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From Financial Distress to Financial Resilience: A Systematic Review of the Determinants and Research Agenda for Oil and Gas Firms in the Energy Transition

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Abstract: The oil and gas (O&G) industry faces a double disruption: structurally higher oil-price volatility and an accelerating net-zero transition that jointly threaten the financial stability of incumbent firms. This study reviews the determinants of financial resilience in O&G firms during the energy transition and consolidates a research agenda. Following the PRISMA 2020 protocol, a Boolean query in Scopus returned 74 records. After removing 5 duplicates and screening 69 records against pre-specified eligibility criteria, 23 studies were retained for synthesis, 22 of them oil-and-gas or energy-firm focused. Evidence was synthesised through an effect-direction matrix and organised with the ADO and TCCM frameworks. The literature converges on a recurrent set of determinants: internally, capital structure and leverage, liquidity, green capital expenditure, and profitability; externally, oil-price volatility, interest rates, and carbon pricing or climate policy. The evidence base remains fragmented and dominated by macro- and policy-level analyses, with limited firm-level dynamic modelling. The review reframes the field from financial distress toward financial resilience, proposes an integrative antecedents–decisions–outcomes framework, and articulates a TCCM-structured research agenda with propositions testable using dynamic panel (GMM) methods.

Keyword: Financial Resilience, Oil And Gas, Energy Transition, Capital Structure, Green Capital Expenditure, Systematic Literature Review.

INTRODUCTION

The global oil and gas (O&G) industry operates at the intersection of two structural shocks that jointly redefine the conditions for corporate survival. On the price side, crude markets have entered an era of amplified volatility in which geopolitical ruptures and supply realignments translate into abrupt swings in firm cash flows (Benlemlih et al., 2024; Nikou, 2025). On the policy and technology side, the global commitment to net-zero emissions has converted decarbonisation from a reputational concern into a financial one, reshaping capital

availability, asset valuations, and the cost of capital for fossil-fuel producers (Koch, 2022; Kroll & Kühne, 2024; Lantushenko & Schellhorn, 2023). The simultaneity of these forces, here termed a double disruption, distinguishes the present moment from earlier price cycles and exposes incumbent firms to pressures that conventional financial management was not designed to absorb.

This double disruption generates a financial paradox. To remain solvent through volatile cycles, O&G firms depend on the very fossil-fuel cash flows that the transition seeks to retire; yet to remain viable over the longer horizon they must commit large, capital-intensive, and uncertain investments in low-carbon assets (Țăran et al., 2026; Huang et al., 2026; Xiao et al., 2026). Such green capital expenditure competes with short-term liquidity and payout commitments, while exposure to climate policy raises the prospect of stranded assets and tighter financing constraints (Tu et al., 2025; Hayne et al., 2020). Navigating this tension is no longer a matter of avoiding bankruptcy alone, but of sustaining the capacity to absorb shocks and to reallocate capital under deep uncertainty.

These conditions motivate a conceptual shift from financial distress to financial resilience. Distress research, exemplified by cash-flow-based models of corporate solvency (Pranowo et al., 2010), asks whether a firm can avoid default; it is essentially a survival lens. Resilience asks a more demanding question: whether a firm can absorb shocks, adapt its financial structure, and recover its growth trajectory while undergoing a costly portfolio transformation. As the energy transition turns episodic shocks into a persistent operating environment, the analytical emphasis moves from predicting failure toward explaining the determinants of adaptive financial capacity (Gitelman et al., 2025; Țăran et al., 2026).

Despite a rapidly expanding literature on energy-transition finance, evidence on what makes O&G firms financially resilient remains fragmented and largely implicit. Studies are dispersed across the financial-stability, climate-risk, ESG, and macro-fiscal literatures; they frequently operate at the country or sector level rather than the firm level; and they rarely model resilience as a dynamic outcome (Tatar & Buleca, 2026; Ojekemi et al., 2023; Sohail et al., 2026). No systematic synthesis has yet consolidated the firm-level determinants of financial resilience for O&G firms in the transition context, mapped the direction and consistency of their effects, or distilled the resulting gaps into a coherent research agenda.

Accordingly, this review addresses three research questions:

1. Which internal and external determinants of financial resilience in oil and gas firms have been identified in the energy-transition literature?
2. What is the direction and consistency of the reported effects of these determinants?
3. Where do the principal gaps and inconsistencies lie, and what research agenda do they imply?

This study makes three contributions. Theoretically, it reframes the field from distress to resilience and assembles three complementary lenses (dynamic capabilities, trade-off, and portfolio theory) into an integrative reading of the evidence. Methodologically, it offers a transparent, PRISMA-based synthesis that combines an effect-direction matrix with the ADO and TCCM frameworks. Practically, it clarifies the financial levers available to managers, investors, and regulators navigating the transition.

The contribution is one of focus and consolidation rather than of inventing the resilience construct. Resilience is already an established lens in strategic management and organizational studies (Hamel & Valikangas, 2003; Sutcliffe & Vogus, 2003; Linnenluecke, 2017), and sustainability research has linked resilience to long-run financial performance (Ortiz-de-Mandojana & Bansal, 2016; DesJardine et al., 2019). The novelty here lies in transferring and operationalizing that lens for oil-and-gas firms under the specific conditions of the energy transition, and in mapping the firm-level financial determinants of resilience, which remain dispersed and under-synthesized.

These lenses combine into a single antecedents-decisions-outcomes logic that the effect-direction synthesis then populates: antecedents (internal financial characteristics and external pressures) act through financial decisions (capital structure, liquidity management, and the pace of low-carbon investment) to produce the outcome of financial resilience. Trade-off and portfolio theory specify the antecedents and decisions; dynamic-capabilities theory specifies the firm-level capacity that converts those decisions into the resilience outcome. This conceptual model is operationalized empirically in the Results and Discussion (Figure 1) and translated into testable propositions in the Research Agenda.

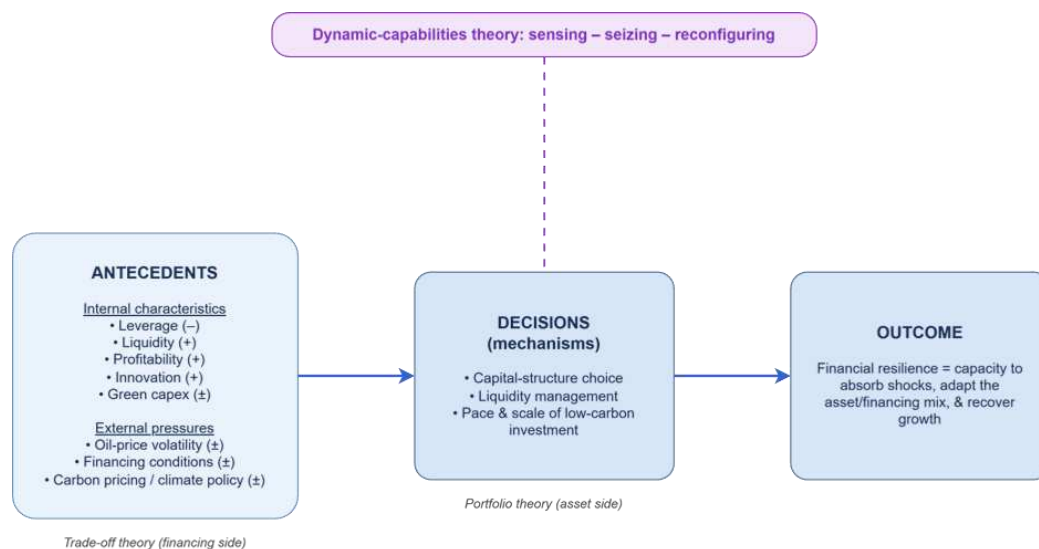


Figure. Integrative antecedents-decisions-outcomes (ADO) model of financial resilience in oil & gas firms.

Figure 1. Integrative antecedents-decisions-outcomes (ADO) model of financial resilience, with trade-off theory governing the financing side, portfolio theory the asset side, and dynamic-capabilities theory the firm-level capacity that converts decisions into the resilience outcome.

METHOD

Research Design

This study adopts a systematic literature review (SLR) conducted in accordance with the PRISMA 2020 guidelines (Page et al., 2021) and established conventions for evidence synthesis in management research (Tranfield et al., 2003; Snyder, 2019; Lim et al., 2022). An SLR is appropriate because the determinants of O&G financial resilience are dispersed across finance, energy, and management literatures; a transparent and reproducible protocol is therefore required to consolidate the evidence and expose research gaps (Paul & Criado, 2020).

Data Source and Search Strategy

Scopus was selected as the single bibliographic source given its broad coverage of peer-reviewed finance, energy, and management journals and its structured metadata, which support reproducible querying. A Boolean query combining resilience and stability constructs with oil-and-gas and energy-transition terms was executed in the title, abstract, and keyword fields: A single, internally consistent source was preferred because the synthesis relies on comparable, structured metadata; merging databases with divergent indexing conventions would introduce duplication and field-mismatch errors. We acknowledge that omitting Web of Science (and other indices such as Dimensions) may exclude some influential energy-finance work indexed elsewhere.

As an informal sensitivity check, the reference lists of the included studies were scanned for frequently cited items absent from the Scopus set; no eligible firm-level study

meeting all inclusion criteria was found to be systematically missing, which suggests the single-database design does not materially bias the determinant synthesis. This remains a limitation and is noted in the Conclusion.

Scientometric comparisons indicate that this design is unlikely to omit a material share of the relevant indexed literature: Scopus indexes a substantially larger set of active peer-reviewed journals than Web of Science and largely subsumes the WoS-indexed titles in business, economics and finance (Mongeon & Paul-Hus, 2016), and Scopus and Dimensions offer comparably broad coverage that exceeds that of Web of Science (Singh et al., 2021).

Because the great majority of WoS-indexed finance and energy journals are also indexed in Scopus, a Scopus-anchored search captures the bulk of the field; the residual unique-to-WoS or unique-to-Dimensions records are addressed pragmatically through backward snowballing rather than by merging databases with incompatible metadata, which would degrade the science mapping.

The search returned 74 records spanning publication years 2004 to 2026. The search was executed on 14 June 2026; reporting the retrieval date fixes the search to a reproducible snapshot of the continuously updated database. The full query string is reported above to enable exact replication. The three-block Boolean design (resilience or stability constructs AND energy-transition constructs AND oil-and-gas or energy terms) was chosen to target studies at the precise intersection of the review's scope and to keep the corpus tractable and topically relevant.

We recognize that requiring an explicit resilience or stability term may exclude studies that examine resilience determinants without using that vocabulary. To mitigate this, the resilience block was deliberately broadened to include neighbouring constructs (financial distress, sustainability, stability, and flexibility), and the screening stage retained studies whose substantive focus was firm-level financial adaptation even where the word 'resilience' did not appear. The residual risk of omission is acknowledged as a boundary condition of the review.

Eligibility Criteria and Study Selection

Eligibility criteria were specified a priori. A study was included if it (i) was published as a journal Article or Review and (ii) addressed, at the firm level, the financial resilience, stability, or sustainability of oil-and-gas or energy firms in the context of price volatility or the energy transition. All retrieved records were in English, so no language exclusion was applied. Studies were excluded if they were non-Article/Review document types or if they lacked a firm-level financial focus (for example, purely macroeconomic, engineering, or policy analyses without firm-level financial outcomes).

Of the 74 records identified, 5 duplicates were removed, leaving 69 for screening. Screening against the eligibility criteria excluded 46 records (18 for not being Articles or Reviews and 28 for lacking a firm-level financial focus or being off-topic), yielding 23 studies for synthesis, of which 22 are oil-and-gas or energy-firm focused. The identification and selection process is summarised in Figure 2. A final set of 23 studies is small in absolute terms but is a direct consequence of querying a narrow intersection (firm-level financial resilience AND energy transition AND oil and gas) rather than of an overly restrictive protocol; it is consistent with the corpus sizes reported by other focused reviews of emerging research fronts.

Two observations support its adequacy for the review's aims. First, the set of recurring determinants reached practical saturation: the internal determinants (leverage, liquidity, profitability, green capital expenditure) and external pressures (oil-price volatility, financing conditions, climate policy) recur across studies, with later-screened studies adding confirmation rather than new determinant categories. Second, because the goal is to map

determinants and the direction of their effects, and to derive a research agenda, rather than to estimate a pooled effect size, breadth of determinant coverage matters more than sample count. The small corpus nonetheless constrains generalizability and the stability of thematic proportions, which we treat explicitly as a limitation and as motivation for the primary firm-level study the review supports.

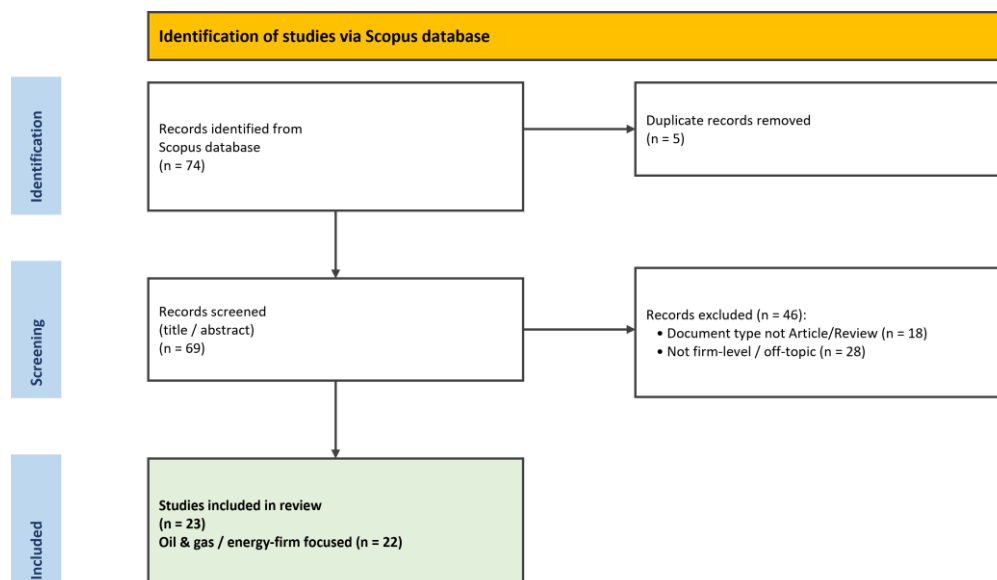


Figure 2. PRISMA flow of study identification and selection

Data Extraction

For each included study, a structured concept matrix recorded bibliographic metadata (authors, year, source, citation count); study context (country or region, and firm type, including national versus international oil companies where reported); the theoretical lens applied; the methodology and data used; the financial-resilience determinants examined; and the reported direction of each determinant's effect. Extraction was performed against the full text and cross-checked against the Scopus record.

Synthesis Method

Evidence was synthesised in two complementary ways. First, an effect-direction matrix mapped each determinant against the sign of its reported association with financial resilience (positive, negative, mixed, or non-significant), allowing the consistency of effects to be assessed across heterogeneous designs. Second, the corpus was organised using the ADO framework (antecedents, decisions, and outcomes) to construct an integrative resilience model, and using the TCCM framework (theory, context, characteristics, and methodology) to structure the research agenda (Paul & Criado, 2020; Lim et al., 2022). To map the intellectual structure of the corpus, the synthesis was complemented by a bibliometric keyword analysis comprising a co-occurrence network of author and index terms and a co-word evolution analysis across time periods.

Thematic streams were derived through structured, iterative coding of the full-text concept matrix. Each study was first coded for its primary financial-resilience focus and its determinants; codes were then grouped into candidate themes and refined over successive passes until the categories were mutually intelligible and collectively exhaustive. Coding was performed by the lead author and cross-checked against the structured extraction sheet; given the single-coder design, formal inter-coder reliability statistics (e.g., Cohen's kappa) were not computed, and we therefore treat the thematic classification as an organizing device rather than a measurement claim. To guard against subjectivity, the qualitative streams were

triangulated against the quantitative keyword co-occurrence clusters reported in Figure 9; the close correspondence between the two provides convergent support for the thematic structure.

RESULT AND DISCUSSION

Descriptive Overview of the Corpus

The 23 included studies are recent: all appeared between 2020 and 2026, and output accelerates across the period, rising from a single study in 2020 to five in 2026, with a notable cluster of five in 2023 (Figure 3). This pattern confirms that firm-level financial resilience in the energy transition is an emerging research front rather than an established field.

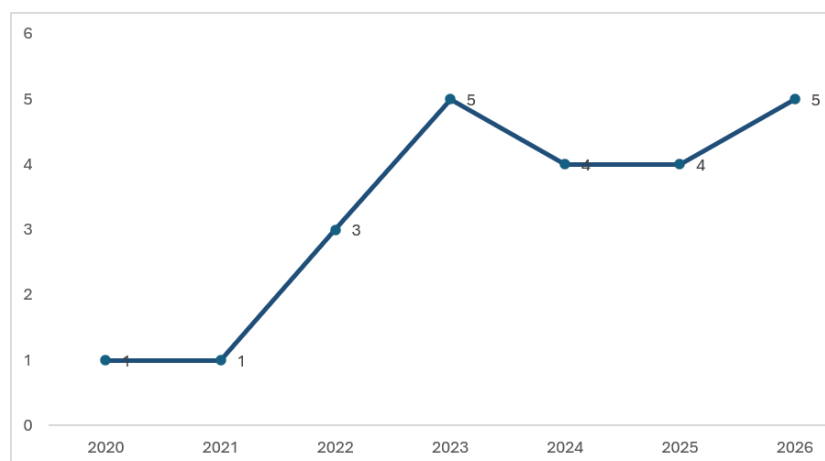


Figure 3. Annual publication trend of the included studies (2020–2026)

The studies are dispersed across energy, sustainability, and environmental-management outlets, most frequently the *Journal of Environmental Management* and *Energies* (two studies each), with the remaining work scattered across eleven further journals (Figure 4). Dedicated finance journals are sparsely represented, indicating that the topic has so far been addressed more by energy and sustainability scholarship than by mainstream corporate finance.

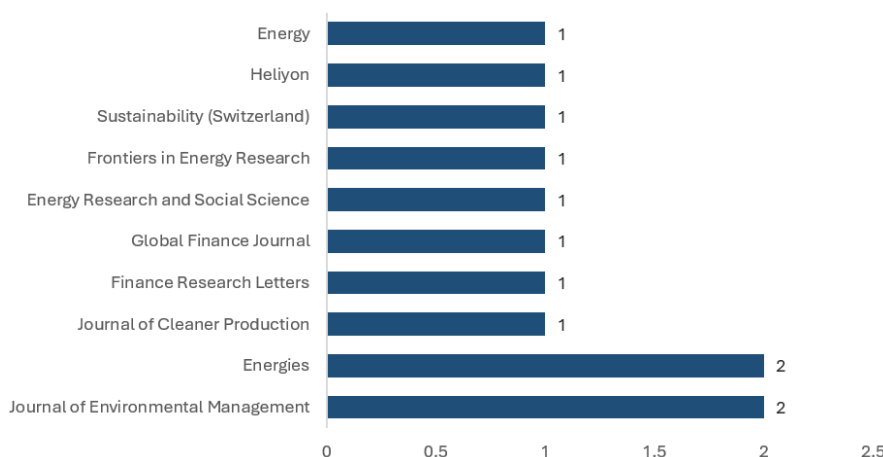


Figure 4. Distribution of the included studies across source journals

Geographically, the evidence is led by China (six studies), followed by Germany (three) and the Russian Federation and the United States (two each), with the remainder spanning ten further European and other economies with one study apiece (Figure 5).

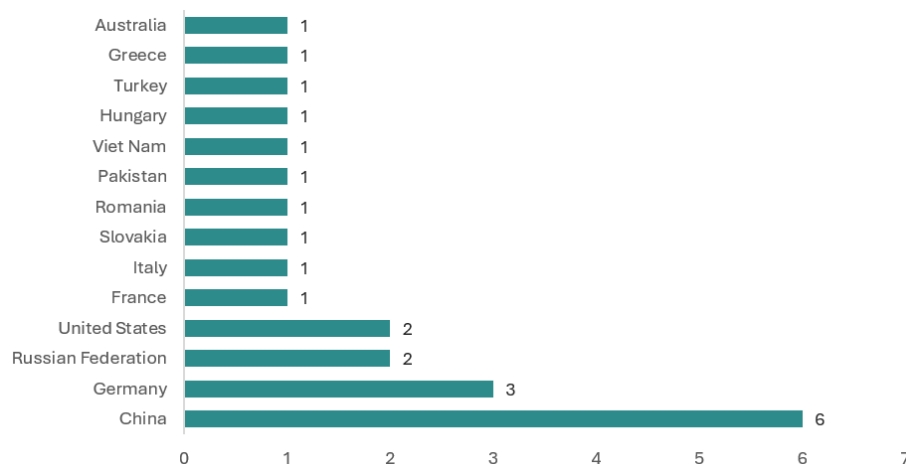


Figure 5. Geographic distribution of the included studies by author affiliation

Methodologically, econometric and panel-regression designs dominate (ten studies), complemented by eight other empirical studies, two simulation or scenario-optimisation models, and one each of conceptual, review, and case-study work (Figure 6). Two implications follow. First, the empirical centre of gravity lies in emerging and European markets rather than in the integrated international majors. Second, the prevalence of single-period econometric designs, together with the near-absence of dynamic panel methods, foreshadows a methodological gap to which the Research Agenda returns.

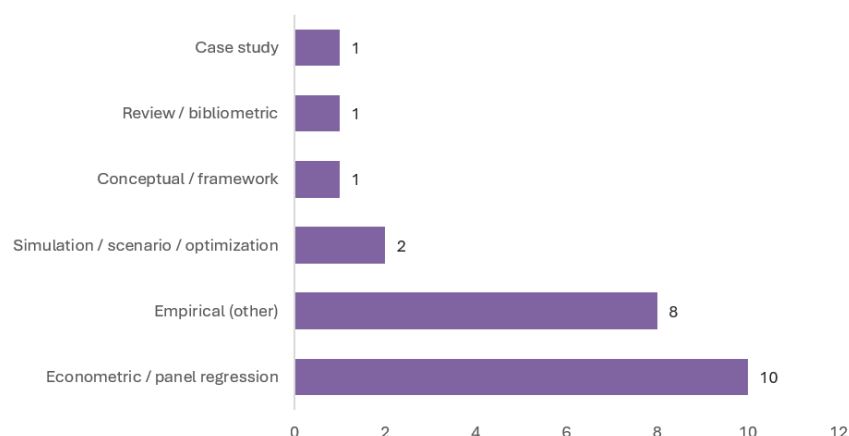


Figure 6. Distribution of the included studies by dominant research method

Bibliometric Performance Analysis

Beyond the descriptive distributions above, a performance analysis of the corpus characterizes its citation impact and concentration, computed from the Scopus metadata of the included studies. The 22 oil-and-gas- and energy-firm-focused studies with retrievable citation records have accumulated 280 citations in total (mean 12.7 per study, median below the mean), confirming an emerging field in which impact is concentrated in a few early entries while most studies are too recent to have accrued citations.

Citation impact is highly skewed: the five most-cited studies account for the large majority of total citations (Table 1). Institutional productivity is correspondingly dispersed, with no single institution contributing more than one study, so the field has not yet consolidated around leading research centres. The most influential works to date span renewable-energy and economic-risk analysis (Ojekemi et al., 2023), marine decarbonization economics (Ejder & Arslanoğlu, 2022), the geopolitics of energy finance (Koch, 2022),

fossil-fuel lobbying risk (Lantushenko & Schellhorn, 2023), and innovation-and-ownership effects on financial sustainability (Duong et al., 2022).

Table 1. Most-cited studies in the included corpus (citation counts as recorded in the Scopus metadata at the time of extraction)

Rank	Study	Year	Source title	Cited by
1	Ojekemi, Aga & Magazzino	2023	Energies	77
2	Ejder & Arslanoğlu	2022	Journal of Cleaner Production	62
3	Koch	2022	Energy Research & Social Science	35
4	Lantushenko & Schellhorn	2023	Global Finance Journal	29
5	Duong et al.	2022	Heliyon	26
6	Wang et al.	2021	Frontiers in Energy Research	15
7	Benlemlih et al.	2024	Journal of Environmental Management	7
8	Kroll & Kühne	2024	Int. Environmental Agreements	6
9	Hayne et al.	2020	ACRN Journal of Finance and Risk	6
10	Subhani et al.	2024	Geological Journal	5

A collaboration analysis of the corpus (Figure 7) shows that international co-authorship is limited and regionally clustered rather than globally integrated: the network resolves into several small, largely disconnected components (for example, China with South Korea and Singapore; Germany with France, the Netherlands and Morocco; and a Turkey-centred group), with many producing countries appearing as isolates.

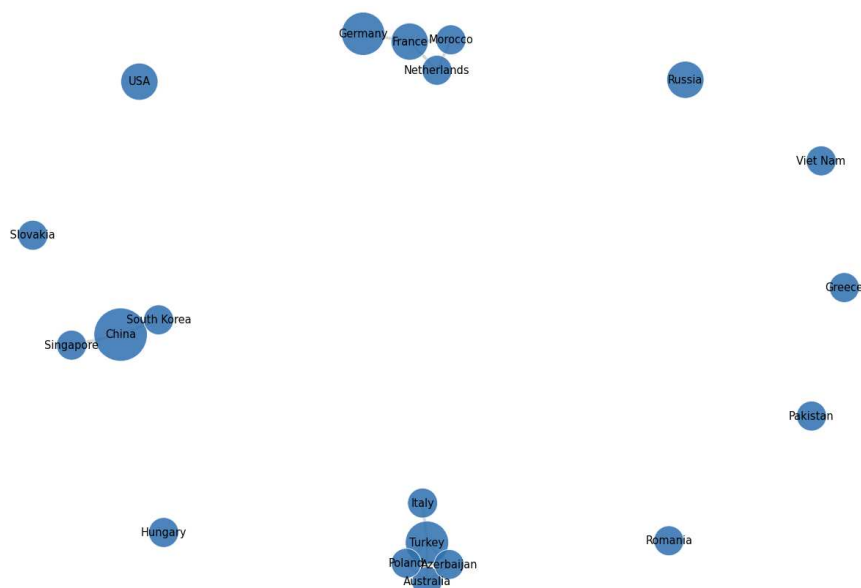


Figure 7. Country co-authorship collaboration network of the included corpus (node size = number of studies; edges = co-authored studies between countries)

This fragmentation is consistent with an emerging research front that has not yet formed a connected international community. Co-citation and bibliographic-coupling networks are not reported because the Scopus export used for this review does not include the cited-references field required to construct them; generating these maps from a reference-enabled export is identified as a direction for dedicated bibliometric work.

Thematic Streams

Thematic coding of the corpus identified four streams (Figure 8). These are organising lenses rather than mutually exclusive categories: several studies contribute to more than one, and together they trace the field's movement from describing transition pressures toward

explaining firm-level financial outcomes. The largest stream (nine studies) examines energy-transition and green-finance dynamics, situating firm financing within the broader decarbonisation context.

This work spans the geopolitics of greening oil revenues (Koch, 2022; Roginko & Fazelianov, 2024), the financial implications of transition policy and corporate lobbying (Tu et al., 2025; Lantushenko & Schellhorn, 2023), tax and financial-strategy reform in petroleum enterprises (Huang et al., 2026), working-capital strategy in hydrogen ventures (Mujie & Liu, 2025), macro-financial modelling of gas as a bridge fuel and of import shocks (Xiao et al., 2026; Nikou, 2025), and an engineering-economic assessment of alternative marine fuels (Ejder & Arslanoğlu, 2022). Its centre of gravity is the transition environment in which resilience must be achieved, rather than firm-level resilience itself.

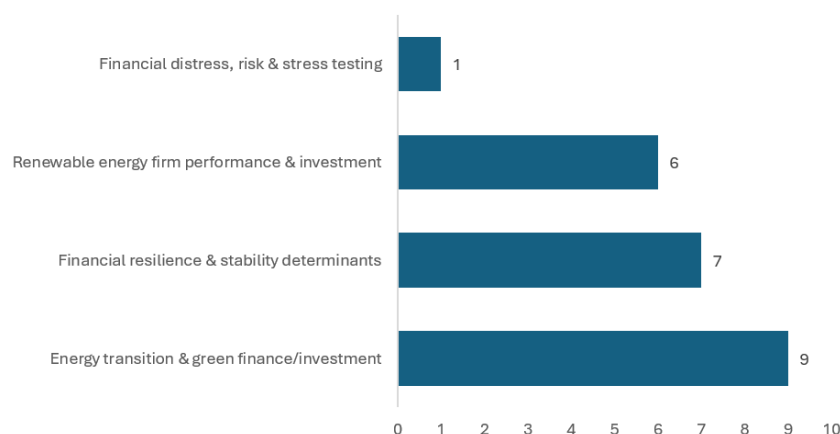


Figure 8. Distribution of the included studies across the four thematic streams

A second stream (seven studies) addresses the financial resilience and stability of firms and systems most directly. It includes the only study to foreground resilience explicitly in connection with green strategy (Țăran et al., 2026), analyses of oil-price volatility and corporate outcomes (Benlemlih et al., 2024), innovation- and ownership-driven financial sustainability (Duong et al., 2022), the role of financial stability in the urban energy transition (Sohail et al., 2026), fiscal resilience and energy-import dependency (Tatar & Buleca, 2026), and climate-risk instruments such as regulatory stress testing and a proposed central-bank climate-bailout mechanism (Hayne et al., 2020; Kroll & Kühne, 2024). This stream supplies most of the determinant evidence synthesised in the effect-direction synthesis.

A third stream (six studies) investigates the financial performance and sustainability of renewable-energy and energy firms: the effect of technology innovation on corporate sustainability (Wang et al., 2021), financial stability as an enabler of the renewable transition (Wu, 2023), unregulated-activity effects on the financial sustainability of energy businesses (Gitelman et al., 2025), the interplay of financial stability, environmental regulation, and renewable investment (Subhani et al., 2024), renewable-energy consumption and economic risk in the BRICS economies (Ojekemi et al., 2023), and market-entry and restructuring risks for energy companies (Vokony & Szalmáné, 2023). These studies connect investment and innovation choices to the firm-level financial outcomes most relevant to O&G incumbents diversifying into renewables.

A fourth, sparsely populated stream (one study) concerns sector-specific disclosure and distress-related risk, represented by an analysis of proposed climate-disclosure rules and their financial implications (Senay et al., 2023). The thinness of this explicitly distress- and risk-oriented stream is itself a finding: as the field reframes around resilience, classical distress analysis has not yet been carried into the transition context at the firm level.

These qualitative streams are corroborated by a keyword co-occurrence analysis of author and index terms (minimum two occurrences), mapped in Figure 9. The network resolves into four clusters organised around the field's largest and most connected nodes: sustainable development, energy transition, renewable energy, and financial stability. The first cluster, centred on sustainable development, draws together the financing and economic terms, including investments, energy policy, economics, capital expenditures, and energy efficiency.

A second cluster links financing instruments and decarbonisation, joining finance, fossil fuel, innovation, and environmental policy. A third cluster captures the transition-and-financial-risk theme, connecting energy transition and financial stability with climate finance, stranded assets, and climate policy. A fourth cluster groups renewable and alternative energy with firm-level performance terms. The dominance of sustainable development, energy transition, and financial stability shows that the intellectual structure of the field is organised around the financing-and-transition nexus, whereas classical distress terms such as financial distress appear only peripherally.

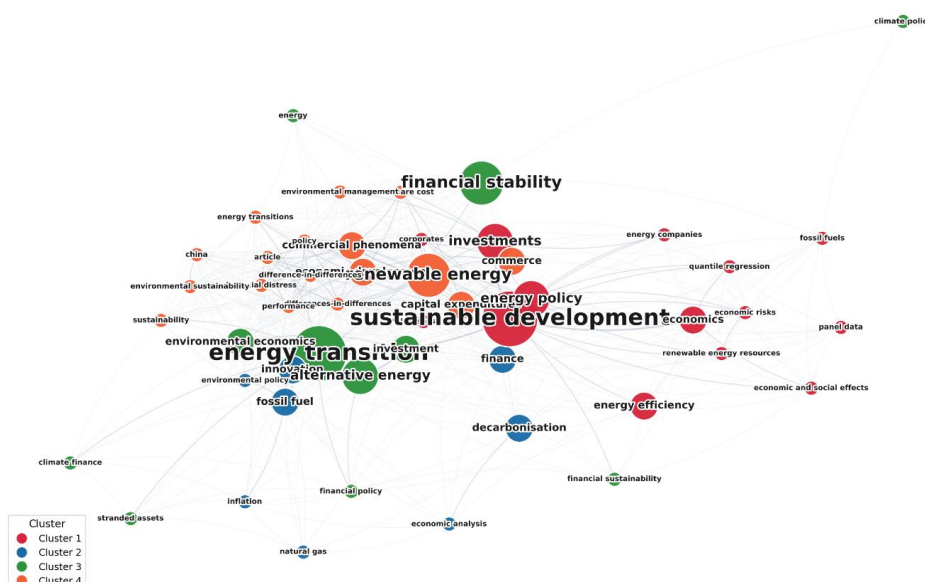


Figure 9. Keyword co-occurrence network of the included corpus (author and index terms, minimum two occurrences)

The co-word evolution analysis in Figure 10, which compares keyword prominence before and after 2024, shows how this structure is shifting. Energy transition rises to become the dominant term in the most recent period, while sustainable development, renewable energy, and financial stability persist across both periods, marking a stable conceptual core. Earlier emphases such as capital expenditures, commerce, and environmental economics give way to a sharper focus on energy policy, investments, and corporate-level concerns. The trajectory describes a field moving from a broad sustainability framing toward firm-level, transition-finance questions, which is precisely the space that the determinant synthesis addresses.



Figure 10. Co-word evolution of the corpus keywords across periods (up to 2024 versus after 2024)

Across the four streams, the literature is rich in characterising transition pressures but comparatively thin in modelling how specific financial determinants shape resilience outcomes. The effect-direction synthesis consolidates that determinant evidence into an effect-direction matrix.

Determinants of Financial Resilience: An Effect-Direction Synthesis

Synthesising the reported findings across the corpus yields a compact set of determinants of financial resilience, summarised in Table 2. Because few studies model resilience as a single dependent variable, effect directions are coded from each study's reported association between the determinant and a proxy for resilience (financial stability, sustainability, performance under stress, or solvency) and are recorded as positive (+), negative (−), or mixed or conditional (±). Two patterns stand out: the internal determinants behave broadly as trade-off and portfolio theory predict, whereas the external determinants act mainly as stressors whose sign depends on the firm's adaptive response.

Table 2. Effect-direction matrix of financial-resilience determinants in the included corpus (+ positive, − negative, ± mixed or conditional)

Determinant (proxy)	Effect on resilience	Representative evidence	Consistency / notes
Leverage / capital structure (DER)	−	Pranowo et al. (2010); Huang et al. (2026)	Theory-consistent (trade-off); direct firm-level O&G tests scarce
Liquidity / working capital (LIQ)	+	Pranowo et al. (2010); Mujie & Liu (2025)	Buffer effect; excess liquidity may signal idle assets (±)
Green capital expenditure / low-carbon investment (GRN)	±	Țăran et al. (2026); Huang et al. (2026); Xiao et al. (2026)	Short-run liquidity drags, long-run adaptive gain; rarely tested as a resilience determinant (key gap)
Profitability / operating efficiency (ATO)	+	Duong et al. (2022); Gitelman et al. (2025)	Consistent; mostly proxied via sustainability or performance
Innovation / technology capability	+	Wang et al. (2021); Duong et al. (2022); Mujie & Liu (2025)	Consistent across renewable and energy-firm samples
Business diversification / unregulated activity	+	Gitelman et al. (2025)	Plausible but thin (single study)
Oil-price volatility (VOL)	− / ±	Benlemlih et al. (2024); Nikou (2025)	Destabilises cash flows; Benlemlih reports volatility raising environmental investment (±)
Financing cost and access / financial-sector linkage	+ access / − constraints	Wu (2023); Tu et al. (2025); Sohail et al. (2026); Kroll & Kühne (2024)	Stable financing supports resilience; transition-driven constraints erode it

Determinant (proxy)	Effect on resilience	Representative evidence	Consistency / notes
Carbon pricing / climate policy and transition risk	– / ±	Tu et al. (2025); Hayne et al. (2020); Subhani et al. (2024); Huang et al. (2026); Lantushenko & Schellhorn (2023)	Stranded-asset and compliance risk negative short-run; can spur adaptive investment

The internal determinants form a coherent, theory-consistent core. Leverage is the classic distress lever: higher gearing reduces the capacity to absorb shocks, echoing the cash-flow-based distress evidence of Pranowo et al. (2010) and the trade-off logic whereby asset-stranding risk raises the expected cost of fossil-linked debt. Liquidity and working-capital discipline act in the opposite direction, providing the buffer that resilience presupposes (Mujie & Liu, 2025), although excessive liquidity can signal under-utilised assets and so attenuate the benefit. Profitability, operating efficiency, and innovation capability are consistently associated with stronger financial sustainability and adaptive capacity (Duong et al., 2022; Wang et al., 2021; Gitelman et al., 2025).

Green capital expenditure is the pivotal and most ambiguous internal determinant: portfolio theory frames it as the mechanism through which firms rebalance toward lower long-run risk, yet in the short run it competes with liquidity and payouts (Țăran et al., 2026; Huang et al., 2026; Xiao et al., 2026). Notably, no study in the corpus tests green capital expenditure directly as a determinant of a firm-level resilience outcome, a gap the present research programme is designed to address.

The external determinants operate chiefly as stressors. Oil-price volatility destabilises the cash flows on which solvency depends (Nikou, 2025); intriguingly, Benlemlih et al. (2024) find that volatility also raises firms' environmental performance, suggesting that it may accelerate adaptive investment rather than purely erode stability. Financing conditions cut both ways: access to stable financial-sector funding underpins resilience (Wu, 2023; Sohail et al., 2026), whereas transition-driven financing constraints and rising capital costs weaken it (Tu et al., 2025; Kroll & Kühne, 2024). Carbon pricing and climate policy register predominantly as transition risk, operating through stranded-asset exposure, compliance cost, and lobbying-related risk (Hayne et al., 2020; Lantushenko & Schellhorn, 2023; Huang et al., 2026), yet the same policy pressure can catalyse the adaptive investment that builds longer-run resilience (Subhani et al., 2024; Tu et al., 2025).

Two inconsistencies merit emphasis. First, the sign of the volatility effect is unsettled: treated as a pure shock it is negative, but when it triggers adaptation, its net effect can turn positive, as the evidence of Benlemlih et al. (2024) implies. Second, green capital expenditure carries opposite short- and long-run signs, so studies that observe only one horizon reach divergent conclusions. More fundamentally, effect directions are coded from heterogeneous proxies (financial stability, sustainability, performance, and solvency) rather than a common resilience metric, which limits comparability and motivates the integrative framework developed in the Discussion.

National versus International Oil Companies

Whether financial resilience differs between national oil companies (NOCs) and international oil companies (IOCs) cannot be answered directly from the corpus, because no included study designs an explicit NOC-versus-IOC comparison and firm ownership is rarely reported as a moderator. Indirect signals are nonetheless visible. The concentration of firm-level evidence in China (six studies) and other state-influenced energy systems means that much of it implicitly reflects state-linked or NOC-adjacent enterprises (for example, Tu et al., 2025; Huang et al., 2026; Mujie & Liu, 2025), where policy alignment and state backing may relax financing constraints and reshape transition incentives.

Evidence from European and market-oriented settings (for example, Gitelman et al., 2025; Țăran et al., 2026; Tatar & Buleca, 2026) speaks more to investor-facing, IOC-type dynamics such as valuation, disclosure, and capital-market discipline. The absence of a controlled comparison is itself a finding: ownership structure is a plausible but untested moderator of resilience determinants, carried forward as a contextual gap in the Research Agenda. Because no included study designs an explicit NOC-versus-IOC comparison, the observations above are read as hypotheses generated by the pattern of evidence, not as empirical findings about ownership effects. They are offered solely as a future-research direction and should not be cited as evidence that ownership moderates' resilience.

Discussion

The evidence assembled above can be integrated into a single antecedents, decisions, and outcomes (ADO) framework. The antecedents are the determinants of the effect-direction matrix: internal financial characteristics (leverage, liquidity, profitability, innovation, and green capital expenditure) and external pressures (oil-price volatility, financing conditions, and climate policy). These antecedents do not act on resilience directly; they operate through financial decisions, namely the firm's choices about capital structure, liquidity management, and the pace and scale of low-carbon investment. The outcome is financial resilience itself, understood as the capacity to absorb shocks, adapt the asset and financing mix, and recover the growth trajectory. Reading the corpus through this logic converts a set of scattered bivariate findings into a coherent causal narrative and clarifies where the evidence is thickest (the antecedents) and thinnest (the decision mechanisms and the resilience outcome itself).

This integration confirms the conceptual shift that motivates the review. The classical distress lens, anchored in cash-flow solvency (Pranowo et al., 2010), remains visible in the roles of leverage and liquidity, but it no longer exhausts the financial problem facing O&G firms. The corpus repeatedly frames financial health in dynamic, forward-looking terms, as sustainability, adaptive performance, and the capacity to finance a transition, rather than as the mere avoidance of default (Gitelman et al., 2025; Țăran et al., 2026; Duong et al., 2022). Resilience, not distress, is the construct toward which the literature is converging, even where the word itself is not used.

The central tension the framework exposes is the green-investment trade-off. Decarbonisation requires substantial, long-horizon capital expenditure, yet the same outlay draws down the liquidity buffer and competes with the payouts that signal financial strength in the short run (Țăran et al., 2026; Huang et al., 2026; Xiao et al., 2026). Through a portfolio-theory lens this is a deliberate rebalancing toward lower long-run risk; through a trade-off lens it is a near-term increase in the expected cost of distress. Resilience, in this setting, is precisely the firm's ability to bear the short-run cost of adaptation without compromising solvency, a capability that dynamic-capabilities theory attributes to sensing, seizing, and reconfiguring (Teece et al., 1997). The literature describes both sides of this trade-off but rarely measures its net effect, which is the empirical space the present research programme occupies.

Finally, the synthesis surfaces genuine disagreement rather than mere absence of evidence. The sign of the oil-price-volatility effect is contested, positive where volatility spurs adaptive investment (Benlemlih et al., 2024) and negative where it is treated as a pure cash-flow shock (Nikou, 2025); the effect of climate policy is similarly double-edged, a source of transition risk and a catalyst of adaptation at once (Tu et al., 2025; Subhani et al., 2024). Much of this inconsistency is traceable to heterogeneity in measurement and horizon: studies proxy resilience with different variables, observe different time windows, and span state-influenced and market-oriented systems. Reconciling these differences calls for a common resilience metric and a dynamic estimator, which the research agenda sets out next.

A critical reading suggests three systematic sources of disagreement rather than random noise. First, measurement heterogeneity: studies proxy resilience with non-equivalent constructs (financial stability, sustainability, performance under stress, solvency), so apparent conflicts partly reflect different dependent variables. Second, the institutional environment: evidence from state-influenced systems (notably China) tends to show policy pressure relaxing financing constraints, whereas market-oriented settings emphasize capital-market discipline and valuation channels, so the sign of the climate-policy and financing effects is partly contingent on context.

Third, the time horizon: green capital expenditure and volatility carry opposite short- and long-run signs, so single-horizon designs reach divergent conclusions. Against this backdrop, the most robust determinants across contexts are the internal financial fundamentals: leverage is consistently resilience-reducing and liquidity and profitability consistently resilience-enhancing, whereas the external pressures and green investment are the determinants whose net effect is genuinely conditional.

Research Agenda

The synthesis exposes four classes of gap that, organised through the theory, context, characteristics, and methodology (TCCM) framework, define a forward agenda for research on O&G financial resilience (Paul & Criado, 2020; Lim et al., 2022).

Theory. The corpus borrows financial theory more than it tests it. Trade-off, portfolio, and dynamic-capabilities logics are invoked to interpret findings, but none has been formally examined as a theory of resilience in the O&G transition setting. The portfolio-theoretic claim that green capital expenditure lowers long-run firm risk, and the dynamic-capabilities claim that reconfiguration capacity translates into financial outcomes, remain assertions rather than tested propositions.

Context. Evidence is geographically and structurally skewed. It concentrates in China and Europe and rarely distinguishes national from international oil companies or developed from developing-market producers (as noted above). Because ownership and institutional setting plausibly moderate every determinant in Table 2, comparative designs (NOC versus IOC, developed versus emerging markets) are a priority. Emerging-market producers such as those on the Indonesia Stock Exchange, the setting of the foundational distress work (Pranowo et al., 2010), are especially under-represented.

Characteristics. Several variables and relationships in the matrix are theorised but barely measured. The clearest is green capital expenditure as a direct determinant of a firm-level resilience outcome, which no included study estimates. Related under-tested relationships include the interaction between leverage and green capital expenditure, the moderating role of a liquidity buffer in absorbing transition shocks, and the threshold or non-linear effects that a cash-flow-coverage view of resilience (for example, debt service coverage) would predict.

Methodology. The corpus is dominated by single-period, static econometric designs (see the Descriptive Overview of the Corpus) and rarely models the intertemporal dynamics that the concept of resilience implies. Resilience is, by definition, a dynamic property: the path of recovery after a shock. Yet persistence, adjustment speed, and feedback are seldom estimated. Dynamic panel methods, in particular the generalised method of moments (GMM), are well suited to this task because they accommodate the persistence of financial ratios, the endogeneity of investment and financing decisions, and firm-level heterogeneity.

Building on these gaps, the following propositions are advanced for empirical testing, including within the dynamic-panel programme that this review supports:

1. P1. Green capital expenditure has a negative short-run but positive long-run association with financial resilience, yielding a net effect that is conditional on the firm's liquidity buffer.
2. P2. Leverage reduces resilience, and this effect intensifies with exposure to climate-transition risk.
3. P3. Liquidity and operating efficiency strengthen resilience and moderate the short-run drag of green investment.
4. P4. Oil-price volatility has an asymmetric effect, eroding resilience as a cash-flow shock while, above a threshold, accelerating the adaptive investment that rebuilds it.
5. P5. The determinants of resilience differ systematically between national and international oil companies, reflecting differences in state backing and capital-market discipline.

These propositions are most credibly tested with dynamic panel (GMM) estimation on firm-level data spanning the recent period of joint volatility and transition pressure, the approach adopted in the doctoral research this review underpins.

CONCLUSION

This review set out to consolidate the determinants of financial resilience in oil and gas firms during the energy transition and to define a research agenda. It makes three contributions. Theoretically, it reframes the field from financial distress, a survival lens, to financial resilience, an adaptive one, and shows that the empirical literature is already converging on this construct even where it is not named. Methodologically, it offers a transparent, PRISMA-based synthesis that combines an effect-direction matrix with the ADO and TCCM frameworks, turning a fragmented body of evidence into an integrative account of antecedents, decisions, and outcomes. Substantively, it identifies a compact set of internal determinants (leverage, liquidity, green capital expenditure, profitability, and innovation) and external determinants (oil-price volatility, financing conditions, and climate policy), and clarifies the direction and the contested points of their effects.

The findings carry practical implications. For management, resilience is built by protecting the liquidity buffer while pacing green capital expenditure so that long-run repositioning does not precipitate short-run distress. For investors and lenders, the determinants of the effect-direction matrix offer a forward-looking complement to backward-looking distress scores, and signal that financing terms themselves shape the resilience of the firms they fund. For regulators and policymakers, the double-edged role of climate policy implies that transition measures are most effective when paired with instruments that preserve firms' capacity to finance adaptation rather than merely penalising fossil exposure.

Several limitations should be acknowledged. The review draws on a single database (Scopus), which, although comprehensive, may omit relevant work indexed elsewhere, and its reliance on English-language records introduces a potential language bias. The synthesis is qualitative and descriptive: effect directions are coded from reported results and abstracts rather than from a quantitative meta-analysis, and studies are not formally weighted by methodological quality. The included corpus is also recent and heterogeneous in its resilience proxies, which constrains direct comparison. These choices favour transparency and breadth over statistical pooling and should be read accordingly.

Financial resilience, not the mere avoidance of distress, is the financial challenge that defines the oil and gas industry's passage through the energy transition. By mapping its determinants and the gaps that remain, this review provides both a conceptual frame and an empirical platform for the dynamic, firm-level research the field now requires.

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