

AMERICAN UNIVERSITY OF BEIRUT

FEASIBILITY STUDY:  
LOG LIBAN LOGISTICS AND WAREHOUSING

by  
L'EMIRA MADA L'EMIR FAYSAL ARSLAN

A project  
submitted in partial fulfillment of the requirements  
for the degree of Master of Business Administration  
to the Suliman S. Olayan School of Business  
at the American University of Beirut

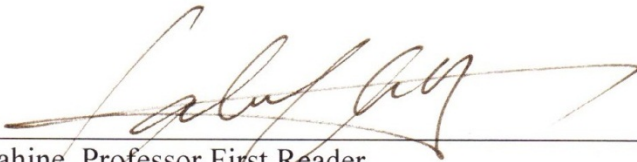
Beirut, Lebanon  
May 2013

AMERICAN UNIVERSITY OF BEIRUT

FEASIBILITY STUDY:  
LOG LIBAN LOGISTICS AND WAREHOUSING

by  
L'EMIRA MADA L'EMIR FAYSAL ARSLAN

Approved by:



---

Dr. Salim Chahine, Professor First Reader  
Suliman S. Olayan School of Business



---

Dr, Riad Obegi, Chairman Second Reader  
Banque BEMO S.A.L

Date of project presentation: May 17th, 2013

# AMERICAN UNIVERSITY OF BEIRUT

## PROJECT RELEASE FORM

I, L'Emira Mada L'Emir Faysal Arslan

authorize the American University of Beirut to supply copies of my project to libraries or individuals upon request.

do not authorize the American University of Beirut to supply copies of my project to libraries or individuals for a period of two years starting with the date of the project deposit.

---

Signature

---

Date

## ACKNOWLEDGMENTS

I would like to express my special thanks and gratitude to the following people

Dr. Salim Chahine for his valuable input, advice and encouragement throughout the course of my MBA,

Dr. Riad Obegi for his trust and support,

Dr. Wassim Dbouk for his guidance and infinite wisdom,

My friends for being there for me during both the good and the bad times,

And finally my mother Hayat Wahab Arslan for her support of my education.

# AN ABSTRACT OF THE PROJECT OF

L'Emira Mada L'Emir Faysal Arslan

for

Master of Business Administration

Major: Business Administration

**Title: Feasibility Study: Log Liban Logistics and Warehousing**

This project is to assess an investment decision on increasing a warehousing location's capacity. We start by examining the macroeconomic environment of Lebanon, then move to an overview of the logistics industry including an analysis of Porter's five forces model. We proceed by describing the company, its value and supply chains, its strengths, its weaknesses, its opportunities and its threats; we present its strategy and a detailed description of its financial performance and benchmark it to its competitors. We continue by assessing the strategic move of expanding the Hadath location, and finally conclude with our recommendations.

# CONTENTS

	Page
ACKNOWLEDGEMENT.....	v
ABSTRACT.....	vi
LIST OF ILLUSTRATIONS.....	x
LIST OF TABLES .....	xi
Chapter	
I. INTRODUCTION.....	1
II. MACROECONOMIC OVERVIEW.....	3
A. Lebanon.....	3
1. Infrastructure.....	4
B. The Logistics Industry.....	5
1. Porter’s Five Forces Model.....	7
III. THE COMPANY.....	9
A. Value Chain.....	9
B. Supply Chain.....	10
C. SWOT Analysis.....	11
D. Strategy.....	11
E. The Competition.....	14

IV. STRATEGIC MOVE.....	16
A. The Hadath Location.....	16
B. Valuing The Project.....	17
1. Base Case.....	19
2. Worst Case.....	19
3. Best Case.....	19
C. Market Survey.....	20
V. CONCLUSION & RECOMMENDATIONS.....	21
Appendix	
I. ORGANIZATION CHART.....	24
II. FINANCIAL HIGHLIGHTS.....	25
III. LOG LOBAN’S LOCATIONS.....	26
IV. THE COMPETITION.....	27
V. THE LEBANESE ECONOMY.....	28
A. MACROECONOMIC OVERVIEW OF LEBANON .....	28
B. STAGE OF DEVELOPMENT OF THE LEBANESE ECONOMY .....	31
C. ECONOMIC DIVERSIFICATION OF LEBANON.....	32
VI. LEBANON’S INFRASTRUCTURE.....	33

VII. COMPARABLE WAREHOUSE RENTS.....	34
VIII. NET PRESENT VALUE ANALYSIS.....	35
IX. BASE CASE’S SENSITIVITY ANALYSIS TO WACC.....	37
X. BEST CASE’S SENSITIVITY TO WACC, CAPACITY UTILIZATION RATES, GROWTH, AND COST OF NEW STRUCTURE.....	38
XI. MARKET SURVEY QUESTIONNAIRE.....	40
XII. MARKET SURVEY RESULTS.....	41
REFERENCES.....	42



# ILLUSTRATIONS

Figure	Page
1. Porter's Five Forces Model.....	7
2. Value Chain Analysis .....	9
3. Supply Chain Analysis .....	10
4. SWOT Analysis .....	11

# TABLES

Table	Page
1. Hadath Warehouse Area Distribution.....	16
2. Calculation Of Cost Of Equity.....	17
3. Calculation Of Cost Of Debt.....	17
4. Capacity Utilization Rates Applied.....	19

*In Memory Of My Father*

# CHAPTER I

## INTRODUCTION

LOG Liban is a B-2-B company aiming at decreasing its clients' supply chain costs by taking care of their warehousing and distribution needs; thus becoming embedded in its customers' supply chain wherever the need to transport lies.

The company accumulated its logistical knowledge and expertise since 1959 when it was a department within ACP Holding, a subsidiary of the ARS Group (refer to Appendix 1 for the organization chart); and in 2006 the department was spun-off into an independent entity that caters to its sister companies and takes on third parties as well: in 1998, LOG won the distributor contract for FastFood Lebanon.

Today, LOG is looking to leverage its distribution know-how and expand its capacity to serve all of the group's companies and extend their services to third parties within Lebanon.

The main challenge facing LOG Liban is capacity. Its Hadath location and its central distribution point in Dekwaneh are operating at a 100% capacity (refer to Appendix 3 for the locations). Management has identified a need for increasing capacity to both serve its existing clients and to take on additional third party clients. Therefore we are assessing the profitability of expanding the Hadath location by rebuilding the warehouse.

We start by examining the macroeconomic environment of Lebanon, then move to an overview of the logistics industry including an analysis of Porter's five forces model. We proceed by describing the company, its value and supply chains, its strengths, its weaknesses, its opportunities and its threats; we present its strategy and a detailed description of its financial performance and benchmark it to its competitors. We continue by assessing the strategic move of expanding the Hadath location, and finally conclude with our recommendations.

## CHAPTER II

### MACROECONOMIC OVERVIEW

“The logistics industry has distinct pull effect on national economy”

(Bin and Chaoyuan, 2005)

#### **A. Lebanon**

Lebanon’s geographical size (10,452 Km<sup>2</sup>) and location at the intersection of Europe and the MENA region, and its natural resources determine its economic structure where services is the dominant sector with 75.8% of GDP, exports are 23.74% of GDP with the UAE (13.1%) being the top export partner, and imports are 50.43% of GDP with the U.S. (10.2%) being the top partner (Appendix 5-A).

The significance of Lebanon as a transportation hub or the gateway to the MENA region is contested by the fact that Lebanon is currently landlocked due to the conflicts in Syria and the enmity with Israel; and the long lasting civil conflicts and political tensions from 1975 to this current day has driven away investments and contributed to the deterioration of the economy when other countries in the region such as the UAE-Dubai has cemented its position as a global hub for trade, transport, and tourism (ForbesCustom).

The political risk has taken its toll on the economy as GDP in 2012 grew at a mere 2%, inflation was at 5.5%, and youth unemployment at 22.1% (Appendix 5-A). According to the IMF (*World Economic Outlook Database, October 2012*), Lebanon’s GDP is expected to grow at 2.5% in 2013 and at 4% from 2014-2017.

In addition, four factors out of the top 5 most problematic factors for doing business in Lebanon relate to government instability and corruption which affect the country’s global competitiveness

(ranking 91<sup>st</sup> out of 144 countries) according to the World Economic Forum (Appendix 5-B). Lebanon is transitioning from the second to the third stage of economic development where the economy in Stage 2 is efficiency driven and the economy in Stage 3 is innovation driven; yet it is still underperforming the average economies in the same transition stage on three crucial dimensions: Infrastructure, Macroeconomic environment, and Technological readiness.

These factors lead Lebanon to be classified as a High Risk country (Economist Intelligence Unit, 2010) that is economically mostly unfree (The Heritage Foundation, 2013).

The Lebanese economy is however well diversified with Trade, Restaurants, Hotels and Real Estate being the dominant sectors. The smallest sectors are Transport & Communication and Distributive (Appendix 5-C).

The Lebanese society is a consumer society with household expenditure representing 79.82% of GDP. The population is highly urbanized at 87% of the population living in cities but only 52% use the internet; the population growth rate is estimated at -0.38% in 2012 (Appendix 5-A).

### *1. Infrastructure*

“Infrastructure is (...) fundamental to economic growth” (European Foundation for the Improvement of Living and Working Conditions, 2008) however, in Lebanon it is the most problematic factor facing businesses according to the World Economic Forum (Appendix 5-B). It is one of the government’s priorities and the IMF recommends the launching of “the long-delayed reforms to develop the infrastructure” in the aim of boosting the economy (IMF, 2012); and based on the IMF’s assessment, Lebanon underperforms the average emerging countries on every infrastructure sub-indicator except quality of air transport, fixed telephone lines, and quality of port infrastructure (Appendix 6).

## **B. The Logistics Industry**

The global trend of logistics is being reshaped by (Hess, 2011):

- *Shifting trade patterns*; where Latin America-Asia (5%), Intra-Asia (25%), and the MENA-Asia (18%) “represent nearly 50% of total trade and are expected to grow fast in the coming years”.
- *Customization*; tailored logistics solutions for each customer. Conducting a market survey in Lebanon (Appendix 10), Lebanese Mezze identified a failed attempt at outsourcing their warehousing and distribution operations (Chaoul, P., personal communication, May 8, 2013).
- *Information management*: “logistics is increasingly about supply chain information management and not only about physical handling of the flow of goods”.
- *Cost & carbon efficiency*: as environmental concerns rise, green logistics seek to minimize the carbon footprint associated with the supply chain.

The MENA region is attracting worldwide transportation and logistics players (Kögler, Majdalani, and Kuge, 2009) as infrastructure improves and the economy shows significant growth at 4.8% real GDP in 2012 compared to the 1.2% sluggish growth of the advanced economies (US, Euro Area, Japan, UK, Canada, others) (IMF, 2013). Total transport and logistics market of the Middle East has a forecast value of \$27 billion in 2012 with Aramex being the regional leading player (Kogler et al., 2009). The market is however highly fragmented with a probability of massive consolidation, and the low level of logistics outsourcing creates an opportunity for the market to grow even further (Kogler et al., 2009).



Companies that outsource non-core functions are able to leverage their “resources, spread risks, and concentrate on issues critical to survival and future growth” (Sink, and Langley, 1997). However, they are yet to realize the full advantages of outsourcing their logistics operations to a 3PL citing financial, chaos, market, and management risks (Wang, and Regan, 2003).

Lebanon’s logistics market is reflective of that of the Middle-East’s in how fragmented it is, yet it lacks the governmental support in nurturing the appropriate climate for it to thrive. “The logistics industry has distinct pull effect on national economy (...), the development of this industry is crucial to the high-speed promotion on GDP of national economy” (Bin and Chaoyuan, 2005); however, the infrastructure’s status cited as the first hindrance to businesses (Appendix 5-B) and the significant political risk prevent the observation of the pull effect on national economy. The overall performance of logistics is 2.58/5 according to the World Bank’s development indicators (Appendix 5-A).

Some rules and regulations exist to monitor and control the storage and distribution of food products especially in relation to product temperature, expiry dates, and cleanliness. LOG Liban abides by the rules and regulations set forth by the ministry of economy and trade, the ministry of health, and the ministry of interior.

*Porter's 5 Forces Model*

Existing Rivals: The market is highly fragmented with little differentiation between competitors which creates low switching costs for the consumers; according to an anonymous source, Expeditors is the leading importer in air freight yet their market share in that segment is less than 5%.

**Porter's Five Forces Model**

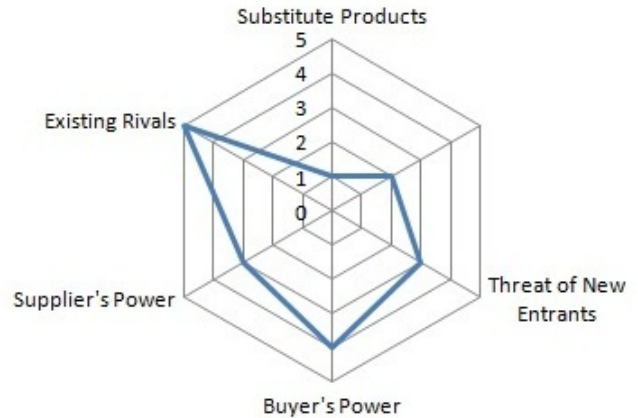


Figure 1: Porter's Five Forces Model

In addition to being price sensitive, consumers are more importantly hesitant to relinquish control over part of their supply chain.

Thus outsourcing to a 3PL is still considered expensive and inflexible. LOG's primary competitors are Agility, BPC Logistics, Al Makhazen, Radec Logistics, Damco, Mareco, Aramex, and Calliondji (refer to the Supply Chain p 10).

Supplier's Power: LOG's suppliers exercise moderate power over it since according to its operations officer it can negotiate a discount from its suppliers. Span supplies LOG with forklifts, racks, and material handling; Caterpillar supplies it with forklifts; Toyota with pick-ups; IRC with part-time labor; Medco with energy; Dataflow with IT services; and other miscellaneous suppliers such as different carpenters with pallets and different forwarders for imports/exports such as TNT, Aramex, and FedEx.

Buyer's Power: Given the low switching costs and the high fragmentation of the industry combined with the prevalent consumer behavior of in-house warehousing and distribution,

buyers do exercise significant power. LOG has a high client concentration risk where its revenues depend primarily on serving its sister companies and one major third-party: McDonald's.

**Threat of New Entrants:** Theoretically, any company with financial resources can cross the barrier to entry; however, the knowledge and expertise remain the critical factors for success. LOG has accumulated its knowledge and expertise over 74 years since it was just a department within ACP Holding (Appendix 1) and before being spun-off into an independent company in 2006. Today LOG can lever its skills by expanding its clientele base and taking advantage of the ARS brand equity and thus raise the barriers to entry.

**Substitute Products:** Goods always need to be stored and moved; therefore there is no substitute for the warehousing and the distribution of goods. However, innovation can greatly impact the way 3PLs conduct business; for example, technological developments can improve demand forecasts and the application of the just-in-time system thereby cutting through the storage revenues but increasing the distribution revenues.

## CHAPTER III

### THE COMPANY

“To satisfy client requests through professional customer service”

(Company Mission Statement)

LOG is a subsidiary of the ARS Group, a diversified portfolio of family owned businesses that operate in the banking and finance, chemicals, agriculture, and fast moving consumer goods sectors with a presence in the Middle East & North Africa and Europe. The company primarily caters to its sister companies within ACP Holding, deriving 95% of its revenues from HL, Blue Bird, and ACP. It offers a full range of services from procurement to delivery and servicing (refer to Value Chain below) with distribution accounting for 64% of revenues (Appendix 2).

#### A. Value Chain

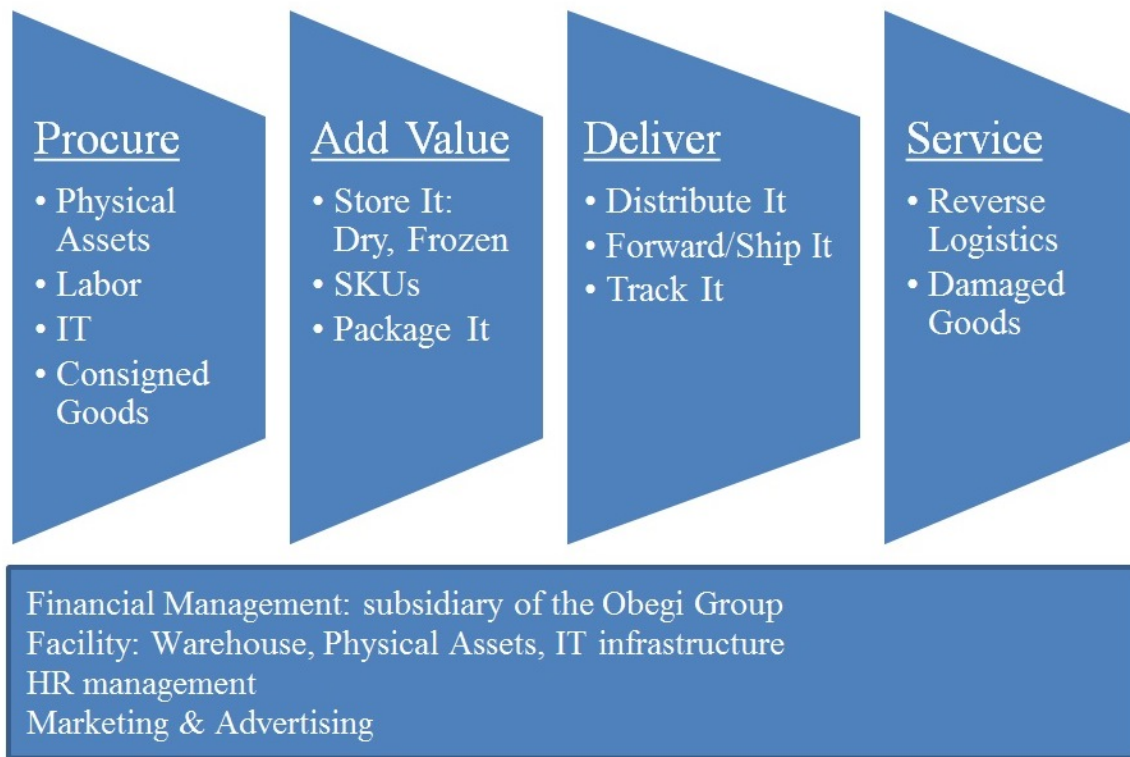


Figure 2: Value Chain Analysis

LOG covers its nationwide network from its 4 strategically located warehouses (Appendix 3). Its fleet of 34 trucks and 110 employees process on average 5,500 deliveries per month. The trucks are equipped with a tracking system to track and ensure that the deliveries are executed within the promised 12-36 hours. The 4 locations are operating at 100% capacity forcing LOG to rent additional spaces during its peak months of June, July, and August for dry products and June and July for frozen products.

## B. Supply Chain

The supply chain depicts LOG's major suppliers and customers as well as its major competitors.

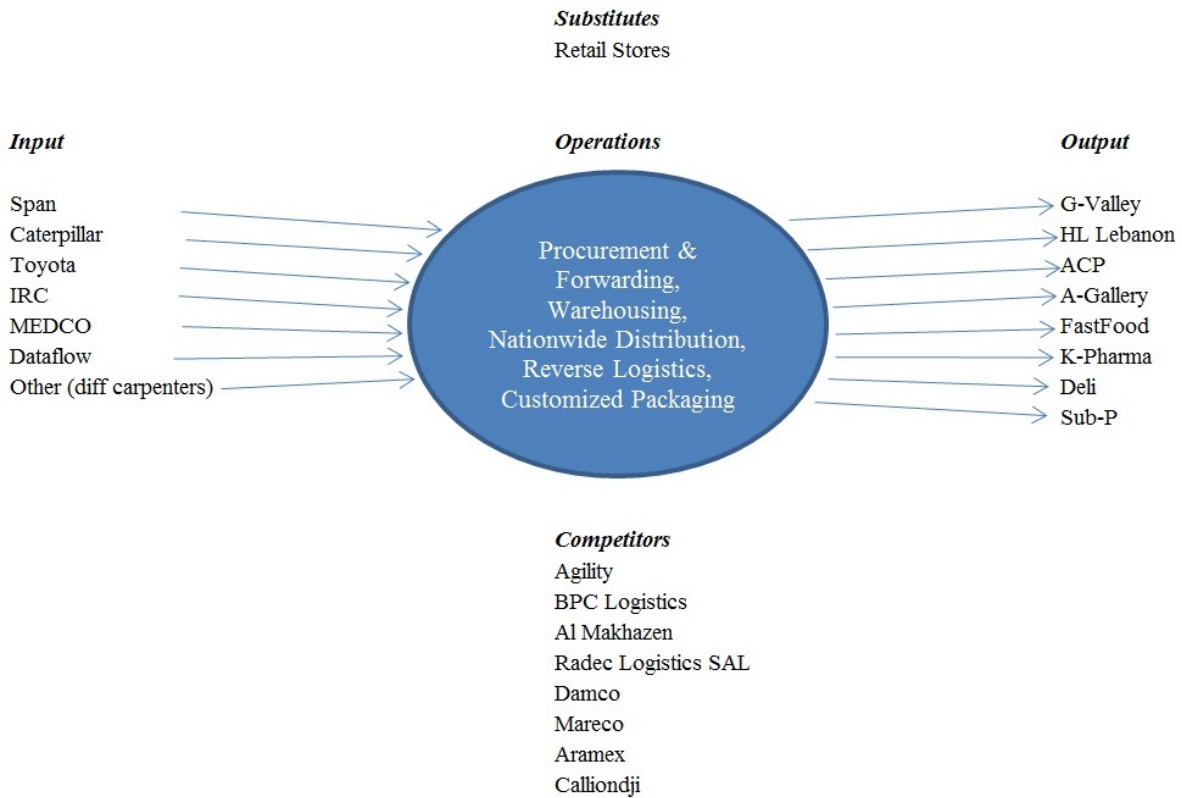


Figure 3: Supply Chain Analysis

### C. SWOT analysis



Figure 4: SWOT Analysis

### D. Strategy

“Essentially, breadth of service portfolio and geographic reach are the dominant factors in defining a sustainable business strategy for a logistics service provider”

(Köglere et al., 2009).

LOG’s strategy is based on providing its sister companies with a full range of services, owning its own fleet of vehicles, and financing its operations through debt (80%, Appendix 2). This model is risky with high client concentration risk (the group and FastFood), geographical concentration risk (operating 100% in Lebanon), and has a high financial risk with 80% debt making it volatile to economic downturns especially since Lebanon’s growth is forecast by the IMF at 2.5% for 2013 and at 4% from 2014-2017 (International Monetary Fund, 2012). However, LOG’s sensitivity to the macroeconomic environment is mitigated by the fact that it

caters primarily to its sister companies operating in the FMCGs sector: It has been growing organically for the past 3 years at an average of 11% in revenues.

In an industry of low profit margins, businesses price their services competitively and adopt a low-cost high-volume approach to stay profitable. Benchmarking LOG to multinational logistics companies operating in Lebanon highlights its financial performance: LOG, Agility, FedEx, UPS, and DHL achieve less than 5% in profit margins (Appendix 4) whereas Aramex achieves the highest profit margin amongst the competitors at 9.39% due to its low effective tax rate of 6.85%<sup>1</sup>; however, Aramex still achieves the highest return on sales (9.87%) which means it is efficiently keeping its operating expenses low. Refer to *The Competition* p 14.

LOG is aiming at diversifying its customer base taking advantage of the rising real estate costs and the shift in consumer behavior where companies find benefits in outsourcing their warehouse and distribution operations to a 3PL thereby eliminating investments in infrastructure, improving their abilities to quickly react to changes in the business environment, and significantly reducing overhead costs (Wang and Regan, 2003).

Pitfalls of outsourcing (Wang and Regan, 2003):

- *Inefficient management*: if the in-house logistics had a poor operational performance, outsourcing that department may not reduce costs.
- *Information asymmetry*: “if a third party logistics provider has incomplete information about the contracting companies’ cost structure, the price it will offer (and therefore its profit level) may not be well matched to that cost structure”.
- *Loss of logistics innovative capacity*

---

<sup>1</sup> Aramex annual report 2011

- *Hidden costs*: there are hidden costs associated with selecting a 3PL provider, negotiating & drafting a contract, and renegotiating it or constantly monitoring the provider to get the needed performance.
- *Dependence on the 3PL provider*: the outsourcing company may lose in the long run control of part of its logistics activities.
- *Loss of control over the 3PL provider*: since the information available to the new logistics manager is less comprehensive than the information available in-house, ineffective communication could lead to quality problems and delays, misunderstandings and mistrust.
- *Problems of evaluating and monitoring the 3PL's performance*: proper evaluation requires resources such as money, time, and expertise which add to the hidden costs.
- *Conflicts of firms' culture*: the parties may assess the commercial merit of the partnership from different perspectives.

These pitfalls hinder the companies' appetite to outsource to a 3PL. Zaatar W Zeit, Roadster Diner, AlSh., Converse, and Lebanese Mezze are some of the surveyed companies that are not willing to outsource their warehousing and distribution operations (Appendix 12).

Multinational FMCGs choose "collaborative arrangements" (Daniels, Radebaugh, & Sullivan, 2012) as a mode of entry into emerging markets to minimize operating costs and exposure to the country and credit risks: Bel Group relies on 2 distributors in Lebanon (Tabbara and Massoud) to market their portfolio of cheese products; the company builds and owns its brands, its primary activity is marketing and setting the sales strategy while the distributors' job is to place the product on the shelves; as a result the warehousing and distribution costs and the credit risk ("Bel only has 2 customers instead of having 3,000") are 100% born by the distributor (R. Mezher,



personal communication, April 11, 2013). Danone-Bledina follows the same approach: Fattal distributes the products and they have no warehousing and distributions costs (H. Razzouk, personal communication, May 7, 2013).

The fragmented logistical sector is both an opportunity and a threat to LOG. As the market could undergo major consolidation, existing or new players could acquire other companies broadening their line of services and offering their customers a one stop shop. “Any logistics player aspiring to master the increasing competitive dynamics will need to act swiftly and strategically to offer comprehensive transportation solutions and warehousing services, create a strong and extended geographic reach, and focus on well-defined customer segments (for instance, by industry or by geographic market) (...) Hence, companies compete only on the basis of price, customer service, and quality of service. (Köglere et al., 2009). LOG differentiates itself from the competition by offering comprehensive transportation and warehousing solutions: by building its capacity, it can capture a bigger market share.

### **E. The Competition**

The supply chain above depicts the primary competitors of LOG: Agility, BPC Logistics, Al Makahzaen, Radek Logistics, Damco, Mareco, Aramex, and Calliondji.

Only Agility and Aramex are public entities yet no specific information about their operations and profitability in Lebanon are published. We will benchmark LOG’s financial performance to these companies and to DHL, FedEx, and UPS.

The overall financial outlook of LOG in 2012 compared to 2011 shows that capital increased 6% as equity increased 31% (no dividends paid out) and total debt increased 2%; revenues increased 13.98%, EBIT increased 8%, and net income increased 12% (the spread in increase between EBIT & NI is due to interest income). A closer look at the balance sheet shows current assets

decreased 9% (inventory and net receivables), long-term assets increased (purchase of fixed assets 55%), and current liabilities have been substituted for long-term liabilities.

A financial ratio analysis (Appendix 2) highlights some weaknesses despite this positive performance: profit margins and operating margins/return on sales (ROS) decreased despite the increase in sales due to the increase in operating expenses. This translates into a lower ROE especially with the increase in equity. ROC however improved as EBIT's increase offset the increase in capital and the asset utilization ratios show improvement in asset management as total asset turnover and capital intensity decreased. Note that non-cash ROE is significantly lower than ROE; this is due to interest income- however this interest is not earned from cash or financial instruments, it is interest on late collection of receivables.

The nature of the transportation industry forces the companies to be capital intense with high fixed costs resulting in low profit margins. However this model does not apply to the MENA and Lebanon since the dominant transportation modes are by land and sea, as opposed to the US market where FedEx for example owns 663 aircrafts, the world's 3rd largest fleet (ArabianBusiness 2012). The highest costs incurred by LOG and Aramex are employee compensations.

LOG and UPS offer their owners high returns with the highest ROEs as compared to the rest of the competitors (Appendix 4). This is due to their high debt levels (both above 80% in 2012). Only Aramex achieved a profit margin above 5%. Comparing the companies' ROC to their respective WACC, only FedEx and Aramex are able to generate excess returns; the rest of the companies are destroying value. LOG therefore needs to improve its ROC, refer to Chapter V: Conclusions and Recommendations (p 20).

# CHAPTER IV

## STRATEGIC MOVE

“Warehousing is nothing more than the management of space and time”

(Speh, 2009)

In order for LOG to grow and improve its return on capital (ROC), especially that low profit margins come with the territory, it has to apply a low-cost high-volume approach to stay profitable which necessitates increase in sales while keeping costs low. Management has identified a need to increase capacity to be able to fulfill the needs of the group and take on additional third parties as they are turning away customers (Bou Nassif, A., personal communication, February 15, 2013). Therefore we are assessing the profitability of expanding the business by rebuilding the Hadath Location. Note that when a company’s ROC is less than its WACC, it is destroying value by earning less than what it is using to finance its projects; however if the investment has a positive Net Present Value, it should be undertaken.

### A. The Hadath Location

The Hadath Location is used to store McDonald’s inventory, frozen and chilled products, the cosmetics of HL, and the imported brands of ACP. Distribution to point of sales are dispatched from the central distribution point in Dekwaneh that also houses the dry products of Blue

Hadath Warehouse	
Dry storage	6,532 m <sup>2</sup>
Refrigerated storage	1,471 m <sup>2</sup>
Deteriorated products	91 m <sup>2</sup>
Packaging	328 m <sup>2</sup>
Offices	126 m <sup>2</sup>

Table 1: Hadath Warehouse Area Distribution

Bird and HL’s detergents. Rent of the Hadath Location is at \$22.17/m<sup>2</sup> whereas the minimum rent of a warehouse space in Beirut and its greater areas is at \$26.67/m<sup>2</sup> (Appendix 7).

## B. Valuing the project

We have valued the investment using the Net Present Value approach (NPV) where we discount the incremental cash flows resulting from the investment (Ross, Westerfield, & Jordan, 2010).

- *Cost of Equity (Re)*: 48.21% calculated using the Capital Assets Pricing Model (CAPM). It is based on the risk-free rate (Rf) of the U.S. Treasury 10 Year Yield of 1.71%

Risk-free Rate <sup>2</sup>	1.71%
Equity Risk Premium <sup>3</sup>	5.80%
Unlevered Beta Adjusted For Cash <sup>3</sup>	1.14
Debt/Equity Ratio <sup>2</sup>	233%
Levered Beta	3.40
Country Risk Premium <sup>3</sup>	6.77%
Liquidity Risk Premium	20%
Cost of Equity	48.21%

Table 2: Calculation of Cost of Equity

(Bloomberg<sup>3</sup>), The U.S. Equity Risk

Premium of 5.80%<sup>4</sup>, The Unlevered Beta Adjusted For Cash for a U.S. retail store of 1.14<sup>3</sup> (given the nature of the businesses LOG caters to, FMCGs). The cost of equity is adjusted to Lebanon based on a country risk premium (CRP) of 6.77%<sup>3</sup> and a liquidity risk premium of 20% (Damodaran, 2005).

- *Cost of Debt (Rd)*: The pre-tax cost of debt of 6.92% is obtained by adding 5.21%<sup>5</sup> country default spread to Rf.

Pre-Tax (Rd)	6.92%
Marginal Tax Rate - Lebanon	15.00%
After-Tax (Rd)	5.88%

Table 3: Calculation of Cost of Debt

- *Weighted Average Cost of Debt (WACC)*: **18.58%** calculated by using the targeted debt ratio of 70%.
- *Growth Rate (g)*: 7.98% in 2012 calculated as non-cash ROC (4.02%, Appendix 2) x Reinvestment Rate (199%). Reinvestment Rate is based on normalized reinvestments ÷

<sup>2</sup> Appendix 2

<sup>3</sup> <http://www.bloomberg.com/markets/rates-bonds/government-bonds/us/>

<sup>4</sup> Aswath Damodaran

<sup>5</sup> Aswath Damodaran

adjusted EBIT(1-t). We applied a straight-line decreasing growth that reach stable growth period in 2017 at 4% (the economy's estimated growth by IMF).

- *Period (N)*: We used a period of 7 years starting in 2014 since a typical payback period for a distribution center is 6 to 7 years (Faraj, R. personal communication, May 8, 2013).
- *Capacity*: The current capacity used at the Hadath location is 4,000 cbm/day for dry storage and 3,000 cbm/day for frozen and chilled storage. During peak months, LOG rents additional external space to fulfill 3,000 cbm/day for dry products (June, July, and August) and 2,100 cbm/day for frozen products (June and July). The new warehouse has double the capacity thus eliminates the need for external renting.
- *Incremental Revenue*: Revenues generated from the additional capacity that resulted from the expansion. The yearly additional capacity is based on the capacity utilization estimates.
- *Operating Costs*: The average margins from 2010-2012 were used.
- *Incremental Costs*: These are relevant costs incurred as a result of the investment. Maintenance of the new building estimated by management at \$75,000/year.
- *Cost Savings*: External renting in connection with peak months of \$138,700/year. Maintenance of the old structure of \$20,000/year. Increased efficiency of \$48,000/year.
- *Investment Costs*: New Structure \$3.2 million (mix of steel and concrete). Material Handling Equipment based on 1 forklift per 1,000 additional cbm that cost \$180,000. Racking based on 2,754 pallets that cost \$165,264.
- *Depreciation*: New Structure 10% based on management estimate which is in line with the ministry of finance. Forklifts 15%. Pallets 10%. For simplicity, we assume that the salvage values of the assets are the same as their book values.

- *Capacity Utilization Estimates:* the capacity utilization is estimated under the normal scenario (base case) to start at 40% in 2014 and steadily increase in increments of 10% over the next 6 years reaching 100% in 2020.

Capacity Utilization Rates			
Year	Worst Case	Base Case	Best Case
2014	20%	40%	85%
2015	30%	50%	100%
2016	50%	60%	100%
2017	60%	70%	100%
2018	80%	80%	100%
2019	100%	90%	100%
2020	100%	100%	100%

Table 4: Capacity Utilization Rates Applied

### 1. Base Case Scenario

The Base Case Scenario shows a negative NPV of \$1,109,705 with a negative IRR of 9.74%. The project should be **rejected** despite the positive IRR. Appendix 9 shows the base case's sensitivity to different WACC levels. When WACC descends to 9.74% the project becomes profitable. It is also worthy to note that even when we remove the illiquidity premium under the fact that there is only one owner of the company with no intention to sell, WACC would be 12.58% which is still higher than break-even IRR of 9.74% and would generate a negative NPV of \$418,074.

### 2. Worst Case Scenario

The Worst Case Scenario based on lower capacity utilization rates. It results in a negative NPV of \$2,519,949 with a negative IRR of 5.91%. The project should be **rejected**.

### 3. Best Case Scenario

The Best Case Scenario shows a positive NPV of \$45,178 with an IRR of 18.96%. The project should be **accepted**. However, high capacity utilization needs to be achieved from the first year.

Appendix 10 shows the best case's sensitivity to different WACC levels, capacity utilization rates, growth, and cost of the new structure. The sensitivity study shows that even with the combination of the lowest level of WACC (13.86%), the highest growth rate throughout the years (constant 7%) that decreases to 4% only in 2020, and the lowest structure cost of \$2.8 million, the capacity needed to achieve positive NPV is still high at 60% in 2014, 80% in 2015, 90% in 2016, and 100% thereafter.

Refer to Appendix 8 for details of the calculations.

### **C. Market Survey**

We have conducted a market survey to assess demand in the market and the potential revenues. The survey questionnaire is shown in Appendix 11 and the results in Appendix 12. Nine out of the 18 surveyed businesses own and operate<sup>6</sup> their own warehouse and distribution network, 2 implement a hybrid model where they own their own warehouses and outsource part of their distribution operations to a 3PL. The remaining 7 companies that outsource their warehousing and distributions are multinationals: Diageo uses Fastrack in the premium drinks business, its product portfolio encompass Johnnie Walker, J&B, Baileys, Smirnoff and Ketel One vodkas etc.; Azadea contracts Expeditors; L'Oreal commissions Abou Adal; Novartis pharmaceuticals relies on Fattal; Bel Group collaborates with Tabbara and Massoud to distribute its cheese portfolio that include Picon, Kiri, BabyBel, Boursin, La Vache qui rit etc.; and Danone-Bledina collaborates with Fattal.

---

<sup>6</sup> Note: when we mention that the companies own their warehouses, we do not mean that they have necessarily bought the space, they could be renting it.

The potential revenues identified are an estimated average of \$2.2 million. However, should LOG undertake the investment hoping for a best case scenario, it faces the challenge of convincing these companies to outsource as they are hesitant to relinquish control over part of their supply chain. In addition, should LOG target these companies, it needs to fundamentally understand their cost structure in order to profitably price its offer. There are many factors that play into determining the commercial merit of outsourcing, refer to “pitfalls of outsourcing” on page12 above.



## CHAPTER V

### CONCLUSION & RECOMMENDATIONS

“Most firms have difficulties sustaining growth for long periods especially while earning excess returns. What creates value is the company’s sustainable competitive advantage”.

(Dr. Wassim Dbouk)

LOG Liban faces tough challenges. Operating at 100% capacity, its operating and profit margins have decreased despite the increase in sales (Appendix 2), and return on equity and return on capital have also both decreased.

LOG Liban needs to increase its sales volume. As we have shown in Chapter IV above, expanding the Hadath location to double its capacity is only profitable under the best case scenario where the additional capacity is immediately utilized at 85% and jumping to 100% utilization in the subsequent years. However, the use of 18.58% as WACC is one of the pitfalls of operating in emerging markets. Investors in Lebanon require higher returns as compensation for taking high risk in a country with political turmoil, inefficient capital markets (illiquid and undiversified stock exchange- Beirut Stock Exchange), and where most companies are private family-owned businesses. Realistically, businesses in Lebanon cannot achieve a return on capital as high as this WACC. RYMCO is a publicly traded Lebanese automotive company that managed to achieve return on capital of 3.67% in 2010<sup>7</sup>.

---

<sup>7</sup> Annual report, Rymco 2010.

The consumer behavior is changing towards outsourcing but those that are currently outsourcing are multinationals and despite identifying potential additional revenues of \$2.2 million on average that LOG can pursue (market survey- Appendix 12), winning over new clients requires a meticulous study of that client's cost structure and understanding of their culture to avoid the pitfalls of outsourcing (p 12). Therefore, unless LOG can generate \$2 million in revenues from additional clients immediately and increase those revenues at an average of 4.4% a year, the investment will not be profitable.

We advise against undertaking this investment even though it would be profitable under the base case scenario if management is willing to accept a lower WACC at 9.74% (Appendix 9). We base this decision on the fact that LOG is required to immediately fill almost 100% of the additional capacity, and attracting new customers may drive the company into a price war with its competitors that it cannot sustain given its current cost structure. In addition, Lebanon is currently landlocked and despite the anticipated boom from oil and gas to lift the economy, we do not foresee a near qualitative change in infrastructure that would propel the logistics sector and justify a current investment of \$3.8 million.

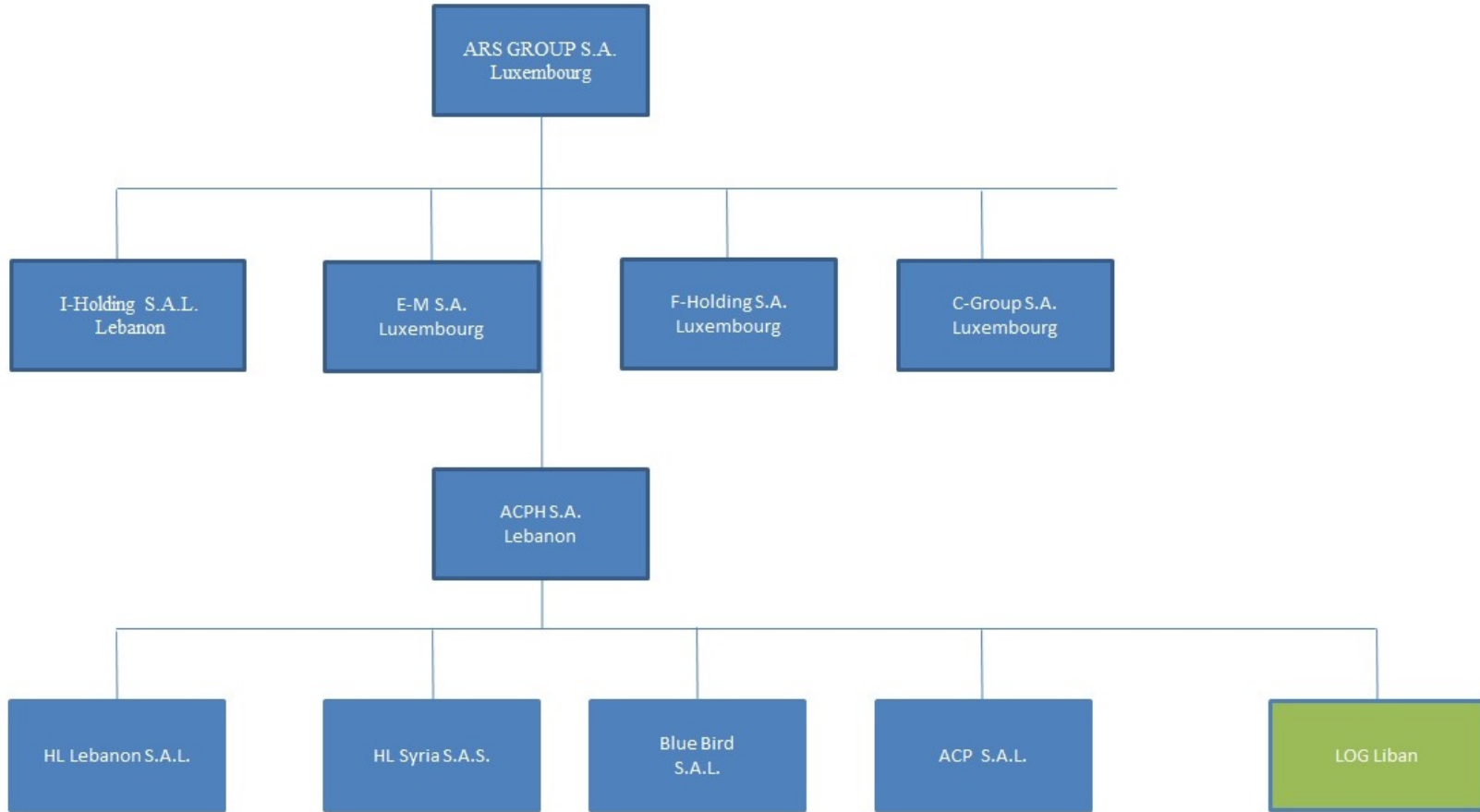
We would also like to note that according to the operations manager, LOG cannot serve the whole ARS Group due to the nature of their businesses- agriculture and chemicals are packaged and stored in different ways and impose additional operational risks: safety, contamination etc. (Itani, A., personal communication, April 18, 2013).

To improve performance (ROC), we recommend that LOG increases its EBIT and/or decrease its capital by:

- 1- Using its functions and resources profitably within the group rather than take the role of a cost center for the benefit of its sister companies; LOG should be treated as an independent entity rather than a supportive entity. The main increase in capital that lead to a decrease in ROC is due to the purchase of fixed assets that were leased to sister companies.
- 2- Taking advantage of synergies with sister companies to jointly forecast demand and minimize the time the products spend in storage. This increases the space utilization and sales turnover. Implementing an optimized just-in-time system will increase LOG's distribution revenues which is its most profitable activity segment.
- 3- Keeping its current debt levels despite the potential associated financial risks since after-tax cost of debt (5.88%) is significantly less than cost of capital at 48.21% and LOG's interest coverage (TIE) of 2.32 in 2012 and cash coverage ratio of 6.11 are close to industry median (Appendix 4). Aramex and FedEx exhibit the highest TIE and cash coverage ratios since they have low debt-to-equity levels at 31% and 103% respectively.

Finally, LOG Liban can diversify and grow its revenue stream without having to heavily invest in capital by providing supply chain consultancy services thus leveraging its 74 years of accumulated knowledge and expertise in warehousing and distribution management.

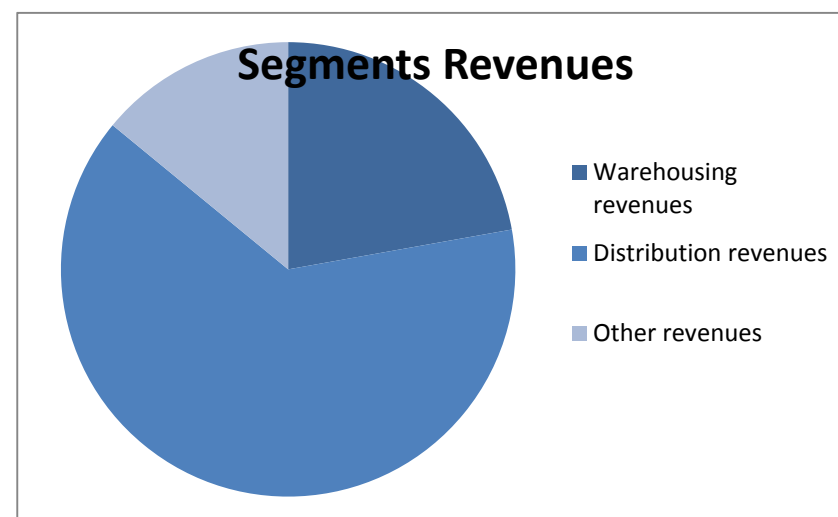
**Appendix 1: Organization Chart**



*Source: Company management*

## Appendix 2: Financial Highlights (*source: company management*)

	US\$ 2012	US\$ 2011	US\$ 2010
<b>DuPont ROE*:</b>	23.50%	27.53%	39.25%
Profit margin*	4.18%	4.27%	4.77%
Asset turnover*	1.07	0.99	1.31
Equity multiplier*	5.27	6.48	6.29
<i>Liquidity ratios</i>			
Current Ratio	1.28	1.10	1.00
Quick Ratio	0.83	0.65	0.71
Cash Ratio	0.003	0.010	0.006
<i>Asset Management ratios*</i>			
Accounts Receivable Turnover	2.60	2.32	2.58
Average Collection Period	140.36	157.63	141.72
Fixed Asset Turnover	3.25	4.59	5.83
Capital Intensity	0.94	1.01	0.76
<i>Debt Management ratios</i>			
Debt Ratio	81.04%	84.58%	84.09%
Debt-to-Equity	427%	548%	529%
Times Interest Earned	2.32	2.38	5.13
Cash Coverage Ratio	6.11	4.8	9.54
<i>Profitability ratios*</i>			
Return on Sales (ROS)	4.43%	4.67%	5.82%
Basic Earning Power (BEP)	4.72%	4.64%	7.62%
Return on Assets (ROA)	4.46%	4.25%	6.24%
Return on Capital (ROC)	4.01%	3.94%	6.47%
non-cash ROC	4.02%	3.97%	6.50%
non-cash ROE	9.74%	13.49%	28.24%



Other revenues consist of promotions, forwarding and exceptional services.

Market Value ratios are not applicable given that the company is private and does not have shares being traded.



Source: Constructed Using Google Maps.

#### Appendix 4: The Competition

<b>Year 2011</b>	<b>LOG Liban</b>	<b>Agility</b>	<b>Aramex</b>
Profit Margin	4.27%	2.35%	9.39%
ROS (operating margin)	4.67%	2.05%	9.87%
TIE ratio			
Cash Coverage ratio			
ROE	27.53%	3.48%	12.76%
ROC	3.94%	1.27%	9.50%
WACC	18.58%	6.84%	7.65%
D/E	548.37%	55.98%	31.47%
Debt ratio	84.58%	35.89%	23.94%

<b>Year 2012</b>	<b>LOG Liban</b>	<b>DHL</b>	<b>UPS</b>	<b>FEDEX</b>
Profit Margin	4.18%	3.09%	1.49%	4.76%
ROS (operating margin)	4.43%	4.62%	2.48%	7.46%
TIE ratio				
Cash Coverage ratio				
ROE	23.50%	14.63%	17.05%	13.80%
ROC	4.01%	5.48%	2.25%	6.93%
WACC	18.58%	5.97%	6.25%	6.42%
D/E	427.40%	180.51%	721.11%	103.05%
Debt ratio	81.04%	64.35%	87.82%	50.75%

Note: ratios were calculated using annual reports. The WACC of competitors were obtained from Damodaran's website.

Sources: *Annual Reports: Agility, Aramex, DHL, FedEx, UPS.*

*Aswath Damodaran*

## Appendix 5: The Lebanese Economy

### A. Macroeconomic Overview of Lebanon

	Value- 2012	
<b>Geography*</b>		
Area	10,452 Km <sup>2</sup>	
Coastline	225 Km	
<b>General Economics*</b>		
GDP (world rank #88)	\$41.77 billion	
GDP Real Growth Rate (world rank #137)	2.00%	
Per Capita GDP (world rank #83)	\$15,900	
GDP Composition By Sector		
Agriculture	4.60%	
Industry	19.60%	
Services	75.80%	
Consumer Inflation Rate (world rank #150)	5.50%	
Unemployment (world rank #49)	22.1%	
Export (world rank #108)	\$5.655 billion	
UAE	13.1%	
Iraq	8.40%	(2011 est.)
Saudi Arabia	8%	(2011 est.)
Turkey	7.00%	(2011 est.)
Syria	6.70%	(2011 est.)
Switzerland	5.50%	(2011 est.)
Other	64.70%	(2011 est.)
Import (world rank #77)	\$20.73 billion	
USA	10.20%	(2011 est.)
Italy	9.30%	(2011 est.)
France	8.80%	(2011 est.)
China	8.20%	(2011 est.)
Egypt	5.30%	(2011 est.)
Germany	5.10%	(2011 est.)
Turkey	4.00%	(2011 est.)
Other	49.10%	(2011 est.)
Household final consumption expenditure, etc. (% of GDP)	79.82%	y 2011
Final consumption expenditure, etc. (% of GDP)	93.63%	y 2011
Exports of goods and services (% of GDP)	23.74%	y 2011
Imports of goods and services (% of GDP)	50.43%	y 2011



## Appendix 5: The Lebanese Economy (continued)

### A. Macroeconomic Overview of Lebanon (continued)

	Value- 2012	
<b>Population &amp; Demographics*</b>		
Total Population	4,131,583	(2013 est.)
Population Growth Rate	-0.38%	(2012 est.)
Age Structure:		
0-14	22.10%	
15-64	68.50%	
65+	9.40%	
Rural population as % from total	13.00%	
Urban population as % from total	87.00%	as of 2010
<b>Government- Laws and Regulation</b>		
Government Stability*	7 (39th)	High Risk
Economic Freedom*	59.5 (91st)	Mostly Unfree
Openness to FDI measured as FDI inflow %GDP*	8.67%	y 2011
Legal System*	Mixed Legal System	
Paying taxes*	flat rate on profits 15%	
	21.5% Employee Social Security contributions	
	Sales tax (VAT) 10%	
<b>Society &amp; Lifestyle</b>		
capitalistic and individualistic consumer society		
growing internet use for convenience and time-saving		

## Appendix 5: The Lebanese Economy (continued)

### A. Macroeconomic Overview of Lebanon (continued)

	Value- 2012	
<b>Energy &amp; Communication: Physical infrastructure &amp; IT</b>		
Electricity Production (world rank #88) *	12.98 billion kWh	(2009 est.)
Electricity - installed generating capacity (world rank #98) *	2.314 million kW	(2009 est.)
Carbon dioxide emissions from consumption of energy (world rank #90) *	15.24 million Mt	(2010 est.)
Roads and Highways (KM) (world rank #148) *	6,970	y 2005
Airports (world rank #169) *	7	
Merchant Marine (world rank #85) *	29	
Ports*	2	Beirut & Tripoli
Fixed Telephone Market (world rank #82) *	900,000	y 2011
Wireless Telephone Market (world rank #121) *	3.35 million	y 2011
Logistics performance index: Efficiency of customs clearance process (1=low to 5=high) *	2.21	
Logistics performance index: Ease of arranging competitively priced shipments (1=low to 5=high) *	2.71	
Logistics performance index: Frequency with which shipments reach consignee within scheduled or expected time (1=low to 5=high) *	3.11	
Logistics performance index: Quality of trade and transport-related infrastructure (1=low to 5=high) *	2.41	
Logistics performance index: Competence and quality of logistics services (1=low to 5=high) *	2.38	
Logistics performance index: Overall (1=low to 5=high) *	2.58	
Logistics performance index: Ability to track and trace consignments (1=low to 5=high) *	2.61	
Internet users (per 100 people) *	52%	y 2011

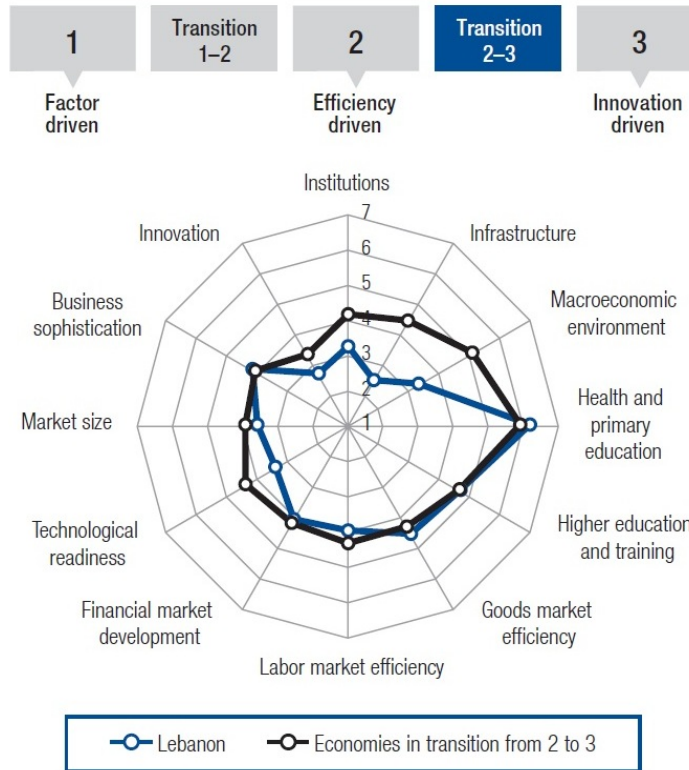
Note: The CIA's world rank is based on 236 countries.

Sources: \*CIA Factbook; \*World Development Indicators; \*The Economist; \*Heritage; \*PKF

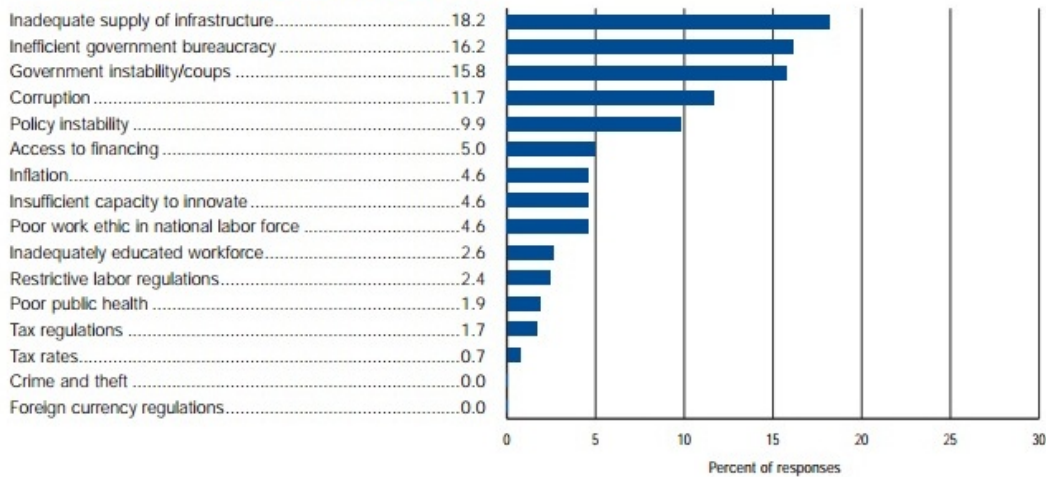
## Appendix 5: The Lebanese Economy (continued)

### B. Stage of Development of the Lebanese Economy

#### Stage of development



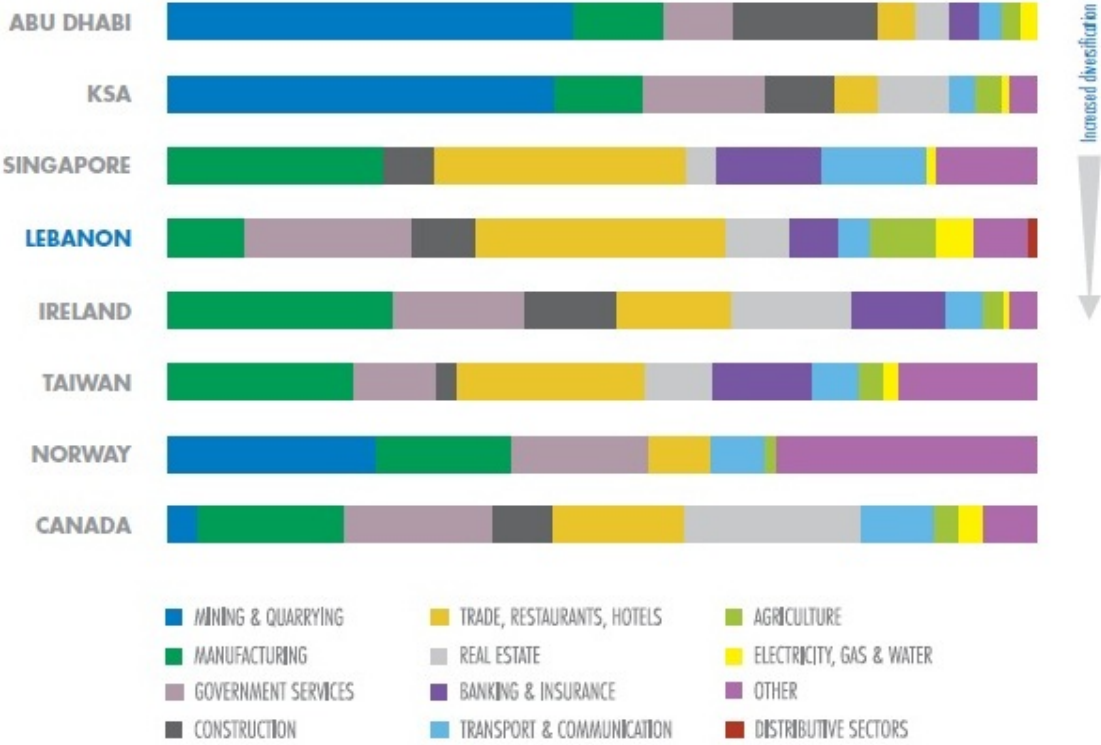
#### The most problematic factors for doing business



Source: World Economic Forum

**Appendix 5: The Lebanese Economy (continued)**

**C. Economic Diversification of Lebanon**



Source: IDAL, 2011.

## Appendix 6: Lebanon's Infrastructure

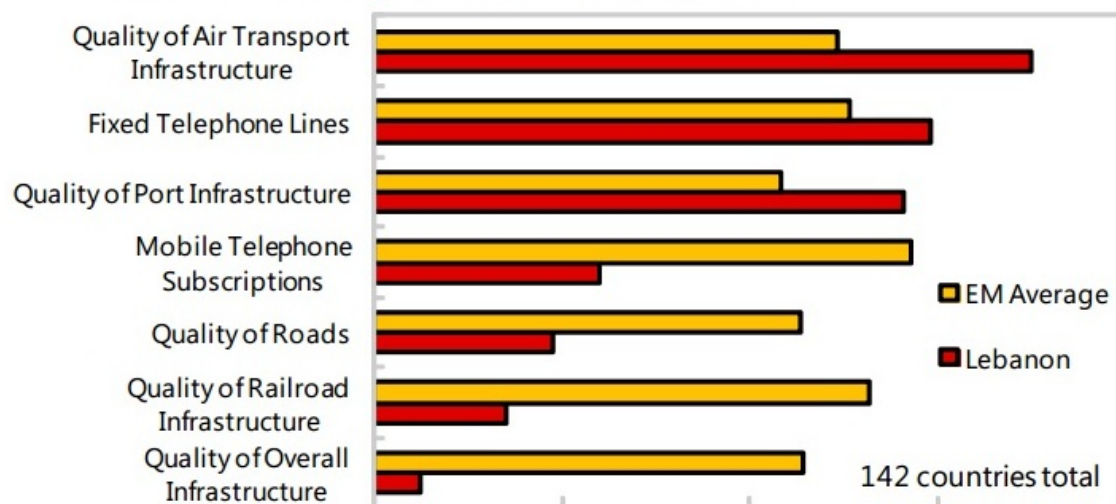
INFRASTRUCTURE MAP OF LEBANON



Source: Investment Development Authority Of Lebanon (IDAL)  
[www.investinlebanon.gov.lb](http://www.investinlebanon.gov.lb)

## Appendix 6: Lebanon's Infrastructure (continued)

### Lebanon Infrastructure: Percentile Rankings of Sub-Indicators, 2011



Source: IMF, 2012.

## Appendix 7: Comparable Warehouse Rents

Area	Size (m <sup>2</sup> )	Rent/year	Rent/m <sup>2</sup>
Hazmieh	900	\$24,000	\$26.67
Sin El Fil	620	\$55,000	\$88.71
Sin El Fil	1,300	\$65,000	\$50.00
Dekwaneh	245	\$24,000	\$97.96
Dekwaneh	500	\$15,000	\$30.00
Dekwaneh	1,600	\$130,000	\$81.25
Mansourieh	2,000	\$90,000	\$45.00
Mansourieh	800	\$60,000	\$75.00

Source: Beirut Plus Real Estate <http://www.beirutplus.com/>

## Appendix 8: Net Present Value Analysis

		<u>US\$</u> <u>2013E</u>	<u>US\$</u> <u>2014E</u>	<u>US\$</u> <u>2015E</u>	<u>US\$</u> <u>2016E</u>	<u>US\$</u> <u>2017E</u>	<u>US\$</u> <u>2018E</u>	<u>US\$</u> <u>2019E</u>	<u>US\$</u> <u>2020E</u>
<b>Growth</b>		7.19%	6.39%	5.59%	4.80%	4.00%	4.00%	4.00%	4.00%
<b>Estimated capacity occupied</b>									
	Dry	1,733,750	2,044,000	2,190,000	2,336,000	2,482,000	2,628,000	2,774,000	2,920,000
	Frozen	675,250	766,500	821,250	876,000	930,750	985,500	1,040,250	1,095,000
<b>Net Sales</b>		<b>11,749,999</b>							
<b>Rate of sales per cbm</b>		<b>4.88</b>							
<b>Additional Cbm</b>			<b>401,500</b>	<b>200,750</b>	<b>200,750</b>	<b>200,750</b>	<b>200,750</b>	<b>200,750</b>	<b>200,750</b>
<b>Additional Revenue from increased capacity</b>		-	1,958,333	3,047,042	4,172,370	5,318,431	6,510,335	6,770,748	7,041,578
<b>Total Incremental Costs</b>			(1,576,759)	(2,526,553)	(3,508,294)	(4,508,123)	(5,547,945)	(5,775,131)	(6,011,404)
<b>Operating costs</b>			(1,305,356)	(2,031,051)	(2,781,155)	(3,545,079)	(4,339,560)	(4,513,142)	(4,693,668)
	<i>Operating costs % revenue</i>	67%	67%	67%	67%	67%	67%	67%	67%
<i>Estimated eliminated costs- external renting</i>			138,700	138,700	138,700	138,700	138,700	138,700	138,700
<i>Estimated eliminated costs- maintenance of old building</i>			20,000	20,000	20,000	20,000	20,000	20,000	20,000
<i>Estimated additional costs- maintenance of new building</i>			(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)	(75,000)
<i>Estimated eliminated costs- increased efficiency</i>			48,000	48,000	48,000	48,000	48,000	48,000	48,000
<b>Other expenses</b>			(258,008)	(401,444)	(549,704)	(700,696)	(857,728)	(892,037)	(927,718)
	<i>Other expenses % revenue</i>	13%	13%	13%	13%	13%	13%	13%	13%
<b>Administrative expenses</b>			(109,247)	(169,982)	(232,759)	(296,693)	(363,185)	(377,712)	(392,821)
	<i>Administrative % revenue</i>	6%	6%	6%	6%	6%	6%	6%	6%
<b>Management fees- cst (sunk cost)</b>			-	-	-	-	-	-	-
<b>Provisions for stocks</b>			(11,742)	(18,270)	(25,017)	(31,889)	(39,036)	(40,597)	(42,221)
	<i>Provisions for stocks % revenue</i>	1%	1%	1%	1%	1%	1%	1%	1%
<b>Provision end of service indemnity</b>			(24,106)	(37,507)	(51,359)	(65,466)	(80,137)	(83,343)	(86,676)
	<i>Provision EOSI % revenue</i>	1%	1%	1%	1%	1%	1%	1%	1%
<b>EBITDA</b>			381,575	520,489	664,076	810,308	962,390	995,617	1,030,174
<b>Depreciation</b>			(363,526)	(363,526)	(363,526)	(363,526)	(363,526)	(363,526)	(363,526)
<b>EBIT</b>			18,048	156,963	300,549	446,782	598,863	632,091	666,648
<b>Δ non-cash NWC</b>			-	-	-	-	-	-	-
<b>CAPEX</b>									
	<b>New Structure</b>	(3,200,000)							960,000
	<b>Material Handling Equipments-Forklifts</b>	(180,000)							-
	<b>Racking- Pallets</b>	(165,264)							49,579
	<b>Additional expenses- transitional renting</b>	(269,188)							-
	<b>Operating Cash Flows</b>	(3,814,452)	378,867	496,945	618,993	743,291	872,560	900,804	1,939,756
	<b>WACC</b>	18.58%	18.58%	18.58%	18.58%	18.58%	18.58%	18.58%	18.58%
	<b>NPV</b>	(1,109,705)	<b>Reject</b>						
	<b>IRR</b>	9.74%							

## Appendix 8: Net Present Value Analysis (continued)

$$\text{Cost of Equity } (R_e) = R_f + \beta L (R_m - R_f)$$

$$\beta L \text{ Firm} = \beta U \text{ adjusted for cash } (1 + (1 - t) D/E)$$

$$\text{WACC} = W_e R_e + W_d R_d (1 - t)$$

$$\text{Growth } (g) = \text{non-cash ROC} \times \text{Reinvestment rate}$$

$$\text{non-cash ROC} = \text{EBIT } (1 - t) / (\text{Capital} - \text{Cash})$$

$$\text{Reinvestment Rate} = \text{normalized Reinvestment} / \text{adjusted EBIT } (1 - t)$$

$$\text{Reinvestment} = \Delta \text{Revenue} / (\text{Sales} / \text{Capital})$$

$$\text{Adjusted EBIT} = \text{EBIT} + \text{Current Operating Lease} - \text{Depreciation Present Lease}$$

$$\text{Operating Cash Flows} = \text{EBIT } (1 - t) + \text{Depreciation}$$



## Appendix 9: Base Case's Sensitivity Analysis to WACC

WACC	NPV	Note
5.88%	694,582	After-tax cost of debt with 100% debt level
6.92%	491,487	Pre-tax cost of debt with 100% debt level
8.14%	269,602	
9.74%	-	Targeted Zero NPV
10.22%	(76,081)	
12.58%	(418,074)	No illiquidity premium considered in calculating cost of equity
13.86%	(585,626)	90% debt level
14.40%	(652,736)	L-T beta of 1
14.75%	(694,909)	Push down levered beta of 1.2
15.67%	(802,886)	Unlevered beta adjusted for cash of the Retail/Wholesales food industry
15.83%	(820,273)	
16.22%	(864,467)	Current capital structure (80% debt)
16.92%	(940,280)	Unlevered beta adjusted for cash of the Air transport industry
17.85%	(1,037,425)	Other: unlevered beta adjusted for cash assumed at 1
18.58%	(1,109,705)	Optimal capital structure (70% debt)

**Appendix 10: Best Case’s Sensitivity Analysis to WACC, Capacity Utilization Rates, Growth, And Cost of New Structure**

WACC	IRR	NPV	Capacity Utilization Rate	Structure Cost
Growth of 7.98% with stable period growth of 4% in 2017				
18.58%	18.60%	2,766	90-93-98-100-100-100-100	\$3,200,000
18.58%	18.75%	18,587	85-85-90-100-100-100-100	\$2,800,000
17.85%	18.09%	27,807	90-92-95-100-100-100-100	\$3,200,000
17.85%	17.87%	1,690	80-85-95-95-100-100-100	\$2,800,000
16.92%	17.02%	12,730	85-91-95-100-100-100-100	\$3,200,000
16.92%	17.21%	33,596	80-85-90-95-100-100-100	\$2,800,000
16.22%	16.34%	14,414	82-90-95-100-100-100-100	\$3,200,000
16.22%	16.24%	2,773	75-85-90-95-100-100-100	\$2,800,000
15.83%	15.98%	19,587	80-90-95-100-100-100-100	\$3,200,000
15.83%	16.24%	49,297	75-85-90-95-100-100-100	\$2,800,000
15.67%	15.98%	39,199	80-90-95-100-100-100-100	\$3,200,000
15.67%	16.24%	67,581	75-85-90-95-100-100-100	\$2,800,000
14.75%	15.02%	34,341	85-85-90-95-100-100-100	\$3,200,000
14.75%	14.81%	7,479	75-80-85-95-100-100-100	\$2,800,000
14.40%	14.49%	11,059	82-85-90-95-100-100-100	\$3,200,000
14.40%	14.81%	50,152	75-80-85-95-100-100-100	\$2,800,000
13.86%	14.14%	36,625	80-85-90-95-100-100-100	\$3,200,000
13.86%	13.88%	2,370	70-80-85-95-100-100-100	\$2,800,000

WACC	IRR	NPV	Capacity Utilization Rate	Structure Cost
Growth of 7.98% with stable period growth of 4% in 2020				
18.58%	18.60%	3,032	85-95-98-100-100-100-100	\$3,200,000
18.58%	18.71%	14,235	82-85-90-100-100-100-100	\$2,800,000
17.85%	18.23%	45,925	85-95-95-100-100-100-100	\$3,200,000
17.85%	18.43%	64,446	80-85-95-95-100-100-100	\$2,800,000
16.92%	16.96%	5,151	85-90-95-95-100-100-100	\$3,200,000
16.92%	17.42%	58,575	75-85-95-95-100-100-100	\$2,800,000
16.22%	16.55%	42,010	80-90-95-100-100-100-100	\$3,200,000
16.22%	16.61%	46,601	75-80-95-95-100-100-100	\$2,800,000
15.83%	15.98%	20,311	81-85-95-100-100-100-100	\$3,200,000
15.83%	15.95%	14,729	75-80-90-95-100-100-100	\$2,800,000
15.67%	15.80%	16,840	80-85-95-100-100-100-100	\$3,200,000
15.67%	15.95%	33,119	75-80-90-95-100-100-100	\$2,800,000
14.75%	14.79%	5,301	80-85-91-95-100-100-100	\$3,200,000
14.75%	14.98%	28,931	70-80-90-95-100-100-100	\$2,800,000
14.40%	14.57%	22,819	76-85-95-95-100-100-100	\$3,200,000
14.40%	14.45%	6,416	70-80-86-95-100-100-100	\$2,800,000
13.86%	13.92%	7,752	80-80-90-95-100-100-100	\$3,200,000
13.86%	14.04%	22,597	65-80-90-95-100-100-100	\$2,800,000

**Appendix 10: Best Case’s Sensitivity Analysis to WACC, Capacity Utilization Rates, Growth, And Cost of New Structure (continued)**

WACC	IRR	NPV	Capacity Utilization Rate	Structure Cost
Growth of 7% with stable period growth of 4% in 2017				
18.58%	19.13%	64,410	90-95-95-100-100-100-100	\$3,200,000
18.58%	18.84%	28,953	80-85-95-100-100-100-100	\$2,800,000
17.85%	18.16%	37,473	85-95-95-100-100-100-100	\$3,200,000
17.85%	17.99%	15,191	75-86-95-100-100-100-100	\$2,800,000
16.92%	17.38%	57,018	85-90-95-100-100-100-100	\$3,200,000
16.92%	17.38%	30,491	75-85-90-100-100-100-100	\$2,800,000
16.22%	16.44%	28,203	80-90-95-100-100-100-100	\$3,200,000
16.22%	16.35%	15,481	75-80-90-100-100-100-100	\$2,800,000
15.83%	15.85%	2,598	80-90-90-100-100-100-100	\$3,200,000
15.83%	16.19%	43,365	70-85-90-100-100-100-100	\$2,800,000
15.67%	15.67%	4	80-85-95-100-100-100-100	\$3,200,000
15.67%	16.19%	62,027	70-85-90-100-100-100-100	\$2,800,000
14.75%	15.08%	42,897	80-85-90-100-100-100-100	\$3,200,000
14.75%	15.37%	76,646	70-80-90-100-100-100-100	\$2,800,000
14.40%	14.76%	48,426	75-85-95-100-100-100-100	\$3,200,000
14.40%	14.40%	268	65-80-90-100-100-100-100	\$2,800,000
13.86%	14.17%	41,886	75-85-90-100-100-100-100	\$3,200,000
13.86%	14.40%	69,622	65-80-90-100-100-100-100	\$2,800,000

WACC	IRR	NPV	Capacity Utilization Rate	Structure Cost
Growth of 7% with stable period growth of 4% in 2020				
18.58%	19.16%	69,109	90-90-95-100-100-100-100	\$3,200,000
18.58%	18.66%	9,675	75-85-95-100-100-100-100	\$2,800,000
17.85%	18.20%	43,356	85-90-95-100-100-100-100	\$3,200,000
17.85%	18.17%	36,064	80-80-90-100-100-100-100	\$2,800,000
16.92%	17.43%	64,833	85-85-95-100-100-100-100	\$3,200,000
16.92%	17.17%	29,305	75-80-90-100-100-100-100	\$2,800,000
16.22%	16.51%	37,244	80-85-95-100-100-100-100	\$3,200,000
16.22%	16.51%	35,111	70-82-90-100-100-100-100	\$2,800,000
15.83%	15.87%	6,376	80-85-90-100-100-100-100	\$3,200,000
15.83%	16.18%	44,206	70-80-90-100-100-100-100	\$2,800,000
15.67%	15.75%	14,333	76-85-95-100-100-100-100	\$3,200,000
15.67%	15.80%	16,056	75-75-86-100-100-100-100	\$2,800,000
14.75%	14.97%	30,005	75-85-90-100-100-100-100	\$3,200,000
14.75%	15.22%	60,655	65-80-90-100-100-100-100	\$2,800,000
14.40%	14.97%	77,901	75-85-90-100-100-100-100	\$3,200,000
14.40%	14.43%	3,315	65-75-90-100-100-100-100	\$2,800,000
13.86%	14.04%	25,318	74-80-90-100-100-100-100	\$3,200,000
13.86%	14.28%	55,723	60-80-90-100-100-100-100	\$2,800,000

**Appendix 11: Market Survey Questionnaire**

Dear Sirs,

LOG Liban is considering expanding its warehouse capacity to support a bigger distribution channel in Lebanon. In this perspective we would kindly ask you to answer these questions:

**Do own your own warehouse?** Yes / \_\_\_ / No / \_\_\_ /

**Do you operate your own distribution channel?** Yes / \_\_\_ / No / \_\_\_ /

If either of the above answers is no,

**Who do you outsource the function(s) to:** \_\_\_\_\_

If you operate your own distribution channel, how big is your channel:

**Number of trucks or pick-ups:** \_\_\_\_\_

**Number of employees:** \_\_\_\_\_

**Are you willing to outsource your warehouse &/or distribution channel to a 3PL company?** Yes / \_\_\_ / No / \_\_\_ /

**What is your estimated yearly warehousing & distribution costs?**  
\$.....mil < Value < \$.....mil

**What is your estimated yearly volume of products moved in cbm?**  
\_\_\_\_\_

## Appendix 12: Market Survey Results

	Industry	number of branches	warehouse/ distribution	number of trucks	number of employees	Outsource	Distributor	Costs \$'000	Volume cbm
Kababji	Restaurants	6	yes	n/a	n/a	no	n/a		
Zaatar W Zeit	Restaurants	6	yes	3	7	no	n/a	120	2000
Americana	Restaurants, Food & Beverage		yes			no	n/a		
Roadster Diner	Restaurants	11	yes	9	100	no	n/a	75-100	
AlSh.*	Diverse	15	yes	6	15	no	n/a	1,500-2,500	
Diageo	Food and Beverage	n/a	no			yes	Fastrack		
L'Oreal	Beauty & Care	n/a	no			yes	Abou Adal		
Converse	Fashion		yes			no	n/a		
AYF*	Fashion	3	yes	1	1	no	n/a	8	
Azadea	Fashion & Lifestyle		no			yes	Expeditors		
Indevco	Manufacturing	n/a	hybrid model	100		no	yes	3% of sales	300,000
Novartis	Pharmaceutical	n/a	no	n/a	n/a	yes	Fattal Tabbar & Massoud	n/a	n/a
Bel Group	Food and Beverage	n/a	no	n/a	n/a	yes	Fattal	n/a	n/a
Danone-Bledina	Food and Beverage	n/a	no	n/a	n/a	yes	n/a	n/a	n/a
Golden Foods	Food and Beverage	n/a	yes	50-60		no	n/a		
Tony's Food	Food and Beverage	1	hybrid model			yes			
Halway	Food and Beverage	1	yes	36		no	n/a		
Lebanese Mezze	Food and Beverage	1	hybrid model	2	1	yes	n/a	40	n/a

Some information was not disclosed by the surveyed companies given the sensitivity of the subject.

\*We have hidden some names of companies that have provided us with dollar figures for privacy purposes.

## References

- Arabian Business, 2012. World's top 10 largest airline fleets. Arabian Business. Retrieved from: <http://www.arabianbusiness.com/photos/world-s-top-10-largest-airline-fleets-360758.html?img=2>
- Bin, S., Chaoyuan, S. (2005). *The Correlativity Analysis between Logistics Industry and National Economy Development*. Retrieved from <http://www.seiofbluemountain.com/upload/product/201001/12646716644xym9b6o.pdf>
- Aswath Damodaran. (2013). Damodaran Online: The Data Page [Data file]. Retrieved from <http://pages.stern.nyu.edu/~adamodar/>
- Damodaran, A. (2005). The Cost of Illiquidity. Retrieved from <http://pages.stern.nyu.edu/~adamodar/pdfiles/country/illiquidity.pdf>
- Daniels, J., Radebaugh, L., & Sullivan, D. (2012). *IINTERNATIONAL BUSINESS* (14<sup>th</sup> ed.). Prentice Hall.
- Datamonitor. (2009). *Global Top 10 Logistics Companies: Industry, Financial and SWOT Analysis*. Retrieved from [http://www.datamonitor.com/store/Product/global\\_top\\_10\\_logistics\\_companies\\_industry\\_financial\\_and\\_swot\\_analysis?productid=DMAU0408](http://www.datamonitor.com/store/Product/global_top_10_logistics_companies_industry_financial_and_swot_analysis?productid=DMAU0408)
- Dr. Wassim Dbouk, personal communication, April 4, 2013
- "*Economist Intelligence Unit: Social Unrest*", 2010, [http://viewswire.eiu.com/site\\_info.asp?info\\_name=social\\_unrest\\_table&page=noads](http://viewswire.eiu.com/site_info.asp?info_name=social_unrest_table&page=noads)
- European Foundation for the Improvement of Living and Working Conditions. (2008). *Trends and drivers of change in the EU transport and logistics sector: Mapping report*. Dublin, Ireland. Retrieved from <http://www.eurofound.europa.eu/pubdocs/2008/16/en/1/ef0816en.pdf>
- ForbesCustom. *Dubai: World-Class Infrastructure and a Global Hub for Trade, Transport and Tourism*. ForbesCustom.com. Retrieved from <http://www.forbescustom.com/EconomicDevelopmentPgs/DubaiWorldClass.html>
- Hess, C. (2011). *Logistics Trends*. Deutsche Post DHL. Brussels, Belgium. Retrieved from [http://www.ceps.eu/files/Hess\\_DHL\\_Trends.pdf](http://www.ceps.eu/files/Hess_DHL_Trends.pdf)
- Hills, J. (2012). *Lebanon Tax Guide 2012*. PKF International Limited. United Kingdom. Retrieved from <http://www.pkf.com/publications/tax-guides/lebanon-pkf-tax-guide>
- International Monetary Fund (IMF). (2012). *Lebanon: 2011 Article IV Consultation*. Retrieved from <http://www.imf.org/external/pubs/ft/scr/2012/cr1239.pdf>

Investment Development Authority of Lebanon (IDAL). (2011). *Annual Report 2011*. Beirut, Lebanon. Retrieved from <http://www.idal.com.lb>

International Monetary Fund (IMF). (2013). *World Economic Outlook, April 2013: Hopes, Realities, Risks*. Retrieved from <http://www.imf.org/external/pubs/ft/weo/2013/01/pdf/text.pdf>

Kögler, U., Majdalani, F., & Kuge, S. (2009). *Not Too Late Finding Opportunity in Middle East Logistics*. Booz & Company. Retrieved from [http://www.booz.com/media/uploads/Middle\\_East\\_Logistics.pdf](http://www.booz.com/media/uploads/Middle_East_Logistics.pdf)

"Lebanon", CIA- World Factbook, 2012, <https://www.cia.gov/library/publications/the-world-factbook/geos/le.html>, accessed March 30, 2013

"Lebanon", International Monetary Fund- *World Economic Outlook Database, October 2012*, <http://www.imf.org/external/pubs/ft/weo/2012/02/weodata/index.aspx/>, accessed March 30, 2013

"Lebanon", The Heritage Foundation- *Index of Economic Freedom, 2013*, [www.heritage.org/index/country/lebanon](http://www.heritage.org/index/country/lebanon), accessed March 30, 2013

"Lebanon", The World Bank- *World Development Indicators, 2012*, <http://data.worldbank.org/>, accessed March 30, 2013

Ross, S.A., Westerfield, R.W., & Jordan, B.D. (2010). *FUNDAMENTALS OF CORPORATE FINANCE: ALTERNATE EDITION* (9th ed.). New York: McGraw-Hill/Irwin.

Schwab, K., Martin, X. (2012). *Insight Report: The Global Competitiveness Report 2012-2013*. World Economic Forum. Geneva, Switzerland. Retrieved from [http://www3.weforum.org/docs/WEF\\_GlobalCompetitivenessReport\\_2012-13.pdf](http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2012-13.pdf)

Sink, H. L., Langley, J.C. (1997). *A Managerial Framework for the Acquisition of Third Party Logistics Services*. *Journal of Business Logistics*, 18 (2), pp 163-189.

Speh, T. W. (2009). Understanding Warehouse Costs and Risks. *Ackerman Warehousing Forum*, 24 (7). Retrieved from [http://www.warehousing-forum.com/news/KB\\_v24n07\\_June2009.pdf](http://www.warehousing-forum.com/news/KB_v24n07_June2009.pdf)

Wang, C., Regan, A. C. (2003). Reducing Risks In Logistics Outsourcing. Retrieved from <http://www.uctc.net/papers/641.pdf>