

Index

- Agility, 15–16
- Allocation constraints, 44–45
- American Production and Inventory Control Society (APICS), 17
- Analysis of variance (ANOVA), 5, 120, 145–146, 159
- Analytical hierarchy process (AHP), 4, 90–91, 93, 115
 - case study, 94–95
 - first application, 94
 - literature review, 91–92
 - methodology and empirical strategy, 92–93
 - results, 95–101
 - validation, 96–101
- Annual holding cost, 220
- Annual ordering costs, 220
- Area under the curve (AUC), 312
- Auction. *See also* Multi-dimensional auctions, 43
 - auction-based procurement, 43
 - environment, 43
 - framework, 46–47
 - models, 46–47
 - terminology, 44
- Bahía (BA), 177
- Balance scorecard (BSC), 257
- Better Cities for Logistics Toolkit, 109–110
- Bidding languages, 45, 46–47
- Bloom’s Taxonomy, 256–257, 260, 262
- Bodega Siglo XXI*, 313
- Branch-and-price algorithm, 180
- Brazil, 158–160, 176
- British Petroleum (BP), 12
- Business continuity planning (BCP), 17, 24–25
- Business practices (BP), 236, 243
 - questionnaire, 241
- Capacity slack, 15
- Cargo
 - loss, 162
 - robbery, 161
 - theft, 158–160
 - transportation, 164
- Cargo risks, 158
 - source in supply chain, 161–162
- Cathedral, 134–135
- Causal loop diagram (CLD), 280
- Center for Latin-American Logistics Innovation (CLI), 3
- Center for Transportation and Logistics of the Massachusetts Institute of Technology (MIT-CTL), 136
- Characteristic function, 220–221
- Círculo K*, 274
- City logistics, 135
- City-wide assessment, 109–110
- Classification yards, 182
- Cluster
 - analysis, 109
 - boundary delineation, 136
 - theory analysis, 136
- Collaboration, 15–16, 66
 - in supply chains, 216
- Collaborative assessment of promotions performance using financial KPIs changing retail sector, 61–64
- collaborative promotion management, 66–67

- financial KPI for assessing
 - promotions performance, 67–71
- promotions at retail supply chain in
 - Colombia, 72–81
 - promotions in retail sector, 64–66
- Collaborative inventory replenishment
 - accounting for additional objectives, 229–231
 - birth of new actor in supply chain, 227–229
 - empirical results, 224–227
 - game theory approach, 223–224
 - model solution approach, 220–223
 - problem description and collaborative logistic strategy, 217–218
- Collaborative joint replenishment
 - problem, 218–220
- Collaborative promotion planning, 85
- Collaborative strategy, 5
- Collaborative supply chain, 66
- Colombia
 - GMROI, 74–76
 - market share variation, 77
 - product category results, 81
 - promotions at retail supply chain in, 72–81
 - regional category results, 81
 - ROI, 73–74
- Colombian supermarket chain, 4
- Combinatorial auctions model, 42, 47–48, 53–54
- Communality, 138
- Competitive advantage, 94
- Competitive uncertainties, 16
- Conceptual system evaluation and reformulation methodology (CSAR methodology), 4, 90–93, 95
- Consistency index (CI), 99–100
- Consistency ratio (CR), 100
- Consumer-packaged-goods (CPG), 4, 274, 300, 312
- Coordination, 228
- Córdoba in Argentina, 132, 134
 - case study in old downtown of, 140–142
- Core stakeholder, 177
- Cost of goods sold (*COGS*), 71
- Culture of risk management, 15
- Customer and store attributes, 300
- Daily train scheduling in seaport terminal, 179
 - case study implementation, 189–190
 - constraints, 185–188
 - data collection, 184
 - decision variables, 185
 - formulation of generic optimization model to schedule trains at ports, 184–189
 - indices and sets, 184–187
 - literature review, 179–181
 - methodology, 182–189
 - objective function, 188–189
 - parameters, 185, 188
 - results, 190
 - solution algorithm, 189
- Data analysis, 101
- Data envelopment analysis (DEA), 91
- Data-driven solutions, 109
 - freight trip generation models, 123
 - general methodological framework, 109–114
 - loading and unloading bays optimization models, 114–115
 - logistic profile of Quito, 109–110
 - logistics hotspots and data collection, 110–114
 - methods and results, 115–117, 118–121, 123–126
 - results and analysis of logistics solutions, 114
 - transfer centers optimization models, 118

- Decision
 - decision-maker risk, 16, 22
 - support methodologies, 45
- Descriptive analysis, 276
- Discounts, 62–63
- Discrete choice model
 - literature review, 301–304
 - methods and procedures, 304–309
 - results, 309–312
- Discrete simulation techniques (DESS), 216
- Disruptions, 15, 18
- Disruptive events, 17–18, 33–34
- Distribution centers (DCs), 159
- Double-track segments, 189

- Earthquakes (EQ), 27–28
- Economic Order Quantity model, 218
- Economist Intelligence Unit (EIU), 19–20, 22–24
- Efficient Customer Response (ECR), 66–67
- Eigenvalue, 99
- 7-Eleven, 274
- Elimination and choice expressing reality (ELECTRE), 91
- Elitist approach, 221–223
- Emerging markets, 108, 132, 274
- En Route to Customer [RC], 163
- En Route to Distribution Center [RDC], 164
- Environmental
 - disruptive events, 24
 - risk, 16–17, 22
- Erosion, 2
- Estrada de Ferro Carajás* (EFC), 177
- Euclidean 1-center problem, 119–120
- Everyday low prices (EDLP), 65
- Exploratory factor analysis (EFA), 138

- Factor analysis (FA), 5, 137–138, 143
- Factor loading, 143–144
- Faculty of Exact, Physical and Natural Sciences (FCEFyN), 134
- Fast-moving consumer goods sector (FMCG sector), 61–63
- Fiado* system, 282
- “Financial microcenter” of city, 134–135
- Firm[s], 12, 17
 - level models, 28
 - organizational culture effect, 34–35
- Food processing, 90
- Freight generation (FG), 123
- Freight transportation, 5, 123, 126
- Freight trip generation models (FTG models), 108, 123
 - situation and solution, 123
- Functional strategy map (FSM), 4, 90–93

- Game theory approach, 223–224
- GeneSys, 205–209
- Genetic algorithm (GA), 220–223
- Geographic culture effect, 34–35
- Geographical location risk, 22–24
- Geopolitical risk, 13
- Geospatial Intermodal Freight Transportation model, 180
- Global trade identification number (GTIN), 73
- Greenhouse gas emissions, 2
- Gross domestic product (GDP), 1, 12, 61–62, 197–198
 - per capita, 21, 25
- Gross margin return on investment (GMROI), 68–71, 74–76
- Gross national income (GNI), 1

- Heuristics, 181
- High density high income (HDHI), 145–146, 148
- High density low income (HDLI), 145–148
- High-income areas
 - analysis of, 286–288
 - customer service, 294
 - nanostores in, 292–294

- operations, 293–294
- supply, 292–293
- High-low prices (HILO prices), 65
- Historic downtown area, 147
- Hurricanes, 27–28
- Immersion, 242
- Independencia, 134–135
- Industry risk, 16
- Input market uncertainties, 16
- Insecurity, 158
- Intermodal transportation, 180–181
- Internal grain trains, 183
- Inventory management, 292
- Inventory slack, 15
- IT-based approaches, 199–200, 202
- Joint Replenishment Problem (JRP), 216
- Key performance indicators (KPIs), 4, 64, 136, 178, 182–184, 256
 - assessment of KPI knowledge, 260–261
 - usage and importance, 261
- KM² methodology, 136, 139–140
- Knowledge attainment of concepts, 258
- Last mile
 - deliveries, 134
 - distribution, 108
- Latin America (LATAM), 25, 28
 - micro and small firms in, 197–200
 - research agenda on supply chain management for MSEs in, 209–211
- Latin America and the Caribbean (LAC), 1–2
 - supply chain and logistics operations in, 2
 - urbanization and densification rates in, 1
- venues of applied research in SCM for, 3–6
- Latin Developing Countries (LDCs), 237
- Loading bays optimization models, 114–115
 - situation and solution, 114–115
- Logistics performance index (LPI), 2
- Logistics. *See also* Urban logistics
 - regression, 25, 159, 308–309
 - security, 161
- LOGYCA, 3
- Long-term
 - planning, 42
 - return on investment, 199–200
- Low density high income (LDHI), 145–146, 148
- Low density low income (LDLI), 145–146, 148
- Low-income areas
 - analysis of, 279–282
 - customer service, 290–291
 - nanostores in, 289–291
 - operations, 290
 - supply, 289–290
- Loyalty programs, 299–300
- Macroeconomic risk, 13, 17, 33
- Major ordering costs, 220
- Management, 236
- Mann-Whitney test, 265–266
- Maranhão (MA), 177
- Market share variation [Δ MS], 4, 71, 77
- Mean Absolute Percentage Error (MAPE), 124–125
- Mexico City metropolitan area (MCMA), 274
- Micro and small enterprises (MSEs). *See also* Small-and medium-sized companies (SMEs), 198, 235–236
 - in Peru, 238–239

- productivity and good practices, 237–238
- research agenda on supply chain management for MSEs in Latin America, 209–211
- supply chain management for, 201–209
- Micro and small firms in Latin America, 197–200
 - connection between productivity and SCM for small firms, 198–199
 - fostering productivity and survival of small firms by focusing on SCM, 200–201
 - research agenda on supply chain management for MSEs in Latin America, 209–211
 - SCM for large firms vs. SCM for micro and small firms, 199–200
 - supply chain management for MSEs, 201–209
- Mid-sized city, 132, 140
- Middle-income areas
 - analysis of, 282–286
 - customer service, 292
 - nanostores in, 291–292
 - operations, 291–292
 - supply, 291
- Minimum order quantity (MOQ), 290
- Minor ordering costs, 220
- MIT Center for Transportation and Logistics, 3
- MIT GeneSys Project, 200, 205–208
- MIT SCALE Latin America network, 3
- Mixed research methodologies, 91–92
- Mixed-integer linear programming model (MILP model), 5, 180–181
- Mixed-integer programming (MIP), 47
- Model solution approach, 220–223
- Modi operandi*, 162
- Mom-and-pop stores, 274, 300
- Monte Carlo Simulation, 115
- Multi-attribute auctions, 45
- Multi-attribute decision analysis (MCDA), 3–4
- Multi-attribute utility method (MAUT), 91
- Multi-criteria auctions, 45
- Multi-criteria decision analysis model (MCDA model), 42, 51–53, 55–57, 91
- Multi-criteria value analysis, 47
- Multi-dimensional auctions, 42
 - literature review, 43–46
 - models, methods, and procedures, 46–53
 - results, 53–57
- Multidimensional reverse auction, 43–44
- Nagelkerke determination factor, 171
- Nanostores, 3, 300
 - business models, 274–275
 - channel, 300
 - methodological framework, 276–278
 - recommendations for nanostore supply chains and operations, 289–294
 - results, 278–288
 - v2. 0, 288
- National Hurricane Center, 18
- Natural disaster risk, 13, 17, 19–20, 33
- Network-based models, 181
- Non-food items (NFI), 53
- Nongovernmental organization (NGO), 3–4, 42
- Norte-Sul* railroad, 177
- North American Industry Classification System (NAICS), 124
- North of Peru, 236
 - literature review, 237–239
 - methodology, 239–242

- results, 242–248
- Northern Arc, 176
- Objective function, 188–189, 220
- On time in full (OTIF), 55
- One-way analysis of variance (one-way ANOVA), 138
- Operation research techniques, 181
- Operational plan, 95
- Optimization model, 120
- Organization for Economic Co-operation and Development (OECD), 2
- Organizational risk, 16, 22
- Origin-destination matrices (O-D matrices), 123
- Oxxo, 274
- Package, 43–44
- Pará (PA), 177
- Parked at Customer (PC), 163
- Parked at Distribution Center (PDC), 164
- Performance measurement systems (PMSs), 257–258
- Performance metrics, 257, 265
- Peru, 236
 - MSEs in, 238–239
- Piauí (PI), 177
- Pilot study, 207–208
- Point of purchase (POP), 293
- Points of sale (POS), 67
- Political instability, 16
- Port
 - dwelt time, 179
 - operations, 180–181
- Pre-qualification questionnaire (PQQ), 47
- Preference ranking organization method for enrichment of evaluations (PROMETHEE), 91
- Pricing, 65
- Principal component analysis (PCA), 109, 138, 143
- Proactive planning, 16
- Problem-specific risk, 16, 22
- Process mapping, 182–184, 276
- Product market uncertainties, 16
- Productivity, 198, 235–236, 256
- Promotion forecast accuracy (PFA), 4, 71, 76
- Promotions, 62–63
 - in retail sector, 64–66
 - at retail supply chain in Colombia, 72–81
- Proximity, 313
 - retailing, 274
- Puerto Rico, 12–13, 18
- Questionnaire, 240
- Quito, 108
 - logistic profile, 109–110
- Railway logistics corridor, 176–177
- Random consistency index (RI), 99–100
- Rapid Plant Assessment (RPA), 242
- Reengineering, 15–16
- Regions of world, 34–35
- Regression analysis, 245–248
- Reinforcing loop, 281–282
- Request for quotation (RFQ), 42
- Research gap analysis, 181
- Research questions (RQs), 209
- Resilience culture, 24–25
- Resilient Enterprise, The*, 15
- Resilinc Database, 19–20
- Retail industry, 6
- Retail landscape, 274, 299–300
- Retail sector
 - changing, 61–64
 - promotions in, 64–66
- Retailer[s], 216–217
 - promotions, 65
- Retailing, 61–62

- Return of investment (ROI), 4, 67, 69–70, 73–74
- Reverse auctions, 43–44, 46
- Risk[s], 12
 - analysis of transporting goods, 158
 - data collection and risk location-related variables, 163–164
 - literature review, 159–162
 - management culture, 16–17, 24–25, 159–160
 - matrix, 166–168
 - methodological framework, 162–165
 - numerical results, 165–171
 - results and managerial insights, 172
 - risk matrix framework, 165
 - scores, 13
 - statistical analysis, 164
- Road freight, 159
- Robberies, 159, 164
- Root Mean Square Error (RMSE), 124–125

- Sales uplift, 68
- Sensitivity analysis, 56–57
- Shapley Value, 220
- Short-term planning, 179
- Simple logit model, 27
- Single-item reverse auction, 43–44
- Site level model, 27–28
- Small-and medium-sized companies (SMEs). *See also* Micro and small enterprises (MSEs), 199–200, 216, 256
 - obstacles for adoption of KPI in, 258
- Stakeholder's interactions, 276
- Statistical
 - analysis, 135, 164
 - methods, 137–138
 - tests, 165–166, 168–171
- Stochastic Collaborative Joint Replenishment problem (S-CJRP), 5, 216
- Stochastic Multi-Objective Joint Replenishment Problem (S-MJRP), 230
- Stockyard product allocation and terminal routing, 180
- Strategy, 90–91, 258
- Supermarkets, 300, 305
- Supplier selection, 42–43
 - problems, 45
- Supply Chain And Logistics Excellence (SCALE), 3
- Supply chain collaboration, 66
- Supply chain management (SCM), 2, 91, 198, 236, 276
 - actions, 203–205
 - experience, 205
 - fostering productivity and survival of small firms by focusing on, 200–201
 - for large firms *vs.* SCM for micro and small firms, 199–200
 - lessons learning, 202–205
 - for MSEs, 201–209
 - research agenda on supply chain management for MSEs in Latin America, 209–211
 - size matters, 202–203
 - venues of applied research in SCM for LAC, 3–6
- Supply Chain Operations Reference model (SCOR model), 236–237
- Supply chain resilience, 12, 15–18, 158
 - data collection and processing, 19–22
 - disruptive events, 33–34
 - literature and hypothesis development, 14–18
 - macroeconomic risk, 33
 - managerial implications, 35–36
 - methodology, 19–28
 - natural disaster risk, 33
 - regions of world, 34–35
 - results, 28–30

- Supply chain risk management
 - (SCRM), 14–16, 157, 160–161
 - framework, 22–28
 - models, 25–28
 - variables, 22–25, 26–27
- Supply chain risks (SCRs), 17, 158, 160
- Survey-based methodology, 200–201
- System dynamic approach, 276, 280

- Technique for order of preference by similarity to ideal solution (TOPSIS), 91
- Terminal dwell time, 179
- Termination condition, 221–223
- Theft, 164
- Third-Party Logistics (3PL), 217, 228
- Tocantins (TO), 177
- Traditional
 - auction, 43
 - channel, 274
- Train
 - dispatching, 178–179
 - scheduling, 181
 - traffic management, 178
- Transfer centers optimization models, 118
 - situation and solution, 118
- Transportation of bulk products for exports, 179–180
- Tukey HSD test, 145–146
- Two-sample t-test, 120

- Uniqueness, 138
- United Nations Database, 20–21
- United States Food and Drug Administration (USFDA), 12
- Universidad San Francisco de Quito (USFQ), 112
- Unloading bays optimization models, 114–115
 - situation and solution, 114–115

- Urban logistics
 - case study in old downtown of Córdoba, Argentina, 140–142
 - factors, 132–133
 - general methodology, 137–140
 - literature review, 135–137
 - methods and procedures, 137–146
 - numerical setting, 142–146
 - results, 146–149
 - solutions, 4–5, 114
 - solutions, 148–149
- Urban planning, 108
- Urbanization, 108

- Valor Logística Integrada* (VLI), 177, 184
- Value
 - functions and ranges, 45
 - proposal, 91–92
- Variable inflation factor test (VIF test), 30
- Vertical collaboration, 66
- Volume discount auctions model, 42, 47, 49–51, 54–55
- Vulnerability, 160
 - reduction, 158

- Walmart strategy, 65
- Weights of streets and establishments, 115
- Winner determination problem, 44–45
- Wood and timber SMEs in Peru
 - assessment of KPI knowledge, 260–261
 - literature review, 257–258
 - methods and procedures, 258–261
 - results, 261–266
 - usage and importance of KPIs, 261
- World Bank Database, 21

- Yard management, 180–181