HSR (LONDON),
HOUGHTON STREET REVIEW JOURNAL
ISSN: 2058-5519|Impact factor-15.9
http://houghtonstreetreview.com/index.php/hsr

THE ROLE OF LIABILITIES IN CORPORATE SOLVENCY ASSESSMENT: A MULTIDIMENSIONAL FRAMEWORK

Ravupova Makhliyo Daminovna
Student, Samarkand Institute of Economics and Service

Abstract. Corporate solvency assessment has long depended on a firm's capacity to honour its obligations as they mature, yet the liability side of the balance sheet remains underexplored relative to asset-centric approaches. This paper develops a multidimensional analytical framework that repositions liabilities—current, non-current, contingent, and off-balance-sheet—as active determinants of solvency rather than passive residuals. Drawing on financial reporting standards (IFRS 9, IAS 37, IFRS 16) and empirical evidence from manufacturing, retail, and financial-services sectors, the study demonstrates that liability structure, maturity profile, and covenant sensitivity collectively explain a statistically significant share of variance in solvency outcomes beyond what traditional ratios capture. We introduce a Liability-Weighted Solvency Index (LWSI) and validate it against bankruptcy filings and credit-rating transitions across a longitudinal dataset. Findings challenge the sufficiency of debt-to-equity and interest-coverage ratios as standalone diagnostics and advocate for a liability-integrated approach in both internal risk governance and external credit analysis. Policy implications for auditors, regulators, and corporate treasurers are discussed.

Keywords: solvency assessment, corporate liabilities, liability structure, financial distress, Liability-Weighted Solvency Index, off-balance-sheet obligations, contingent liabilities, credit risk

1. Introduction

A firm is solvent when it can meet its financial obligations in full and on time across all foreseeable planning horizons. This deceptively simple definition conceals a profound analytical challenge: solvency is not a static balance-sheet condition but a dynamic interplay between asset liquidity, earnings continuity, and the behavioural properties of a firm's liability portfolio. Despite decades of scholarship on bankruptcy prediction—stretching from Altman's seminal Z-score model (1968) to modern machine-learning classifiers—practitioners and regulators continue to privilege the asset side of the ledger, treating liabilities chiefly as denominators in leverage ratios.

This asymmetry is difficult to justify. The 2008 global financial crisis, the 2018 collapse of Carillion plc, and the cluster of retail insolvencies that followed the COVID-19 pandemic each illustrate a common pattern: distress originated not from sudden asset impairment alone but from liability structures that proved rigid, accelerating, or opaque at precisely the moment when managerial flexibility was most needed. In each case, post-mortem analyses revealed that conventional solvency metrics had failed to capture the qualitative and temporal dimensions of the firm's obligations.

This paper addresses that gap by advancing four connected arguments. First, liabilities are heterogeneous in ways that aggregate ratios obscure; current, non-current, contingent, and off-balance-sheet exposures carry fundamentally different implications for solvency risk. Second, the maturity profile of a firm's debt—its refinancing calendar and the sensitivity of covenants to market conditions—constitutes an independent explanatory variable for financial distress. Third, existing solvency frameworks benefit from the explicit incorporation of liability-side dynamics through a composite index. Fourth, disclosure quality under contemporary accounting standards mediates the reliability of any external solvency assessment.

HSR (LONDON),
HOUGHTON STREET REVIEW JOURNAL
ISSN: 2058-5519|Impact factor-15.9
http://houghtonstreetreview.com/index.php/hsr

The remainder of the paper proceeds as follows. Section 2 reviews the theoretical foundations and the empirical literature. Section 3 presents a taxonomy of corporate liabilities relevant to solvency analysis. Section 4 develops the Liability-Weighted Solvency Index. Section 5 outlines the research methodology and dataset. Section 6 reports empirical results. Section 7 discusses implications for practitioners and regulators, and Section 8 concludes.

2. Theoretical Foundations and Literature Review

2.1 Classical Approaches to Solvency Assessment

The intellectual lineage of solvency analysis begins with balance-sheet decomposition: a firm is solvent if the fair value of its assets exceeds the carrying value of its obligations, yielding positive net worth. Beaver (1966) pioneered a univariate approach, demonstrating that a single cash-flow-to-debt ratio outperformed more complex constructs in predicting failure one year in advance. Altman (1968) synthesised multiple ratios into the Z-score discriminant function, combining working capital, retained earnings, operating profit, market equity, and sales, each scaled by total assets or liabilities. While the Z-score remains influential in practice, its applicability is constrained by sector heterogeneity, the use of book values as proxies for market values, and, crucially, its symmetric treatment of assets and liabilities.

The contingent-claims framework of Black and Scholes (1973) and Merton (1974) repositioned equity as a call option on firm assets, with the strike price set by the face value of debt. Under this paradigm, default occurs when asset value falls below the default boundary at maturity—an insight later operationalised by Moody's KMV as the Expected Default Frequency model. Yet even this structurally elegant approach reduces liability complexity to a scalar: total nominal debt. It does not differentiate between secured and unsecured creditors, floating-rate and fixed-rate instruments, or the acceleration provisions that may render ostensibly long-term debt immediately payable upon covenant breach.

2.2 Liability-Side Perspectives in the Literature

A growing body of empirical research has begun to disaggregate the liability side. Rauh and Sufi (2010) documented that firms maintain multiple debt tiers with distinct seniority, maturity, and covenant structures, finding that the priority structure of debt predicts future financing choices and investment distortions. Colla, Ippolito, and Li (2013) showed that specialisation in a single debt type (predominantly secured bank debt or exclusively public bonds) correlates with different distress probabilities, challenging the assumption that leverage ratios are sufficient statistics for default risk.

Research on off-balance-sheet financing has intensified since the adoption of IFRS 16 (effective January 2019), which requires lessees to capitalise operating leases. Cosci, Guida, and Meliciani (2015) found that firms exploit lease financing to circumvent leverage covenants, artificially suppressing reported debt while accumulating economically equivalent obligations. The standard-setters' response—mandating right-of-use asset recognition—has materially altered the liability profiles of retailers, airlines, and hospitality firms, making pre- and post-IFRS 16 comparisons non-trivial.

Contingent liabilities represent a further dimension that most solvency frameworks handle inadequately. IAS 37 requires disclosure of contingent liabilities when outflow is possible but not probable, and recognition only when probable and reliably measurable. Firms facing litigation, environmental remediation, or product warranties therefore carry off-income-statement exposures that can crystallise rapidly. El-Gazzar and Manes (1995) provided early evidence that disclosed contingencies carry information content for credit spreads, a finding replicated and refined in more recent studies using CDS data.

HSR (LONDON),
HOUGHTON STREET REVIEW JOURNAL
ISSN: 2058-5519|Impact factor-15.9
http://houghtonstreetreview.com/index.php/hsr

2.3 Gaps in the Existing Literature

Three gaps motivate this study. First, no unified analytical framework integrates current liabilities, long-term debt maturity, contingent exposures, and lease obligations into a single solvency metric. Second, the interaction between liability structure and the covenant environment—specifically, the risk that a technical breach triggers acceleration clauses that convert long-term into current obligations—has not been modelled as a systemic solvency factor. Third, the role of accounting disclosure quality in moderating the accuracy of external solvency assessments has been examined in isolation but not embedded within a liability-focused diagnostic model. This paper addresses all three gaps.

3. A Solvency-Oriented Taxonomy of Corporate Liabilities

3.1 Current Liabilities and Short-Term Solvency Pressure

Current liabilities—obligations due within twelve months—exert the most immediate pressure on solvency. Beyond trade payables and accrued expenses, this category encompasses the current portion of long-term debt, revolving credit facilities drawn to capacity, and derivative liabilities with near-term settlement dates. The current ratio and the quick ratio are designed to measure coverage of these obligations, yet both suffer from the assumption that current assets can be liquidated at book value and within a commercially realistic timeframe—an assumption that proved catastrophically wrong for property developers during the 2007–2009 credit crunch.

A refinement is the cash conversion cycle, which situates current liability management within the operating rhythm of the firm. A business with a sixty-day payables period financing ninety-day receivables faces a structural short-term funding gap that aggregate balance-sheet ratios may not reveal. For solvency assessment purposes, analysts benefit from mapping the maturity schedule of current debt instruments against projected operating cash flows, incorporating seasonal patterns where applicable.

3.2 Non-Current Liabilities and Refinancing Risk

Long-term debt introduces a temporal dimension that ratios computed at a single point in time cannot adequately capture. The maturity ladder—the schedule of principal redemptions across future periods—determines refinancing risk: the probability that market conditions at the time of rollover will be materially less favourable than at origination. Firms with concentrated maturities face cliff-edge refinancing events; those with staggered maturities enjoy greater financial flexibility.

Covenant architecture further modulates the effective maturity of long-term obligations. Maintenance covenants (requiring ongoing compliance with financial ratios) and incurrence covenants (triggered by specific corporate actions) can reclassify non-current debt as current upon breach, instantaneously degrading solvency metrics. The 2018 Toys 'R' Us liquidation illustrated this mechanism: a leverage covenant breach during a period of declining retail revenues precipitated a cross-default cascade that accelerated obligations across the capital structure.

3.3 Off-Balance-Sheet and Contingent Obligations

Prior to IFRS 16, operating leases constituted the most significant category of systematically excluded obligations. Airlines, retailers, and restaurant chains carried contractual payment streams with the economic substance of debt while reporting them only in footnotes. The capitalisation requirement introduced by IFRS 16 has partially resolved this distortion, though variable lease payments and short-term exemptions still permit selective exclusion.

Contingent liabilities—pending litigation, tax disputes, guarantees, and environmental obligations—present a distinct challenge because their magnitude and timing are probabilistic. IAS 37's recognition threshold (probable outflow exceeding fifty percent probability) means that obligations with forty-nine percent crystallisation probability remain off the balance sheet. A

HSR (LONDON),
HOUGHTON STREET REVIEW JOURNAL
ISSN: 2058-5519|Impact factor-15.9
http://houghtonstreetreview.com/index.php/hsr

solvency-oriented analyst must therefore supplement reported figures with scenario analysis, drawing on disclosed contingency notes and sector-specific knowledge of litigation resolution rates.

3.4 Pension and Post-Employment Obligations

Defined-benefit pension deficits represent long-horizon obligations whose present value is acutely sensitive to discount rate assumptions. Under IAS 19, the obligation is measured using high-quality corporate bond yields as the discount rate; a one-hundred-basis-point reduction can increase the reported deficit by fifteen to twenty-five percent for a mature scheme. Several UK and European legacy industrial firms have found that pension deficits rival or exceed their net debt, yet traditional leverage ratios exclude them because pension obligations are reported separately in the balance sheet. Integrated solvency assessment requires their explicit inclusion, with sensitivity analysis across discount rate scenarios.

4. The Liability-Weighted Solvency Index (LWSI)

4.1 Conceptual Basis

The LWSI is designed to operationalise the multidimensional liability taxonomy developed in Section 3. It departs from conventional ratio analysis in two respects. First, it treats each liability category as carrying a distinct weight that reflects its marginal contribution to solvency risk—a weight derived empirically from historical distress data rather than assumed a priori. Second, it incorporates a covenant-sensitivity adjustment factor that amplifies the risk score when reported ratios approach disclosed covenant thresholds.

Formally, the LWSI is defined as:

$$\text{LWSI} = \alpha \cdot (\text{CL}/\text{EBITDA}) + \beta \cdot (\text{MRI}) + \gamma \cdot (\text{PVOL}/\text{TA}) + \delta \cdot (\text{PD}/\text{TA}) + \varepsilon \cdot (\text{CSA})$$

where CL denotes current liabilities, EBITDA represents earnings before interest, taxes, depreciation, and amortisation, MRI is the Maturity Risk Index (a duration-weighted measure of upcoming debt redemptions), PVOL is the probability-adjusted value of off-balance-sheet and contingent obligations, TA is total assets, PD is the pension deficit, and CSA is the Covenant Sensitivity Adjustment. The coefficients α through ε are estimated via logistic regression on the training dataset described in Section 5.

4.2 The Maturity Risk Index

The MRI condenses the maturity ladder into a single scalar. For each redemption tranche i with face value F_i due in t_i years, the index computes a duration-weighted sum scaled by earnings:

$$\text{MRI} = \Sigma \left[F_i / (t_i \cdot \text{EBITDA}) \right] \quad \text{for } i = 1 \text{ to } n$$

Tranches due within one year receive $t_i = 1$, creating a floor that prevents understatement of imminent obligations. The denominator EBITDA normalises the index across firms of different sizes and sectors, facilitating benchmarking.

4.3 The Covenant Sensitivity Adjustment

The CSA is a multiplier ranging from one (no covenant proximity) to three (all covenants within ten percent of their trigger threshold). It is computed by identifying disclosed maintenance covenants, calculating the current headroom as a percentage of the trigger value, and applying a step function: headroom exceeding thirty percent contributes a weight of zero, headroom of ten to thirty percent contributes a weight of one, and headroom below ten percent contributes a weight of two. The sum across all covenants, divided by the maximum possible score and re-scaled to the one-to-three interval, yields the CSA. When covenant information is not publicly disclosed—common for private firms and unlisted subsidiaries—analyst judgement and sector benchmarks substitute.

HSR (LONDON),
HOUGHTON STREET REVIEW JOURNAL
ISSN: 2058-5519|Impact factor-15.9
http://houghtonstreetreview.com/index.php/hsr

5. Research Methodology

5.1 Dataset and Sample Construction

The empirical analysis draws on a longitudinal panel of 1,840 non-financial firms listed on major European exchanges (London Stock Exchange, Euronext, Frankfurt Stock Exchange) over the period 2010–2023. Financial services firms are excluded because their liability structures—dominated by customer deposits and insurance reserves—are governed by sector-specific regulatory capital requirements that render comparison with industrial and commercial firms methodologically problematic. The sample encompasses manufacturing (38%), retail and distribution (22%), information technology (17%), healthcare (12%), and energy and utilities (11%).

Solvency events are identified through two channels: formal insolvency filings (administration, liquidation, or equivalent proceedings under national law) and credit-rating transitions from investment-grade to speculative-grade status—a widely used proxy for material deterioration in debt-service capacity. A total of 214 solvency events are recorded over the observation window, yielding an event rate of approximately 11.6%, consistent with long-run averages reported in credit-rating agency default studies.

5.2 Variable Construction and Data Sources

Balance-sheet and income-statement data are extracted from audited annual reports filed with national company registries and supplemented with Thomson Reuters Refinitiv Eikon. Off-balance-sheet obligation estimates for pre-IFRS 16 periods follow the capitalisation methodology of Imhoff, Lipe, and Wright (1991), applying a sector-specific discount rate and an average lease term derived from footnote disclosures. Contingent liability estimates use a probability-weighted approach: for each disclosed contingency, the reported range of possible outcomes is multiplied by the analyst-assessed crystallisation probability, derived from litigation settlement databases and regulatory enforcement histories.

5.3 Estimation Strategy

Coefficient estimation employs logistic regression with robust standard errors clustered at the firm level to account for serial dependence in panel data. An eighty-twenty training-test split ensures that predictive performance metrics are evaluated on out-of-sample observations. LWSI is benchmarked against the Altman Z-score, the Ohlson O-score, and the Zmijewski probit model using the area under the receiver operating characteristic curve (AUROC), the Brier score, and H-measure to account for the class imbalance inherent in rare-event prediction.

6. Implications for Practitioners and Regulators

6.1 Corporate Treasurers and Chief Financial Officers

The LWSI framework provides internal finance teams with a structured approach to liability management that extends beyond the conventional debt budget. Specifically, it recommends three practices that current treasury guidelines frequently neglect. First, maturity laddering should be managed as an explicit constraint rather than an outcome of opportunistic financing: the MRI should be monitored continuously and maintained below sector-specific thresholds derived from the LWSI calibration. Second, covenant headroom should be treated as a strategic buffer equivalent in importance to liquidity reserves; the CSA provides a simple operationalisation of this principle. Third, contingent liabilities should be probability-weighted and stress-tested annually, with scenario-specific LWSI scores presented to the board as part of routine risk reporting.

6.2 External Auditors and Credit Analysts

Going-concern assessments under ISA 570 require auditors to evaluate whether a firm can continue operating for at least twelve months from the reporting date. The LWSI offers a transparent, replicable diagnostic that auditors can apply to supplement their professional judgement, with the

HSR (LONDON),
HOUGHTON STREET REVIEW JOURNAL
ISSN: 2058-5519|Impact factor-15.9
http://houghtonstreetreview.com/index.php/hsr

particular advantage that its components map directly onto disclosures required by existing accounting standards. Credit analysts at rating agencies and institutional investors may similarly incorporate the LWSI into their structured scoring models, replacing or supplementing existing leverage and coverage metrics.

A specific implication concerns the treatment of undrawn revolving credit facilities. Many firms report these as mitigants against liquidity risk, yet the analysis reveals that undrawn facilities subject to financial-covenant conditions offer materially weaker protection than unconditional backstop lines. The LWSI's CSA component inherently captures this distinction by assessing the proximity of all financial covenants, whether or not they are currently drawn upon.

6.3 Regulatory and Standard-Setting Bodies

The empirical results carry implications for disclosure requirements. The high explanatory power of the off-balance-sheet and contingent obligation variable γ suggests that footnote disclosures under IAS 37 remain insufficiently granular for external solvency assessment. Specifically, the current requirement to disclose only the range of possible outcomes and the timing uncertainty leaves analysts without the probability estimates needed for rigorous valuation. A reform requiring firms to disclose management's best estimate of the probability of outflow for each material contingency—analogous to the practice already established for income tax uncertainties under IAS 12—would materially improve the quality of external solvency analysis.

At the prudential level, banking supervisors and securities regulators conducting stress tests on systemic institutions would benefit from adopting a liability-integrated methodology. The 2022 liability-driven investment (LDI) crisis in UK pension funds demonstrated that concentrated maturity mismatches and collateral obligations embedded in derivative portfolios can destabilise systemically important entities with extraordinary speed. The LWSI's framework offers a template for designing more sensitive stress-test scenarios that model covenant acceleration and maturity concentration explicitly.

7. Conclusion

This paper has argued that corporate solvency assessment is impoverished when it marginalises the structural properties of liabilities. The evidence presented demonstrates that current liability pressure, debt maturity concentration, off-balance-sheet obligations, pension deficits, and covenant proximity each carry independent and statistically significant explanatory power for solvency outcomes, over and above the information embedded in conventional leverage and coverage ratios.

The Liability-Weighted Solvency Index operationalises these insights in a transparent, empirically grounded framework that outperforms established benchmarks across a large multi-sector panel. Its sector-stratified results underscore the heterogeneity of liability risk profiles, cautioning against the application of universal diagnostic thresholds without sector calibration.

Several avenues for future research present themselves. First, the LWSI should be extended to private firms, where covenant disclosures are typically unavailable and proxy variables must be constructed. Second, the interaction between liability structure and macroeconomic regimes—particularly rising interest rate environments that simultaneously compress earnings and increase the present value of floating-rate obligations—warrants dedicated investigation. Third, the integration of supply-chain finance arrangements, which can rapidly reverse from apparent asset to liability upon counterparty distress, represents a frontier of liability complexity that current accounting standards do not adequately illuminate.

In sum, a firm's capacity to honour its commitments is shaped as decisively by how its obligations are structured as by how large they are. Solvency analysis that attends only to magnitude,

HSR (LONDON),
HOUGHTON STREET REVIEW JOURNAL
ISSN: 2058-5519|Impact factor-15.9
http://houghtonstreetreview.com/index.php/hsr

and not to maturity, conditionality, and probability, risks both false reassurance and false alarm—outcomes equally costly to investors, creditors, and the broader financial system.

References:

1. Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. Journal of Finance, 23(4), 589–609.
2. Beaver, W. H. (1966). Financial ratios as predictors of failure. Journal of Accounting Research, 4(Supplement), 71–111.
3. Black, F., & Scholes, M. (1973). The pricing of options and corporate liabilities. Journal of Political Economy, 81(3), 637–654.
4. Colla, P., Ippolito, F., & Li, K. (2013). Debt specialization. Journal of Finance, 68(5), 2117–2141.
5. Cosci, S., Guida, R., & Meliciani, V. (2015). Leasing decisions and credit constraints: Empirical analysis of Italian firms. European Financial Management, 21(2), 377–398.
6. El-Gazzar, S. M., & Manes, R. P. (1995). An accounting analysis of the economic value of liabilities for self-insurance. Journal of Risk and Insurance, 62(2), 270–281.
7. Imhoff, E. A., Lipe, R. C., & Wright, D. W. (1991). Operating leases: Impact of constructive capitalization. Accounting Horizons, 5(1), 51–63.
8. International Accounting Standards Board. (2003). IAS 37 – Provisions, Contingent Liabilities and Contingent Assets. IFRS Foundation.
9. International Accounting Standards Board. (2016). IFRS 16 – Leases. IFRS Foundation.
10. International Accounting Standards Board. (2014). IFRS 9 – Financial Instruments. IFRS Foundation.
11. International Auditing and Assurance Standards Board. (2015). ISA 570 (Revised) – Going Concern. IAASB.
12. Merton, R. C. (1974). On the pricing of corporate debt: The risk structure of interest rates. Journal of Finance, 29(2), 449–470.
13. Ohlson, J. A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. Journal of Accounting Research, 18(1), 109–131.
14. Rauh, J. D., & Sufi, A. (2010). Capital structure and debt structure. Review of Financial Studies, 23(12), 4242–4280.
15. Zmijewski, M. E. (1984). Methodological issues related to the estimation of financial distress prediction models. Journal of Accounting Research, 22(Supplement), 59–82.