FINANCIAL SITUATION ANALYSIS IN IDENTIFYING RISKS OF ECONOMIC INSOLVENCY: A CASE STUDY OF GENERAL MOTORS

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Abstract

The article examined the role of financial situation analysis in the early identification of economic insolvency risks using General Motors as a case study. A systematic assessment of liquidity, solvency, profitability, and cash flow indicators was conducted. The findings substantiated that financial analysis supported improved managerial decision-making and risk reduction. The Altman Z-score model was applied to determine the probability of bankruptcy and evaluate the level of financial stability. The results confirmed that regular monitoring of financial indicators and the application of forecasting models contributed to strengthening corporate resilience and preventing crisis situations.

Keywords: financial situation analysis, economic insolvency risk, bankruptcy, Altman Z-score, liquidity, General Motors, risk management, leverage, cash flow.

Annotatsiya

Maqolada moliyaviy holat tahlilining iqtisodiy nochorlik risklarini erta aniqlashdagi ahamiyati General Motors kompaniyasi misolida o‘rganildi. Korxonaning likvidlik, to‘lovga qobiliyatlilik, rentabellik va pul oqimlari ko‘rsatkichlari tizimli baholandi. Moliyaviy tahlil natijalari boshqaruv qarorlarini takomillashtirish va risklarni kamaytirish imkonini bergani asoslandi. Altman Z-score modeli orqali bankrotlik ehtimoli aniqlanib, moliyaviy barqarorlik darajasini baholash imkoniyati ko‘rsatildi. Tadqiqot natijalari moliyaviy ko‘rsatkichlarni muntazam monitoring qilish va prognozlash usullarini qo‘llash korporativ barqarorlikni mustahkamlash hamda inqirozlarning oldini olishda samarali vosita bo‘lganini tasdiqladi.

Kalit so‘zlar: moliyaviy holat tahlili, iqtisodiy nochorlik riski, bankrotlik, Altman Z-score modeli, likvidlik, General Motors, risklarni boshqarish, moliyaviy leveraj, pul oqimi.

Аннотация

В статье исследована роль анализа финансового состояния в раннем выявлении рисков экономической несостоятельности на примере компании General Motors. Проведена системная оценка показателей ликвидности, платёжеспособности, рентабельности и денежных потоков. Обосновано, что результаты финансового анализа способствовали совершенствованию

управленческих решений и снижению рисков. С использованием модели Альтмана (Z-score) определена вероятность банкротства и дана оценка уровня финансовой устойчивости. Полученные результаты подтвердили, что регулярный мониторинг финансовых показателей и применение прогностических моделей способствовали укреплению корпоративной устойчивости и предупреждению кризисных ситуаций.

Ключевые слова: анализ финансового состояния, риск экономической несостоятельности, банкротство, модель Альтмана (Z-score), ликвидность, General Motors, управление рисками, финансовый рычаг, денежный поток.

INTRODUCTION

The financial stability of enterprises is a fundamental aspect for their competitiveness and continued operation in a market economy. Financial analysis helps to identify the risk of economic insolvency (inability to pay) that may arise in an enterprise at an early stage. Preventing insolvency increases investment attractiveness, strengthens the confidence of creditors, and ensures the effectiveness of management decisions. Therefore, assessment methods based on financial indicators - liquidity, stability, profitability, and cash flow analysis - are of great importance in the activities of enterprises. Financial distress may occur incidentally due to declining revenues, excessive debt, or poor liquidity, making early identification essential to avoid full-scale bankruptcy.

Solvency rations is a financial metric that determine a company`s ability to meet its long-term obligations. If the ratio is high means the company is solvent and can pay its debts. If the ratio is low then the company may have financial risk or the risk of insolvency. General Motors is a large multinational corporation and for such a company insolvency menace not only the company itself but also employees, investors, suppliers, and the broader economy. Understanding and monitoring company`s financial situation is necessary for determining the factors that lead to its near-bankruptcy and implement adequate measures that can recover the losses. The aim of the work is to analyze how GM`s solvency ratios affected its financial risks, influenced management decisions and how large corporations like GM can prevent similar crises.

LITERATURE REVIEW

The problems of insolvency and bankruptcy forecast were investigated by many renown scientists:

According to the investigations of Beaver (1966) a pioneering study that used financial ratios to predict corporate failure. It showed that the cash flow to debt ratio was the single best predictor, and other significant predictors included net income to total assets and total liabilities to total assets, particularly those related cash flow and liquidity significantly signal to future distress.

Altman (1968), building on Beaver's study created the Z-score model, a multi-variable discriminant approach including several financial ratios (profitability, leverage, liquidity, solvency) which was the most renowned model in predicting

company bankruptcy using financial ratios. The aim of this model is to arrive to the most useful financial ratios to predict bankruptcy.

Research done by Taffler (1983) was focused on a statistical model to predict corporate failure by applying multivariate discriminant analysis (MDA) to a large dataset of financially healthy and failed UK companies. His empirical research, which involved analyzing financial statements, aimed to identify the accounting ratios most effective at distinguishing firms likely to go bankrupt from those that would remain solvent.

The study shows that insolvency can be detected through financial ratio analysis and models such as founded by Beaver, Altman and Taffler.

METHODOLOGY

This section outlines the methodological approach used to investigate the role of financial and solvency analysis in detecting insolvency risks, with a specific focus on General Motors (GM).

The following analytical approaches were used in the study:

Financial Ratios: Liquidity (current, quick, absolute), solvency (debt ratio, equity ratio, capital adequacy), profitability (ROA, ROE, ROS), and cash flows (operating, investing, financing).

Bankruptcy Models: Altman Z-score, Taffler model, and Beaver coefficient to evaluate the probability of financial distress.

Trend Analysis: A 3-5 year dynamic review of key indicators to identify patterns of declining solvency and rising financial risk.

ANALYSIS AND RESULTS

This section presents a comprehensive financial analysis of the General Motors Corporation during its five-year trajectory toward the largest industrial bankruptcy in American history (2005-2009). The methodology employed multiple diagnostic frameworks, including detailed assessments of liquidity, solvency, and profitability, complemented by main established bankruptcy prediction model: the Altman Z-Score. This multi-faceted approach allowed for the precise identification of the financial mechanisms underpinning the company's collapse (Figure 1).

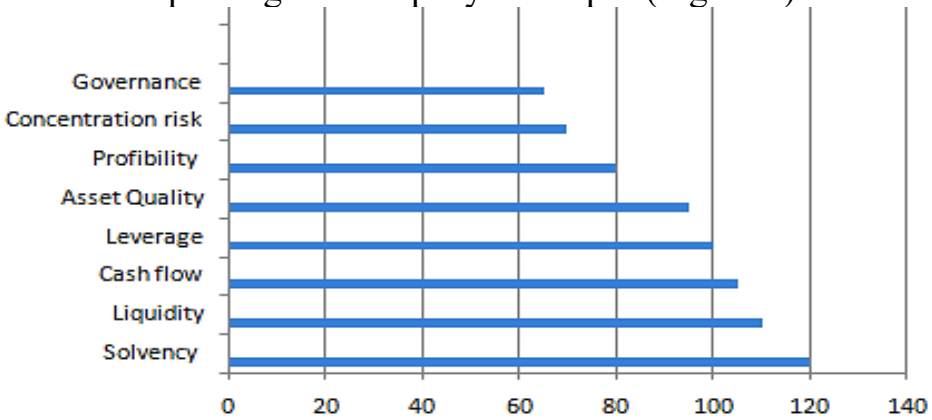

Figure 1. Key Indicators for Identifying Insolvency[1]

[1] Source: Author's elaboration based on Altman (1968), Beaver (1966), and Brigham & Ehrhardt (2019).

The factors presented in the chart-Solvency, Liquidity, Cash flow, Leverage, Asset Quality, Profitability, Concentration risk, and Governance-constitute a fundamental diagnostic framework used by analysts and creditors to assess a firm's financial stability and its overall risk of insolvency. These eight metrics are not isolated measurements; rather, they are essential and interdependent elements that, when analyzed collectively, provide a comprehensive picture of a firm's long-term viability and its proximity to failure. Deterioration across these categories signals deep structural problems that can lead to catastrophic financial collapse.

Case study: General Motors bankruptcy.

The case of General Motors serves as a critical paradigm of corporate financial failure, demonstrating that insolvency is rarely a sudden event. Rather, it is a gradual, predictable process characterized by sustained deterioration in key financial ratios and the accumulation of unheeded early warning signals. While the global financial crisis provided the ultimate trigger for the filing on June 1, 2009, GM's eventual insolvency was the culmination of fundamental structural weaknesses that had been developing for years.

Fundamentally, the company's financial distress resulted from the simultaneous manifestation of three interconnected systemic failures:

1. A Liquidity Crisis that severely hampered the ability to meet short-term operational obligations.

2. A Solvency Crisis stemming from an unsustainable increase in leverage and debt accumulation.

3. A Profitability Crisis driven by the fundamental obsolescence of the core business model in a rapidly evolving market (Figure 2).

Indicator	2005	2006	2007	2008	2009
Cash and cash equivalents	30726	26131	24817	14053	22679
Total current liabilities	102427	86214	69510	75608	52435
Total Long-term debt	191395	31268	33384	29018	5562
Total liabilities	460442	476363	184363	176115	107340
Total assets	474268	186304	148883	91039	136295
Total equity (deficit)	14442	5652	37094	85076	21957
Accounts Receivable	6625	6124	4744	1875	1172
Inventory	13921	13903	14939	13042	8902
Revenue	192604	207349	179984	148979	104589

Figure 2. Diagnostic Indicators of Financial Distress and Insolvency Risk[1]

The company's financial position evolved significantly between 2005 and 2009. A marked reduction in leverage was achieved, with long-term debt declining substantially from 191,395 to 5,562. Concurrently, the balance sheet underwent

[1] Source: Developed by the author based on General Motors Annual Reports (SEC Form 10-K, 2006-2010).

considerable contraction, as both total assets and total liabilities decreased. While cash reserves recovered modestly in the final year following a prior decline, operational performance weakened, evidenced by a consistent downward trajectory in revenue, which fell by nearly half over the period. This combination suggests a strategic shift towards deleveraging and a smaller operational scale (Table 1).

Table 1

Liquidity Ratios of General Motors (2005-2009)[1]

Liquidity Ratios

Ratio	Formula	2005	2006	2007	2008	2009
Current Ratio	CA/CL	0.50	0.54	0.64	0.38	0.62
Quick Ratio	(CA-Inv)/CL	0.36	0.37	0.43	0.21	0.45
Cash Ratio	Cash/CL	0.30	0.30	0.36	0.19	0.43

Liquidity Ratios:
Current Ratio = Current Assets ÷ Current Liabilities
Quick Ratio = (Current Assets - Inventory) ÷ Current Liabilities
Cash Ratio = Cash + Cash Equivalents ÷ Current Liabilities

Liquidity ratios show a company's ability to pay short-term obligations. For years, GM's financial reports showed it didn't have enough ready cash to pay its bills. The numbers that track cash health were all warning signs well before the bankruptcy. By 2008, it had almost no cash left relative to its debts. The apparent rebound in 2009 was due to the government rescue, not because its core business improved. This shows that a long-term cash shortage is a sure sign a company is heading for failure (Table 2).

Table 2

Trend Analysis of Key Solvency Ratios (2005-2009)[2]

Solvency Ratios

Ratio	Formula	2005	2006	2007	2008	2009
Debt-to-Equity	TD/TE	20.35	20.78	2.77	1.23	2.64
Debt Ratio	TD/TA	0.62	0.63	0.69	1.15	0.43
Interest Coverage	EBIT/Interest	-0.61	-1.16	7.74	-4.64	-3.82

[1] Source: Author's calculations based on General Motors Annual Reports (SEC Form 10-K, 2006-2010).
[2] Source: Author's calculations based on General Motors Annual Reports (SEC Form 10-K, 2006-2010).

Debt-to-Equity Ratio = Total Debt / Equity
Debt Ratio = Total Debt / Total Assets
Interest Coverage = EBIT / Interest Expense
Solvency ratios measure the company's ability to meet long-term obligations

The company was extremely highly leveraged in 2005-2006 (Debt-to-Equity >20). It sharply improved in 2007 with lower leverage and strong interest coverage (7.74). However, in 2008, financial distress returned: the Debt Ratio spiked to 1.15, indicating negative equity, and interest coverage was negative again, meaning EBIT could not cover interest expenses. 2009 saw lower debt levels but continued operating losses. Overall, the brief recovery in 2007 was not sustained, and profitability remained the critical weakness.

Altman (1968) established a model (Altman Z Score) that consists of a set of financial ratios which are then analyzed using Multiple Discriminate Analysis (MDA), based on the assumption of a relationship between financial ratios in previous years and the time of bankruptcy for the following years.

Altman's Z score Model

As mentioned above, this model was developed in 1968 and was the first in predicting corporate bankruptcy by using financial ratios. The Z score for a company is the weighted average of five separate financial ratios; these are represented in the following formula:

$$Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$$

Where:
Z = weighted average of five separate ratios
X1 = working capital / total assets
X2 = retained earnings / total assets
X3 = profit before interest and tax / total assets
X4 = market capitalization / book value of debts
X5 = Revenue / total assets

- Z < 1.8 → High risk of bankruptcy (distress zone)
- 1.8 - 3.0 → Grey zone (medium risk)
- Z > 3.0 → Safe zone (low risk of failure)

Altman's model shows companies that have a Z-score of > 2.7 are considered as a good sign for being successful compared to those which have a Z-score of < 1.8 had potential serious problems and may not be able to continue.

However, for a company who's Z-score falls between 2.7 and 1.8, it is difficult to determine its status (Table 3).

Each year is classified in the "Distress" zone. This means the calculated Z-Score was below 1.81 every year, indicating a high probability of financial failure according to the model. A score below 1.81 suggests the company was, from a solvency and operational standpoint, in a financially precarious position with a heightened risk of bankruptcy throughout the entire 2005-2009 period.

Table 3

The table presents the company's Altman Z-Score-a financial model predicting bankruptcy risk-over a five-year period[1].

Component	2005	2006	2007	2008	2009
Working Capital/TA	-0.108	-0.215	-0.168	-0.512	-0.145
Retained Earnings/TA	0.025	0.039	0.170	0.755	0.109
EBIT/TA	-0.019	-0.055	0.035	-0.165	-0.064
MVE/TL	0.031	0.012	0.201	0.483	0.204
Sales/TA	0.406	1.113	1.209	1.636	0.768
Z-Score	0.27	0.82	1.53	1.74	0.73
Zone	Distress	Distress	Distress	Distress	Distress

The Z-Score improved from a critical low of 0.27 in 2005 to a peak of 1.74 in 2008, nearing the "Grey" safety zone, before falling back to 0.73 in 2009. This peak was driven primarily by two factors:

1. A sharp, one-year surge in Retained Earnings/TA in 2008 (0.755), indicating a significant accumulation of past profits relative to assets.

2. A steady rise in Sales/TA, peaking in 2008 (1.636), which shows improved asset efficiency.

However, the score remained in distress because other fundamentals were weak. Working Capital/TA was negative every year, signaling persistent liquidity strain. More critically, EBIT/TA was negative in four of five years, confirming that the company's core operations were generally unprofitable. The 2009 decline back into deep distress was caused by a collapse in retained earnings, profitability, and asset turnover.

CONCLUSION AND SUGGESTIONS

This article analyzes the risks of insolvency in General Motors by examining the company’s liquidity ratios, solvency ratios, and Altman Z-score for the years leading up to its 2009 bankruptcy. The results show that while GM remained a major global automaker, its financial position weakened steadily over time. The patterns observed in the financial indicators suggest that declining liquidity and increasing leverage were critical warning signs of the company’s growing vulnerability. GM’s liquidity ratios dropped consistently, indicating a shrinking ability to cover short-term obligations. At the same time, solvency ratios showed a rise in financial risk as total debt increased and the company’s capital structure became less stable. The Altman Z-score provides

[1] Source: Author’s calculations using the Altman (1968) model and financial data from General Motors SEC filings (2006-2010).

further confirmation, as GM's values moved deeply into the distress zone, signaling a high probability of bankruptcy well before the actual filing.

In summary, the findings suggest that GM's insolvency was the result of long-term financial deterioration rather than a sudden collapse. For companies in similar situations, regular monitoring of liquidity and solvency ratios, combined with bankruptcy prediction models like the Altman Z-score, is essential to identify emerging risks early, strengthen financial resilience, and prevent severe financial distress.

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