-law, rule-of-law capital, and overlegislation. $f_k > 0$, $f_r > 0$, $f_R > 0$, indicating that production increases with respect to k , r and R . $f_{kk} < 0$, $f_{rr} < 0$, $f_{RR} < 0$, indicating that marginal productivity of k , r and R are decreasing. Again, $f_O < 0$, indicating that overlegislation reduces output production, and $f_{OO} > 0$, indicating that the marginal (dis)productivity of overlegislation is increasing.

The current-value Hamiltonian of the optimal control problem (2) is defined as,

$$\mathcal{H} = U(c, r, R, O) + m_1 (r - \delta_R R - \beta O) + m_2 (f(k, r, R, O) - c - pr - \delta_k k). \quad (3)$$

where m_1 and m_2 are the current-value multipliers, capturing the marginal valuations of the state variables R and k , respectively, at time t .

The optimality conditions with respect to control variables c and r are derived as:

$$\frac{\partial \mathcal{H}}{\partial c} = U_c(c, r, R, O) - m_2 = 0, \quad (4)$$

$$\frac{\partial \mathcal{H}}{\partial r} = U_r(c, r, R, O) + m_1 + m_2 f_r(k, r, R, O) - m_2 p = 0. \quad (5)$$

The multiplier equations are:

$$\frac{dm_1}{dt} = \rho m_1 - \frac{\partial H}{\partial R} = \rho m_1 - [U_R(c, r, R, O) - m_1 \delta_R + m_2 f_R(k, r, R, O)], \quad (6)$$

$$\frac{dm_2}{dt} = \rho m_2 - \frac{\partial H}{\partial k} = \rho m_2 - [m_2 f_k(k, r, R, O) - m_2 \delta_k], \quad (7)$$

and the state equations are:

$$\frac{dR}{dt} = r - \delta_R R - \beta O, \quad (8)$$

$$\frac{dk}{dt} = f(k, r, R, O) - c - pr - \delta_k k, \quad (9)$$

The optimality conditions, the multiplier equations, and the state equations constitute the dynamics system that determines the optimal path of endogenous variables. By eliminating the Lagrangian multipliers, we obtain a system consisting of four equations and four endogenous variables. To be more specific, equations (4) and (5) lead to:

$$m_2 = U_c(c, r, R, O), \quad (10)$$

$$m_1 = m_2 p - m_2 f_r(k, r, R, O) - U_r(c, r, R, O). \quad (11)$$

Differentiating with respect to time t yields:

$$m_1' = [U_{cc} * p - U_{cc} * f_r - U_{rc}] c' + [U_{cr} * p - U_{cr} * f_r - U_c * f_{rr} - U_{rr}] r' + [U_{cR} * p - U_{cR} * f_r - U_c * f_{rR} - U_{rR}] R', \quad (12)$$

$$m_2' = U_{cc} * c' + U_{cr} * r' + U_{cR} * R'. \quad (13)$$

Substituting out the Lagrangian multipliers m_1 and m_2 in the multiplier equations by using equations (12) and (13), we obtain:

$$\begin{aligned} & [U_{cc}p - U_{cc}f_r - U_{rc}] c' + [U_{cr}p - U_{cr}f_r - U_c f_{rr} - U_{rr}] r' \\ & + [U_{cR}p - U_{cR}f_r - U_c f_{rR} - U_{rR}] R' \\ & = \rho [U_{cc}p - U_{cc}f_r - U_{rc}] - [U_R - (U_{cp} - U_{cf_r} - U_r) \delta_R + U_c f_R], \end{aligned} \quad (14)$$

and

$$U_{cc}c' + U_{cr}r' + U_{cR}R' = \rho U_c - [U_c f_k - U_c \delta_k]. \quad (15)$$

Thus, the equilibrium dynamic system can be summarized as (13), (14) and

$$R' = r - \delta_R R - \beta O, \quad (16)$$

$$k' = f(k, r, R, O) - c - pr - \delta_k k. \quad (17)$$

If we assume that the utility function is separable of the form:

$$U(c, r, R, O) = \mathcal{U}(c) + \mathcal{V}(r) + \mathcal{W}(R) - \mathcal{Z}(O), \quad (18)$$

where $\mathcal{U}'(c) > 0$, $\mathcal{V}'(r) > 0$, $\mathcal{W}'(R) > 0$, $\mathcal{Z}'(O) > 0$, and $\mathcal{U}''(c) < 0$, $\mathcal{V}''(r) < 0$, $\mathcal{W}''(R) < 0$, $\mathcal{Z}''(O) < 0$. As a consequence, the cross derivatives of the utility function $U(c, r, R, O)$ will all equal zero, i.e., $U_{cr} = 0$, $U_{rc} = 0$, $U_{cR} = 0$, $U_{cO} = 0$, $U_{rR} = 0$, $U_{rO} = 0$, $U_{RO} = 0$.

Accordingly, the equilibrium dynamic system can be simplified as:

$$\begin{aligned} [U_{cc}p - U_{cc}f_r]c' + [-U_{cf_{rr}} - U_{rr}]r' - U_{cf_{rR}}R' \\ = \rho[U_{cp} - U_{cf_r} - U_r] \\ - [U_R - (U_{cp} - U_{cf_r} - U_r)\delta_R + U_{cf_R}], \end{aligned} \quad (19)$$

$$U_{cc} * c' = \rho U_c - [U_{cf_k} - U_{c\delta_k}], \quad (20)$$

$$R' = r - \delta_R R - \beta O, \quad (21)$$

$$k' = f(k, r, R, O) - c - pr - \delta_k k. \quad (22)$$

Substituting equation (20) and (21) into equation (19) to replace c' and R' , we would have:

$$\begin{aligned} r' = & -\frac{1}{(U_{cf_{rr}} + U_{rr})} \left\{ [(p - f_r)(f_k + \delta_R - \delta_k) - f_R + f_{rR}(r - \delta_R R - \beta O)] * U_c \right. \\ & \left. - \rho U_r - U_R - \delta_R U_r \right\}, \end{aligned} \quad (23)$$

$$c' = \frac{U_c}{U_{cc}} (\rho - f_k + \delta_k), \quad (24)$$

$$R' = r - \delta_R R - \beta O, \quad (25)$$

$$k' = f(k, r, R, O) - c - pr - \delta_k k. \quad (26)$$

3. A SPECIAL CASE WITH (SEPARABLE) LOGARITHMIC UTILITY AND COBB-DOUGLAS PRODUCTION FUNCTION

We assume a separable logarithmic utility and a Cobb-Douglas production function. Let us denote the utility function as:

$$U(c, r, R, O) = \log(c) + \chi_r \log(r) + \chi_R \log(R) - \chi_O \log(O), \quad (27)$$

where $\chi_r > 0, \chi_R > 0, \chi_O > 0$ capture the relative importance attached to the new investment in the rule of law, accumulation of the rule-of-law capital, and overlegislation, respectively. It is worth noting that the importance of consumption is normalized to unity.

In addition, the production function takes the Cobb-Douglas form:

$$f(k, r, R, O) = \frac{\bar{A} (k^{\alpha_k} r^{\alpha_r} R^{1-\alpha_k-\alpha_r})^\zeta}{O^{\alpha_O}}, \quad (28)$$

where $\bar{A}$ represents the level of production technology. $0 < \alpha_k < 1, 0 < \alpha_r < 1, 0 < 1 - \alpha_k - \alpha_r < 1$ measure the contribution of production capital, new investment in the rule of law, and the rule-of-law capital, respectively, in the production function. $0 < \zeta < 1$ captures the degree of decreasing return to scale of the production function. It's noteworthy that overlegislation hinders production, with the adverse effect being reflected by parameter $\alpha_O > 0$. The larger α_O is, the greater the adverse effect of overlegislation on production.

At the steady state, $r' = c' = R' = k' = 0$, leading to four equations to determine the steady-state values $\{c^*, k^*, R^*, r^*\}$. These equations are:

$$0 = [(p - f_r)(f_k + \delta_R - \delta_k) - f_R + f_{rR}(r - \delta_R R - \beta O)] * U_c - \rho U_r - U_R - \delta_R U_r, \quad (29)$$

$$0 = \rho - f_k + \delta_k, \quad (30)$$

$$0 = r - \delta_R R - \beta O, \quad (31)$$

$$0 = f(k, r, R, O) - c - pr - \delta_k k. \quad (32)$$

Plugging into equation (27) and (28) yields a system for the determination of $\{c^*, k^*, R^*, r^*, y^*\}$,

$$0 = \left[\left(p - \zeta \alpha_r \frac{y^*}{r^*} \right) \left(\zeta \alpha_k \frac{y^*}{k^*} + \delta_R - \delta_k \right) - \zeta (1 - \alpha_k - \alpha_r) \frac{y^*}{R^*} \right] \times \frac{1}{c^*} - (\rho + \delta_R) \frac{\chi_r}{r^*} - \frac{\chi_R}{R^*}, \quad (33)$$

$$0 = \rho - \zeta \alpha_k \frac{y^*}{k^*} + \delta_k, \quad (34)$$

$$0 = r^* - \delta_R R^* - \beta O, \quad (35)$$

$$0 = y^* - c^* - pr^* - \delta_k k^*, \quad (36)$$

$$y^* = \frac{\bar{A} ((k^*)^{\alpha_k} (r^*)^{\alpha_r} (R^*)^{1-\alpha_k-\alpha_r})^\zeta}{O^{\alpha_O}}. \quad (37)$$

Next, we solve $\{c^*, k^*, R^*, r^*, y^*\}$ respectively as a function of exogenous parameters

$$\{\rho, \beta, \delta_R, \delta_k, \chi_r, \chi_R, \alpha_k, \alpha_r, \zeta, \bar{A}, \alpha_O, p, O\}$$

3.1. Solving for the long-run steady state

We aim to reduce the equation system into a single equation for R^* . Equation (34) implies:

$$y^* = \frac{\rho + \delta_k}{\zeta \alpha_k} k^*. \quad (38)$$

According to equation (35),

$$r^* = \delta_R R^* + \beta O. \quad (39)$$

Substituting equations (38) and (39) into equation (37) yields:

$$\frac{\rho + \delta_k}{\zeta \alpha_k} k^* = \frac{\bar{A} ((k^*)^{\alpha_k} (\delta_R R^* + \beta O)^{\alpha_r} (R^*)^{1-\alpha_k-\alpha_r})^\zeta}{O^{\alpha_O}}, \quad (40)$$

that is,

$$\frac{\rho + \delta_k}{\zeta \alpha_k} \frac{O^{\alpha_O}}{\bar{A}} = (k^*)^{\zeta \alpha_k - 1} (\delta_R R^* + \beta O)^{\zeta \alpha_r} (R^*)^{\zeta(1-\alpha_k-\alpha_r)}. \quad (41)$$

After further manipulation, we have

$$(k^*)^{1-\zeta \alpha_k} = \left(\frac{\rho + \delta_k}{\zeta \alpha_k} \frac{O^{\alpha_O}}{\bar{A}} \right)^{-1} (\delta_R R^* + \beta O)^{\zeta \alpha_r} (R^*)^{\zeta(1-\alpha_k-\alpha_r)}, \quad (42)$$

or equivalently,

$$k^* = \left(\frac{\rho + \delta_k}{\zeta \alpha_k} \frac{O^{\alpha_O}}{\bar{A}} \right)^{\frac{1}{\zeta \alpha_k - 1}} (\delta_R R^* + \beta O)^{\frac{\zeta \alpha_r}{1-\zeta \alpha_k}} (R^*)^{\frac{\zeta(1-\alpha_k-\alpha_r)}{1-\zeta \alpha_k}} \equiv \kappa(R^*). \quad (43)$$

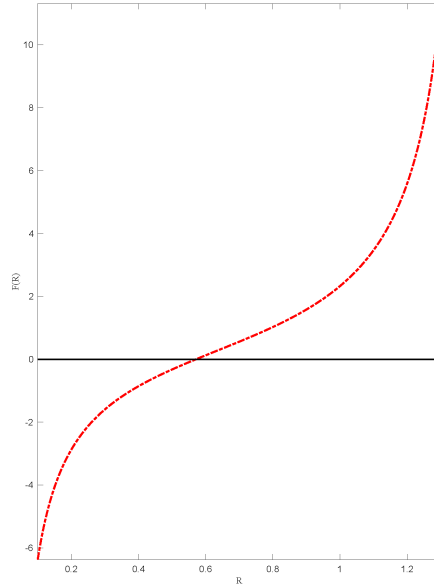
Plugging equations (38), (39) and (43) into (36) results in :

$$c^* = \left(\frac{\rho + \delta_k}{\zeta \alpha_k} - \delta_k \right) \kappa(R^*) - p(\delta_R R^* + \beta O). \quad (44)$$

Substituting equations (38), (39), (43) and (44) into (33) leads to:

$$\begin{aligned} \mathcal{F}(R) = & \left[\left(p - \zeta \alpha_r \frac{\frac{\rho + \delta_k}{\zeta \alpha_k} \kappa(R^*)}{\delta_R R^* + \beta O} \right) (\rho + \delta_R) - \zeta (1 - \alpha_k - \alpha_r) \frac{\frac{\rho + \delta_k}{\zeta \alpha_k} \kappa(R^*)}{R^*} \right] \\ & \times \left(\left(\frac{\rho + \delta_k}{\zeta \alpha_k} - \delta_k \right) \kappa(R^*) - p(\delta_R R^* + \beta O) \right)^{-1} \\ & - (\rho + \delta_R) \frac{\chi_r}{\delta_R R^* + \beta O} - \frac{\chi_R}{R^*} = 0. \end{aligned} \quad (45)$$

FIG. 1. The value of $\mathcal{F}(R)$ with respect to changes in R



Given the parameter values documented in Table 1, the steady state can be solved as follows:

$$c^* = 0.1210, \quad k^* = 0.9199, \quad R^* = 0.5707, \quad r^* = 0.1071, \quad y^* = 0.4271. \quad (46)$$

4. THE DYNAMIC IMPLICATIONS

We will now explore the impact of different exogenous variables on the four endogenous variables through a comparative dynamics analysis of the

TABLE 1.

Parameter values for the model

Parameter	Description	Value
ρ	Discount rate	0.03
β	Adverse effect of overlegislation	0.05
δ_R	Depreciation rate of the rule-of-law capital	0.1
δ_k	Depreciation rate of production capital	0.1
χ_r	Weight on new investment in the utility function	0.5
χ_R	Weight on the rule-of-law capital in the utility function	0.5
α_k	Share of production capital in the production function	0.7
α_r	Share of new investment in the production function	0.1
α_R	Share of the rule-of-law capital in the production function	0.2
ζ	Degree of decreasing return to scale in the production function	0.4
$\bar{A}$	Exogenous level of technology	0.5
α_O	Share of overlegislation in the production function	1
p	Exogenous price level of new investments	2
O	Exogenous level of overlegislation	1

steady-state equations. This analysis will illustrate how economic and institutional variables dynamically influence each other over time.

4.1. The degree of the adverse effect of overlegislation

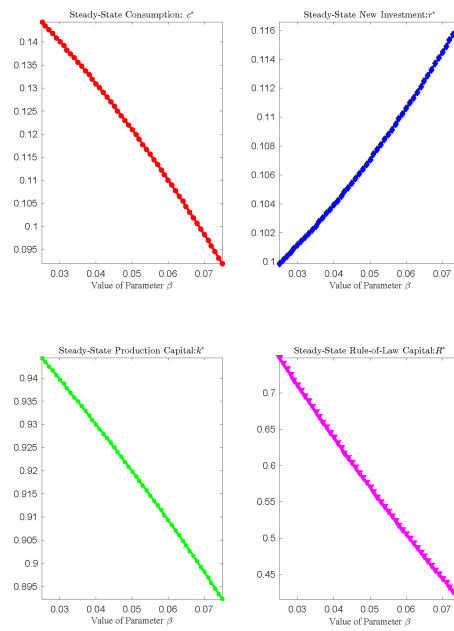
PROPOSITION 1. *An increase in β leads to higher levels of the rule-of-law investment r^* , while simultaneously decreasing consumption c^* , capital k^* , and the rule-of-law capital R^* .*

The increase in β signifies a greater destructive impact of overregulation on the accumulation of the rule-of-law capital. In order to maintain the accumulation of the rule-of-law capital, individuals would increase their investments in upholding the rule of law. However, such investments come at the expense of consumption and capital accumulation and are insufficient to offset the losses caused by overregulation. Simulation results in Figure 2 indicate that with the rise in β , expenditures on upholding the rule of law increase, but consumption, physical capital, and the rule-of-law capital all decline.

4.2. The relative importance of new investments on the rule-of-law capital in preferences

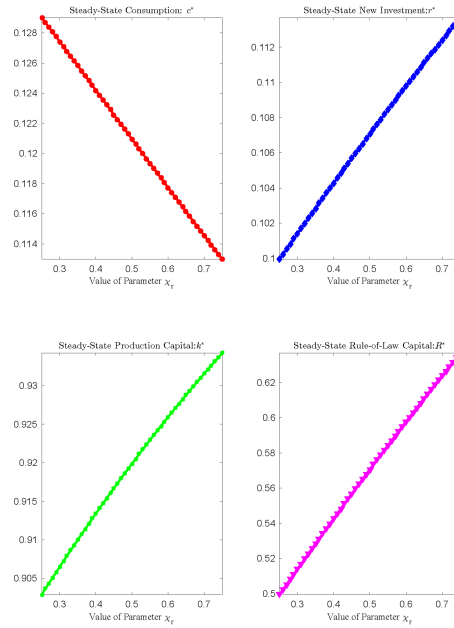
PROPOSITION 2. *An increase in χ_r leads to a decrease in consumption c^* , but results in higher levels of the rule-of-law investment r^* , capital k^* , and the rule-of-law capital R^* .*

FIG. 2. The impact of the degree of adverse effect of overlegislation on long-run steady state



Preferences for the rule-of-law investments induce higher levels of investment, thereby stimulating accumulation of the rule-of-law capital and contributing to increased aggregate output in the economy. However, since individuals derive greater utility from the rule-of-law investments, it results in a corresponding decrease in consumption. Figure 3 depicts that, as χ_r increases, new rule-of-law investments, the rule-of-law capital, and physical production capital all rise, while consumption falls.

FIG. 3. The impact of the emphasis of new investment in preference on long-run steady state



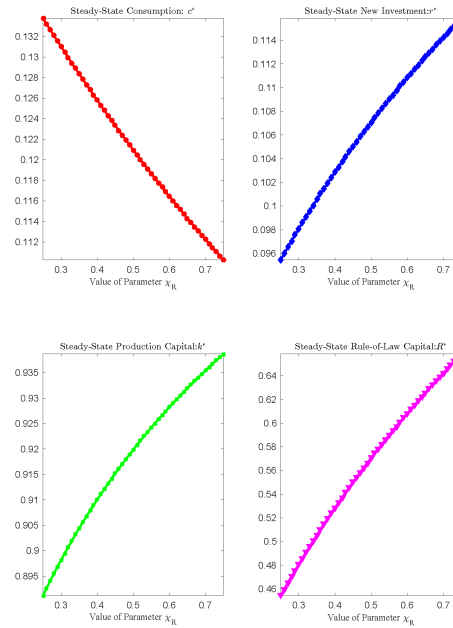
4.3. The relative importance of the rule-of-law capital in preferences

PROPOSITION 3. *An increase in χ_R leads to a decrease in consumption c^* , but results in higher levels of the rule-of-law investment r^* , physical capital k^* , and the rule-of-law capital R^* .*

Preferences for the rule-of-law capital lead to higher levels of the rule-of-law capital accumulation, thereby contributing to increased aggregate output in society. However, since individuals derive greater utility from the rule-of-law capital, consumption decreases. Figure 3 depicts that a higher χ_R tends to increase new rule-of-law investments, the rule-of-law capital, and production capital, while decreasing consumption.

These results from our theoretical dynamic analysis support the important empirical studies by De Soto (1989, 2000) and historical studies by North and Thomas (1973), North (1981, 1990). In Hernando de Soto's seminal works, "The Mystery of Capital" (1989) and "The Other Path" (2000), the importance of the rule of law is highlighted as fundamental to addressing economic challenges, particularly in developing countries. De Soto argues that the lack of formal property rights and legal frameworks

FIG. 4. The impact of prioritizing the rule-of-law capital in preferences on the long-run steady state



hinders economic development by preventing individuals from leveraging their assets effectively in developing economies. He emphasizes that the rule of law, including clear property rights, accessible legal systems, and transparent regulations, is essential for unlocking the potential of capital and promoting entrepreneurship and investment.

In “The Mystery of Capital,” de Soto explores how the informal economy, characterized by undocumented property ownership and unregistered businesses, limits economic growth. He contends that without formal recognition of property rights, individuals are unable to use their assets as collateral for loans or to participate fully in the market economy. De Soto demonstrates how establishing secure property rights through legal reforms and the rule of law can incentivize investment, stimulate entrepreneurship, and alleviate poverty.

Similarly, in “The Other Path,” de Soto examines the informal sector’s role in the economies of developing countries. He argues that the lack of legal recognition and protection for informal businesses perpetuates poverty and inequality. De Soto advocates for legal reforms that formalize informal enterprises, enabling them to access credit, markets, and legal protections. By embracing the rule of law, governments can empower marginalized com-

munities and integrate them into the formal economy, fostering inclusive growth and social development.

The rule of law plays a critical role in creating and safeguarding patents, contracts, and property rights, each contributing to innovation and economic development in the West (North and Thomas (1973), North (1981, 1990)). Patents, as established by state law, grant inventors exclusive rights to their creations, encouraging innovation by providing protection against competition. Legal frameworks surrounding patents define criteria for patentability, rights of patent holders, and enforcement mechanisms. Similarly, contracts, legally binding agreements between parties, are enforced through legal principles ensuring fulfillment of obligations and resolution of disputes. They provide certainty and stability in transactions, facilitating economic exchange and specialization. Property rights, another aspect of the rule of law, establish ownership and control over assets, incentivizing investment and entrepreneurship by ensuring security and protection against expropriation. These systems have historically driven industrial revolutions by encouraging investment, facilitating innovation, and fostering economic growth, thus underlining their crucial importance in promoting technological advancement and societal progress.

4.4. The depreciation rate of the rule-of-law capital

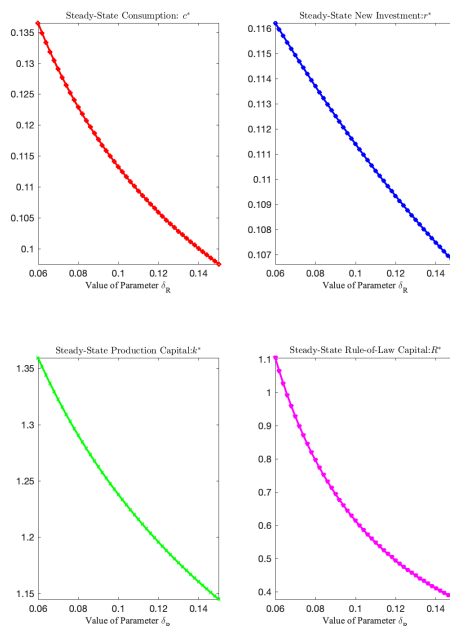
PROPOSITION 4. *In our model, an increase in δ_R leads to a decrease in consumption c^* , rule-of-law investment r^* , capital k^* , and rule-of-law capital R^* .*

A higher δ_R diminishes the resilience of rule-of-law capital, making its accumulation more difficult and sluggish, thereby reducing individual utility and constraining both output levels and individual incomes in the economy. Consumption and rule-of-law investment by individuals are also curtailed. Figure 5 illustrates that an increase in δ_R leads to an overall deterioration in economic activity.

This proposition is highly relevant for the present world: the increasing depreciation rates of rule-of-law capital in the US and Europe reflect a range of challenges and factors that undermine the effectiveness, integrity, and legitimacy of legal systems and institutions. Here are some details highlighting the rising depreciation rates of rule-of-law capital today:

Erosion of Trust and Confidence: Declining public trust and confidence in the legal system and government institutions contribute to the depreciation of rule-of-law capital. Skepticism about the fairness, impartiality, and accountability of legal processes and judicial outcomes undermines the rule of law's credibility and legitimacy.

FIG. 5. The impact of the depreciation rate of rule-of-law capital on long-run steady state



Perception of Political Interference: Concerns about political interference, partisan influence, and undue pressure on judicial independence undermine the rule of law's foundational principles. Perceptions of bias, favoritism, and selective enforcement of laws erode public trust in the fairness and integrity of legal institutions.

Corruption and Bribery: Instances of corruption, bribery, and unethical conduct within legal systems and law enforcement agencies diminish public confidence in the rule of law and undermine the effectiveness of anti-corruption measures. Corrupt practices, including judicial misconduct, abuse of power, and illicit enrichment, weaken institutional integrity and erode rule-of-law capital.

Inequality Before the Law: Disparities in access to justice, legal representation, and judicial remedies perpetuate systemic injustices and undermine the rule of law's commitment to equality before the law. Socioeconomic inequalities, discrimination based on race, ethnicity, gender, and other factors, and barriers to legal aid exacerbate disparities in legal outcomes and diminish public trust in the rule of law.

Backlogs and Delayed Justice: Backlogs in court proceedings, case congestion, and delayed justice impede timely access to legal remedies and erode confidence in the effectiveness of legal systems. Lengthy litigation processes, procedural delays, and administrative inefficiencies undermine the rule of law's promise of prompt and fair adjudication of disputes.

Inadequate Legal Protections: Insufficient legal protections for human rights, civil liberties, and fundamental freedoms weaken the rule of law's ability to safeguard individuals' rights and liberties. Weak enforcement mechanisms, inadequate legal safeguards against arbitrary detention, censorship, and infringement of privacy rights undermine the rule of law's role as a bulwark against authoritarianism and abuse of power.

Challenges to Judicial Independence: Threats to judicial independence, including executive overreach, legislative interference, and intimidation of judges, compromise the rule of law's principles of judicial autonomy and impartiality. Attacks on judicial independence undermine public confidence in the judiciary's ability to uphold constitutional principles and safeguard the rule of law.

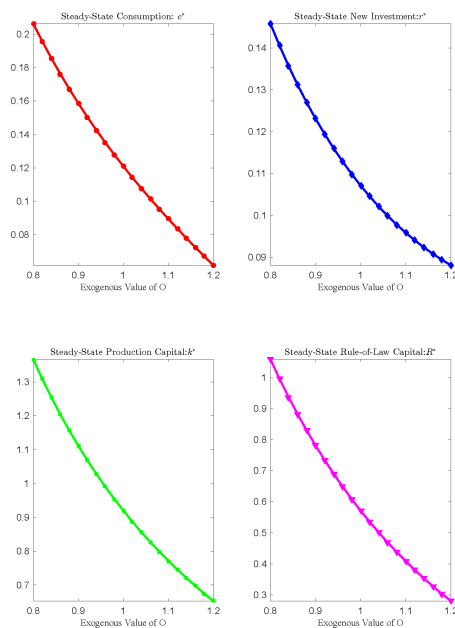
In summary, the rising depreciation rates of rule-of-law capital in the US and Europe underscore the urgent need for reforms to strengthen legal institutions, enhance judicial integrity, and promote transparency and accountability in governance. Addressing the root causes of depreciation requires concerted efforts to combat corruption, enhance access to justice, protect human rights, and uphold the rule of law's core principles of fairness, equality, and impartiality.

4.5. The level of overlegislation

PROPOSITION 5. *An increase in O leads to a decrease in consumption c^* , rule-of-law investment r^* , capital k^* , and rule-of-law capital R^* .*

A higher degree of overregulation, O , signifies comprehensive economic harm: individual utility decreases, societal output diminishes, and rule-of-law capital accumulation declines. Figure (6) illustrates that even a slight increase in O leads to a substantial decrease in all consumption and capital accumulation.

This proposition is fully supported by both theory and empirics. Bruno Leoni (1991), in his analysis, highlights overlegislation as a significant impediment to the rule of law in modern democratic societies. He argues that excessive laws and regulations imposed by legislative bodies infringe upon individual freedoms and disrupt the principles of limited government and legal certainty crucial for societal well-being. Leoni advocates for a minimalist legislative approach, emphasizing the importance of preserving individual autonomy and diversity within communities. He contends that

FIG. 6. The impact of exogenous level of overlegislation on long-run steady state

reliance on common law and legal precedent is sufficient to maintain the rule of law, criticizing legislative intervention as unnecessary and harmful. Leoni's concerns remain relevant today, particularly with the increasing authority of regulatory agencies in rule-making processes.

Leoni argues that law can emerge on a case-by-case basis. Each time a court makes a decision, its task is to find the outcome that most fits social norms. This is a discovery process.

"Both the Romans and the English shared the idea that the law is something to be discovered more than to be enacted and that nobody is so powerful in his society as to be in a position to identify his own will with the law of the land." (Leoni, 1991, p.11)

"Substituting legislation for the spontaneous application of nonlegislated rules of behavior is indefensible unless it is proved that the latter are uncertain or insufficient or that they generate some evil that legislation could avoid while maintaining the advantages of the previous system." (Leoni, 1991, p. 14)

"... the more numerous the people are whom one tries to "represent" through the legislative process and the more numerous the matters in which one tries to represent them, the less the word "representation" has a meaning referable to the actual will of the people" (Leoni, 1991, p. 19)

Leoni claimed that the socialist calculation problem applies to legislation. That is, just as a central planner lacks the information that emerges in a market, a legislator lacks the information that emerges in case law.

“... no legislator would be able to establish by himself, without some kind of continuous collaboration on the part of all the people concerned, the rules governing the actual behavior of everybody in the endless relationship that each has with everybody else. No public opinion polls, no referenda, no consultations would really put the legislators in a position to determine these rules, any more than a similar procedure could put the directors of a planned economy in a position to discover the total demand and supply of all commodities and services.” (Leoni, 1991, p. 20)

In short,

“... a legal system centered on legislation resembles in its turn—as we have already noticed—a centralized economy in which all the relevant decisions are made by a handful of directors, whose knowledge of the whole situation is fatally limited and whose respect, if any, for the people’s wishes is subject to that limitation.” (p. 22)

Our intuition tells us that legislation, by putting rules in writing, provides citizens with certainty. In theory, legislation gives us precise boundaries of what is legal and what is not. Against this, Leoni argued that in practice, legislation creates uncertainty, because laws can be changed suddenly and without warning. A business that is planned under one set of rules may become unprofitable under new legislation.

The certainty of the law, in the sense of a written formula, refers to a state of affairs inevitably conditioned by the possibility that present law may be replaced at any moment by a subsequent law. The more intense and accelerated is the process of law-making, the more uncertain will it be that present legislation will last for any length of time. Moreover, there is nothing to prevent a law, certain in the above-mentioned sense, from being unpredictably changed by another law no less “certain” than the previous one. (p.80)

The core ideas presented by Bruno Leoni in the text are as follows:

Both the Romans and the English believed that the law should be discovered rather than enacted, and no individual should equate their will with the law of the land. Leoni questioned the necessity of supplementing common law with legislation, arguing that legislation should only be introduced if non-legislated rules are uncertain, insufficient, or causing harm. As a polity expands, the concept of legislators representing the entire population becomes less feasible, as it becomes increasingly difficult to truly represent the will of the people. Leoni drew parallels between the socialist calculation problem and legislation, suggesting that legislators lack the comprehensive information available in case law, akin to how central planners lack information in a market economy. He likened a legal sys-

tem centered on legislation to a centralized economy, where decisions are made by a limited number of directors with incomplete knowledge and limited respect for public sentiment. While legislation may provide a sense of certainty due to written rules, Leoni argued that it actually introduces uncertainty because laws can be changed suddenly and without warning, affecting businesses and individuals who planned under previous legislation.

In both the United States and Britain, the proliferation of countless legislations over time has contributed to uncertainties and infringements on freedom.

In the United States, the legislative process at both the federal and state levels has resulted in a vast and complex body of laws that often overlap, contradict, or become outdated. This legislative maze creates uncertainty for individuals and businesses trying to navigate legal requirements. Moreover, the continuous enactment of new laws and regulations adds to the uncertainty, as it becomes challenging to anticipate how these changes will impact various aspects of life and business.

Similarly, in Britain, the accumulation of legislations over centuries has created a dense legal framework that can be difficult to comprehend and apply consistently. The sheer volume of laws, regulations, and statutes adds layers of complexity, making it hard for citizens to understand their rights and obligations under the law. This complexity also provides ample opportunities for arbitrary enforcement and interpretation, further eroding individual freedoms.

Both countries have experienced instances where well-intended legislative efforts have resulted in unintended consequences, stifling innovation, entrepreneurship, and personal liberties. Additionally, the sheer volume of laws and regulations can lead to overcriminalization, where ordinary citizens may unwittingly violate obscure or outdated laws.

In essence, the continuous expansion of legislative authority, without adequate consideration of its implications for freedom and individual rights, has contributed to a climate of uncertainty and diminished liberty in both the United States and Britain.

This is exactly what Milton Friedman means (from an Oct. 1974 speech he gave to the business community): "... The number of laws is so great that I doubt that there is a man in this room, myself included, who could not be sent to prison if there were a sufficiently determined attempt by prosecutors to do it. There are laws we have all broken, not because we are not law-abiding, but because there are so many laws and so many that we don't know about." Milton Friedman's statement reflects the sentiment that the sheer volume of laws and regulations has reached a point where virtually everyone could unknowingly violate them. He emphasizes that the vast number of laws creates a situation where even law-abiding individuals,

including those present at the speech, could potentially be prosecuted and sent to prison if authorities were determined to enforce every infraction.

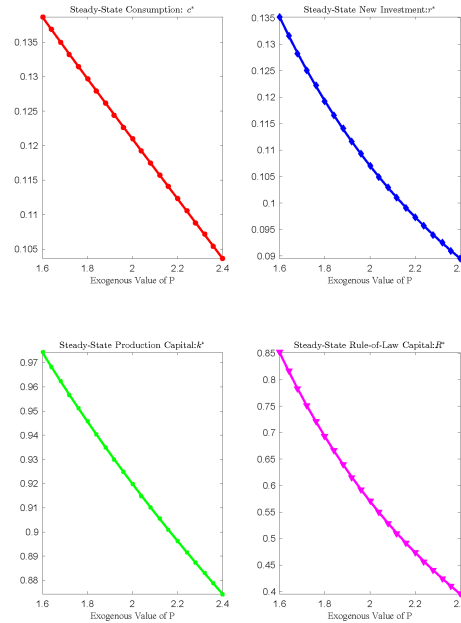
Friedman's remark underscores the concern that the proliferation of laws and regulations has led to a state of legal complexity and ambiguity. This complexity makes it challenging for individuals to remain fully compliant with all legal requirements, as there are simply too many laws to know and understand comprehensively. As a result, individuals may inadvertently find themselves in violation of laws they were unaware of, highlighting the potential for arbitrary enforcement and the erosion of individual liberties.

In essence, Friedman's statement highlights the need for greater clarity, simplicity, and restraint in the legislative process to ensure that laws are understandable, justly enforced, and conducive to fostering a free and law-abiding society.

4.6. The price of new investments on the rule-of-law capital

PROPOSITION 6. *An increase in p leads to a decrease in consumption c^* , rule-of-law investment r^* , capital k^* , and rule-of-law capital R^* .*

FIG. 7. The impact of the exogenous price of new investment on long-run steady state



If the cost of rule-of-law investment increases, individuals will reduce their corresponding investments in rule of law, leading to less rule-of-law capital and thereby adversely affecting production. Ultimately, individual incomes decrease, leading to reduced consumption as well. Figure 7 demonstrates that as p rises, consumption, new investment, rule-of-law capital and production capital all decline.

The rising costs or prices associated with the rule of law in the US and Europe reflect various challenges and complexities encountered in upholding legal principles, ensuring access to justice, and maintaining effective legal institutions. Here are some details highlighting the increasing price of the rule of law:

Legal Proceedings and Litigation Costs: Individuals, businesses, and governments incur significant expenses in legal proceedings, litigation, and dispute resolution processes. Legal fees, court costs, expert witness fees, and administrative expenses contribute to the overall cost of resolving legal disputes and enforcing legal rights under the rule of law.

Legal Services and Representation: Access to legal services and representation is essential for navigating the legal system, understanding legal rights and obligations, and securing legal remedies. Legal fees charged by attorneys, law firms, and legal consultants add to the cost of obtaining legal advice, representation, and advocacy services, particularly in complex legal matters and contentious disputes.

Judicial Resources and Case Backlogs: Overburdened court systems, judicial backlogs, and delays in case adjudication prolong legal proceedings and increase the time and resources required to resolve legal disputes. Court congestion, scheduling conflicts, and procedural inefficiencies contribute to the rising costs of litigation and the rule of law, as litigants and stakeholders endure prolonged legal processes and uncertainty.

Regulatory Compliance and Administrative Burdens: Compliance with regulatory requirements, administrative procedures, and legal obligations imposes financial burdens on individuals, businesses, and organizations. Regulatory compliance costs, including compliance monitoring, reporting, and administrative expenses, add to the overall cost of adhering to legal standards and regulatory frameworks established under the rule of law.

Legal Education and Professional Development: The pursuit of legal education, professional training, and continuing legal education (CLE) programs entails financial investments in tuition fees, study materials, professional certifications, and licensure requirements. Legal professionals, including attorneys, judges, legal scholars, and law enforcement personnel, incur costs related to academic and professional development, contributing to the sustainability and effectiveness of the legal profession and legal institutions.

Legal Aid and Access to Justice Initiatives: Ensuring access to justice for marginalized and underserved populations requires investment in legal aid programs, pro bono services, and access to justice initiatives. Funding legal assistance programs, public defender services, and legal clinics enables individuals with limited financial resources to exercise their legal rights, seek redress for grievances, and participate meaningfully in the legal system.

Legal Technology and Innovation: Adoption of legal technology solutions, digital platforms, and online legal services facilitates legal research, case management, document automation, and dispute resolution processes. However, implementing legal technology initiatives and embracing digital transformation in legal practice entail initial investments in technology infrastructure, software development, cybersecurity measures, and training programs.

Thus, the rising costs of the rule of law in the US and Europe underscore the importance of investing in legal infrastructure, judicial reforms, access to justice initiatives, and legal profession development to uphold the principles of justice, fairness, and accountability. Addressing cost factors requires collaboration among legal stakeholders, policymakers, and civil society organizations to promote legal reforms, enhance legal services delivery, and foster public trust and confidence in the rule of law.

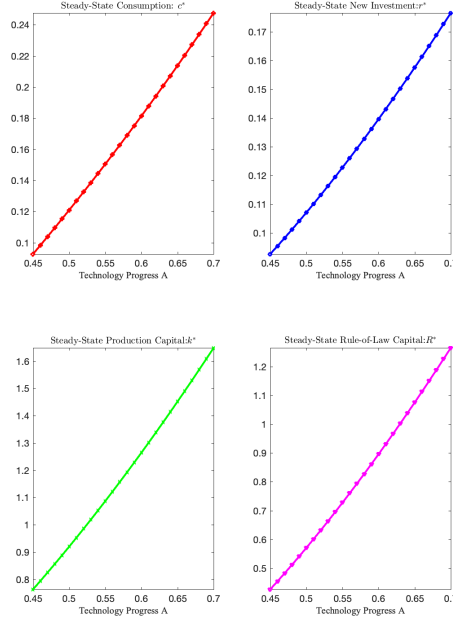
4.7. The effects of technology progress

PROPOSITION 7. *The higher the exogenous level of technology $\bar{A}$, the higher the long-run consumption c^* , rule-of-law investment r^* , capital k^* , and rule-of-law capital R^* .*

The implication of this proposition is rather straightforward: as technological advancement increases, so does production and individual income. Consequently, individuals have the means to consume and invest more in the rule of law. Investments in the rule of law contribute to the accumulation of legal capital, which subsequently leads to higher production incomes. It is evident that the pursuit of the rule of law relies on a foundation of material capital accumulation. Moreover, it is observable that countries with more advanced technology and wealth tend to possess more developed legal systems. Our analysis underscores the role of economic factors in shaping institutions such as the rule of law, property rights, and legal systems.

4.8. The depreciation rate of production capital

PROPOSITION 8. *The higher the depreciation rate of production capital, δ_k , the lower the long-run consumption c^* , rule-of-law investment r^* , capital k^* , and rule-of-law capital R^* .*

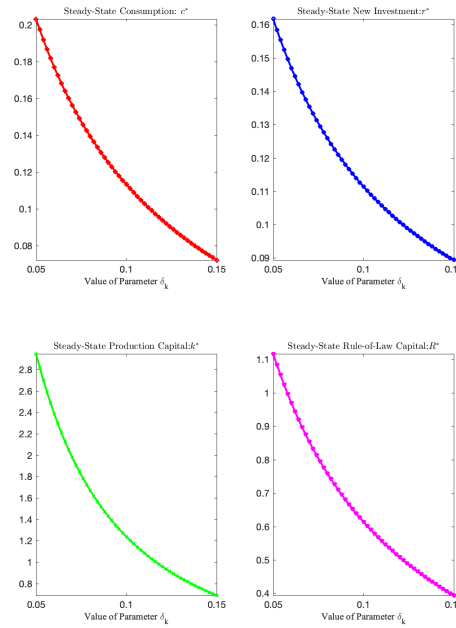
FIG. 8. The impact of the exogenous level of technology on long-run steady state

In an environment with a higher depreciation rate of physical capital, agents have less motivation to expand production, which implies a lower income for agents. This leads to a reduction in consumption c^* and rule-of-law investment r^* , and less formation of the rule-of-law capital R^* . Once more, it is evident how changes in economic variables, such as alterations in the rate of physical capital depreciation, directly influence institutional changes, such as investments in the rule of law and the accumulation of rule-of-law capital.

5. CONCLUDING REMARKS

Regardless of our identities or locations, the rule of law impacts every individual. It serves as the cornerstone for societies built on principles of justice, opportunity, and tranquility, fostering development, transparent governance, and the protection of fundamental rights. Empirical evidence demonstrates a positive correlation between the rule of law and various socio-economic indicators, including economic growth, peace, education,

FIG. 9. The impact of the depreciation rate of production capital on long-run steady state



and health outcomes. This study delves into the intricate relationship between investment in the rule-of-law capital and physical production capital within a dynamic model of optimal growth and development. It emphasizes the reciprocal influence between institutional changes, such as those in the rule of law, property rights, and legislative systems, and economic performance across different nations over time. Notably, the study highlights how the increasing costs associated with maintaining the rule of law, alongside the rapid erosion of the rule-of-law capital, can hinder long-term economic growth and development. Conversely, the rising expenses and swift depreciation of physical capital accumulation can significantly undermine the rule of law. Specifically, excessive legislation poses a threat to both the rule of law and economic progress. By elucidating these dynamics, this paper provides valuable insights into the intricate interplay between legal institutions and economic prosperity.

It is imperative to underscore the interconnected and reciprocal relationship between institutions and economic development across nations over time. Numerous empirical studies employ statistical regression analysis to

examine economic performance, often treating institutions as exogenous variables. However, this approach is fundamentally flawed because factors such as the rule of law, property rights, legislation, and political systems (whether despotic or democratic) are endogenously and significantly influenced by economic variables. Institutional changes and economic developments have consistently influenced each other across nations over time. Relying solely on superficial statistical regression coefficients as causal determinants is a grave error. These coefficients merely reflect correlations between economic variables and outcomes, rather than causative relationships. Therefore, it is essential to recognize the intricate interplay between institutions and economic dynamics and avoid oversimplifying complex phenomena through statistical analysis alone. The primary insight gleaned from our dynamic model elucidating the interplay among the rule of law, property rights, legislation, economic growth, and development, as expounded in this paper, is of utmost importance.

APPENDIX: RULE OF LAW AND ITS DEFINITIONS

The rule of law is a fundamental political ideal that holds all individuals and institutions accountable to the same legal standards, ensuring that no one is above the law. It is closely linked to constitutionalism and the concept of *Rechtsstaat*, emphasizing equality before the law and preventing the arbitrary use of power. Originating in 16th-century Britain and popularized by thinkers like John Locke in 17th century and A. V. Dicey in the 19th century, the principle asserts that everyone, including lawmakers, law enforcement, and judges, is subject to the law. This concept promotes a fair and just society where legal norms govern behavior and protect individual liberties.

Government officials in the United States, including the President, Supreme Court Justices, state judges and legislators, and members of Congress, pledge allegiance to uphold the Constitution, emphasizing the supremacy of the rule of law over individual leadership. While the federal government possesses considerable discretion, such as the legislative branch's authority to enact statutes within its enumerated powers while respecting individual rights, and the judicial branch's judicial discretion, scholars debate the interpretation of the rule of law within the U.S. Constitution. Some argue that judges lack discretion to invalidate laws based on unwritten criteria, while others contend that unjust laws are not truly laws. Additionally, the rule of law has faced challenges, with some scholars suggesting its erosion due to a utilitarian view of law. However, others argue that the rule of law has evolved to accommodate administrative discretion, as seen in the procedural transformation of administrative agencies. Despite debates, historical figures like James Wilson and Chief Justice John Marshall af-

firmed the judiciary's duty to uphold laws unless clearly unconstitutional, emphasizing the rule of law's role in ensuring legal validity.

APPENDIX: WHY FREE-MARKET PHILOSOPHERS LIKE HAYEK AND LEONI HAVE PRAISED JUDGE-MADE LAW

Hayek and Leoni have championed judge-made law for its role in preserving freedom and flexibility within legal systems, citing several key reasons. Firstly, they argue that judge-made law facilitates decentralized decision-making, aligning with principles of individual liberty by reducing the concentration of power in the hands of legislators or government officials. This decentralization safeguards individual freedoms by preventing potential abuses of authority. Additionally, judge-made law demonstrates a remarkable adaptability to changing circumstances and societal needs, surpassing statutory law in its responsiveness to evolving social, economic, and cultural contexts. By interpreting and applying legal principles based on judicial precedents and common law traditions, judges contribute to a more flexible and dynamic legal system that can effectively address emerging challenges.

Moreover, Hayek and Leoni assert that judge-made law acts as a bulwark against tyranny and arbitrary rule by the state. By relying on established legal precedents and common law principles, legal decisions are shielded from political manipulation or authoritarian dictates, thereby upholding the rule of law and protecting individual rights. Furthermore, they highlight the role of judge-made law in preserving legal tradition and continuity by building upon established customs and practices. This continuity fosters predictability and consistency within the legal system, enhancing confidence and trust in the administration of justice.

Furthermore, Hayek and Leoni's perspectives on common law evolution are closely intertwined with the concept of spontaneous order. They view common law as an emergent phenomenon that arises organically from the decentralized interactions of individuals within society, rather than being centrally planned or legislated by authorities. This organic evolution occurs through the cumulative decisions of judges adjudicating specific cases over time, shaping a body of case law reflective of societal norms and values. By emphasizing spontaneous order, they advocate for a bottom-up approach to legal development that respects individual autonomy and fosters innovation.

Oliver Wendell Holmes Jr.'s renowned aphorism, "The life of the law has not been logic: it has been experience," presents a nuanced perspective on the influence of reason and experience in molding legal principles. This assertion serves as a subtle qualification of Sir Edward Coke's earlier dictum, "Reason is the life of the law." Both statements lend support to

the concept of spontaneous order within judge-made law, suggesting that legal principles evolve not solely through logical deduction but also through the practical wisdom gained from real-life experiences. In this view, the law is not merely an abstract construct derived from pure reason but is deeply rooted in the collective experiences, customs, and traditions of society. By recognizing the dynamic interplay between reason and experience in the development of legal norms, Holmes and Coke acknowledge the organic, bottom-up nature of legal evolution, wherein judges draw upon a rich tapestry of precedents and societal practices to render decisions that reflect the realities of human existence. This spontaneous order within judge-made law allows for the continual adaptation and refinement of legal principles in response to changing societal needs and values, ultimately contributing to the maintenance of a just and equitable legal system.

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