MANAGERIAL ACCOUNTING AND FINANCIAL ANALYTICS

Predictive Financial Decision Models for Cash Flow Optimisation in Saudi Manufacturing Companies

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Published November 2026

Abstract

In manufacturing, liquidity depends not only on how much a company sells but also on when customers pay and when suppliers, employees and lenders must be paid. The timing of these flows makes cash forecasting a practical management decision rather than an exercise in projecting accounting balances. This critical review examines how predictive financial models might improve cash management in Saudi manufacturing companies in the context of Vision 2030. We examine thirty peer-reviewed studies published from 2020 to 2025, covering working capital, invoice payment forecasting, probabilistic time series, optimisation and financial governance. The literature shows why greater forecasting accuracy does not automatically lead to better decisions: a model may predict cash balances well while encouraging payment or inventory policies that damage operations. We therefore develop a conceptual approach that joins reconciled accounting data, customer payment patterns, production commitments and liquidity scenarios to realistic management actions. Its value should be judged through avoided cash shortages, financing costs and the ability to maintain production, alongside forecasting accuracy and explainability. Direct evidence from Saudi manufacturing treasury remains limited. The review identifies practical safeguards and a programme of research to test whether these approaches improve real decisions rather than merely produce more sophisticated forecasts.

Keywords: Cash flow forecasting; financial decision intelligence; manufacturing; working capital; liquidity risk; Saudi Vision 2030; predictive optimisation

1 Introduction

A manufacturing company can report a profit and still struggle to pay for materials, wages or essential maintenance. Revenue may be recognised well before the customer settles an invoice, while imported inputs and debt repayments require cash at fixed times. These mismatches matter in Saudi manufacturing, where localisation plans, expanding supply networks and substantial equipment investment can make cash commitments more complex. A useful treasury forecast must therefore do more than predict the month end balance. It should also show which payments are most uncertain, when a shortage might occur and what the finance team can do about it.

Traditional cash budgets aggregate expected receipts and payments from departmental estimates. They remain useful because assumptions can be challenged and authorised, but fixed schedules can obscure late payment variation, purchasing volatility and shocks to production. Modern enterprise systems generate more detailed evidence: invoice due dates, payment histories, sales order milestones, purchase order commitments, material movements and projected payroll. Used carefully, these records enable a move from single point estimates to conditional distributions and transaction-aware planning. Singh and colleagues [1] demonstrate the practical scope for machine learning in multiple entity liquidity forecasting, while Saini and colleagues [2] show how individual invoice receipt timing can be represented as a survival problem.

The distinction between financial performance and liquidity is central to this review. Manufacturing-focused studies associate working capital components with profitability, although results vary across countries, industries and estimation methods [3–6]. Saudi evidence connects cash conversion cycle management with corporate performance [7], yet evidence on how predictive tools should select designed to preserve cash actions remains thinner. A company may improve its cash conversion cycle ratio by postponing suppliers, while simultaneously undermining supply reliability or forfeiting discounts. Similarly, aggressively reducing inventories can release liquidity but raise the probability of stock shortages. Consequently, financial optimisation cannot be reduced to minimising receivable days or maximising cash balances independently.

The central argument is that an effective predictive financial decision model must couple forecasting with a controlled choice architecture. The forecast estimates the distribution of future receipts, outflows and funding needs; the decision layer selects permissible interventions; governance determines responsibility and monitors consequences. Unlike a ranking model that compares companies using financial ratios, the proposed perspective evaluates the sequence of decisions within a manufacturing firm's operating cycle. The contribution is a critical synthesis and implementable research agenda rather than an empirically estimated algorithm. It recognises that Saudi relevance must be demonstrated through future access to company operational data, not inferred from generic international results.

2 Aim, objectives and research questions

The aim is to critically evaluate how predictive financial decision models can convert operational and accounting information into reliable, risk-aware cash flow interventions for Saudi manufacturing companies. The review has five objectives: to identify the drivers and temporal structure of manufacturing cash flows; to compare accounting, machine learning and probabilistic forecasting approaches; to examine how predicted liquidity can inform inventory, collection, supplier payment and funding decisions; to establish governance and validation principles; and to define Saudi-focused research gaps appropriate for empirical investigation.

Four questions organise the synthesis. First, which individual transaction and macroeconomic variables explain short-horizon cash uncertainty? Second, under what conditions do complex predictive models add value beyond transparent financial baselines? Third, how should a manufacturer translate forecasts into feasible decisions when profitability, service continuity and liquidity conflict? Fourth, what evidence would establish the effectiveness and transferability of an integrated model in the Saudi industrial environment? These questions deliberately separate forecasting performance, organisational implementation and realised financial outcomes.

3 Review methodology

This article applies a structured critical review, selected because the relevant literature crosses accounting, corporate finance, operations research and computational forecasting. The available studies comprises thirty identifiable journal or peer-reviewed conference studies dated 2020 to 2025, with publication metadata and digital object identifiers checked against available publisher or bibliographic records. The supplied manufacturing decision support article [8] informed the initial conceptual vocabulary and numeric citation convention. Additional studies were located through targeted searches pairing cash flow, liquidity, manufacturing, working capital, forecasting,

receivables, optimisation, decision support and uncertainty with the publication years. Backward tracing of relevant bibliographies broadened coverage of adjacent methods.

Eligibility favoured papers that contributed an interpretable mechanism, an empirical comparison, a forecasting architecture or an operational decision method relevant to corporate cash. The review included evidence from other countries when Saudi industrial evidence was absent, but maintained that transferability must be tested rather than assumed. Descriptive articles without a discernible method, sources outside the specified period, unverified bibliographic records and papers focused exclusively on market price prediction were not selected. Because this is a purposive integrative synthesis, it does not claim exhaustive database coverage, pooled effect estimates or formal risk of bias scoring. The reference count therefore represents the selected analytical corpus rather than a fabricated total of search results.

Evidence was organised in five themes: cash conversion economics; disaggregated receipts and payments; forecasting and uncertainty; decision optimisation; and governance under Saudi industrial conditions. For each paper, the analysis considered the unit of observation, forecast horizon or decision interval, key covariates, evaluation method, and reported limitations. Findings were compared for their practical fit with manufacturing rather than combined into a single quantitative estimate. In particular, an association between cash conversion cycle duration and profitability was not treated as evidence that a predictive policy would cause a corresponding improvement. This distinction protects the framework presented here from overclaiming causal benefits.

The quality appraisal emphasised temporal separation between model training and testing, clarity about target variables, competing baselines, uncertainty calibration, sensitivity to economic regimes and transparency of the intervention being evaluated. Studies of liquidity forecasting [1], invoice collection [2] and manufacturing working capital efficiency [9] provided different forms of evidence and were interpreted within their original analytical boundaries. Research on multiple criteria financial decision support [1, 17 to 19] was examined for its ability to articulate conflicting objectives, not taken as direct proof of improved cash outcomes. A remaining limitation is that some publicly available abstracts do not disclose implementation details, restricting independent replication of reported effects.

4 Manufacturing cash flow as a coupled operating system

The cash conversion cycle provides a useful diagnostic identity: inventory days plus receivable days minus payable days. Its managerial appeal lies in making operational delays visible in finance terms, but the identity is not itself an optimisation objective. A lower cycle can reflect improved collections, faster inventory turnover or longer supplier credit, each with different commercial consequences. Kiymaz and colleagues [3] find international differences in working capital component relationships, while manufacturing studies from Ghana and India show that local conditions and firm characteristics materially influence observed performance [4, 5]. A model that prescribes the same cycle target across industry segments would consequently ignore variation in lead times, purchasing power and customer concentration.

Production creates cash commitments before the accounting period in which completed goods are sold. Engineering modifications, imported components and warranty obligations alter expected outflows; milestone contracts can produce irregular customer receipts. Aggregate revenue forecasts cannot fully capture these events because invoice dates depend on acceptance, claims and payment practice. At the receiving end, probability distributions for invoice settlement are more informative

than assumed uniform delays. Saini and colleagues [2] present an individual invoice forecasting method built around discrete survival analysis, offering a way to translate customer histories into expected collection times while acknowledging censoring and heterogeneous payment behaviour.

Working capital optimisation also faces a nonlinear trade-off. Fernández-López and colleagues [6] report relationships between manufacturing profitability, inventory and payment periods in a specialised industry, whereas Yeboah and colleagues [10] identify differing inventory dynamics across cyclical businesses. Zhou and colleagues [11] further identify ownership and growth related variation in the relationship between working capital and profitability within advanced technology manufacturing. These findings caution against interpreting every day of inventory as waste. Safety stocks protect delivery reliability; supplier discounts can make early settlement economically preferable; stricter customer terms may increase collection speed while discouraging desirable orders. A more useful goal is to preserve a minimum liquidity buffer at acceptable economic and operational cost, subject to service and contractual obligations.

Saudi evidence strengthens the contextual argument without closing the methodological gap. Kouaib and Bu Haya [7] examine cash conversion components in listed Saudi companies, and Yilmaz and Nobanee [12] address determinants of the cycle across Middle Eastern and North African settings. Such studies offer relevant financial relationships, yet they typically do not estimate a week by week decision policy using verified transaction records. A Saudi manufacturing model would need to represent local customer payment customs, procurement currency exposures, industrial energy needs and banking terms as empirical variables. These are hypotheses for testing, not universal claims about Saudi firms.

Figure 1 summarises the resulting conceptual pathway.



Figure 1. Conceptual pathway linking manufacturing events, reconciled records, probability forecasts and authorised liquidity choices.

5 Forecast architecture: From records to calibrated probabilities

The first modelling choice concerns the prediction target. A treasury team needs separate forecasts for customer receipts, supplier payments, payroll, tax commitments, capital expenditure and financing flows because each category has different drivers and controllability. Predicting a single net figure can hide offsetting errors; an underestimated collection and an underestimated payment may cancel numerically while leaving operational planning wrong. Singh and colleagues [1] illustrate the value of combining numerous covariates for corporate and subsidiary liquidity measures. Wouters and Stadtherr [13] demonstrate that cash forecasts are also purposeful accounting constructions embedded in capital decisions, not merely statistical extrapolations.

Simple benchmarks should anchor model comparisons. Historical payment lag profiles, seasonal averages, rolling cash budgets and regression models are transparent, inexpensive and often robust in short series. Wasalwa and Putra [14] show the relevance of comparing operating cash predictions based on earnings and accruals in manufacturing data. Palomero and colleagues [15] demonstrate that forecasting performance depends on the characteristics of particular cash series and that sophisticated methods do not necessarily dominate every conventional alternative. Baselines therefore establish whether data volume, forecast horizon and model complexity justify a more demanding implementation.

Nonlinear methods can exploit interactions that linear forecasting misses. DeepAR learns a probabilistic representation from related time series [16], temporal fusion transformers combine heterogeneous covariates with multiple-horizon outputs [17], and hierarchical interpolation addresses long-horizon forecasting complexity [18]. The wider time series literature provides insight into long-range dependencies and data efficiency [19]. These architectures, however, were not all evaluated on Saudi manufacturing cash flows. Their applicability depends on the availability of sufficiently consistent histories, meaningful predictors, appropriate target aggregation and controls against forward looking information leakage.

Cash flow decisions require uncertainty estimates, not only expected values. A forecast that projects a closing balance of SAR 8 million could conceal a material probability of falling below the payroll threshold. Quantile forecasts can depict the tenth, median and ninetieth percentile outcomes, provided coverage is calibrated on reserved for testing periods. Eggen and colleagues [20] discuss uncertainty estimation and interpretability challenges in financial time series. A model should additionally respect accounting identities and operational constraints: receipts must arise from valid orders or receivables, scheduled payments from recognised obligations, and balances from the opening position plus coherent component flows.

Validation must reproduce the time at which treasury actually makes decisions. A rolling-origin evaluation trains only on information that was available before each forecast date, then compares one-week, four-week and thirteen-week horizons. Results should be segmented by customer class, production line, economic regime and forecast component. Mean absolute error is intuitive, but scale differences require normalised or cash-value-weighted measures; prediction interval coverage tests calibration; and a shortage-focused loss penalises dangerous underprediction more heavily than harmless upside. A model that performs well on random test splits may fail when payment behaviour changes during supply disruption.

The main forecasting families are compared in Table 1.

Table 1. Comparative forecasting approaches and their implications for manufacturing cash decisions.

Forecast family	Decision-relevant inputs	Practical advantage	Primary caution
Rolling cash budget	Treasury estimates; contracted payments	Transparent and readily auditable	Manual assumptions may become stale
Statistical regression	Revenue; accruals; seasonality	Interpretable benchmark with modest data needs	Misses complex interactions and changing behaviour
Invoice survival model	Customer; invoice age; disputes	Represents heterogeneous receipt timing	Requires clean event histories and censoring controls
Tree-based learning	ERP transactions; order status; calendar	Handles nonlinear variables and interactions	Overfitting and unstable extrapolation

Forecast family	Decision-relevant inputs	Practical advantage	Primary caution
Probabilistic sequence model	Multiple linked cash series; known future drivers	Produces scenario-sensitive multiple-horizon forecasts	Computational and calibration demands
Scenario plus optimiser	Forecast distributions; cost and contract rules	Connects predictions to feasible cash interventions	Incorrect constraints can produce harmful recommendations

Forecast targets should also distinguish contractual due dates from empirically expected dates. A customer may consistently settle invoices fifteen days after the agreed term, yet an accounting system can still report the original due date as if it were a reliable cash event. Data preparation should join credit notes, partial settlements, disputes and currency conversions to each invoice history. Splitting settlement outcomes into full, partial and delayed categories provides a more realistic basis for weekly treasury planning. These design choices require documentation because apparently small changes in event definitions can change substantially both model accuracy and commercial interpretation.

6 Translating prediction into cash decisions

A forecast becomes financially valuable only when it changes a feasible action. Consider an expected cash deficit six weeks ahead. The treasury team may accelerate eligible receivables, negotiate payment schedules, defer less urgent capital expenditure, draw committed facilities or adjust procurement. Each action has a monetary cost and a potential operational consequence. The decision layer should specify choice variables, due date limits, contractual penalties, funding ceilings and minimum supplier service requirements. Optimisation is appropriate because these constraints make the lowest immediate outflow an unreliable indicator of best overall performance.

A workable objective brings together expected financing cost, expected cash shortage penalties and business disruption costs, while retaining a risk safeguard for severe downside cases. This need not imply an opaque mathematical programme at the outset. A constrained scenario table can compare several authorised actions; a formal optimiser becomes warranted when interacting commitments and transaction volumes exceed manual capacity. Badakhshan and Bahadori [21] illustrate how based on simulation optimisation can explore trade-offs between working capital efficiency and profitability. Theodorou and colleagues [22] similarly connect data-informed estimates with inventory policy choice, showing why forecast outputs need decision-specific performance measures.

Receivables actions should be sensitive to customer circumstances. Early payment incentives may unlock cash but reduce contribution margins; credit holds may protect liquidity while harming sales relationships. Individual invoice payment probabilities allow collections teams to prioritise accounts by expected recoverable cash, not simply gross overdue balances. Supplier payment changes require a parallel treatment of contract terms and reputational costs. Financing decisions must compare an explicit borrowing rate with the expected economic value of preserving production. The relevant decision is not whether cash is positive on average, but whether a portfolio of choices maintains resilience across plausible receipts, demand and procurement scenarios.

Multi-criteria models contribute governance when objectives cannot be collapsed into one monetary measure. Kaya and colleagues [23] demonstrate the use of expert-assessed weights and simulation in company financial evaluation; Alsanousi and colleagues [24] investigate a multiple criteria approach

in the Saudi market. Baydaş and Pamučar [25] caution that different ranking techniques have different outcome characteristics. In a treasury setting, weights attached to service continuity, financing cost and supplier fairness should therefore be disclosed, subjected to sensitivity tests and approved by responsible managers. The uploaded manufacturing decision support study [8] supplies a related example of combining objective indicators with expert judgement when outcomes are uncertain.

In practice, this creates a working model that is a repeating cycle: update source transactions, generate component forecasts, test shortfall scenarios, evaluate feasible actions, authorise interventions and compare actual outcomes with predicted ones. This loop differs fundamentally from predicting profitability after the event. It asks whether actions taken on the basis of forecast information produced measurable improvement against an appropriate counterfactual. A future study could compare conventional treasury decisions with supported by a model decisions over matched periods, recording intervention costs, funding use, supply continuity and governance exceptions instead of relying on headline forecast accuracy.

Figure 2 illustrates a forecast distribution against a minimum liquidity requirement.

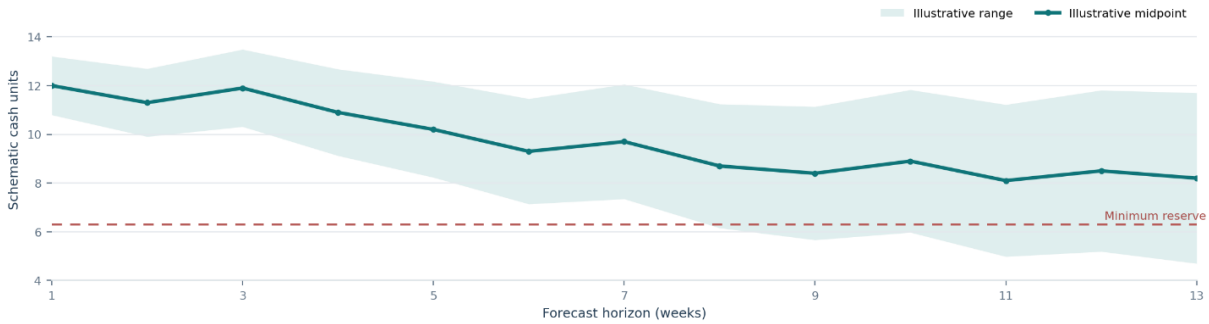


Figure 2. Illustrative forecast distribution and minimum liquidity requirement over thirteen weeks.

Scenario optimisation should treat unexpected operational changes as correlated rather than independent shocks. A supply shortage may delay production, postpone customer acceptance, increase expedited freight expenditure and trigger additional working capital borrowing simultaneously. Independently sampling these components could generate implausible combinations of receipts and costs. A better scenario design preserves dependence through historical event blocks or explicitly modelled common drivers. The resulting decision rule should also be assessed for stability: if trivial forecast revisions repeatedly reverse supplier payment recommendations, managers may lose confidence and incur unnecessary transaction costs. Decision robustness matters as much as nominal optimality.

7 Institutional design and data governance

One of the hardest implementation challenges may be definitional rather than computational. Accounts receivable, bank balances, sales orders and purchase commitments often reside in different systems and use different timestamps. A reproducible cash forecast requires agreed definitions of realised receipt, expected receipt, payment run, disputed invoice and unrestricted cash. Historical datasets must preserve the information actually known at each planning date. Retrospectively corrected invoice records can otherwise make a forecast appear more accurate than it would have been in live use. A owned by finance data dictionary and immutable forecast snapshots are therefore essential controls.

Financial models also create accountability questions. A predictive system may infer that a longstanding customer is likely to pay late, but a commercial manager may know about an approved settlement arrangement. Human intervention should be allowed, documented and subsequently evaluated. Excessive overrides can weaken model value; prohibiting overrides can expose a company to preventable operational risks. Explainable financial prediction research illustrates how local and global explanations may reveal relevant decision drivers [26–29]. Nevertheless, explanation plots are not equivalent to causal evidence, and they cannot independently justify discriminatory or contractually impermissible payment practices.

Governance should separate model development, operational ownership and audit review. Data engineers maintain pipelines, finance controllers reconcile forecasts to the ledger, treasury managers approve liquidity actions, and risk or audit teams assess model changes. Backtesting results should be reviewed after production shifts, changes in supplier concentration or altered credit terms. Sensitive counterparty information requires access restrictions and documented retention policies. Where data are shared across divisions or external service providers, the organisation should examine applicable Saudi data governance obligations and ensure that analytical access matches authorised business purposes.

Introducing the system in stages reduces both technical and organisational exposure. The initial phase may forecast receipts and scheduled payments using simple transparent models; the second can introduce distributional forecasts and horizon specific validation; a later phase can attach controlled scenario optimisation. Progression should depend on evidence of reliable data, calibrated risk estimates and improvements in actual treasury decisions. The same staged approach can identify where automation is inappropriate, such as one-off legal disputes or highly unusual capital projects with insufficient analogues. The framework is designed to augment financial judgement rather than substitute for it.

The implementation stages and their controls are summarised in Table 2.

Table 2. Evidence, accountability and validation requirements for an integrated treasury decision system.

Implementation stage	Observable output	Validation or governance control
Data reconciliation	Linked invoice, bank and purchasing events	Ledger and bank tie-outs; timestamp checks
Forecast construction	Separate receipts, payments and net liquidity	Rolling origin tests against simple baselines
Uncertainty assessment	Quantiles and shortfall probabilities	Coverage, sharpness and stress scenario diagnostics
Decision formulation	Feasible collection, payment and funding actions	Contract, supplier and operating risk constraints
Managerial authorisation	Documented choices and overrides	Approval ownership and reason codes
Post-decision review	Actual liquidity and operating consequences	Funding cost, service continuity and override audit

8 Discussion: Transferability to Saudi manufacturing

The literature supports four propositions, but not their automatic generalisability to Saudi Arabia. First, granular transaction histories can improve visibility over the timing of collections and payments, provided the records are complete and recorded before the forecast date [1, 2]. Second, advanced forecasting methods are candidates for improvement, not substitutes for transparent baselines [15–20]. Third, working capital interventions involve material trade-offs between liquidity, profitability and operational resilience [3 to 9, 14]. Fourth, decision support legitimacy depends on the traceability of objectives and expert judgement [1, 17 to 19]. The benefit of integrating these elements is conceptually strong, but still requires prospective validation.

Saudi Vision 2030 provides a policy rationale for studying liquidity resilience because domestic manufacturing growth, localisation and private sector competitiveness depend on firms' ability to maintain productive investment. This policy context does not prove that any particular algorithm will advance national targets. Rather, it suggests measurable research outcomes: reduced avoidable borrowing, fewer liquidity-related production interruptions, timely payments to domestic suppliers and better prioritisation of investment commitments. For manufacturing enterprises with irregular project contracts, the most consequential gain may come from improved scheduling and governance instead of marginal reductions in average prediction error.

Important variation must be reflected in study design. A food processor with short inventory life, an electrical equipment manufacturer with project milestones and a chemicals producer with continuous operations face different cash dynamics. Researchers should stratify firms by production cycle, export exposure, purchasing concentration and customer payment terms. They should also control for firm size, financing access, interest conditions and sector demand. Without this structure, apparent improvement could arise from a favourable business cycle rather than a arising from use of the model change. International findings remain a source of hypotheses, not calibrated Saudi effect sizes.

An empirically credible programme could begin with a retrospective, multiple company rolling-origin benchmark and then proceed to a controlled prospective deployment. Outcomes would include forecast calibration, tail shortfall frequency, emergency credit costs, supplier payment exceptions and service continuity. Any intervention analysis should explicitly address selection effects: firms adopting advanced systems may already possess superior finance teams and cleaner transaction data. Difference in differences, matched comparisons or staged rollouts could strengthen inference if their assumptions are justified. The objective is to establish whether predictive decision intelligence adds economic value beyond existing financial planning capability.

Supplier invoices may include retention payments and milestone adjustments whose timing differs from ordinary operating expenditure. Import financing and currency settlement dates should be represented explicitly when they affect the expected cash position.

9 Research gaps and future agenda

The first research gap is the shortage of publicly documented Saudi manufacturing datasets linking invoice, inventory, purchasing and treasury records to realised cash outcomes. Aggregated financial statements support cross-sectional performance analysis, but cannot reliably reveal when people making decisions first observed a risk or which preventive action was available. A collaborative research design should use anonymised transaction histories and an agreed event taxonomy, with

strong controls against revealing commercially sensitive customer or supplier information. Shared variable definitions would allow replication across industry segments without requiring firms to expose identifiable counterparties.

A second gap concerns decision-weighted model assessment. Much of the forecasting literature compares numerical errors, while working capital studies estimate statistical associations. Neither alone establishes whether forecast-guided intervention improves cash resilience. Future work should measure the value of a policy under financing constraints, service obligations and downside risk. Researchers could test whether calibrated quantile forecasts outperform point forecasts when selecting credit line drawdowns or prioritising collections, and whether model explanations help managers identify avoidable errors without generating excessive overrides.

A third gap involves causality and organisational adaptation. Customer payment behaviour can change after credit teams intervene; suppliers may revise terms in response to altered settlement practices; inventory policies can affect demand fulfilment. Predictors are therefore partly influenced by earlier decisions. Adaptive models should distinguish naturally occurring variation from caused by policy changes feedback, record interventions and reassess the model after significant process changes. Research could compare conventional rolling budgets, machine learning forecasts and integrated forecast and optimisation systems under identical operational constraints and specified in advance decision metrics.

Finally, the Saudi industrial context warrants dedicated study of localisation requirements, import-linked commitments and financing practices. These variables should be put into practice through measurable transaction characteristics rather than broad national labels. The most publishable contribution would be a reproducible comparison of decision strategies, supported by robust using later time periods evaluation, clearly reported uncertainty and a transparent account of where interventions failed. Such a programme would contribute to advanced decision research while remaining anchored in practical manufacturing finance.

A further methodological requirement is benchmarking against the information set that managers genuinely possessed. Published financial statements often present restated amounts that were unavailable when decisions were taken. Prospective evaluation should therefore archive the contemporaneous forecast, the associated approved action, the reasons for any override and the later financial outcome. This audit trail would permit analysis of whether failures stemmed from data quality, model estimation, changing commercial relationships or inconsistent execution. It would also provide evidence about the organisational learning generated by the model, an outcome generally omitted from conventional prediction studies.

10 Limitations and conclusion

The evidence assembled here spans distinct countries, model objectives, sample sizes and accounting practices. It cannot support a pooled performance estimate, nor does it establish the effectiveness of any proposed framework in Saudi companies. A purposive review also creates selection risk: studies with publicly visible metadata and clear applied relevance may be overrepresented. Furthermore, some financial prediction studies address corporate distress rather than cash receipts, limiting direct transfer. These constraints are acknowledged so that methodological propositions are not presented as empirical findings.

The literature points towards a clear practical approach. Manufacturers first need transaction records that reconcile with their accounts and show the timing of individual receipts and payments. They can then compare transparent forecasting benchmarks with more advanced methods, test the range of possible cash outcomes and assess actions within financing, production and contractual limits. The success of this process should be measured by its effect on liquidity resilience, borrowing costs and continuity of operations, not by average forecast error alone. For Saudi manufacturers, the next step is careful prospective research using real data, documented management decisions and credible comparisons with existing practice. Until such studies are available, the proposed framework should be regarded as a testable model rather than a proven source of financial improvement.

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