THE COST OF LOGISTICS SURVEY FOR SOUTH AFRICA:

Alignment workshop
20 January 2011
AGENDA

- Introduction
- History
- Recent results
- Definitions
- Project approach
- Alignment issues and ideas
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The world of logistics is getting more and more complex as globalization opens new markets and creates new opportunities.
Greater efficiency in logistics and agile supply chains is often seen as the “final frontier” for improving competitiveness.
Yet logistics is an important source of competitive advantage for traders.

- Customer service level
- Impact on profitability
- Source of competitive advantage
- Top management priority

329 large and medium-sized Finnish manufacturing and trading firms in 2009

Breakdown of logistics costs of traders in a developed country

Survey data from 1,291 firms

Manufacturing and trading firms, weighted by industry and firm size according to national statistics

A wide spread of logistics cost levels reported in selected studies

Logistics costs as % of GDP *, Sales **, Total costs ***

- Tajikistan 2005*
- Moldova 2005*
- Ukraine 2007*
- Finland **
- ELA/ AT. Kearney**
- U.S. State of Logistics*
- Sweden*
- State of logistics South Africa*
- BVL Germany; Manufacturing***
- China; Tao (2009) *

Prof. Lauri Ojala, World Bank PREM Day, May 6, 2010
Poor countries penalised both ways:
high costs & very low service quality

Rising global logistics costs is confirmed by a 2005 study – total costs for the countries measured rose from 13.4% in 1997 to 13.8% in 2002.

Costs increased for lower income nations and is higher for lower income nations – due to operational pressures in the 1st world and density considerations.

Latter observations are key to SA where development of the 2nd economy has to be engineered and full potential cost savings on densified first economy corridors need to be exploited.

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A survey prototype was developed in 2006

LOGISTICAL COST IN SOUTH AFRICA

Transport (R42,579m) 56.0%
Stock Losses (R2,394m) 3.1%
Warehousing (R9,578m) 12.6%
Admin & Management (R4,789m) 6.3%
Inventory Carrying Cost (R14,367m) 18.9%
Order Processing (R2,394m) 3.1%

Total logistical cost = R76,101m (18% of GDP)

1996 view
One outcome were to quantify propensity to outsource

**LOGISTICAL COST IN SOUTH AFRICA**

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost</th>
<th>Propensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>(R21,290m)</td>
<td>64.5%</td>
</tr>
<tr>
<td>Admin &amp; Management</td>
<td>(R1,676m)</td>
<td>5.1%</td>
</tr>
<tr>
<td>Order Processing</td>
<td>(R838m)</td>
<td>2.5%</td>
</tr>
<tr>
<td>Stock Losses</td>
<td>(R838m)</td>
<td>2.5%</td>
</tr>
<tr>
<td>Inventory Carrying Cost</td>
<td>(R5,028m)</td>
<td>15.2%</td>
</tr>
<tr>
<td>Warehousing</td>
<td>(R3,352m)</td>
<td>10.2%</td>
</tr>
</tbody>
</table>

Total propensity to outsource = R33 billion
And cost per industry

LOGISTICAL COST IN SOUTH AFRICA

Transport & Other Costs

- Agriculture
- Mining
- Iron, Steel, Metals, Scrap
- Non-metals
- Fuel & Petroleum Products
- Food, Beverages, Tobacco
- Chemicals (Including Haz & Non-Haz)
- Machinery, Motor Vehicles & Parts
- Pulp, Wood, Paper
- Textiles, Clothing, Footwear
- Rubber, Plastics, Glass, Pottery
- High Value Goods

R/Billion

Spoornet  Public Transport  Own Transport  Other Logistical Cost

1996 view
The first flow measurement were attempted in 96

- Figures in million tons
- Total Tonnage Observed on National Roads = 48 mt
And repeated repeated once in 98

- Figures in million tons
- Total Tonnage Observed on National Roads = 54 mt
Per industry flows could be estimated: Eg. Coal

* Tonnage in thousands (1998)

Intra Regional Traffic
- Ermelo: 0/27300
- Witbank: 350/18300
- Bloemfontein: 2/17000
- Thabazimbi: 0/6000
And Processed foods

* Tonnage in thousands (1998)

Intra Regional Traffic

- Johannesburg: 80/5000
- Cape Town: 230/2100
- Durban: 890/4000
Resulting in tested and published methodology
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Logistics costs as a percentage of GDP declined to its lowest level since measurement.
Transport continues to be the biggest contributor to logistics costs

Transport costs improved, relatively, due to different effectiveness trade-offs. But the “administered” nature of cost components is still a concern.
Inventory carrying costs increased the most

2008 distribution

- Transport 50%
- Management, Admin & Profit 17%
- Storage and Ports 14%
- Inventory carrying cost 19%

Indexed = 2003
Relative inventory carrying costs in the secondary sector is higher
But transport remains the biggest challenge

Transport is in fact a strategic resource – more so than for all South Africa’s trading partners

Apart for higher than normal demand, freight growth, usually, outstrips GDP growth – this is the result of specialisation.

**Freight and economic growth from 1993 to 2008**

- **Primary Sector GDP**
- **Secondary Sector GDP**
- **Total GDP**
- **Freight flow (tonne-km) calculated from the NFFM**

**Total GDP / Tonkm**

Source: National Freight Flow Model
But the growth differential is more pronounced (or less) given the maturity of an economy – structural shift

But increased specialisation, leading to more freight transport will require higher levels of transport efficiency
The prime rate declined over the last decade
But inventory were delayed for longer periods of time

Changes in Storage Costs

- Storage costs in 2007: 46
- Inflation: 3.7
- Lower storage volumes: -1.8
- Lower cost to store per unit: -4.3
- Longer storage time: 3.6
- Storage costs in 2008: 47
Solutions should consider the underlying drivers of costs …

• “Administered costs” includes:
  • The price of fuel
  • The availability of alternative infrastructure to road
  • The condition of roads
  • Other external service disruptions
  • Interest rate

• Productivity opportunity costs for example includes:
  • Elimination of empty haul (or at least the optimal trade-off between empty haul, inventory levels and customer service)
  • Increase in tonkm per employee

And continue measurement – it provides perspectives for improvements
The flow of value and the flow of volume
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There is no agreement on a precise definition of logistics costs.

- World Bank found significant discrepancies regarding the activities that should be included in the definition of logistics costs.
- World Bank consider logistics costs to include: transaction costs (those related to transport and trade - processing of permits, customs, standards), financial costs (inventory, storage, security), and non-financial costs (insurance).
Overarching channels describe the economy

- The primary, secondary and tertiary sectors of the economy are essentially linked and demonstrate flows
- Think of practical examples
- On a cluster level also think of value networks – compare the value chains of coal and gas and steel production

<table>
<thead>
<tr>
<th>Extraction</th>
<th>Beneficiation</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Mining &amp; Agriculture) (Primary)</td>
<td>(Manufacturing) (Secondary)</td>
<td>(Private households)</td>
</tr>
</tbody>
</table>

**Services**
(Energy, construction, trade, transport, professional, community)
(Tertiary)
Value is added along the way

- But in each step discrepancies in time and place arises
- These discrepancies requires solving
- The process of solving it is called logistics
  - Irrespective of whether it is consciously or subconsciously done
- Doing it consciously is an advancement and leads to the origin of the discipline
- In this logistics becomes an input – a value add like any commodity or service along the value chain
- It solves time and place problems efficiently

But the function’s ultimate output is customer service
Systems approach is important

- It highlights the necessity of integration
- Systems:
  - Have interconnected parts
  - These parts impact on each other
  - Variation in one part has an effect on each/most of the other parts
  - The sum of a series of activities is greater than its individual parts – if the system is effective
- Are open
- Are subject to entropy
  - The second law states that entropy always increases
  - But this is in closed systems
  - In open systems entropy can decline if the system draws effectively from the environment – in physics this refers to increased order of individual systems amongst entropy in the environment

The systems approach implies trade-offs
The origins of growing logistics is specialisation
Causing faster growth in time and distance disparity

Indexed = 1993

Freight flow (tonne-km) calculated from the NFFM
Primary Sector GDP
Secondary Sector GDP
Total GDP
Specialization in South Africa can be illustrated by comparing supply and demand on provincial levels…
… translating into flows and the need for logistics infrastructure

Total freight flow in SA
2007
Comparison of grain and FMCG flows in 2040

Grain flow in SA 2040

FMCG flow in SA 2040
The relationship between logistics and the marketing concept

Output of logistics = client service with one objective: customer satisfaction. Achievement of this objective should always lead to one specific result, i.e. a competitive advantage for the value cluster at play.
Logistics

Logistics solves the time and place discrepancy in the supply chain which is caused by specialisation.

It optimises transport and inventory carrying cost trade-offs given certain customer service expectations.

This requires the measurement of transport cost, the warehousing cost of inventory, the opportunity cost of investment in this inventory and the management and administration cost of these actions.

Where it is outsourced the profit margin of service providers is also included.
therefore logistics is required to provide time and place utility

Elements of Logistics

Time
1. Warehousing cost
2. Opportunity cost of carrying inventory
3. Admin and/or profit

Place
1. Transport Cost
2. Admin and/or profit

Specialization
Causes discrepancy between when and where a commodity is produced and consumed
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Service Provider (LSP) → Out-sourced cost

Producer → time and place → Consumer (including intermediate consumption)

Store → Transit: Incurred according to ToT → Store

Function within organization → In-sourced cost
Aims and objectives of project

**Reliable data**
- Transport data
- Freight movement on corridors
- Cost drivers

**Data elements**
- Market share
- Cost drivers
- Trends
- Forecasts

**Overarching cost**

**Solutions**
- Policy
- Transport planning
- Capacity creation

**Benchmarking**
The project consists of the following phases:

- Scoping and planning
- Alignment workshop
- Macro-economic analysis
- Industry level analysis
- Cost of logistics report and launch
Alignment workshop - TODAY

What we want to achieve today:

• Alignment on:
  • Assumptions for macro–economic freight logistics measurements
  • Classification of resulting measurement

But first let's contextualize in terms of the project
Macro-economic analysis

**National Freight Flow Model**
- Road & rail freight flows in SA
- Macro summary market share modes
- 4 Network typologies
  - Corridor
  - Metropolitan
  - Rural
  - Primary (long haul of base commodity)
- Freight flow between key economic sectors & key regions

**Logistics cost model**
- Cost on all modes with breakdown of identified logistics activities (inventory carrying cost, transportation cost, storage cost & admin cost) per economic subsector (agriculture, mining & manufacturing)
- Estimated annual logistics cost for SA
Demand side case study – Fruit industry

The purpose of the case study will be two-fold:
• To identify success stories for application in the private or public sector
• Identification of challenges to inform DoT actions and investments

Approach:
1. Analyse the logistics challenges of domestic and export fruit supply chains, including
   • Delays at loading & offloading facilities & truck stops
   • Handling costs, productivity a.o. issues at ports
   • Maintaining the cold chain
   • Potential use of rail
   • Supply chain visibility & information flows
   • Integration of smallholder/developing farmers into the supply chain

2. Investigate industry initiatives, e.g.
   • Tonnage off Tar
   • 1-Citrus packhouse to port transport harmonisation tool
   • ITC / NAMC developing farmer initiative

3. Recommendations
LSP Supply Side Survey

- 15 Interviews
- Areas:
  - Future trends in supply chain service provision;
  - Future technology trends;
  - Opportunities for collaboration between government and LSPs;
  - Positioning of SOEs and other government agencies in terms of creating an enabling environment for logistics service provision;
  - Freight logistics requirements (what the LSPs expect from government); and
  - Skills challenges and required interventions from government.

Workshop
- Participants (emerging operators, industry suppliers, rest of freight logistic industry, government agencies & SOE’s)
- High level implementation plan for integrated planning between Government & private sector
Report content:

- Key stakeholders and sources of information;
- Findings of the cost of logistics in South Africa
  - High-level summary of tonnages transported in the SA economy by both public road, private road and rail
  - High-level summary of logistics cost as % of GDP within major economic sectors (agriculture, mining and manufacturing)
- Trends within SA’s logistics and supply chain management and a benchmark of SA’s performance globally
- Results of LSP survey and demand-side case study to inform the status of the supply chain network for the various sectors of the freight transport industry
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Alignment issues and ideas
People must therefore get away from the idea that serious work is restricted to beating to death a well-defined problem in a narrow discipline, while broadly integrative thinking is relegated to cocktail parties.

In academic life, in bureaucracies, and elsewhere, the task of integration is insufficiently respected. Yet anyone at the top of an organization, a president or prime minister or a CEO, has to make decisions as if all aspects of a situation, along with the interaction among those aspects, were being taken into account.

Is it reasonable for the leader, reaching down into the organization for help, to encounter only specialists and for integrative thinking to take place only when he or she makes the final intuitive judgements?

Murray Gell-Mann, Winner of the Nobel Prize for Physics, in “The Quark and the Jaguar”