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ORIGINAL PAPER

Organizational emergence theory: addressing invisible conflicts and emerging dynamics in entrepreneurship

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Abstract
This study presents the Theory of Organisational Emergence (TOE), an interdisciplinary framework for understanding non-linear dynamics, emergent resilience, and invisible conflicts in entrepreneurial settings. TOE integrates Interacting Q's and the PIE model (Politics, Ideology, Economy) to address gaps in established theories like Dynamic Capabilities and Effectuation. Through a qualitative analysis of the House of Mendes and Tesla Inc., TOE demonstrates how organisations adapt under systemic pressures. The framework also provides a practical diagnostic toolkit to detect tensions, simulate disruptions, and inform strategic action. By bridging theory and application, TOE offers a novel and actionable perspective for navigating uncertainty, fostering innovation, and enhancing resilience in complex environments. It equips organisations with tools to thrive amid systemic volatility and institutional complexity.

Keywords Entrepreneurial complexity · Invisible conflicts in organisations · Nonlinear organisational Dynamics · Organisational emergence · Strategic adaptability

JEL Classifications L26 · D23 · M13 · O31

1 Introduction: contextualisation and theoretical gap

Entrepreneurial environments are increasingly complex and unpredictable, demanding theoretical frameworks attuned to non-linear interactions, emergent organizational behaviours, and invisible systemic conflicts shaping decision-making. While traditional quantitative methods provide predictive insights, they neglect the salience of the sociopolitical and qualitative forces influencing entrepreneurial suc-

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cess in volatile contexts (Acs and Audretsch 2003; McMullen and Shepherd 2006). Recent interdisciplinary research has attempted to bridge this gap (Ferreira et al. 2019; Salmony and Kanbach 2022). However, widely recognized theories such as Dynamic Capabilities (Teece 1997, 2018) and Effectuation Theory (Sarasvathy 2001) remain limited in addressing hidden tensions, systemic complexity, and emergent adaptation mechanisms (Cavallo et al. 2021; Shepherd and Gruber 2021; Welter et al. 2017; McMullen and Dimov 2013). Similarly, Paradox Theory (Smith et al. 2017), Chaos Theory (Lorenz 1963), and Complexity Theory (Goldstein 1999) contribute to understanding uncertainty and non-linearity but lack the analytical depth to integrate emergent organizational dynamics with broader systemic forces.

This paper introduces the Theory of Organisational Emergence (TOE) as an integrative and reflexive framework, designed to transcend disciplinary boundaries. TOE advances entrepreneurial research by conceptualizing organizations as interacting Q's, dynamic subunits whose recursive interactions generate system-wide emergent outcomes (Goldstein 1999). Additionally, TOE incorporates the PIE framework (Political, Ideological, and Economic factors; Leite 2013) to examine how systemic pressures shape strategic adaptation. To illustrate its applicability, this study employs a historical case study of Dona Gracia Nasi, a 16th-century entrepreneur notable for navigating systemic constraints and leveraging geopolitical forces to expand her business networks. By applying TOE to this historical context, the study demonstrates how emergent organizational behaviours and invisible tensions shape entrepreneurial trajectories, offering insights that remain profoundly relevant to contemporary entrepreneurship research.

Rather than opposing existing theories, TOE complements and extends prior frameworks by integrating disciplinary perspectives into a unified model. The table below delineates TOE's contributions in comparison to established theories, clarifying how it builds upon prior work while addressing previously overlooked dimensions of entrepreneurial complexity (Table 1).

This study adopts a qualitative methodological framework grounded in historical analysis and theoretical synthesis, positioning Dona Gracia Nasi's case as an empirical lens to demonstrate TOE's applicability. While historical studies offer valuable insights into long-term resilience patterns, they remain underutilized in entrepreneurship research (Maclean et al. 2016; Rowlinson et al. 2014; Landström and Harirchi 2018; Wadhwani et al. 2020). This study aligns with contemporary calls for hybrid methodologies that integrate qualitative depth with systemic analytical rigor (Eisenhardt 1989; Decker et al. 2015).

The remainder of this paper is structured as follows: the next section examines TOE's interdisciplinary foundations, followed by an overview of the methodology and historical case study of Dona Gracia Nasi. The subsequent sections apply TOE to analyse emergent organizational dynamics, systemic constraints, and resilience strategies, leading to a discussion on broader theoretical and managerial implications. Finally, the conclusion synthesizes key contributions and future research directions. By integrating emergent dynamics, systemic forces, and hidden organizational interactions, TOE offers a paradigm shift in entrepreneurship research, enhancing theoretical discourse while providing actionable insights for managers, policymakers, and scholars navigating complexity and uncertainty.

Table 1 Comparative analysis of TOE and established theoretical frameworks.
Source Developed by authors

Aspect	TOE	Dynamic capabilities (Teece 1997, 2018)	Effectuation theory (Sarasvathy 2001)	Paradox theory (Smith et al. 2017)	Chaos theory (Lorenz 1963)	Complexity theory (Goldstein 1999)
Focus	Invisible conflicts, emergent adaptation, systemic interdependencies (PIE framework)	Resource orchestration and strategic agility	Decision-making under uncertainty	Managing tensions and contradictions	Sensitivity to initial conditions	Adaptive and self-organizing systems
Nature of Interactions	Non-linear, interdisciplinary, emergent	Strategic and iterative	Contingent and flexible	Dialectical and dynamic	Non-linear and unpredictable	Adaptive and multi-layered
Theoretical Basis	Complexity science, sociology, philosophy	Strategic management	Entrepreneurial contingency	Organizational paradoxes	Chaos theory and complexity	Interdisciplinary systems theory
Analytical Strengths	Captures invisible conflicts and emergent behaviours	Practical for resource-intensive industries	Adaptive decision-making in uncertainty	Encourages innovation through balancing contradictions	Explains unpredictable organizational shifts	Connects micro- and macro-level organizational behaviours
Conceptual Limitations	Context-dependent, requires deep qualitative analysis	Overlooks emergent conflicts	Limited to entrepreneurial decision logic	Requires careful operationalization	Lacks emphasis on qualitative factors	Abstract and challenging to operationalize

2 Interdisciplinary foundations of organisational emergence

The Theory of Organisational Emergence (TOE) addresses critical gaps in traditional business and entrepreneurship research by integrating complexity science, sociology, philosophy, and management studies to explore how organisations evolve under systemic constraints. While quantitative approaches provide predictive insights, they often overlook the social, psychological, and institutional dynamics shaping resilience and adaptation. TOE advances a qualitative and interdisciplinary perspective, conceptualising resilience as an emergent property of continuous interactions with political, economic, and ideological pressures — a view that resonates with the emergent literature on organisational antifragility and adaptive recompositing (Linnenluecke 2017; Ramezani and Camarinha-Matos 2020).

TOE builds upon foundational epistemes in economics, philosophy, and complexity sciences. Structural tensions, as highlighted by Marx (1867), and resource-driven conflicts, as discussed by Hobbes (1651), further inform this perspective, illustrating how power dynamics shape business evolution. Philosophical contributions such as Heraclitus' concept of perpetual change and Spinoza's emphasis on interconnected systems reinforce TOE's emphasis on non-linear organisational adaptation. These ideas align with complexity theory, particularly in the study of self-organisation and emergent behaviour (Goldstein 1999; Lorenz 1963), as well as contemporary work on complex adaptive systems (Holland 2014; Page 2011).

Sociological insights deepen TOE's theoretical foundations by explaining how institutional structures and collective norms shape organisational emergence. Symbolic interactionism (Blumer 1969) and Durkheim's (1893) concept of collective norms illustrate how social interactions construct organisational realities, while Giddens' (1984) structuration theory highlights the reciprocal influence of human agency and institutional constraints. These perspectives intersect with the institutional isomorphism framework proposed by DiMaggio and Powell (1983), which examines how organisations evolve within broader socio-cultural environments. TOE applies these theories to the Interacting Q's model, demonstrating how organisational subunits adapt to systemic pressures, driving emergent patterns of resilience and transformation.

The case of Dona Gracia Nasi, a 16th-century entrepreneur, illustrates TOE's practical relevance. Her strategic relocations, alliances, and adaptations to shifting regulatory landscapes exemplify the interplay between emergent organisational strategies and systemic constraints. This aligns with historical institutionalism, which examines long-term institutional transformations (Suddaby et al. 2014). TOE's principles also extend to contemporary contexts such as technology startups, corporate mergers, and crisis management, where non-linear adaptation processes shape business trajectories.

By advocating for methodological pluralism, TOE integrates interpretive depth with empirical rigor, complementing dynamic capabilities research on strategic reconfiguration and resilience (Teece 2018). This interdisciplinary synthesis positions TOE as a critical tool for understanding complex entrepreneurial ecosystems, equipping scholars and practitioners with a robust framework to navigate uncertainty and systemic change.

3 Methodology and application of TOE

3.1 Qualitative approach and justification

This study employs a qualitative, complexity-informed research design, grounded in constructivist epistemology, to explore the non-linear, emergent, and socially embedded organizational dynamics underlying the Theory of Organisational Emergence (TOE). Traditional quantitative methods, though valuable for causal inference, often fail to capture the recursive, adaptive, and systemic nature of entrepreneurial interactions (Bhaskar 2013; Holland 2014). TOE aligns with this paradigm, emphasizing systemic emergence, adaptive agency, and co-evolutionary change, necessitating an interpretive and context-sensitive approach.

A case study methodology is particularly suited to TOE, allowing for in-depth exploration of emergent organizational dynamics within historically embedded entrepreneurial ecosystems (Eisenhardt 1989; Yin 2014). This study integrates recent advances in systemic methodologies, including the hybrid critical-systemic intervention method proposed by Parrilla and Belderrain (2024), which combines systemic intervention and critical heuristics to address unstructured problems while fostering long-term learning and adaptability. This systemic perspective synergises with TOE's epistemological architecture by offering a structured pathway to analyse emergent and dynamic organizational interactions.

Additionally, the study draws on the Socio-Economic Approach to Management (SEAM), which incorporates participatory action research principles to foster collaborative problem-solving and methodological rigor (Kuran 2024). By integrating qualitative and quantitative data, SEAM strengthens the methodological framework, aligning closely with TOE's emphasis on emergent adaptation and systemic resilience in entrepreneurial contexts.

Historical case study research is particularly well suited for theory-building in complex organizational contexts, as it allows for the identification of patterns of systemic interactions, the tracing of adaptive responses over time, and the capture of socio-historical embeddedness (Eisenhardt 1989; Yin 2014). Historical analysis, as emphasized by George (2005), enables the process-tracing of resilience strategies across multiple institutional layers, offering unique insights into long-term adaptability. The case of Dona Gracia Nasi, a 16th-century entrepreneur, exemplifies how entrepreneurial agency, systemic constraints, and emergent strategies co-evolve, making it a valuable empirical setting for TOE. By analysing her strategies, this study identifies enduring principles of resilience and organizational dynamics that transcend temporal and industrial contexts (Welter 2011).

The integration of organizational theory and historical analysis, as articulated by Maclean et al. (2016), underscores the principle of dual integrity, ensuring both historical accuracy and theoretical rigor. This approach fosters a nuanced understanding of long-term organizational patterns. Furthermore, Rowlinson et al. (2014) advocate for historical approaches to analyse how past events shape contemporary organizational practices. The case of Dona Gracia Nasi serves as an empirical demonstration of TOE's principles, illustrating the dynamic interplay of systemic forces, emergent adaptation, and strategic agency.

Building on the work of Decker et al. (2015), this investigation foregrounds the temporal choreography and contextual embeddedness of emergent organisational phenomena. Dona Gracia's ability to navigate hostile socio-political environments highlights the practical applicability of TOE in addressing both visible and invisible conflicts. Rather than seeking statistical generalization, this study employs analytic generalization, identifying underlying patterns of resilience, emergent adaptation, and systemic interplay, contributing theoretically to entrepreneurship, organizational theory, and complexity science (Flyvbjerg 2006; Yin 2014).

Examining modern startups navigating volatile markets or organizations facing systemic challenges such as hostile takeovers provide additional comparative insights. Startups, particularly in technology sectors, often encounter emergent interactions among investors, teams, and regulatory environments—paralleling historical challenges. Similarly, mergers and acquisitions frequently reveal systemic tensions and conflicts that TOE is uniquely positioned to address. The combination of historical and contemporary cases reinforces TOE's applicability across diverse temporal and industrial landscapes, offering a multidimensional perspective on emergent organizational phenomena.

3.2 Case study: application of TOE in house of mendes

The case study method was chosen to explore business dynamics within historical and socio-political contexts, ensuring methodological rigor through an iterative, theory-building approach (Yin 2014; Eisenhardt 1989). This study examines Dona Gracia Nasi, a 16th-century entrepreneur, to illustrate how invisible conflicts and systemic barriers shaped her strategic decisions, demonstrating TOE's applicability in explaining emergent dynamics, systemic constraints, and adaptive strategies (McKelvey 2004).

Using an iterative pattern-matching approach, insights from biographies, business records, and historical analyses were cross-referenced to identify patterns of resilience and adaptation (Eisenhardt 1989). This methodological triangulation strengthens TOE's theoretical validity, capturing the non-linear interactions that drive entrepreneurial resilience. Rather than an empirical study, this case serves as a conceptual illustration of TOE, highlighting how emergent strategies arise from systemic pressures.

Dona Gracia's ability to navigate religious persecution and systemic constraints exemplifies how adaptive strategies emerge through complex interactions. While a single historical case limits immediate generalizability, rich case studies provide deep theoretical insights that can be tested across contemporary settings (Flyvbjerg 2006). This contextualized historical analysis strengthens TOE's capacity to explain entrepreneurial emergence across diverse environments.

3.3 Historical reconstruction and business complexity

Historical reconstruction was employed to address gaps in the historical record, contextualizing Dona Gracia Nasi's strategic decisions within broader social, political, and economic frameworks. This method enables the study to trace the long-term

emergence of systemic forces and adaptive behaviours, uncovering patterns of entrepreneurial resilience and strategic adaptation that contribute to TOE's theoretical development (Welter 2011). By examining socio-cultural and economic forces, the study illustrates how systemic barriers, and emergent strategies shaped her entrepreneurial trajectory.

Yin (2014) introduces the logic model as a tool for structuring complex, long-term interactions of systemic forces. Applying this approach, this study maps non-linear cause-and-effect relationships in Dona Gracia's strategic decisions, reinforcing TOE's emphasis on emergent and recursive processes. By structuring historical events as dynamic interactions, the logic model provides a foundation for analysing how systemic constraints and opportunities co-evolve over time (Yin 2014).

While historical reconstruction offers valuable longitudinal insights, it faces inherent limitations, such as gaps in historical records and interpretive subjectivity. However, methodological triangulation with multiple sources and organizational history methodologies (Rowlinson et al. 2014) mitigates these constraints, strengthening the robustness and validity of the analysis.

3.4 Document analysis: historical and business evidence

Document analysis was a key method in this study, examining historical texts and business records related to Dona Gracia Nasi's entrepreneurial activities. This approach identified behavioural patterns, conflict management strategies, and mechanisms for overcoming invisible barriers. A review of literature on historical entrepreneurship further reinforced the theoretical foundation of TOE, enabling the study to refine its framework by identifying patterns of organizational emergence, resilience, and systemic adaptation. Integrating historical documents with contemporary theories reinforced TOE's applicability to both historical and modern contexts.

3.5 Validation and triangulation of historical and theoretical data

Data triangulation, as described by Patton (2002) and cited in Yin (2014), was employed to enhance the credibility of findings by cross-referencing historical data, business records, and theoretical frameworks. This ensured that historical insights were not merely descriptive but contributes to theory refinement and conceptual development. Teece (2018) highlights the importance of balancing strategic adaptability with operational stability, and TOE builds on this by examining how historical and emergent interactions among organizational elements shape systemic outcomes.

This aligns with Uhl-Bien and Arena's (2018) concept of adaptive leadership, where "adaptive spaces" enable entrepreneurial ideas to engage with operational systems, fostering innovation. TOE's methodological framework provides both theoretical depth and practical insights, offering valuable tools for contemporary organizations navigating complexity. By tracing emergent and adaptive strategies through history, this study provides actionable knowledge for modern entrepreneurial ecosystems, leadership, and strategic decision-making.

4 Theory of organisational emergence (TOE)

4.1 Interdisciplinary foundations of TOE

The Theory of Organisational Emergence (TOE) is a groundbreaking framework that addresses gaps in traditional models by integrating insights from physics, sociology, and philosophy (Richardson 2008; Smith and Lewis 2011; Smith et al. 2017). Unlike reductionist approaches that compartmentalize knowledge into discrete domains—such as resource optimization (Teece et al. 1997) or paradox management (Smith and Lewis 2011)—TOE recognizes that organisational phenomena are inherently complex and require a holistic perspective. By synthesizing systemic emergence, adaptive agency, and recursive interactions, TOE provides a more comprehensive understanding of organisational behaviour in uncertain environments.

From physics, TOE incorporates complex systems and chaos theory to explain how small changes in initial conditions can lead to non-linear, unpredictable outcomes—a principle known as the butterfly effect (Lorenz 1963). These insights, when combined with Dynamic Capabilities Theory (Teece 1997; Teece 2018), extend traditional strategic frameworks by considering invisible conflicts and emergent organisational shifts, particularly in volatile contexts like hostile takeovers (Leite 2013). TOE further refines complexity science (Goldstein 1999; McKelvey 2004) by integrating sociopolitical constraints that shape emergent organisational change. While Dynamic Capabilities Theory (Teece 1997) focuses on deliberate managerial reconfiguration, TOE accounts for emergent resilience mechanisms arising from institutional and social interdependencies (Greenwood et al. 2017).

From sociology, TOE aligns with Durkheim's (1893) theory of social structures, which views organisations as dynamic entities shaped by collective norms and power structures. The framework also incorporates Foucault's (1977) analysis of systemic constraints and Weber's (1978) insights on legitimacy and entrepreneurial barriers. This transdisciplinary approach enables TOE to transcend disciplinary silos (Osborn and Hunt 2007; Sawyer 2005), integrating institutional logics and emergent complexity into its analytical scope.

Philosophically, TOE builds on Heraclitus' notion of flux, emphasizing that organisations exist in a state of constant transformation. Similarly, Spinoza's emphasis on interconnectivity highlights how every organisational decision produces systemic ripple effects (Castells 1996). These perspectives reinforce TOE's emphasis on non-linear interactions that drive emergent behaviours.

TOE also reconceptualizes leadership as an emergent property of self-organizing systems, rather than a fixed hierarchical role. Complex Adaptive Systems (CAS) theory suggests that leadership should enable rather than control adaptability (Schneider and Somers 2006). Complex Adaptive Leadership Theory (Uhl-Bien and Arena 2018) supports this view, illustrating how leaders act as catalysts within networks that self-regulate at the "edge of chaos". TOE thus reframes leadership as a dynamic force shaping influence, legitimacy, and decision-making in uncertain environments.

Emergent dynamics, as identified by Smith et al. (2017), thrive on tensions that sustain and challenge organisational systems. TOE expands on Paradox Theory by conceptualizing contradictions as drivers of organisational adaptation, rather than

constraints. This approach provides a more nuanced view of systemic tensions, highlighting their role in innovation and transformation.

By synthesizing these interdisciplinary insights, TOE not only addresses the limitations of existing theories but also offers practical tools for navigating complexity. Its emphasis on non-linear dynamics, invisible conflicts, and systemic interdependencies enhances the understanding of organisational resilience and adaptability, making it highly relevant for both historical and contemporary business environments.

4.2 The multidimensional framework of TOE

To deepen the understanding of business complexity, the Theory of Organisational Emergence (TOE) introduces a multidimensional framework that captures the interplay between organisational components and systemic forces. Unlike traditional analytical models, TOE emphasises interdependencies, emergent behaviours, and non-linear dynamics often overlooked in conventional studies. By incorporating historical and situational reconstruction, it offers a more contextually grounded lens for analysing organisational phenomena.

At its core, Emergence is the defining outcome of TOE, where recursive interactions between organisational units (Q's) and external systemic forces produce unpredictable patterns (Goldstein 1999; Sawyer 2005). Unlike deterministic models, TOE recognises that minor changes at the micro-level can trigger large-scale systemic shifts, a particularly relevant feature in turbulent business environments where adaptability and innovation arise through multi-level interactions.

The TOE framework (Fig. 1) structures organisational components into nested layers. The innermost layer consists of Interacting Q's (departments, teams, leaders, stakeholders) shaping organisational behaviour. These elements are embedded within broader systemic forces such as Politics (P), Ideology (I), and Economy (E) (Anderson 1999). This nested structure reinforces TOE's non-linear perspective, illustrating how internal dynamics and external pressures co-evolve to generate emergent organisational properties.

As depicted in Fig. 1, TOE highlights three interdependent domains:

Leadership and Organisational Units– Micro-level structures that shape emergent strategies.

External Pressures– Regulatory, economic, and political shifts that shape organisational responses.

Systemic Forces– captured in the PIE triad (Politics, Ideology, Economy)– Macro-level dimensions influencing organisational adaptability and identity.

By embedding organisations within a broader socio-political and economic landscape, TOE offers a dynamic lens for analysing how external pressures interact with internal structures. For instance, regulatory shifts or technological disruptions can rapidly reshape strategic trajectories, forcing firms to adapt in real time (Tushman and Romanelli 1985). The recursive feedback loops between systemic forces and internal dynamics allow firms to continuously reconfigure their structures to navigate uncertainty.

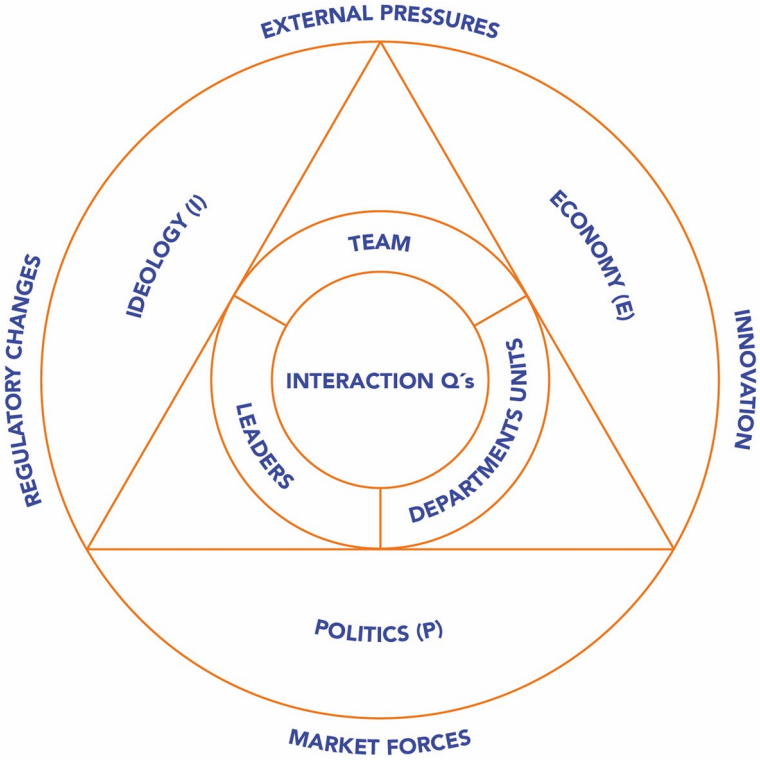

Fig. 1 Conceptual Framework.
Source Developed by authors

While traditional management theories focus on resource-based strategies, TOE advances an interaction-based perspective, where emergent properties shape long-term organisational trajectories. Through this lens, TOE identifies hidden tensions, equipping scholars and practitioners with tools to anticipate and manage systemic shifts. By analysing how organisations dynamically respond to market fluctuations, political transitions, and ideological transformations, TOE presents a robust framework for navigating complexity in modern business ecosystems.

4.2.1 Interacting Q's

At the core of the Theory of Organisational Emergence (TOE) lies the concept of Interacting Q's, which represent the dynamic, interacting elements within organisations. These Q's—individuals, teams, departments, and external stakeholders—continuously interact and adapt to systemic forces. Unlike traditional models that assume linear cause-and-effect relationships, TOE conceptualizes organizations as complex adaptive systems, where slight perturbations in a single Q can cascade into significant systemic transformations (Lorenz 1963; Goldstein 1999). TOE integrates sociological and philosophical perspectives to explain how emergent organizational behav-

iours are shaped by power structures, institutional logics, and social norms (Weber 1978; Foucault 1977; Clegg 2023).

Figure 2 illustrates how the Organizational Core is shaped by primary and secondary nodes that define its emergent dynamics. The core consists of employees, teams, and innovation, directly influenced by systemic forces such as leadership, regulatory changes, financial markets, and organizational politics. The TOE framework highlights that these interactions are not merely reactive but constitutive and recursive, meaning that organizations actively shape their external environments through adaptation and strategic decision-making (Tushman and Romanelli 1985; Schneider and Somers 2006).

A key insight from TOE is that Q's are not static entities—they evolve, dissolve, or recombine, creating emergent organizational structures. For instance, strategic alliances (e.g., joint ventures) represent the fusion of existing Q's into new autonomous Q's with distinct systemic interactions (Anderson 1999; Smith et al. 2017). However, the formation of new Q's does not eliminate the old ones; instead, it generates new layers of interdependence, reinforcing TOE's assertion that organizational dynamics cannot be understood through linear models alone.

This adaptability is evident in startup ecosystems, where venture capital (a Q), regulatory environments (a Q), and founding teams (a Q) coalesce, forming dynamic organizational landscapes. Similarly, economic downturns illustrate non-linear adaptability, as labour unions (a Q) may push for wage reductions to sustain firms, while in economic booms, they demand salary increases. These recursive interactions exemplify TOE's emphasis on emergence and non-linearity.

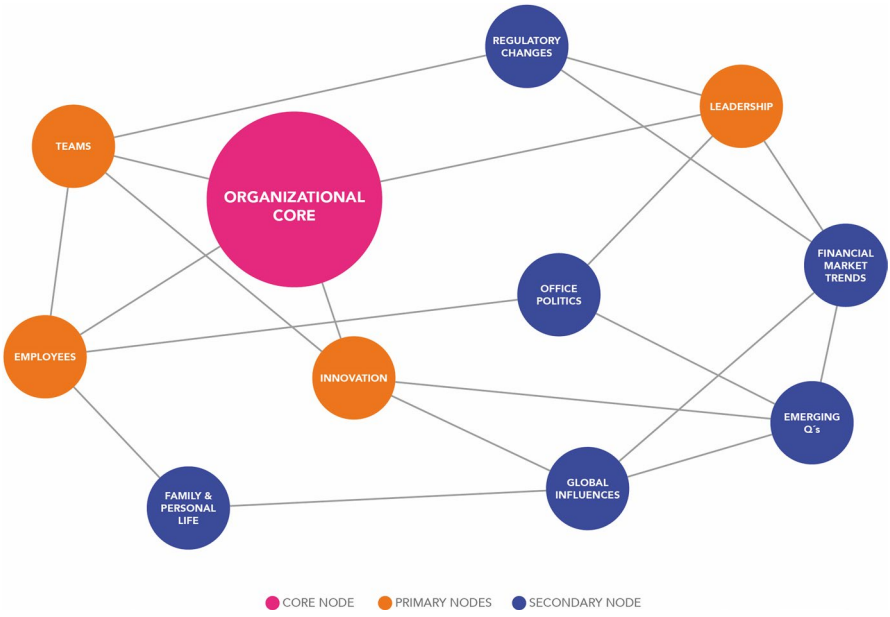

Fig. 2 Interacting Q's Model—Conceptual Framework of TOE.
Source Developed by authors

Grasping the dynamics of interacting Q's offers actionable insights for managing complexity in business environments. Leadership transitions, for example, require analysing how CEO replacement (a Q) affects company culture, investor confidence, and strategic direction. Mergers and acquisitions should evaluate emergent Q's beyond financial synergies, assessing how the integration of two organizations catalyses novel and often unintended systemic dynamics. Similarly, market disruptions from technological advancements or regulatory shifts necessitate anticipating how external Q's interact with internal structures (Uhl-Bien and Arena 2018; Teece 2018).

By applying TOE's Interacting Q's framework, business leaders can move beyond reactive approaches to embrace complexity, emergence, and adaptability as key drivers of organizational resilience. The TOE framework thus positions organizations not as static entities but as evolving networks of interacting Q's, reinforcing their ability to navigate uncertainty and complexity.

4.2.2 PIE (politics, ideology, economy)

The PIE framework within the Theory of Organisational Emergence (TOE) provides a lens to analyse how external systemic forces shape organisational dynamics. Each Q operates both as an independent entity and as part of a larger system, each with distinct political, ideological, and economic dimensions. This structure suggests that an organisation's emergent behaviour is not solely dictated by internal capabilities, but co-shaped through continuous interactions with these external forces. Politics influences leadership structures and access to resources, ideology defines cultural and strategic orientations, and economics determines sustainability and market positioning (Leite et al. 2024). Together, these dimensions create a dynamic system where organisations must continuously negotiate strategic responses within evolving and often volatile systemic landscapes.

Unlike static models, TOE conceptualises organisations as adaptive systems, where emergent properties arise from recursive interactions between micro-level decision-making and macro-level systemic constraints (Goldstein 1999; Sawyer 2005). In this context, systemic forces act not only as constraints but also as catalysts for transformation, compelling organisations to engage in continuous reconfiguration (Leite 2025b). The PIE framework helps explain how political structures, ideological currents, and economic shifts determine business evolution, influencing resilience, strategic adaptation, and long-term viability (Tushman and Romanelli 1985).

Figure 3 illustrates the interplay between Politics, Ideology, and Economy, showing how organisations must continuously align themselves within a shifting system of pressures and opportunities. The historical case of Dona Gracia Nasi exemplifies this framework, demonstrating how political persecution, economic opportunities, and ideological imperatives shaped her strategic decisions. She leveraged financial networks to secure political protections, using trade as both an economic resource and a diplomatic tool. Similarly, Tesla navigates policy incentives, shifting regulatory architectures, and prevailing ideological currents to sustain its competitive advantage. Despite differences in context, both cases illuminate how systemic forces shape organisational trajectories.

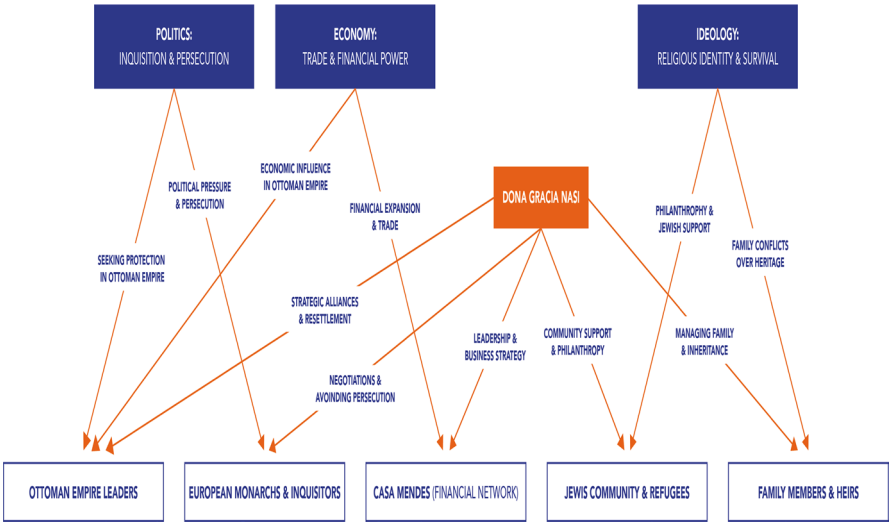

Fig. 3 PIE Framework—The Interplay of Politics, Ideology, and Economy in Organizational Emergence.
Source Developed by authors

Table 2 compares the systemic forces influencing the evolution of the House of Mendes in the sixteenth century and Tesla Inc. in the contemporary era. While both organisations were led by historically prominent figures—Dona Gracia Nasi and Elon Musk—the focus lies on how their respective systems responded to political, ideological, and economic tensions, thus illustrating TOE's relevance across different contexts. The leadership dimension, although crucial, is understood as an emergent property embedded in broader organisational dynamics.

While the PIE framework provides a unifying structure to compare systemic pressures, it is essential to acknowledge the fundamental differences in their historical nature and organisational implications. The House of Mendes operated under absolutist monarchies with limited institutional autonomy and direct state control over religious and economic freedoms, whereas Tesla navigates contemporary capitalist democracies with regulatory incentives, market volatility, and globalised value chains. Ideologically, crypto-Judaism entailed survival and resistance under persecution, in contrast to Tesla's aspirational ethos of technological disruption and ecological transformation. Economically, Mendes' operations were based on diasporic trade and geopolitical arbitrage, while Tesla's ecosystem is shaped by speculative finance, vertically integrated innovation, and platform-based competition. These distinctions illuminate that although both cases reflect adaptive responses to systemic forces, the underlying political, ideological, and economic architectures differ markedly in scale, structure, and agency.

Ultimately, the PIE framework demonstrates that organisations do not merely react to external conditions but actively co-construct and reshape their systemic environments through strategic adaptation. Whether through mergers, acquisitions, lobbying, or sustainability initiatives, organisations leverage systemic interactions to influence

Table 2 Comparative PIE dynamics in organisational emergence– house of Mendes and Tesla Inc.
Source Developed by authors

PIE dimension	House of Mendes (16th Century)	Tesla Inc. (Contemporary Context)
Political (P)	Operated under absolutist monarchies (Portugal and the Ottoman Empire); faced systemic persecution and state-imposed constraints on mobility, trade, and identity	Navigates fluctuating regulatory regimes; benefits from state incentives for electric mobility; exposed to geopolitical tensions (e.g., trade dependencies on China)
Ideological (I)	Rooted in crypto-Judaism; driven by cultural resilience and transnational networks of religious solidarity and resistance	Promotes technological utopianism and sustainability; shaped by ideological tensions between decentralised innovation and centralised leadership narratives
Economic (E)	Leveraged diasporic trade networks, maritime routes, and credit systems; acted as a cross-border financial and commercial hub	Entrenched in volatile global financial and technological markets; pursues vertical integration across EVs, software, and batteries; highly sensitive to investor sentiment and speculative valuation

industry standards and maintain competitive positioning (Leite 2025a). TOE provides a robust tool for scholars and practitioners to understand how organisations navigate complexity and uncertainty, reinforcing its applicability across historical and contemporary contexts.

4.2.3 Modern application of PIE: Tesla's organisational dynamics

Tesla's organisational evolution exemplifies TOE's application, with PIE dynamics serving as the analytical lens. Building on the prior explanation of the PIE framework, we now explore how Tesla navigates political incentives, ideological narratives, and economic volatility. Just as historical figures such as Dona Gracia Nasi navigated socio-political and economic barriers through emergent adaptation, Tesla's strategies reflect a dynamic interplay between political, ideological, and economic forces.

From a political perspective, Tesla benefits from state-led incentives promoting renewable energy, including U.S. EV tax credits and the EU's carbon emissions regulations. However, its global supply chain relies on resources like lithium and rare earth minerals, which are exposed to geopolitical frictions, particularly with China, illustrating how governance structures and trade policies impact its strategic flexibility.

Ideologically, Tesla is embedded in sustainability narratives and technological utopianism, positioning itself as a disruptor within the automotive industry. Beyond sustainability, its first-principles approach, championed by Elon Musk, reinforces its identity as an innovation-driven company. This ideological positioning shapes consumer perception, investor confidence, and Tesla's long-term strategic narrative,

much like historical entrepreneurs leveraged ideological narratives to consolidate influence.

Economically, Tesla operates within a rapidly transforming industry, where market expectations, supply chain dependencies, and digitalisation drive competitiveness. Unlike traditional automakers, it has pursued vertical integration, spanning battery production, software development, and autonomous vehicle technology, giving it greater control over supply chains. Moreover, speculative finance significantly influences Tesla's market valuation, illustrating how modern economic forces often transcend classical production-based models, shaping strategic agility and resilience.

This strategic adaptability reflects the foundations of dynamic capabilities, particularly the firm's ability to orchestrate assets, learn continuously, and reshape its business model architecture in response to systemic volatility (Teece 2018). However, TOE extends beyond deliberate reconfiguration by illuminating how such capabilities often emerge through recursive tensions and non-linear interactions with political, ideological, and economic forces.

These dynamics resonate with empirical studies on Tesla's entry strategy. Thomas and Maine (2019), through a longitudinal case study, demonstrate that Tesla did not follow a disruptive innovation trajectory but instead leveraged architectural innovation and the attacker's advantage to circumvent incumbent constraints and establish a differentiated architectural position and value proposition. Their findings further support TOE's emphasis on systemic and invisible tensions—political, ideological, and economic—that enable emergent organisational forms in contested markets.

These observations align with the broader patterns identified by Sovacool et al. (2017), who examined Tesla and other clean tech firms through the lens of open versus closed innovation dynamics. Their study highlights Tesla's hybrid strategy, which simultaneously embraces external collaboration and open intellectual property, while maintaining centralised control over core technological pathways. This duality reinforces TOE's proposition that emergent organisational forms arise from navigating systemic tensions—balancing openness with strategic closure.

The recursive interactions between politics, ideology, and economy reinforce TOE's premise that small systemic shifts can generate disproportionate effects. A minor policy change on EV subsidies can reshape demand, triggering cascading transformations across production, investment, and supply chains. Similarly, technological advancements—such as breakthroughs in battery efficiency—can force industry-wide adaptations, corroborating TOE's assertion that emergent organisational dynamics are products of recursive feedback loops.

By analysing Tesla's strategic evolution through the PIE framework, it becomes evident that organisational adaptability is not solely a function of internal capabilities, but an emergent property shaped by continuous systemic interactions. Tesla's case affirms the empirical resonance of TOE in explaining how historical and modern organisations evolve under dynamic systemic pressures, particularly in industries shaped by regulatory forces, technological shifts, and ideological transformations.

4.2.4 Dynamic states

Dynamic states are a central concept in the Theory of Organisational Emergence (TOE), referring to the continuously evolving conditions that shape interactions among Q's in a business environment. Unlike static models of organisational development, TOE posits that organisations exist in a constant state of flux, adapting to external pressures and internal transformations in ways that defy linear progression. Dynamic states unfold through recursive feedback loops, where micro-level interactions—between departments, teams, and leadership—collectively influence macro-level organisational behaviour. This aligns with complexity science, where phase transitions explain how small systemic shifts can trigger large-scale transformations (Holland 2014; Goldstein 1999).

In TOE, dynamic states unfold in response to market fluctuations, regulatory changes, technological disruptions, and socio-cultural shifts. Departing from models that assume fixed growth stages, TOE highlights business ecosystems as inherently self-organising (Anderson 1999). For example, during an economic crisis, companies may shift from expansion to resilience-building, mirroring how complex adaptive systems respond to external disturbances. This questions conventional strategic models, reinforcing TOE's emphasis on non-linearity and adaptability.

TOE extends Paradox Theory (Smith et al. 2017) by demonstrating how tensions between stability and change play out across multiple organisational levels. While Paradox Theory highlights competing forces, TOE explains how contradictions interact dynamically, leading to emergent strategic adaptations. This recursive interplay between internal complexity (e.g., leadership tensions, operational constraints) and external shocks (e.g., technological breakthroughs, regulatory shifts) leading to bifurcation points—critical thresholds of organisational transformation (Schneider and Somers 2006).

In volatile industries such as technology, energy, and finance, understanding dynamic states is essential for navigating uncertainty. Unlike traditional models that seek to control external variability, TOE emphasises strategic fluidity, where firms continuously adjust their structures and decision-making to remain competitive (Teece et al. 1997). Resilience, in this context, is not a fixed capability but an emergent property, shaped by an organisation's ability to reconfigure itself in response to systemic perturbations.

In sum, dynamic states encapsulate the core principles of TOE: emergence, adaptability, and non-linearity. By viewing organisational evolution as a recursive process, rather than linear progression, TOE provides a powerful lens for understanding how firms balance stability with change, navigate complexity, and sustain long-term adaptability in unpredictable business environments.

4.2.5 Emergence and non-linearity

A fundamental principle of the Theory of Organisational Emergence (TOE) is emergence, where interactions among simple elements generate complex and unpredictable behaviours that cannot be understood by examining individual components in isolation. Within TOE, emergence manifests in adaptive strategies, resilience pat-

terns, and non-linear organisational shifts, revealing how dynamic forces mould long-term organisational trajectories (Goldstein 1999; Holland 2014). Unlike reductionist models, TOE emphasises systemic interdependencies, where subtle variations may yield disproportionate systemic effects across business ecosystems (Anderson 1999).

Non-linearity, another key principle of TOE, demonstrates how small changes can lead to significant organisational consequences (Lorenz 1963). For instance, a slight increase in trust within an executive team may enhance cohesion, reducing internal tensions and improving strategic alignment. Conversely, minor leadership misalignments in volatile contexts may amplify tensions, causing structural fractures that propagate across multiple levels of the organisation (Schneider & Somers 2006). This unpredictability explains why traditional linear forecasting models often fail to account for emergent organisational phenomena.

To illustrate this phenomenon, Fig. 4 presents a conceptual model of trust-driven collapse in organisational alignment. The curve demonstrates how an initial decline in trust—though imperceptible at first—leads to stress accumulation and culminates in a rapid, non-linear deterioration of alignment. The y-axis represents trust and alignment levels on a normalized scale (0 to 1), while the x-axis captures the progression of time. As trust erodes, the system reaches a critical inflection point, beyond which coherence collapses exponentially.

This visualisation highlights a core insight of TOE: that latent fragility may be masked by surface-level stability, giving decision-makers a false sense of control. Once trust begins to erode, misalignments intensify, and stress amplifies recursively resulting in organisational incoherence. Recognising such inflection points is critical. Intervening early—through cultural recalibration or leadership realignment—can prevent cascading failures.

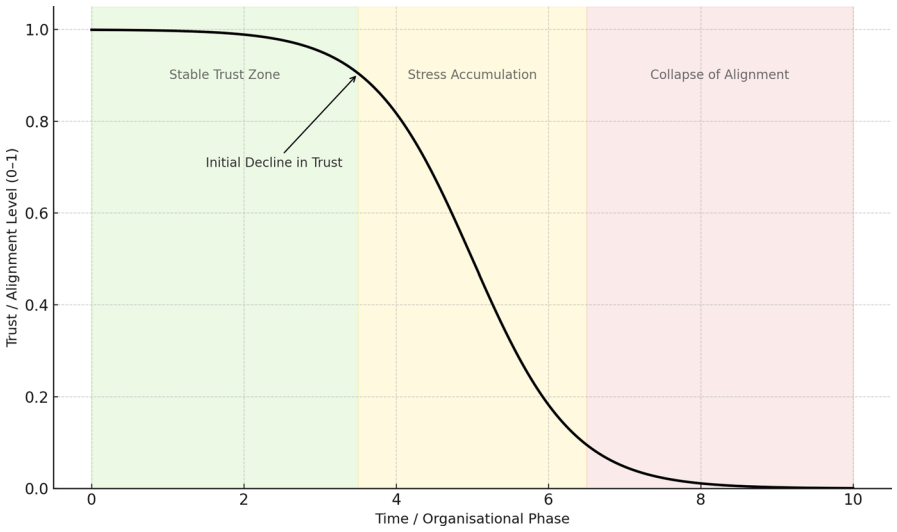

Fig. 4 Collapse of Alignment—Recursive Dynamics of Trust, Stress, and Organisational Fragility. *Source* Developed by authors

In volatile and high-stakes contexts—such as start-up environments, crisis response, or post-merger transitions—understanding the non-linear collapse dynamics of alignment is essential for sustaining resilience. TOE provides a critical analytical lens for anticipating, modelling, and mitigating such breakdowns through systemic, recursive, and forward-looking thinking.

5 Applying the theory of organisational emergence (TOE): historical and contemporary insights

This section applies the Theory of Organisational Emergence (TOE) to historical and contemporary contexts, demonstrating how emergent organisational dynamics materialise in response to systemic pressures. By examining Dona Gracia Nasi's trajectory, a 16th-century business leader, illustrates patterns of organisational resilience, adaptive strategy, and systemic interplay. The case study serves as an empirical foundation for TOE's interdisciplinary approach, showcasing how organisations evolve through recursive interactions between internal agency and external systemic forces.

5.1 The case of dona gracia nasi: a historical illustration of TOE

Dona Gracia Nasi, also known as Beatrice de Luna, exemplifies TOE's principles as one of 16th-century Europe's most influential business leaders. Her strategic agility in navigating systemic constraints and leveraging emergent opportunities and adapt to shifting political and ideological pressures highlights the non-linear and dynamic processes central to TOE. As the head of House of Mendes, a powerful financial network operating across Portugal, Belgium, Italy, and the Ottoman Empire, her strategic decisions illustrate how organisations evolve through recursive interactions between internal agency and external systemic forces.

Born in 1510 in Lisbon to a family of conversos (New Christians), Dona Gracia faced political and religious constraints under the Portuguese Inquisition, which justified persecution, property confiscation, and financial control (Roth 1947; 2002). As state intervention intensified, she strategically relocated to Antwerp, a major financial hub, where she expanded House of Mendes' operations and built alliances with European rulers, including Henry II of France and Emperor Charles V (Carsten 1961). However, Antwerp, like Portugal, imposed systemic constraints, necessitating further strategic repositioning.

Following the death of her husband, Francisco Mendes, Dona Gracia assumed leadership of House of Mendes, overseeing its transition into one of Europe's most powerful financial institutions. Her capacity to reconcile political pressures with economic imperatives TOE's premise that organisations emerge through iterative adaptations (Roth 1947). However, her financial success also attracted state intervention, illustrating how entrepreneurial strategies can be constrained by political forces seeking economic consolidation (Stern 1950).

As state control intensified, she made a decisive pivot to the Ottoman Empire, which provided greater religious and economic autonomy. In Istanbul, she established new financial and trade networks, strengthened political alliances, and invested

in Jewish educational and social infrastructure (Roth 1947; Saperstein 1989). This trajectory underscores strategic relocation as a mechanism of emergent resilience.

Dona Gracia's strategic decisions were shaped by the interplay of political constraints (state intervention and exile), ideological pressures (religious persecution and cultural identity), and economic imperatives (trade networks and capital control). This triadic interaction, already detailed in the PIE framework, becomes evident in Gracia Nasi's case through her strategic navigation of political persecution, ideological resilience, and economic networks.

Her journey exemplifies the non-linear trajectories inherent to organisational emergence, where small shifts—such as relocation or alliance-building—trigger cascading effects that restructure the organisational landscape. This case provides a powerful empirical foundation for TOE, illustrating how entrepreneurs co-evolve with systemic environments rather than following pre-determined strategic trajectories.

5.2 Organisational emergence in action: the case of dona gracia nasi and the house of mendes

The Theory of Organisational Emergence (TOE), developed through an interdisciplinary synthesis of physics, sociology, and philosophy, offers a comprehensive lens for examining dynamic, non-linear organisational phenomena. Expanding upon Schumpeter's (1942) concept of creative destruction and Cantillon's (1755) perspective on entrepreneurial uncertainty, TOE explores how emergent, interdependent dynamics drive organisational transformation—processes often overlooked by conventional quantitative analyses. TOE posits that organisations do not evolve linearly but rather emerge through recursive interactions between agents, structures, and systemic forces (Goldstein 1999).

Dona Gracia Nasi's entrepreneurial trajectory exemplifies these emergent principles, as her leadership was deeply embedded within the complex interplay of interacting Q's—family, employees, financial networks, and political and religious institutions. These Q's evolved dynamically, simultaneously shaping and responding to emergent constraints and opportunities. Her decision to relocate from Portugal to Antwerp illustrates TOE's principle of recursive adaptation, where a shift in one Q (political persecution) triggers cascading transformations across others (business expansion, financial independence, and strategic alliances).

TOE's Politics, Ideology, and Economy (PIE) framework provides an analytical lens for systemic pressures shaping entrepreneurial decision-making (Leite 2013). In Dona Gracia's case, political forces—such as King John III's attempts to control her fortune via marriage alliances—constituted systemic constraints on entrepreneurial agency. However, her resistance was not merely reactive but reflected an emergent strategy to preserve ideological and economic autonomy. Similarly, the intersection of commercial operations and ideological tensions (religious persecution) necessitated continuous strategic recalibration. TOE's emphasis on non-linearity highlights that minor shift—such as strategic relocation—can produce disproportionate systemic changes. Dona Gracia's departure from Portugal not only ensured business continuity but also reconfigured financial networks across multiple geopolitical contexts, exemplifying how entrepreneurial agency co-evolves with structural constraints.

The case study findings align with Eisenhardt's (1989) iterative theory-building approach, demonstrating that organisational adaptation is not static but a recursive, emergent process. The non-linearity principle of TOE—where small changes can lead to significant systemic transformations—is particularly evident in Dona Gracia's trajectory. Her seemingly modest decision to flee Portugal catalysed a series of emergent adaptations, including financial expansion in Antwerp, legal negotiations over inheritance disputes, and eventual establishment in the Ottoman Empire. Each phase of this process restructured House of Mendes, reinforcing TOE's proposition that entrepreneurial emergence unfolds through iterative, interconnected transformations rather than linear, pre-determined strategies.

Beyond visible systemic pressures, TOE also addresses invisible conflicts—psychological, cultural, and social tensions shaping organisational behaviour. For Dona Gracia, religious persecution was not just a financial threat but a socio-political constraint influencing strategic decisions. These hidden tensions—such as family disputes over Diogo Mendes' inheritance—exemplify TOE's proposition that latent power struggles within interacting Q's catalyse emergent organisational behaviours. The final stage of her trajectory—her strategic establishment in the Ottoman Empire—illustrates how organisations stabilise and evolve through systemic repositioning. By leveraging new Q's (local authorities, financial networks, Jewish communities), she expanded her operations and emerged as both an economic leader and philanthropist. This underscores TOE's key assertion: organisational resilience is not merely a matter of survival but of continuous systemic reconfiguration.

5.3 Comparative insights: the application of TOE across historical and contemporary contexts

The Theory of Organisational Emergence (TOE) demonstrates strong explanatory power across distinct temporal and institutional contexts by juxtaposing the strategic trajectories of Dona Gracia Nasi in the sixteenth century and Tesla Inc.in the 21st. Both cases illustrate how organisations navigate systemic pressures—political, ideological, and economic (PIE)—through emergent adaptation, reinforcing TOE's interdisciplinary validity.

Resilience through adaptation emerges as a key theme. Dona Gracia restructured the House of Mendes across geopolitical boundaries under persecution, while Tesla has adapted to regulatory volatility and ideological shifts by scaling innovation, securing subsidies, and vertically integrating its operations. In both cases, strategic repositioning in response to PIE forces exemplifies TOE's core assertion: that resilience is not reactive survival, but proactive transformation.

The previously established PIE framework enables structured comparison across historical and contemporary organisational systems. Dona Gracia resisted religious oppression and leveraged diasporic networks; Tesla navigates policy incentives, sustainability discourses, and market speculation. Both reflect recursive interactions between internal agency and external structures, validating TOE's claim that organisational emergence is shaped by multilevel systemic engagement.

Critically, TOE captures non-linearity in both narratives. Seemingly minor strategic shifts—Dona Gracia's relocation or Tesla's entry into Berlin—triggered cascad-

ing organisational realignments. These dynamics affirm TOE's utility in explaining how micro-decisions within Q's can generate disproportionate systemic outcomes, a limitation in more linear strategic models.

Moreover, TOE transcends context by identifying entrepreneurial constants—strategic foresight, political navigation, and economic reconfiguration—as enduring mechanisms of emergence. Its integration with complexity science, sociology, and historical analysis offers an epistemologically rich and operationally versatile framework.

Tesla's PIE dynamics—its use of policy, ideology, and speculative capital—reveal it as more than an innovator: it is a systemic actor embedded in institutional ecosystems. Compared to the coercive theocratic regimes faced by Dona Gracia, Tesla operates in a neoliberal field of soft power and symbolic legitimacy. TOE accommodates both paradigms, evidencing its robustness across ontologies of power.

In sum, TOE not only bridges eras but also redefines how we understand organisational resilience and innovation under constraint. It reveals that emergence is neither ahistorical nor purely structural—it is dynamic, recursive, and ideologically infused. This comparative insight strengthens TOE as a generalisable model for scholars, practitioners, and policymakers navigating complex, evolving ecosystems.

6 Concluding insights and future pathways

The Theory of Organisational Emergence (TOE) provides a transformative interdisciplinary framework for understanding the complexity of organisational behaviour. By integrating systemic forces, emergent behaviours, and non-linear dynamics, TOE surpasses traditional management theories, offering a nuanced perspective on how organisations evolve, adapt, and navigate uncertainty. Its application in historical and contemporary case studies demonstrate its broad relevance, showing how political, ideological, and economic (PIE) factors shape organisational resilience and strategic adaptation.

This study highlights TOE's capacity to bridge theoretical discourse with practical applications. The case of Dona Gracia Nasi illustrates how organisations in historical contexts leveraged strategic relocation and alliances to sustain operations under external constraints, while Tesla's evolution exemplifies TOE's applicability in modern challenges such as regulatory shifts, technological disruption, and market volatility. These insights reinforce TOE's explanatory power across different periods and industries, offering a valuable analytical lens for understanding organisational complexities over time.

6.1 Theoretical contributions of TOE

TOE's interdisciplinary foundation advances both organisational research and real-world decision-making. To enhance its theoretical depth and practical relevance, future studies should explore:

- Empirical Validation and Predictive Applications: Expanding TOE's empirical

foundation through quantitative and mixed-method approaches will enhance its predictive capabilities. Its application in high-uncertainty environments—such as crisis management, startup ecosystems, and regulatory transitions—will further validate its framework for dynamic settings.

- Sector-Specific Adaptation: Investigating TOE's relevance across industries such as technology, healthcare, and renewable energy can reveal sector-specific organisational dynamics. Its emphasis on non-linearity and systemic adaptation provides valuable insights into navigating regulatory constraints and market transformations.
- Hybrid Methodologies and Advanced Analytics: Integrating TOE with computational models, such as agent-based simulations and network analysis, can refine its methodological depth. Hybrid approaches will capture the complex feedback loops and interdependencies that define organisational evolution.
- Comparative Case Studies and Cross-Cultural Research: Applying TOE in diverse historical and cultural contexts will strengthen its universality and adaptability. Longitudinal studies comparing organisational emergence in different geopolitical settings can further illuminate the role of systemic forces in shaping adaptive strategies.
- Interdisciplinary Collaboration for Organisational Innovation: TOE's integration of complexity science, philosophy, and sociology promotes collaboration across disciplines. Engaging with cognitive science, behavioural economics, and computational modelling can expand our understanding of emergent organisational phenomena.

6.2 Practical and policy implications

TOE provides a practical lens for navigating uncertainty, enabling strategic foresight and adaptive action. Specifically:

- Diagnosing Organisational Tensions: Managers can apply the Interacting Q's model to surface internal misalignments during mergers, leadership transitions, or market disruptions.
- Systemic Risk Assessment: The PIE framework equips decision-makers to assess how external forces (policy, ideology, economic shifts) interact with internal dynamics, guiding resilient and ethically aligned strategies.
- Strategic Narrative Alignment: Entrepreneurs can align organisational identity with dominant ideologies (e.g., sustainability, digital sovereignty) to enhance legitimacy and stakeholder trust—exemplified by Tesla's positioning.
- Policy Design and Institutional Foresight: Policymakers can use TOE to anticipate organisational responses to regulation, enabling policies that foster innovation while maintaining systemic stability.
- Scenario Planning: Embedding TOE into foresight tools enhances the design of adaptive institutions, improves crisis anticipation, and supports resilient strategic ecosystems.

6.3 Limitations and future research

Despite its conceptual richness and interdisciplinary ambition, the Theory of Organisational Emergence (TOE) presents key limitations that warrant both critical reflection and methodological advancement.

First, TOE's reliance on qualitative, historically embedded analysis—as exemplified by the case of the House of Mendes—provides deep contextual insight but limits generalisability to digitally native or high-frequency organisational environments. Translating emergent resilience from 16th-century diasporic strategies to sectors like fintech or biotechnology requires adaptive recalibration.

Second, TOE's core constructs—Interacting Q's and the PIE framework (Politics, Ideology, Economy)—are theoretically robust yet challenging to operationalise quantitatively. Capturing ideological frictions during mergers or recursive Q dynamics in innovation teams currently depends on interpretive techniques, highlighting the need for more computationally tractable models.

Third, TOE's use of historical reconstruction introduces epistemic asymmetry: insights are derived from fragmentary records, limiting replicability and obscuring undocumented micro-interactions crucial to non-linear emergence.

7 Future research directions

These limitations open promising avenues for both scholarly refinement and applied innovation:

- Operational Tool Development: Creating applied instruments—such as a TOE Dashboard that uses real-time organisational data (e.g., metadata from Slack or Teams)—could visualise Q interdependencies and systemic stressors. In High Energy Physics, the Tesla platform developed at CERN has demonstrated how real-time data reconstruction and analysis can be achieved in highly complex systems through modular architecture and recursive optimisation (Aaij et al. 2016). Inspired by such systems-level architectures, TOE-based dashboards could be designed to simulate emergent organisational dynamics, identify early systemic tensions, and support strategic decision-making under complexity.
- Methodological Hybridity: Agent-based modelling, dynamic network analysis, and recursive simulations could transform TOE from interpretive heuristic into a predictive system.
- Sector-Specific Validation: TOE could be tested in live contexts such as AI start-ups navigating regulatory volatility, pharmaceutical mergers with hidden functional frictions, or renewable energy firms responding to policy shifts.
- Crisis and Foresight Applications: TOE provides a structure for organisational diagnostics in three steps: (1) audit Q configurations, (2) simulate systemic shocks (e.g., via Fig. 4), and (3) iteratively adapt based on emergent patterns.
- Cross-Disciplinary Integration: Collaborations with behavioural economics, information systems, and computational sociology may enhance TOE's explanatory depth and translational power.

Table 3 TOE Managerial Toolkit: structured application. *Source* Developed by authors

Step	Action	Method/Instrument	Illustrative application
1	Map Interacting Q's	Stakeholder Mapping; Network Analysis (e.g., Gephi)	Post-merger: Map IT (Q1) vs. acquired cloud ops (Q2) to uncover legacy frictions
2	Diagnose PIE Pressures	PIE Matrix; TOE-aligned SWOT	Startup scaling: Investor demands (E) vs. engineering ethos (I) vs. data policy (P)
3	Simulate Emergent Behaviour	Agent-Based Modelling; Scenario Planning	Auto sector: Simulate ripple effects of carbon regulation on supply Q's
4	Monitor Adaptive Cycles	Pulse Surveys; Slack NLP sentiment analysis	Crisis recovery: Detect trust erosion between ops (Q2) and senior leaders (Q1)
5	Intervene at Leverage Points	Complexity-informed frameworks (Uhl-Bien and Arena 2018)	Innovation bottleneck: Align R&D incentives (E) with commercial vision (I)

In sum, while TOE currently prioritises conceptual clarity over predictive precision, its evolution into a versatile diagnostic and strategic tool remains both viable and necessary. Future work should focus on bridging its interpretive strength with empirical scalability, reinforcing its role as a generative model for navigating complexity in emergent organisational ecosystems.

7.1 Operationalising TOE: a managerial toolkit

To complement the conceptual robustness of the Theory of Organisational Emergence (TOE), this section outlines a practical, modular toolkit that supports diagnosis, simulation, and intervention in dynamic organisational systems. Grounded in complexity theory and PIE dynamics, the toolkit enables managers to anticipate nonlinear disruptions and intervene at critical leverage points (Table 3).

8 Key features for practitioners

- Modular Design: Each step may be deployed independently or sequentially, depending on urgency and system complexity.
- Diagnostic Metrics:
  - *Q Connectivity Score* assesses the strength and density of inter-unit interactions.
  - *PIE Stability Index* tracks volatility in external pressures over time.
- Supporting Tools:

- *Worksheet 1: TOE Quick Audit*– Fast mapping of Qs and PIE vectors for strategic planning.
- *Worksheet 2: Emergence Simulator*– Scenario-based modelling of decision impact via recursive logic.

Mini-Case: Tesla's Berlin Gigafactory.

The toolkit's application is exemplified through Tesla's expansion in Berlin. Key Q's include local workforce (Q1), environmental regulators (Q2), and ESG-aligned investors (Q3). The PIE diagnosis surfaces:

- Political tension: Labour law protections (P) vs. anti-union stance.
- Ideological friction: Sustainability narrative (I) vs. local ecological activism.
- Economic risk: Investor concern over regulatory delays (E).

Simulation reveals that a permitting delay by Q2 leads to disengagement in Q1 and reputational damage in Q3—demonstrating TOE's principle of cascading systemic feedback. Strategic intervention involves early union engagement and ecological coalition-building to restore alignment.

Strategic Impact.

TOE transforms complex systems thinking into actionable organisational insight. It empowers leaders to:

- Surface hidden conflicts,
- Anticipate emergent disruptions,
- Make strategic interventions with systemic awareness.

In a world defined by interdependence and volatility, TOE equips managers with the foresight and agility needed to thrive.

8.1 Conclusion

The Theory of Organisational Emergence (TOE) offers a timely and interdisciplinary contribution to contemporary organisational theory. By integrating systemic pressures, recursive adaptation, and non-linear dynamics, TOE reframes how resilience and transformation occur—not as responses to isolated shocks, but as emergent patterns shaped by constant interaction between internal Q's and external PIE forces.

In a world defined by volatility and complexity, TOE advances a model of organisational co-evolution, emphasising how firms adapt not only reactively, but strategically and ethically. Its dual lens—Interacting Q's and the PIE framework—equips leaders to uncover latent tensions, anticipate tipping points, and act systemically in contexts ranging from startups to global institutions.

The fusion of historical insight and contemporary application underscores TOE's versatility across temporal, industrial, and geopolitical boundaries. Whether addressing digital disruption, ecological transition, or institutional instability, TOE enables organisations to diagnose systemic misalignments and cultivate resilient, future-oriented strategies.

Beyond interpretive power, TOE offers a normative proposition: that strategy, leadership, and design must evolve in alignment with the complex realities they seek to influence. By rejecting linear, mechanistic views, TOE positions organisations as living systems, co-shaped by ideology, policy, and economic dynamics.

As institutions confront cascading crises—from technological upheaval to environmental risk—TOE provides both a diagnostic toolkit and a philosophical compass. It stands not merely as a theoretical model, but as a generative platform for organisational foresight, innovation, and ethical transformation. In doing so, TOE redefines what it means for organisations to emerge, endure, and evolve in the twenty-first century.

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