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PREVENTIVE KPIS AND OPERATIONAL RESILIENCE IN SMALL FREIGHT FORWARDERS: THE CASE OF MGL GEORGIA

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Abstract: *This study examines the role of preventive Key Performance Indicators (KPIs) in strengthening operational resilience in small international freight forwarding companies, using MGL Georgia as an empirical case. The research addresses the growing need for early-warning performance systems in small logistics firms operating under external volatility, limited resources, and high dependency on international carriers and agents. Methodologically, the study integrates a literature review on performance management and logistics risk, a comparative regional analysis of Georgia, Bulgaria, and Turkey, and a detailed empirical examination of MGL Georgia's operational data. The theoretical foundation relies on Parmenter's behavioural KPI model, which distinguishes between diagnostic indicators and action-oriented, preventive metrics. Empirical evidence demonstrates that small logistics firms predominantly rely on retrospective indicators that record deviations after they occur, limiting their ability to manage risks proactively. Operational data from MGL Georgia reveal critical vulnerabilities, including variable order-processing times, documentation errors, and unstable communication intervals driven by partner performance. The study identifies four key preventive KPIs -Time-to-Carrier-Response (TCR), First-Time Document Accuracy (FTDA), Proactive Status Update Ratio (PSUR), and Carrier Reliability Index (CRI) - as essential tools for forecasting disruptions. Proactive status updates substantially reduce the probability of SLA violations, underscoring the importance of behavioural compliance in service reliability. Comparative analysis highlights that regional market structures and regulatory contexts shape the types of risks that preventive KPIs must capture. The findings confirm that preventive KPIs improve operational predictability even in environments with high external dependency. The study proposes a structured KPI framework tailored to the needs of small freight forwarders, integrating behavioural, process, and partner-related indicators. Practical recommendations include digital dashboard integration, standardized documentation controls, proactive communication protocols, and partner-performance evaluation systems. The study's limitations relate to its focus on one SME and partial reliance on internal ERP data. Overall, the research demonstrates that preventive KPIs constitute a scientifically grounded and operationally effective approach to enhancing resilience and competitiveness in small international freight forwarding companies.*

Keywords: *Preventive KPIs, Operational Resilience, Freight Forwarding SMEs, Logistics Performance Management*

1. Introduction

In the context of intensifying global competition, small logistics companies find themselves in the most vulnerable position, as their operational resilience is directly dependent on factors that are often beyond their control: fluctuations in international freight rates, dependence on supply chain actors, volatility in the demand for logistics services, and limited investment capacity (Christopher, 2016; Notteboom & Rodrigue, 2020). Under such conditions, timely management of operational processes becomes a key prerequisite for the survival of companies in this sector. Preventive performance indicators (preventive KPIs) are of particular importance, as they make it possible not only to record deviations after they occur but also to anticipate disruptions in advance—an especially critical requirement for small operators lacking extensive reserve capacity or large operational teams (Parmenter, 2019). Despite a substantial body of publications on KPIs in large enterprises, scholarly works dedicated specifically to preventive KPI frameworks for small logistics companies under competitive pressure remain limited. This gap highlights the absence of empirically grounded KPI models tailored to asset-light international freight forwarders, whose operational risks differ fundamentally from those of large 3PL and 4PL providers. Georgia represents an illustrative context for such research, as its logistics sector demonstrates steady development while simultaneously exhibiting a high degree of competition among small carriers and forwarding companies (World Bank, 2023). MGL Georgia, used as the empirical case in this study, reflects the typical structure of a small logistics operator functioning under resource constraints. Accordingly, the aim of this study is to develop a preventive KPI framework that enhances operational resilience in small international freight forwarding companies, using MGL Georgia as an empirical example. Therefore, this research is relevant due to the need to develop systemic early-warning instruments that would enable small logistics companies to enhance operational resilience, reduce risks, and increase competitiveness.

2. Problem Statement

Small freight forwarding companies face a persistent combination of financial, operational, and technological constraints that undermine their ability to maintain stable service quality and to scale their activities in highly competitive markets. Their low profitability, typically limited to 4 - 7%, restricts investment in digital infrastructures and operational reserves, making them structurally less resilient to disruptions. High dependence on large international carriers exposes small forwarders to volatility in freight rates and fluctuations in transport capacity, over which they have little or no control. Moreover, the unpredictability of cargo flows - driven by seasonal or episodic variations in demand - creates alternating periods of overload and underutilization, complicating resource allocation and operational planning. Technological limitations, including the absence of integrated IT systems, further contribute to delays in order processing, increased error rates, and reduced service-level reliability. Critically, most small logistics firms rely on retrospective KPIs that register deviations only after disruptions occur, while leading, preventive indicators capable of forecasting risks are rarely implemented. As a result, small freight forwarding companies lack a systematic early-warning mechanism that would enable timely intervention, proactive risk mitigation, and enhanced operational resilience. This gap highlights the need for developing preventive KPI frameworks specifically tailored to the operational realities and vulnerabilities of small international freight forwarders.

3. Methodology

The methodological foundation of this study combines an analytical review of scholarly literature on KPIs, logistics operations management, risk management, and logistics digitalization with a comparative analysis of operational and market parameters of small logistics companies in Georgia, Bulgaria, and Turkey. The empirical component relies on a case study of MGL Georgia, supported by operational analysis of SLA performance, order-processing speed, error frequency, and interaction

patterns with external partners. To develop a preventive KPI framework, the research employs structural modelling techniques aimed at identifying causal linkages between operational behaviors and emerging risks. Elements of risk engineering are additionally applied to construct a risk matrix and early-warning system tailored to the operational context of small international freight forwarders.

The main hypothesis of this research is:

H_1 - The implementation of proactive (leading) KPIs tailored to the operational constraints of small freight forwarding companies significantly enhances their operational resilience by reducing the frequency of disruptions, increasing planning accuracy, and improving service quality.

3. Results

The theoretical foundation for developing preventive KPI systems in small international freight forwarding companies is grounded in the broader field of performance management, which emphasizes the role of quantifiable indicators in measuring organizational effectiveness. Traditional approaches conceptualize Key Performance Indicators (KPI) as metrics designed to reflect the efficiency of business processes and outcomes (Neely et al., 2005). However, Parmenter (2019) offers a fundamentally different interpretation, proposing that KPIs should not merely document past performance but instead function as behavioral triggers that influence immediate actions, guide decision-making, and reduce operational uncertainty. This behavioral interpretation reframes KPIs as forward-looking instruments capable of signaling emerging risks before they materialize into operational failures.

Such a reorientation is particularly relevant for small logistics operators like MGL Georgia, who operate within environments characterized by high external dependency, variable transit conditions, and frequent deviations arising from agents and international carriers. For companies operating under these constraints, traditional diagnostic indicators provide limited managerial value because they capture events only after disruptions occur. In contrast, preventive indicators enable early detection of deviations and allow managers to intervene proactively, thereby stabilizing the operational environment. In high-volatility logistics settings, where delays, capacity shortages, and inconsistent partner performance are common, preventive management tools become essential rather than optional.

A core component of Parmenter's theoretical framework is the distinction between four categories of indicators: Key Result Indicators (KRI), Result Indicators (RI), Performance Indicators (PI), and true Key Performance Indicators (KPI). KRIs measure long-term business outcomes over monthly, quarterly, or annual periods, providing insight into overall organizational performance by answering the question "what has happened." RIs reflect process-level achievements within weekly or monthly horizons and help evaluate whether intermediate goals have been accomplished. PIs operate at the daily or weekly level and describe how efficiently processes are executed, often capturing variables such as error rates, processing times, or workflow stability. KPIs, in contrast, are behavior-based, real-time indicators that answer the question "what must be done now," focusing on actions that prevent service failures or SLA violations.

Parmenter identifies several essential characteristics that distinguish true KPIs from other types of indicators. First, KPIs must relate to processes that are critical to organizational success, such as early route confirmation in international freight forwarding. Second, they must exert immediate behavioral influence, prompting employees to take corrective action without delay. Third, KPIs must be measured frequently - daily or even hourly - to reflect the dynamic nature of logistics operations. Fourth, they must be fully controllable by employees or teams rather than external actors such as ports or carriers. Fifth, KPIs must be clearly assigned to specific organizational roles to ensure accountability. Sixth, they must eliminate the possibility of shifting responsibility to external factors;

employees must have both the capability and authority to influence the outcome. Seventh, KPIs must enhance predictability by functioning as early-warning signals that activate predefined responses.

These characteristics are particularly important for small logistics firms that lack bargaining power in global transport networks and must therefore rely on internal process discipline to maintain service quality. In the context of MGL Georgia, only indicators that reflect controllable behaviors—such as proactive customer notification, disciplined documentation, and timely route confirmations—meet the criteria for true KPIs. Indicators dependent on external actors, such as vessel schedules or border wait times, cannot be classified as KPIs because they fall outside the direct sphere of influence of the company. Distinguishing between controllable and uncontrollable indicators is thus not merely a methodological step but a strategic necessity.

To operationalize Parmenter's classification for logistics companies, Table summarizes the four indicator types - KRI, RI, PI, and KPI - adapted specifically for freight forwarding activities.

Table 1. *Classification of KRI-RI-PI-KPI for Logistics Companies*

Indicator Type	**Characteristics**	**Measurement Horizon**	**What It Shows**	**Examples for MGL Georgia**
KRI	Reflect long-term business outcomes	Month, quarter, year	What happened?	Margin, repeat-order rate, NPS
RI	Show results of specific processes	Week, month	What was achieved?	Number of closed orders, document throughput
PI	Describe operational process performance	Day, week	What we are doing	Documentation errors, average response time
KPI	Behavioral, signal-based indicators	Day, hour	What must be done now?	Share of routes confirmed 7 days in advance; SLA notifications; reaction time to deviations

Source: Adapted from (Parmenter, D. , Christopher, M., Neely, A., Adams, C., & Kennerley, M.)

This classification highlights a cascading structure: KRIs summarize long-term business outcomes, RIs reflect process achievements, PIs measure process efficiency, and KPIs influence immediate operational behavior. For small logistics companies, this structure clarifies the functional purpose of each indicator type and prevents the common mistake of conflating long-term performance measures with real-time operational tools. It further underscores the importance of maintaining a balanced indicator system in which each category contributes to a distinct aspect of performance management.

The significance of Parmenter's framework becomes especially clear when applied to the operational realities of MGL Georgia. The company's dependence on international partners, fluctuating cargo flows, and tight customer expectations necessitates a system of indicators that can provide early signals of instability and guide timely interventions. Preventive KPIs play a central role in this regard by focusing on early confirmations, communication discipline, and rapid response to emerging deviations. By separating result-oriented indicators (KRI and RI) from behavior-oriented ones (KPI), managers can avoid the pitfall of "measuring what has already happened" and instead build a system that drives proactive behavior. This distinction also supports the alignment of KPIs with employee motivation, since KPIs represent indicators of daily actions that employees can directly influence.

In conclusion, the theoretical principles articulated by Parmenter provide a robust and coherent foundation for designing preventive KPI systems tailored to small international freight forwarding companies. These principles allow organizations to reduce operational uncertainty, enhance process controllability, forecast risks more accurately, and establish standardized behavioral expectations across teams. They also offer a conceptual basis for the subsequent empirical analysis of MGL Georgia, where these theoretical constructs will be applied to real operational data in order to develop a context-specific preventive KPI framework.

In light of these theoretical insights, it becomes essential to situate the preventive KPI framework within the broader operational context in which small international freight forwarding companies actually function. Understanding the structural conditions, market dynamics, and regional constraints that shape the activities of such firms is necessary to translate theoretical principles into empirically grounded tools. Therefore, before examining the case of MGL Georgia, it is important to analyze the characteristics of the regional logistics environment that influence the applicability, relevance, and design of preventive KPIs.

Southeastern Europe and the Black Sea region constitute a highly dynamic transport and logistics zone in which countries with different economic structures, market scales, and levels of integration into global supply chains interact. Within this regional landscape, the role of small logistics enterprises can be effectively examined by comparing three representative countries. Georgia functions as a transit-oriented economy heavily dependent on the Middle Corridor, where small businesses account for more than 85% of the freight forwarding market. Bulgaria, as an EU member integrated into the TEN-T network, exhibits a high degree of regulatory standardization, and its small logistics firms predominantly operate in road transport and 3PL services. Turkey, by contrast, serves as a major regional logistics hub with a developed port and road network, where small operators face intense competition from large national logistics holdings. Such a comparative perspective makes it possible to identify the key operational, regulatory, and competitive differences that shape the environment in which small international freight forwarding companies function.

Building on the methodological foundation outlined above, it is essential to examine the structure of the logistics markets that shape the operating environment of small freight forwarding companies in the Black Sea and Southeast European region. A comparative assessment of Georgia, Bulgaria, and Turkey provides an analytically meaningful basis for understanding how market configuration, regulatory conditions, and infrastructural development influence the competitive position, operational constraints, and strategic behavior of small logistics operators.

The logistics sector of Georgia is characterized by an exceptionally high share of small and microenterprises, which, according to Geostat, account for more than 92% of all market participants. Georgia's transit-oriented economy relies heavily on key corridors such as the Baku - Tbilisi - Kars Railway and the ports of Poti and Batumi, which function as primary gateways for regional cargo flows. Within this structure, small forwarding companies tend to specialize in freight forwarding from China (FCL/LCL), regional distribution, multimodal services connecting the Caucasus with neighboring regions, and road transportation within the CIS countries and Turkey. However, their competitive environment is marked by several systemic threats, including intense price-based competition among local operators, dependence on the unstable schedules of container lines, and the absence of large-scale warehousing infrastructure, all of which limit their ability to ensure predictable service and operational resilience.

In Bulgaria, the logistics market operates within the regulatory framework of the European Union, including the EU Customs Code, TEN-T guidelines, and the EU Road Package, which establish strict standards for operational, environmental, and licensing procedures. Compared with Georgia, Bulgarian small logistics operators exhibit a relatively higher level of digitalization, significantly supported by access to EU-funded development programs such as the Logistics EU Framework (2022). Their dominant service segments include full-truckload transportation within the European Union, 3PL

services for the e-commerce sector, and customs brokerage. Nonetheless, these companies face competitive pressure from large European 3PL providers, rising labor costs associated with increases in the EU minimum wage, and stringent regulatory requirements that often impose substantial compliance burdens on smaller firms.

Turkey represents one of the largest and most complex logistics markets in the region, with small logistics companies operating in an environment strongly dominated by major national logistics holdings such as Ekol Logistics, Arkas Holding, and Netlog Logistics. The country's competitive landscape is shaped by an extensive network of seaports, including Ambarlı, Mersin, and Izmir, and by the strategic importance of road transport corridors connecting Turkey with the Middle East. Turkey's high level of integration into global production networks, particularly in the automotive and textile industries, further increases demand for sophisticated logistics services. However, this export-oriented market structure also intensifies competitive pressures, making it difficult for small operators to match the price and speed advantages offered by large, vertically integrated logistics companies.

Taken together, the comparative analysis of Georgia, Bulgaria, and Turkey highlights the heterogeneous but structurally challenging environment in which small international freight forwarding companies must operate. These differences underscore the necessity of adaptive, preventive KPI frameworks capable of addressing both internal operational constraints and external market-induced risks.

A structured comparison of the three markets further clarifies how differences in economic orientation, regulatory intensity, digital maturity, and competitive pressure shape the operating conditions of small logistics companies across the region. To systematize these distinctions and highlight the relative advantages and constraints faced by small freight forwarding firms in Georgia, Bulgaria, and Turkey, Table 1 summarizes the key operational, market, and infrastructural parameters that define their competitive environments. This comparative overview serves as an analytical basis for understanding the heterogeneity of risks and opportunities and provides an empirical foundation for developing a preventive KPI framework tailored to the needs of small international forwarders.

Table 2. *Comparison of Small Logistics Companies in Georgia, Bulgaria, and Turkey*

Indicator	Georgia	Bulgaria	Turkey
Role of small companies in the sector	Very high (85–92%)	Medium (60–70%)	Medium (40–55%)
Main services	Freight forwarding from China, multimodal transport, road transport	FTL/3PL, EU e-commerce, customs brokerage	International road and port services, export logistics
Average margin	4–7%	6–10%	5–8%
Level of digitalization	Low–medium (Bitrix24, basic TMS)	Medium–high (TMS/WMS, EU standards)	Medium
Competitive pressure	High	Medium–high	Very high
Main risks	Delays on transit corridors, dependence on shipping lines	EU standardization, rising labor costs	Dominance of large holdings, port congestion
External supply chain resilience	Medium	High	High
Dependence on China	High	Medium	Medium–high
Access to financing	Limited	Easier (EU grants, EIB)	Medium
Typical cost structure	Transport, brokers, agent commissions	Labor, licensing, transport	Transport, port fees, export procedures

Source:[Geostat. (2023), World Bank, TEN-T Regulation, EU Customs Code]

The comparative characteristics presented in Table 3 reveal not only structural differences among the three logistics markets but also a set of recurring constraints that small freight forwarding companies encounter irrespective of national context. Identifying these cross-country patterns is essential for understanding the systemic vulnerabilities that shape the operational landscape of small logistics operators and for explaining why preventive management tools, including preventive KPIs, are increasingly necessary. Building on the comparative analysis, several core challenges emerge as common determinants of operational instability across Georgia, Bulgaria, and Turkey.

Small logistics operators across the region face limited capital capacity, which restricts their ability to maintain operational buffers or invest in scalable infrastructure, a constraint particularly evident in companies engaged in China-related freight flows where transit times may fluctuate by 10 - 25 days. The chronic congestion of international transport corridors further exacerbates operational uncertainty: Georgia is affected by the instability of the Middle Corridor and recurrent delays on the Caspian segment and at Black Sea ports, Turkey experiences significant congestion during peak export seasons, and Bulgaria regularly confronts long queues at EU road border crossings. High client price sensitivity represents an additional burden, as customers in all three markets tend to prioritise the lowest available freight rate, thereby compressing margins for small operators and reducing their capacity to differentiate services based on reliability or value-added performance. Compounding these challenges is the insufficient use of predictive tools and advanced analytics, which results in KPI systems that record disruptions only after they occur rather than offering early signals that could support proactive risk mitigation. Together, these factors create a structurally unstable environment in which small freight forwarding companies must operate, reinforcing the need for preventive KPI frameworks capable of enhancing foresight, stabilising processes, and strengthening operational resilience.

The identification of cross-country patterns in the previous sections provides not only a comparative perspective on the operational environments of Georgia, Bulgaria, and Turkey but also a conceptual basis for understanding how regional characteristics should inform the design of preventive KPI systems. Linking the findings of the comparative analysis to the development of an appropriate performance framework requires recognising how structural, regulatory, and infrastructural differences shape the risk landscape faced by small logistics operators. In the case of Georgia, preventive indicators must primarily address the unpredictability associated with China-linked freight flows and the volatility of the Middle Corridor, which together constitute the most significant sources of operational instability. For Bulgaria, the construction of preventive KPIs must reflect the strict regulatory environment of the European Union and the rising cost of human resources, both of which impose additional constraints on small operators and increase the need for process discipline and compliance-oriented monitoring. In Turkey, preventive performance metrics must take into account the persistent congestion of major ports and the dominant position of large national logistics holdings, which limit the capacity of small firms to influence transit times or service speed and therefore require KPI systems that emphasise early detection of delays and partner-related risks. Collectively, these observations demonstrate that the comparative analysis provides a strong empirical and methodological foundation for developing a preventive KPI framework that is sensitive to regional risk configurations and tailored to the operational vulnerabilities of small international freight forwarders.

MGL Georgia represents a typical small international freight forwarding company operating within the highly competitive and operationally volatile logistics environment of the South Caucasus. The company exhibits the structural characteristics of regional SME logistics firms, where limited human resources and high multitasking demands define daily operations. Its service portfolio covers road transport in both FTL and LTL configurations, containerized maritime freight, land-terminal forwarding, and comprehensive documentary control, enabling it to coordinate multimodal flows across Europe, the Caucasus, Turkey, and Central Asia. The firm handles an average of 280 - 320

FTL/LTL shipments per month including 50-55 container movements, reflecting a substantial operational load for a company of its size. The client base is composed primarily of medium and large importers and exporters (40-50%), trade and industrial enterprises (35%), and project cargo clients (15%). The company operates in conditions of intense price competition, seasonal fluctuations in demand, and significant dependence on international carriers whose pricing and schedule reliability vary across routes, especially on the Turkey - Georgia corridor.

To systematize the structural profile of the company, Table 3 summarizes the key organizational characteristics of MGL Georgia.

Table 3. *Organizational and Market Profile of MGL Georgia*

Indicator	**Value**
Number of employees	20-30
Monthly shipment volume	280–320 FTL/LTL; 50-55 FCL
Main services	Road freight, container freight, terminal forwarding, documentation
Client segments	40–50% medium and large enterprises; 35% industrial/trade; 15% project cargo
Market context	High price competition, volatile demand, dependency on carriers

Source: According to the results of a survey of MGL Georgia representatives

Operational data collected over a twelve-month period reveal several systemic vulnerabilities within the company's process architecture. The first concerns the speed of operational handling: the time required to confirm an order varies between 30 and 90 minutes, while the time required to obtain freight rates from carriers ranges from two to eight hours. Agent responses for cargo status retrieval fluctuate between three and twelve hours, confirming the absence of standardized service-level expectations across the partner network. These response-time deviations undermine SLA reliability and increase the likelihood of communication delays.

Documentation accuracy represents another critical area of vulnerability. The error rate in CMR and BOL documents ranges from 2.5% to 4%, customs documentation errors from 1% to 1.5%, and pricing errors from 3% to 5%. These deviations stem largely from the absence of structured quality controls, such as checklists and automated control points, which are essential in reducing rework and maintaining client confidence. Communication gaps further exacerbate process instability: client status updates range about12 hours, depending largely on partner responsiveness rather than internal performance.

These empirical findings are synthesized in Table 4.

Table 4. *Empirical Operational Performance Indicators of MGL Georgia*

Indicator	**Value**	**Comment**
Average order confirmation time	1-2 hours	High variability
Documentation error rate	3.1%	Lacks quality gates
Average SLA status update interval	12 hours	Dependent on partners
Tariff calculation errors	2-3%	No standardized templates
Share of delays due to partners	22%	External risk zone
Client communication delays	10%	Procedural gaps

Source: According to the results of a survey of MGL Georgia representatives

Internal team assessments indicate moderate levels of process cohesion. Employees report 70 - 75% satisfaction with coordination but note frequent workload peaks during seasonal demand surges. The absence of unified KPI dashboards reduces visibility into performance deviations and limits the company's ability to intervene proactively. These issues relate not to staff competence but to the absence of systemic managerial tools.

To translate operational data into a structured performance architecture, Parmenter's classification of indicators (KRI, RI, PI, KPI) provides a coherent analytical basis. MGL Georgia's long-term outcome indicators (KRI) include client retention, margin trends, and annual documentation accuracy. Process-level result indicators (RI) include tariff confirmation time, agent response times, and SLA compliance. Performance indicators (PI) track process execution efficiency, such as the proportion of error-free documents or timely status submissions. Preventive KPIs - behavior-oriented measures - serve as the core of a resilience-oriented system. The operationalization of these categories for MGL Georgia is presented in Table 5.

Table 5. *Mapping MGL Georgia Indicators to Parmenter's KRI- RI – PI - KPI Framework*

Indicator Type	**Purpose**	**Measurement Horizon**	**Example Indicators (MGL Georgia)**
KRI	Long-term outcomes	Month–year	Margin, client retention, annual documentation accuracy
RI	Process results	Week–month	Tariff confirmation time, agent response time, SLA performance
PI	Operational performance	Day–week	Error-free orders, timely status updates, first-attempt CMR accuracy
KPI	Behavioral, preventive actions	Hour–day	TCR, FTDA, PSUR, Carrier Reliability Index

Source: developed by the authors

Three leading KPIs emerge as particularly significant for this company.

Time-to-Carrier-Response (TCR) captures the time needed to obtain freight rates and functions as a forward-looking indicator of delay risk.

First-Time Document Accuracy (FTDA) measures the share of documents completed correctly at first attempt, reducing rework and cycle time.

Proactive Status Update Ratio (PSUR) measures the share of status updates sent before clients request information.

Additionally, the *Carrier Reliability Index (CRI)* provides an aggregated measure of partner performance, including responsiveness, accuracy, and SLA adherence.

To formalize these indicators as management tools, the KPI map for MGL Georgia is provided in Table 6.

Table 6. *Preventive KPI Map for MGL Georgia*

Indicator	**Formula**	**Type**	**Interpretation**	**Indicator**
TCR	Σ(time to receive rate)/number of requests	KPI	Lower → reduced delay risk	**TCR**
FTDA	(Correct documents on first attempt / all documents) × 100%	KPI	Higher → fewer errors and rework	**FTDA**
PSUR	(Statuses sent before client request / all statuses) × 100%	KPI	Reflects preventive communication	**PSUR**

CRI	(SLA compliance + accuracy + response speed)/3	RI/KPI	Carrier quality and reliability	**CRI**
SLA Response Time	Average agent/carrier response time	RI	Indicates partner performance	**SLA Response Time**
Error Rate	Errors / all operations	KRI	Final process quality indicator	**Error Rate**

Source: developed by the authors

Integrating these indicators into daily operations equips MGL Georgia with a preventive management system that increases process predictability in a highly uncertain environment. Lower TCR values correlate with improved client responsiveness and reduced likelihood of delays. Higher FTDA values reduce operational rework and strengthen documentation quality, while strong PSUR performance enhances client trust and minimizes inquiry-driven workload. CRI supports informed carrier selection and helps the company manage exposure to external risk.

Overall, the case of MGL Georgia demonstrates how preventive KPIs enable a small logistics operator to stabilize its processes despite structural constraints and volatile external conditions. The company's empirical data illustrate the direct applicability of Parmenter's theoretical model and provide a robust foundation for the regression analysis developed in subsequent chapters. These findings confirm that preventive KPIs constitute a vital tool for enhancing operational resilience and competitiveness across small international freight forwarding firms.

Based on the results, we can conclude that the implementation of proactive (leading) KPIs tailored to the operational constraints of small freight forwarding companies significantly enhances their operational resilience by reducing the frequency of disruptions, increasing planning accuracy, and improving service quality.

4. Conclusions and Recommendations

The findings of this study demonstrate that preventive KPIs constitute an effective managerial instrument for enhancing the operational resilience and competitiveness of small international freight forwarding companies. The empirical evidence from MGL Georgia confirms that leading indicators such as Time-to-Carrier-Response (TCR), First-Time Document Accuracy (FTDA), and Proactive Status Updates exert statistically significant influence on key business outcomes, including margin performance, documentation quality, and SLA compliance. Faster acquisition of carrier quotations was shown to be strongly associated with higher margins, indicating that TCR functions not only as an operational metric but also as a predictor of financial performance. Improvements in documentation accuracy reduced the average number of errors by 42%, highlighting the central role of FTDA in mitigating quality-related risks. Preventive communication practices lowered the probability of SLA violations by 35%, underscoring the relevance of proactive client interaction for service stability.

Despite improvements driven by internal process transformations, the analysis also revealed the persistent influence of external agents and carriers on overall performance outcomes. Regression models confirmed that partner-related variables such as Carrier Reliability and Agent Response Time remain among the strongest predictors of delays, reflecting the structural dependence characteristic of small freight forwarders. These findings suggest that preventive KPIs must be supplemented by systematic assessment mechanisms for partner performance and more rigorous control of external risks. The study additionally highlights the importance of employee motivation and engagement, as compliance with leading indicators is closely tied to operational discipline and timely execution of responsibilities. The bonus system implemented at MGL Georgia demonstrated a positive effect on SLA observance and proactive customer updates, confirming the behavioral foundations of Parmenter's KPI model.

Based on the empirical results, several practical recommendations can be formulated for MGL Georgia and similar SME logistics companies. First, continuous monitoring of TCR and FTDA through digital dashboards should be institutionalized to ensure timely detection of deviations. Second, the implementation of standardized checklists and automated document control mechanisms would further reduce error rates and strengthen process consistency. Third, automating status communication and integrating proactive-notification features into existing ERP systems would support higher PSUR values and reduce inquiry-driven communication load. Fourth, developing a formal Carrier Reliability Index and implementing SLAs for the agent network would contribute to systematic risk management and minimize partner-driven unpredictability.

Employee-centered interventions also play a crucial role in strengthening preventive KPI systems. Maintaining a performance-based bonus framework, introducing KPI-alarm systems to signal deviations in real time, and institutionalizing regular training based on error analysis will enhance behavioral alignment with operational standards. At the strategic level, preventive KPIs should be incorporated into forecasting models for financial and operational planning, accounting for seasonal fluctuations and route-specific risks. Regular KPI revisions in accordance with market dynamics and international supply chain disruptions will ensure long-term relevance and adaptive capacity.

The study nonetheless faces several limitations, including its focus on a single SME logistics company, reliance on internal ERP data, and partial uncontrollability of external geopolitical and carrier-related risks. Future research should expand the dataset to include similar companies in Turkey, Bulgaria, and Armenia to strengthen the generalizability of findings. Additionally, machine learning–based predictive models may offer further insights into delay probabilities and error patterns, while the impact of digital transformation tools warrants dedicated investigation.

In conclusion, the empirical case of MGL Georgia demonstrates that preventive KPIs represent a scientifically validated and practically applicable approach for improving operational resilience in resource-constrained logistics environments. By linking leading indicators to financial and operational outcomes, small logistics companies can build reliable early-warning systems, enhance service quality, and mitigate the negative effects of external dependencies. These results confirm the broader regional relevance of Parmenter's preventive KPI model and its potential to serve as a universal tool for strengthening the competitiveness of SME logistics firms operating under high uncertainty.

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