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Strategic Controlling as a Determining Factor in Optimization
LOGISTICS COST ANALYSIS: A MULTIDIMENSIONAL ANALYSIS FOR THE COMPETITIVENESS IN FREIGHT TRANSPORT

STRATEGIC CONTROLLERSHIP AS A DETERMINANT FACTOR IN OPTIMIZING LOGISTICS COSTS: A MULTIDIMENSIONAL ANALYSIS FOR COMPETITIVENESS IN FREIGHT TRANSPORT

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SUMMARY

This scientific article develops an exhaustive analysis of the role of strategic controlling in the management of road freight transport companies. Faced with an adverse macroeconomic scenario, characterized by volatile fuel prices and complex tax systems, it investigates how the transition from empirical operational management to management based on robust financial data is fundamental for organizational survival. The study delves into advanced costing methodologies, matrix budgeting, asset management, and tax planning, demonstrating that logistical efficiency is inseparable from financial intelligence.

Keywords: Controllership. Logistics. ABC Costing. Asset Management. Tax Planning.

ABSTRACT

This scientific article develops an exhaustive analysis of the role of strategic controllership in the management of road freight transport companies. Given an adverse macroeconomic scenario, characterized by fuel price volatility and tax complexity, it investigates how the transition from empirical operational management to management based on robust financial data is fundamental for organizational survival. The study delves into advanced costing methodologies, matrix budgeting, asset management, and tax planning, demonstrating that logistics efficiency is inseparable from financial intelligence.

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1. INTRODUCTION

The road freight transport sector in Brazil is the backbone of the national economy, being the predominant mode for transporting agricultural and industrial production and supplying urban centers. However, companies operating in this segment face a "perfect storm" scenario, where deteriorating road infrastructure, legal uncertainty, and high tax burdens converge to compress profit margins to dangerously low levels.

In this context, purely operational management, focused solely on the physical movement of cargo,

It proves insufficient and obsolete. The pressing need is for management that integrates the logic of the supply chain with the sophistication of financial engineering. Strategic controlling then emerges not as a mere accounting department, but as the nerve center of the organization, capable of translating physical variables into precise economic indicators.

The objective of this work is to dissect, with theoretical and practical depth, the controlling tools applicable to logistics, demonstrating how they can reverse situations of chronic inefficiency. The central hypothesis is that the financial sustainability of a transport company depends directly on its ability to measure hidden costs, manage capital risks, and optimize the tax burden. To this end, it draws on the fundamentals of Management Accounting, Financial Mathematics, and Operations Management, disciplines that form the necessary academic basis for the training of high-performance managers. The proposed analysis goes beyond the obvious, questioning established paradigms on fleet renewal, freight pricing, and inventory management.

2. The Activity-Based Costing (ABC) Revolution in Logistics

Activity *-Based Costing (ABC)* methodology represents a fundamental break from traditional absorption costing models, which often distort the economic reality of logistics operations by using arbitrary and simplistic allocation criteria. In a modern transportation company, the complexity of operations demands that indirect costs—which often exceed direct labor costs—be accurately allocated to the activities that actually consume them, such as order processing, warehouse handling, cargo tracking, and fleet management. According to Bruni (2018), the inability to track these costs leads to invisible cross-subsidies, where highly profitable clients or routes end up financing loss-making operations without management realizing it, eroding the company's long-term competitiveness and preventing the formulation of assertive commercial strategies based on the real contribution margin of each contract.

Implementing ABC in logistics allows for a granularity of analysis that transforms decision-making, as it enables managers to identify which internal processes are "value generators" and which are merely "cost generators" without proportional return. For example, by analyzing the cost of the "waiting for unloading" activity in large distribution centers, the controlling department can financially demonstrate the devastating impact of the idle vehicle's unproductivity, which continues to depreciate and consume working capital even without generating revenue. This information, when quantified monetarily through the correct *cost drivers ,* provides communication for the sales area to renegotiate demurrage clauses with shippers or implement *demurrage* rates that effectively cover the opportunity cost of the fixed asset, something that traditional costing could never clearly demonstrate.

Furthermore, the application of ABC costing facilitates the strategic management of the customer portfolio, allowing segmentation based on net profitability and not just gross revenue. It is common in the transportation sector to find clients who demand a very high level of service, with restricted delivery windows, complex documentation requirements, and customized reports, disproportionately consuming administrative and operational resources. By mapping the specific *cost-to-serve* of each client, the controlling department can reveal which accounts are "strategic" due to their volume.

In fact, they are detrimental to economic value added (EVA). Based on this analysis, company management can choose to discontinue predatory contracts or readjust the level of service offered, aligning operational delivery with the agreed financial compensation.

Another critical area where ABC proves superior is in fleet maintenance management, allowing for the allocation of internal workshop costs and spare parts inventory directly to the vehicles that require these services, instead of diluting them as a general fixed cost. This creates a culture of responsibility and efficiency, where the performance of each driver and the durability of each vehicle are financially audited. If a particular truck model consumes 30% more preventive and corrective maintenance resources than the fleet average, the ABC system will immediately capture this anomaly, providing data for fleet management to review asset purchase and renewal policies, opting for brands and models that offer the best Total Cost of Ownership (TCO) throughout the vehicle's lifecycle.

Integrating Activity-Based Costing with enterprise resource planning (ERP) and transportation management systems (TMS) is the final step towards automating and ensuring the sustainability of this management model.
The collection of real-time operational data, via telemetry and digital data entry, feeds the costing model with reliable information, reducing human error and subjectivity. As highlighted by Padoveze (2016), modern controlling must be supported by robust information technology, ensuring that the calculated cost reflects the instantaneous dynamics of the operation. This allows for scenario simulations ("what-if analysis"), where the impact of an increase in the price of diesel or a change in labor legislation can be projected onto the cost structure of each activity even before it occurs.

Finally, the adoption of ABC promotes a profound cultural change within the organization, shifting the focus from linear cost reduction to managing process efficiency. When employees understand that each activity performed has a measurable cost and that this cost impacts the bottom line, engagement in the pursuit of continuous improvement increases. The controlling department thus assumes an educational role, translating accounting language into operational language, and demonstrating that eliminating waste at the operational level—whether by reducing load *setup* time or optimizing routes—generates direct positive effects on the bottom line of the income statement, ensuring job sustainability and company growth.

3. Matrix Budgeting and Expense Management (EMM)

The budget planning process in logistics companies cannot be a mere extrapolation of the previous year's expenses adjusted for inflation, a practice known as incremental budgeting that perpetuates historical inefficiencies. The Matrix Budgeting methodology, or Matrix Expense Management (MEM), presents itself as a powerful corporate governance tool, as it combines the traditional view of cost centers (who spends) with the view of expense packages (what is spent). This approach forces the organization to justify every real invested or spent, promoting a qualified debate about the need and return of each expense line, from fuel consumption to telephony and office supplies, eliminating the budgetary "fat" accumulated over the years.

In the matrix structure, "package managers" are defined. These are specialists responsible for monitoring an expense category across the entire company, regardless of where it occurs. For example, the Maintenance Manager might be the manager of the "Parts and Tires" package for all branches of the transport company. They have the authority and responsibility to define purchasing policies, approve suppliers, and audit consumption, ensuring that best practices are replicated in all units. Lunkes (2019) argues that this dual subordination—to the cost center manager (branch manager) and to the package manager—creates a system of checks and balances that increases control and transparency, making it more difficult to deviate from and purchase outside the policy established by management.

Zero-Based Budgeting (ZBB) is frequently used in conjunction with GMD (Managed Value Chain) to maximize results during times of crisis or restructuring. In ZBB, there is no vested right to the previous year's budget; each manager must build their budget proposal from scratch, justifying each requested resource based on projected production and sales plans for the next period. For a transportation company, this means recalculating tire needs based on projected mileage, not historical purchases. This financial discipline, while laborious, ensures that scarce resources are allocated to priority activities that generate the highest return on investment, aligning the budget with the company's growth strategy.

Budgetary control and monitoring should be carried out through rigorous management rituals, with monthly meetings to analyze results where deviations between budgeted and actual figures are dissected.
The controller's role is to prepare the material for these meetings, identifying the root causes of the variations: whether they resulted from price (inflation of inputs), volume (increase or decrease in demand), or efficiency (consumption above the technical standard). Gitman (2010) emphasizes that variance analysis is more important than the number itself, as it is what generates corrective action plans.
If fuel costs have exceeded the budget due to an increase in diesel prices, the solution could be to pass the cost on to freight; if it was due to inefficient driving, the solution should be driver training.

Budgetary flexibility is another crucial point in a sector as volatile as transportation. Using a *rolling forecast ,* where projections are revised quarterly for the next 12 months, allows the company to adapt its goals and resources to the constantly changing market reality. If there is a truckers' strike or a pandemic that drastically alters transportation volumes, the static annual budget becomes a work of fiction. The *rolling forecast* keeps the budgeting tool alive and relevant, serving as an adjustable compass that guides the company's navigation through economic uncertainties, without losing sight of long-term profitability objectives.

Finally, Matrix Expense Management promotes meritocracy and the alignment of incentives. By linking variable compensation (bonuses and profit-sharing) to the achievement of budgetary targets for packages and cost centers, the company transforms each manager into an "owner" of the business. The branch manager who manages to operate with costs below budget, while maintaining the service level, is rewarded, while waste is penalized. This high-performance culture, supported by figures audited by the controlling department, is what differentiates market-leading companies from those operating informally and with managerial mediocrity, guaranteeing the business's longevity in a highly competitive environment.

4. Strategic Asset Management and the Opportunity Cost of Capital

Asset management in a transportation company is at the heart of its financial strategy, given that the sector is capital-intensive. The vehicle fleet represents a gigantic fixed investment, which suffers accelerated depreciation and requires constant maintenance. The decision to renew the fleet cannot be based solely on intuition or momentary cash availability; it must be the result of a complex economic engineering analysis. Assaf Neto (2014) teaches that the ideal time to replace an asset is when its Equivalent Annual Cost (EAC) of maintenance and operation begins to exceed the EAC of a new asset, considering the resale value and the company's cost of capital.
The accounting department must model these cost curves to mathematically indicate the optimal renewal age for each vehicle category.

The " *Buy vs. Lease* " analysis has become even more relevant with the evolution of business models for heavy equipment rental companies. The accounting department must compare the cash flow from the acquisition (down payment + FINAME installments + maintenance + depreciation + resale) with the cash flow from the lease. (Monthly rent deductible from income tax + guaranteed availability). Often, when considering the tax benefit of the Real Profit regime and the release of working capital that would be tied up in a purchase, leasing proves to be more financially advantageous, improving the company's Return on Assets (ROA) indicator. This analysis requires mastery of Financial Mathematics concepts such as Net Present Value (NPV) and Internal Rate of Return (IRR).

The opportunity cost of capital tied up in spare parts and tire inventories is another frequently overlooked drain on wealth. Maintaining millions of reais worth of tires in the warehouse "to ensure operations" has an implicit financial cost: this money could be invested in the financial market earning interest or invested in fleet expansion. Ballou (2006) introduces inventory management models that seek a balance between the level of service (parts availability) and the cost of maintaining the inventory.
Inventory. The accounting department must calculate the company's *WACC* (Weighted Average Cost of Capital) and apply it internally to the average value of inventory, forcing the supply area to seek *Just-in-Time* logistics efficiency from suppliers.

Managing accounting depreciation versus managerial (economic) depreciation is fundamental for accurate freight pricing. While tax accounting depreciates a truck linearly over 5 years, market reality may show a different depreciation based on heavy use or onboard technology. If the company uses only tax depreciation to determine its price, it may be charging less than necessary to replace the asset in the future, silently decapitalizing itself. The accounting department must maintain parallel control of the economic useful life of assets to ensure that the revenue generated by freight covers the actual replacement of the asset, preserving the company's productive capacity.
eternum.

The use of asset productivity indicators, such as Asset Turnover and Fleet Occupancy Rate, is vital for diagnosing operational health. A truck idle due to lack of cargo or inefficient maintenance is a value-destroying asset. The controlling department must monitor fleet idleness and quantify the resulting financial loss. In many cases, financial analysis suggests that it is better to reduce the size of the fleet and increase its utilization (running 24/7 with two drivers) than to maintain a large and underutilized fleet. This "sweating the assets" strategy maximizes the return on invested capital (ROIC).

Finally, asset security and risk management involve insurance analysis and risk management for theft and accidents. Insurance costs are a significant item on a transportation company's income statement. The accounting department must analyze historical claims history and negotiate policies that balance the premium paid with the deductible assumed. Investments in tracking and monitoring technology, although expensive, should be evaluated based on their return in reducing insurance premiums and preventing losses. Asset management, therefore, is not just about taking care of the physical machinery, but managing the entire financial and risk cycle involved in the ownership and operation of these capital assets.

5. TAX PLANNING AND MAXIMIZING NET INCOME

The Brazilian tax environment is recognized as one of the most complex and burdensome in the world, making tax planning (tax avoidance) a mandatory skill for the survival of any logistics company. Choosing the appropriate tax regime—Real Profit, Presumed Profit, or Simples Nacional—should not be a static decision, but one that is reassessed annually by the accounting department based on revenue and profit margin projections. For transport companies with tight margins or operational tax losses, Real Profit is usually the smartest option, as it allows for the payment of Corporate Income Tax (IRPJ) and Social Contribution on Net Profit (CSLL) on actual profit rather than a presumed revenue, and also allows for the use of tax losses from previous years to offset future tax bases.

Managing PIS and COFINS credits under the non-cumulative regime is an area where controllership can generate substantial value. Legislation allows for credits on inputs essential to the core business activity, such as diesel fuel, tires, spare parts, and maintenance expenses. However, the definition of what constitutes an "input" has been the subject of legal and administrative disputes. A controllership attentive to jurisprudence and the regulations of the Federal Revenue Service must ensure that the company is taking all the credits to which it is legally entitled, reducing the effective tax cost of the operation. Failure to take advantage of these credits represents an unforgivable waste of cash in a market with such tight margins.

ICMS, a state tax levied on interstate transportation, presents additional challenges due to tax competition and differing tax rates between states. Tax intelligence should guide the commercial and operational areas on routes that generate higher or lower ICMS debits and on the possibilities of utilizing ICMS credits in the purchase of fuel and fixed assets. In some states, there are special tax regimes or tax benefits for the transportation sector that can significantly reduce the tax burden. The accounting department must be proactive in seeking and maintaining these benefits, ensuring compliance with the required counterparties (such as maintaining jobs or local investments).

Managing contingent tax and social security liabilities is another critical responsibility. Hiring independent contractors or third-party drivers, if not done with legal rigor, can generate enormous risks of employment relationship recognition and social security assessments. The controllership, in conjunction with the legal department, must audit contracts and operational practices to mitigate these risks. Correctly provisioning for these risks in the balance sheet ensures that the company is not surprised by hidden liabilities that compromise its solvency or prevent it from obtaining Tax Clearance Certificates (CNDs), essential for participating in tenders and contracts with large shippers.

The recovery of amounts unduly or excessively paid (Tax Recovery) is a task of fiscal archaeology that the accounting department must coordinate periodically. Reviewing the calculations of the last five years in search of calculation errors, incorrect tax classifications, or unused credits can generate an extraordinary cash inflow vital to working capital. However, this work must be done with technical responsibility to avoid future exposure to fines. Tax governance ensures that aggressive tax planning does not cross the line into evasion, keeping the company protected under the mantle of legality.

In short, tax planning in logistics is not just a way to pay less taxes, but a competitive strategy. If a transport company manages, through tax intelligence, to have a tax cost 2% or 3% lower than the competition, it can convert this advantage into a lower price to gain *market share* or into a higher net margin to reinvest in the business. The controllership thus acts as an architect of the company's tax structure, designing the most efficient legal pathways for the flow of wealth generated by the operation.

6. Key Performance Indicators (KPIs) and a High-Performance Culture

Implementing a robust performance measurement system allows the controlling department to translate corporate strategy into tangible operational actions. The use of Key Performance Indicators (KPIs) should go beyond traditional financial metrics, incorporating operational, quality, and people indicators, in accordance with the *Balanced Scorecard* (BSC) philosophy. Chiavenato (2020) argues that the systemic and balanced monitoring of all business perspectives is the only path to continuous improvement. In logistics, indicators such as OTIF *(On-Time In-Full),* Order Cycle Time, and Inventory Accuracy are fundamental predictors of future financial performance; a low OTIF today will result in lost customers and fines tomorrow.

The controller's office must ensure the integrity and auditability of the data that feeds the KPIs. In many companies, there is a gap between the indicator reported on executive *dashboards* and the reality on the "factory floor." Data governance, ensured by the controller's office, prevents the manipulation of numbers and guarantees that senior management is making decisions based on truth. Automating data collection via integrated systems is essential to eliminate human bias. Financial KPIs such as EBITDA, Contribution Margin, and Return on Capital Employed (ROCE) should be calculated with the same technical rigor as audited financial statements, serving as a reliable compass for investors and shareholders.

Visual management and the democratization of information are strategies to engage the operational team in the pursuit of results. When the driver understands how their fuel consumption impacts the cost KPI and, consequently, their bonus, their behavior changes. The controlling department should work on communicating these indicators, transforming complex accounting reports into simple and understandable visual dashboards for all hierarchical levels. Slack et al. (2018) emphasize that the alignment of objectives, from the doorman to the CEO, is the secret to world-class operations.

Internal and external *benchmarking* analysis allows a company to compare its performance with best market practices. The controlling department should seek cost and productivity benchmarks in the sector to identify competitive *gaps .* If the company's cost per kilometer is above the market average, it is necessary to investigate the causes and develop action plans. A high-performance culture does not accept...

Mediocrity; she uses indicators to challenge the *status quo* and relentlessly pursue the frontier of efficiency.

The correlation between operational and financial indicators is the most sophisticated analysis that controllership can provide. Statistically demonstrating how much each percentage point reduction in diesel consumption represents in increased net profit, or how much the reduction in loading and unloading time impacts asset turnover, provides irrefutable arguments for prioritizing investment projects. This integrated view transforms controllership into a strategic *Business Partner ,* which not only points out the error but also designs the financial solution for operational problems.

In conclusion, KPIs are not just numbers on a spreadsheet; they are the language through which the organization communicates with itself about its successes and failures. A well-designed KPI system, developed by the controlling department, aligns efforts, corrects deviations from the plan, and celebrates achievements. It is the ultimate management tool that completes the PDCA cycle (Plan, Do, Check, Act), ensuring that strategic planning moves from paper to tangible operational and financial reality.

7. CONCLUSION

The argumentative trajectory developed throughout this scientific article converges on the undeniable conclusion that contemporary logistics management no longer tolerates financial amateurism. The complexity of global supply chains, coupled with the idiosyncrasies of the Brazilian business environment, demands a new manager profile and a new organizational structure, where strategic controlling takes center stage in conducting business. The tools presented—from ABC costing to tax planning, including economic asset engineering—comprise an indispensable arsenal for confronting the price war and margin compression that plague the road freight transport sector.

It is evident that operational efficiency alone does not guarantee profitability. A company can be extremely efficient at delivering goods on time (service level), but do so at such a high cost that it destroys shareholder value. The financial intelligence provided by controlling is the link that connects operational excellence to economic results, allowing for balanced decisions that weigh the *trade-off* between service and cost. The ability to model scenarios, predict cash flows, and manage financial risks therefore becomes the main sustainable competitive advantage in a saturated and commoditized market.

The analysis also demonstrated that information technology is the great enabler of this new controllership. Without integrated systems (ERP/TMS) and without data discipline, advanced costing and budgeting methodologies become impractical theoretical exercises. Investment in digitalization should not be seen merely as technological modernization, but as the necessary infrastructure for financial governance. The transparency and speed of information allow the company to react in real time to market fluctuations, adjusting routes, prices, and resources with an agility that traditional bureaucratic structures cannot match.

Furthermore, the human and cultural dimension of controllership was highlighted as a critical success factor.
Tools like Matrix Budgeting and Visual Management only work if there is a culture of...

Responsibility *(accountability)* and meritocracy. The controller's office has the pedagogical role of educating the organization about the importance of cost control and asset preservation, transforming each employee into a guardian of results. The change in *mindset,* from "spending the budget" to "optimizing resources," is perhaps the greatest contribution that an active controller's office can make to the organizational culture.

Tax planning and legal risk management have proven to be cornerstones in protecting assets.
In a country where state bureaucracy can stifle private initiative, tax compliance and tax intelligence are shields that protect business continuity. The accounting department acts as the first line of defense against hidden liabilities and the spearhead in the pursuit of legitimate tax efficiency, ensuring that the wealth generated by logistical efforts is not unduly confiscated by tax inefficiency or avoidable fines.

Long-term financial sustainability, addressed through asset lifecycle management and the opportunity cost of capital, reinforces the need for an extended time horizon. The immediate cash flow focus, typical of crisis management, often compromises the future by postponing maintenance or fleet renewals. Strategic controlling imposes the discipline of thinking about the business in perpetuity, ensuring that today's decisions do not mortgage tomorrow's viability. The balance between liquidity, profitability, and solvency is the final art of applied financial management.

In conclusion, it can be seen that the management professional, equipped with specialization in finance and controlling, is the agent of transformation capable of leading this revolution in the transportation sector. The union between the systemic vision of the administrator and the analytical rigor of the controller creates the necessary leadership to navigate market turbulence. Companies that embrace this integrated approach will be able not only to survive but to lead the consolidation of the sector, while those that remain in empirical management will be doomed to irrelevance or extinction.

Ultimately, this study validates the thesis that logistics and controlling are two sides of the same coin. There is no efficient logistics without financial control, and there is no effective financial control without a deep understanding of logistics operations. The symbiosis between these two disciplines is the path to business excellence, generating value for shareholders, quality for customers, and economic development for society. Strategic controlling is, therefore, the beacon that illuminates the path to efficiency amidst the fog of economic uncertainty.

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