

Autonomous Treasury Operations: Evaluating AI-Driven Dynamic Yield Optimization and Cash Management in Commercial EnterprisesAuthor: Miguel E. Mansour¹*Affiliation:*

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Abstract:

This study helps to assess the potential to disrupt the conventional methods of corporate cash management through the incorporation of the use of predictive artificial intelligence (AI), automated liquidity management, and machine learning yield optimization into the corporate treasury management system. The existing practice of treasury management is still limited to conventional methods of working capital forecasts, conventional allocations of commercial bank deposits, and treasury management evaluations done periodically with the effect of creating cash drag, inefficient usage of capital, and loss of interest yield. This study will confirm if an AI-based dynamic liquidity management system can improve portfolio interest yields, forecast precision, and capital management in light of these constraints. Two treasury management systems were used concurrently for three months during the case study of a medium-sized commercial company: the conventional treasury management system and an innovative technology-based system using AI algorithms to allocate daily surplus cash balances among money market funds, treasury bills, and high interest-bearing commercial deposits. The five indicators of performance are the annualized net treasury yield, the daily cash forecasting error rate, the daily treasury operation management hours, the idle cash drag percentage, and the transaction execution cost which were determined for approximately 10,000 corporate transaction allocations. It is seen that there has been a significant improvement in the performance of the treasury management environment in the AI age. There has been an increase of 38 percent in the portfolio yield return, there has been a decrease of 52 percent in daily treasury operation execution time, time taken in weekly liquidity planning has been significantly reduced, there has been a reduction of 74 percent in cash forecasting error rates and there has been a reduction of 34 percent in transaction execution costs. The implications of these results are: with the help of cash flow monitoring in real-time, liquidity optimization through prediction and cash sweeping through automation, there can be a positive impact on corporate financial management with the use of AI and dynamic algorithms.

Keywords:

Artificial Intelligence, Treasury Management, Cash Management, Dynamic Yield Optimization, Automated Cash Sweeping, Liquidity Management, Machine Learning, Working Capital Management

Introduction:

Corporate treasury management has, until now, maintained the same system for decades. The system revolves around periodic cash pooling, fixed commercial banking deposit accounts, and monthly liquidity analysis which takes into account the cash position of a company only after the fact, following a transaction. This system was devised in an era characterized by a relatively slow pace and low volatility of the macroeconomy. In today's time, the pace of business has greatly sped up. There is greater interest rate volatility and commercial transactions around the world have become more frequent.

The above-mentioned negative impacts on the firm's financial performance, similar to those encountered by inefficient mid-level market companies, are good examples of how vulnerable the conventional corporate cash management process is in terms of its heavy reliance on human judgment for liquidity management purposes. In this case, the primary deficiency consists in excessive reliance on manual treasury management, which makes it possible to have too much cash in non-interest-bearing checking accounts, not paying back short-term debt on time, and missing the maximum yields in the money market. As a result, some new innovations in finance have been introduced. AI innovations can analyze previous trends of working capital and forecast cash flows on a daily basis accurately. Automation can perform routine operations in transferring money, and predictive models of liquidity can create a dynamic model of yield routing to maximize daily interest income (Beainy & Kamel, 2023).

Each of these innovations solves the problem partially, but the key research question is the following one: Does the combination of AI predictions and automation of cash-sweeping treasury systems outperform the traditional treasury management approach in terms of yield, cash flow prediction, execution speed, and cost-effectiveness?

For answering the above research question, the purpose of my research is to:

- Compare the annualized return on corporate idle cash under both traditional and AI systems.
- Measure differences in daily cash flow forecasting error rates.
- Evaluate how efficient AI is in predicting liquidity bottlenecks in real time.
- Assess whether automated cash sweeping reduces manual treasury workload.
- Analyze the overall operational costs of transitioning to an AI-driven treasury platform.
- Evaluate the impact on corporate risk management, internal controls, and corporate governance frameworks.

Literature Review:

The core issue that was addressed by authors in the literature is the reasons why corporate finance executives believe that we need to change our approach to managing corporate cash and short-term liquidity. In the early 2000s, academics were already pointing out the problems associated with inefficiency of conventional treasury management. After recent liquidity shocks in the financial sector, technology has finally evolved enough to solve those problems.

The development of automated liquidity management occurred in the sphere of cash sweeping and accounts reconciliation in corporate treasury management (Association for Financial Professionals, 2023). According to industry data, daily cash balance and short-term liquidity

management occur much faster and the number of forecasting errors is lower. Moreover, there are contradictory opinions in the literature regarding yield optimization approaches. Despite the fact that early rule-based cash management software managed to generate higher yields in comparison with conventional bank deposits, changes in interest rate market rendered rules ineffective (Deloitte, 2023). Recently, machine learning-based cash forecasts seem very promising since it takes into account real-time revenue cycles.

Upon the introduction of artificial intelligence in corporate treasuries, the hype around the technology began with financial speculation. However, within no time, academic researchers found common ground regarding the essential aspects of artificial intelligence, namely continuous forecasting of working capital and dynamic risk-adjusted liquidity routing (JPMorgan Chase, 2023). Using this technology on corporate cash results in an execution process whereby constant transfers between banks becomes a thing of the past, resulting in the reversal of corporate treasury workflows that is catching the eye of corporate CFOs and banking partners (PwC, 2023). Two notable outcomes of corporate banking pilots of this technology were reduced liquidity management costs and increased stakeholder trust in liquidity safety cushions.

AI had significant influence on non-financial metrics such as sustainability (Kaspard et al., 2026) and on financial metrics such as firm performance (Khalife et al., 2024), yet for these advantages to translate tangibly, control variables such as entrepreneurial knowledge and technology-business experience are a must (Chaanine et al., 2023), in addition to governmental governance support (Athari et al., 2023).

The theory of agency by Jensen & Meckling (1976) gives the framework through which these mechanisms can be understood. It centers on the problem of information asymmetry between the agents (treasury managers) and principals (shareholders or board of directors). Although financial and liquidity reports can try to reduce that problem, their effectiveness is contingent on the accuracy of cash position data collected in real time. The technology can help overcome the problems of corporate governance through agency by making it structurally impossible for excess cash not to be invested because of human negligence.

What the existing literature lacks is the way these forecasting algorithms are integrated into one single treasury platform. Most studies analyze machine learning models for predicting, robotic automation, and corporate banking platforms separately as well as other non-financial metrics impacting the environment and sustainability (Jafarigorzin et al., 2025). Only a few studies integrate them but purely theoretically. That is why this paper empirically models a platform that uses all three functions at once – AI cash forecasting, automated sweeping, and dynamic yield optimization.

Methodology:

For the purpose of the current study, a comparative case method is applied. In essence, this means that two treasury management systems were compared within the three-month trial period. Information was collected from a medium-sized trading company whose operations yield sufficient cash flows to create empirical data without having to rely on intensive manual control.

In the conventional treasury system, corporate accountants would manually verify bank statements every morning. The treasury would have to balance accounts receivable, forecast the amounts payable to the vendors and make manual transfer of extra cash into deposits at the end of the week. There was no constant monitoring; instead, internal audit departments (Saber & Sassine, 2022) conducted quarterly cash verification to comply with liquidity restrictions, particularly because of the current volatile interest rates environment (Beainy & Kamel, 2023).

The AI-driven automated treasury management system was running round-the-clock. Cash movements were recorded in real-time using banking APIs connected to the predictive AI model. The AI model predicted working capital requirements on a daily basis, detected any excess cash, and intelligently allocated the excess cash to more profitable money market investments with preset risk parameters. Automated rules ensured adequate cash balance, timelines, and quality of credit (Kamel et al., 2026).

The dynamic liquidity allocation to multiple yields rather than one commercial bank checking account was selected. Interest earnings are constrained by having one account; however, automated dynamic liquidity allocation to multiple banks ensures that the required liquidity is retained while achieving maximum interest returns from financial markets.

There are about 10,000 transaction lines in the dataset. I measured five different performance measures – annualized net treasury yield, daily cash prediction error rate, operational treasury management hours, idle cash drag rate, and transaction cost per transaction. Both systems received the same underlying cash flow for processing; hence, the operational differences were eliminated.

Results:

The transaction data collected showed clear disparities in all the five measures, whereby the AI-powered system was better than the conventional manual one in all measures. The empirical results comparison is presented in the table below:

Table 1: Performance Comparison Between Traditional and AI Treasury Systems

Metric	Traditional System	AI Treasury System	Operational Change
Annualized Portfolio Yield	3.2%	4.8%	+38% yield increase
Cash Forecasting Error Rate	14.5%	3.8%	74% reduction
Daily Treasury Hours	2.5 hours	1.2 hours	52% reduction
Idle Cash Drag Percentage	28.0%	6.5%	77% reduction
Monthly Treasury Overhead Cost	\$12,500	\$8,200	34% savings

Note: Autonomous Treasury Operations: Dynamic Yield Optimization and Cash Management in the Business Sector Using Artificial Intelligence (2026).

Empirical Data Analysis

Following the analysis of the transactions database, the annualized yield on the working capital of the corporation rose from 3.2% to 4.8%, thereby yielding a 38% increase in interest yields. This was achieved mainly by reducing idle funds kept in the non-interest bearing operational bank accounts. Furthermore, the errors in cash forecasts per day were cut from 14.5% to 3.8% (74% variance decrease) because the forecasting machine learning algorithm learned to predict cash flows much faster than the spreadsheets used previously.

Operational performance has shown significant improvement as well. The time spent on treasury management on a daily basis fell from 2.5 hours to 1.2 hours per day (52% decrease), thus allowing the finance personnel to focus on strategic planning and risk analysis. Moreover, the idle cash drag dropped from 28.0% to 6.5% (77% decrease) thanks to real-time automatic sweeping that deployed the excess liquidity to interest-earning accounts.

Lastly, the monthly expenditure on running the treasury operation fell by 34% from \$12,500 to \$8,200 per month.

Discussion and Conclusion:

This case is an excellent example of how corporate cash management and working capital yields can be greatly improved using artificial intelligence and automation of the liquidity sweep process. The tech-powered treasury management system demonstrated superior results in each of the tested parameters, proving that automated cash routing has its practical application potential beyond mere interest income.

The shorter cash forecasting cycle radically changes the routine operations of corporate finance departments. Managers have access to the current balance of their working capital much earlier in the day, thus enabling them to make liquidity distribution decisions based on changes in the interest rates offered by different banks. Reducing idle cash periods spent at zero-yield checking accounts helps minimize cash drag, which is very important for businesses operating in fluctuating interest rate environment.

This has far-reaching consequences for corporate governance and treasury policy. Optimizing the annualized yield and decreasing cash drag from 28.0% to 6.5% at 3.2% to 4.8% respectively does not just represent a minor improvement in yield and efficiency; it reflects a structural change in working capital management. This is because traditionally, reconciliation between corporate accountants and transactions is carried out days later, resulting in the accumulation of excess money which is left idle, we also highlight the importance of auditor independence to increase efficiency (Sawaya et al., 2025). On the other hand, automated algorithms utilize excess liquidity immediately, making it structurally difficult to leave idle cash uninvested due to human error—in line with Jensen and Meckling's (1976) agency cost framework.

A 34% decrease in treasury operating costs per month shows that there are many more benefits in using AI-based treasury software than earning interest income. Seen in light of operation efficiency alone, this presents a compelling business case for adopting the technology. The only barrier still standing is the initial onboarding process; this evaluation looks into the cost of executing the process on a daily basis, but not in terms of the initial costs of connecting corporate ERP systems to bank APIs.

Also, important regulatory and banking barriers still exist. Regulatory and auditing institutions have not issued any guidelines on automation of liquidity execution or generation of cash flow predictions using artificial intelligence. In absence of any such regulatory guidelines, it is still uncertain how the controls on automation of treasuries would be assessed by the auditor during financial reporting audit process. Future work could focus on bigger multinational enterprises, multilingual treasury management, cross border cash pooling, and effects of continuous real time liquidity reporting on corporate financial reporting framework. Clearly, the results speak for themselves here; what now follows is an important banking barrier problem.

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