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Introduction

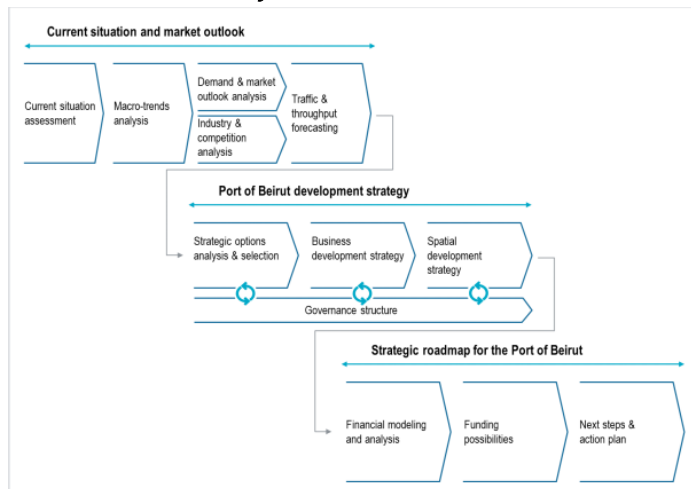
One of the very few landmarks that have stood throughout the Lebanese history is Port of Beirut (PoB). Since the establishment of Lebanon, the port has been one of the most prominent international trades and transit hub, even the road network in the country was built through and into this port, and Beirut was chosen capital thanks to the geographical position of the port.

The distinctive location of the Port on the Eastern Mediterranean made it one of the most important and busiest ports in the region. However, the port was failing in its key role as a driver of economic development in the country due to mismanagement and lack of good governance that reflect the complex political-economic realities of Lebanon.

But that is not all, what added insult to injury was the large explosion that severely damaged the Port of Beirut on August 4, 2020. Hundreds of tons of highly explosive ammonium nitrate, unsafely stored at the port, ignited and caused one of the most devastating explosions in the world. In this context, a new study conducted by Roland Berger in April 2021, titled **“Joining forces for a new Beirut port area - A STRATEGIC STUDY”** summarized the current state of the Port and presented various strategic options for reforming Port of Beirut (PoB). We will try to outline the main aspects of the study in this spotlight, as we believe it has not received the recognition and exposure it deserves.

The study used a structured approach to develop strategic options for the port. This approach has three parts. First, it assessed the current situation at the port. Second, it presented a port development strategy, including strategic options, an overall business strategy and criteria for the port' s future governance model. Finally, it draws up a strategic roadmap for the port.

Structure of the study



Source: Roland Berger, *Joining forces for a new Beirut port area – A Strategic Study*

Current situation and market outlook

Overview of the Port of Beirut

The port of Beirut is located in a very attractive area in the Middle East, in the Mediterranean Sea. The Mediterranean Sea has a geographical advantage as one-third of the world's total merchant shipping passes through it.

Lebanon has four main ports: port of Beirut, port of Tripoli, port of Sidon, and port of Tyr. The biggest two ports in Lebanon are the one in Beirut and Tripoli. In details, port of Beirut was considered one of the most important and busiest ports in the region, with direct links to 56 ports around the world. While the Port of Tripoli is the second most important port in Lebanon as its free zone is larger than the one in Beirut. Hence, port of Tripoli is operated by several foreign companies like Gulftrainer and the Russian energy company Rosneft. The other two ports are less known and less attractive compared to the port of Beirut and port of Tripoli, as Port of Sidon and Port of Tyr are usually used for fishing and only operated during the daytime and Customs are available on request only.

The Port of Beirut prior to the explosion

The port of Beirut can be sub-divided into three main areas: The container terminal, multi-purpose area and the free zone. In details the container terminal has a total capacity of 1.5 million TEU per year. Furthermore, the port of Beirut is capable to accommodate some the world's biggest container vessel.

The container terminal is managed by the Beirut Container Terminal Consortium (BCTC) and the UK's Portia Peel Ports Limited and the US's Logistics, and Port Management Americas LLC.

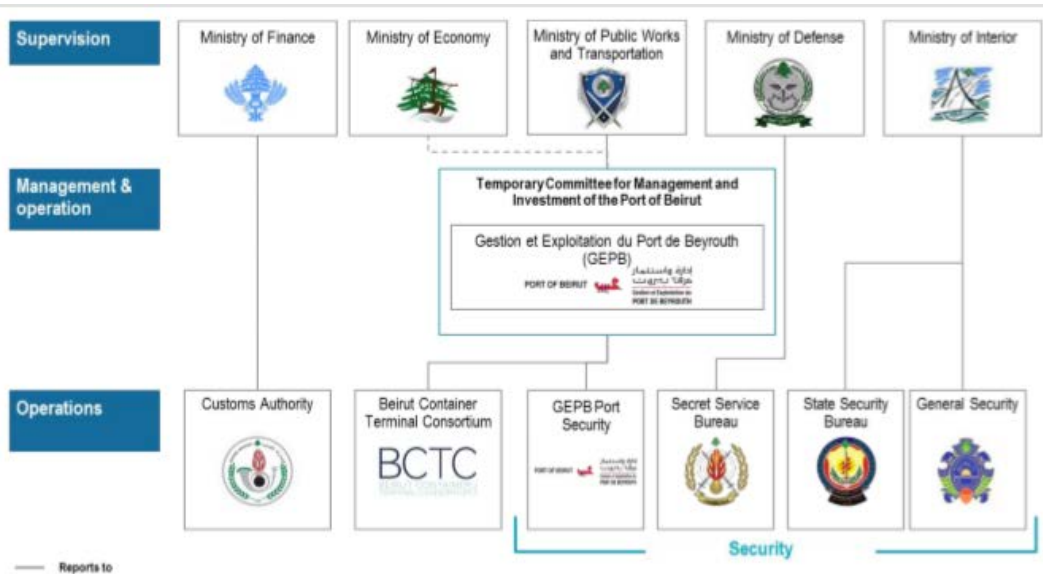
For the Multi-Purpose area, the general cargo terminal and storage area are situated on the west side of the port. Prior to the explosion, this area handled more than 12 warehouses available for storage. Also, the Port of Beirut had three industrial building with 18,000 m capacity of storage.

The free zone covers more than 127000 m of warehouse and market area, and it has a duty-free market and retail area with more than 46 shops. To add more, several large companies have leased the space and built modern houses.

Governance structure of the Port of Beirut

The governance structure is chaotic as it involves several different entities and committees. We will present below the governance structure of the port of Beirut.

Port of Beirut governance structure







Source: Port of Beirut, stakeholders interviews, desk research, Roland Berger

Since 1990s, four committees have managed the Port of Beirut. The current committee is composed of the Chairman of the board, the General Manger of GEPB, GEPB’ s Board of directors and senior management personnel. However this Committee is not a public institution and does not establish the necessary legal frameworks with the absence of accountability and audit on the financial operational.

Government model challenges

The Port of Beirut has no proper legal framework. This puts a major obstacle with regard to the supervision of the port. In details three main challenges should be tackled in order to achieve a better governance model, as listed in the table below:

Management structure 	Regulatory framework 	Vested interests 
<ul style="list-style-type: none"> > Lack of professional port management structure compared to best practices (no clear port administration model) > Lack of a clear governance model that includes a Port Authority and instead includes a "Temporary Committee" > Vague reporting lines between the current Temporary Committee and the Ministry of Public Works and Transportation > Overlapping mandates of security agencies causing interference on a discretionary basis 	<ul style="list-style-type: none"> > Lack of a detailed regulatory framework clearly defining the roles and responsibilities in the current structure > Lack of financial auditing, performance monitoring and supervision > Full control of decision-making by the Temporary Committee without strict supervisory regulations 	<ul style="list-style-type: none"> > Informal allocation of political and sectarian quotas on various port management and operational levels > Interference of multiple stakeholders leading to a slowdown in port development > Lack of clear responsibilities and roles leading to increased allegations of corruption
 <p>Port lacks a formal documented governance model and a permanent legal framework and is subject to vested interest interference – Three of the main obstacles that should be addressed in the future design</p>		

Unfortunately, the port of Beirut lacks of a clear port management structure and have no regulations and regulatory framework.

Concentration of cargo logistics

To start with, Lebanon has four main players in its dairy industry. Three are located in Bekaa region and one is in Mount Lebanon. Considering agriculture, it contributes five percent of the total GDP. Agriculture holding in Lebanon are mainly found in North Lebanon, and Bekaa region. For the cement production the domestic sector is led by three key players: Ciment de Sibline, Cimenterie Nationale and Lafarge-Holcim. For the wheat industry, Lebanon is subject to agricultural limitations as the country dependent on imports. On the other hand, the wine sector in Lebanon is strong as this country was one of the oldest sites of wine production, with 46 winerie in Lebanon, concentrated in the Bekaa region and North Lebanon.

The service and tourism sector is a main contributor to domestic GDP. Lebanon has successful manufactures that are mostly located in Bekaa and Mount Lebanon regions, like "Kassatly Chtoura" and the famous Lebanese Ghandour factory that produce local sweets and confectionery.

Regional hinterland

Lebanon has around 408 km of railroad at one point, including connections to Syria, Palestine and Turkey. During 1965 approximately 250,000 tons of freight were transported between Beirut and Damascus. Today, all this traffic goes by road.

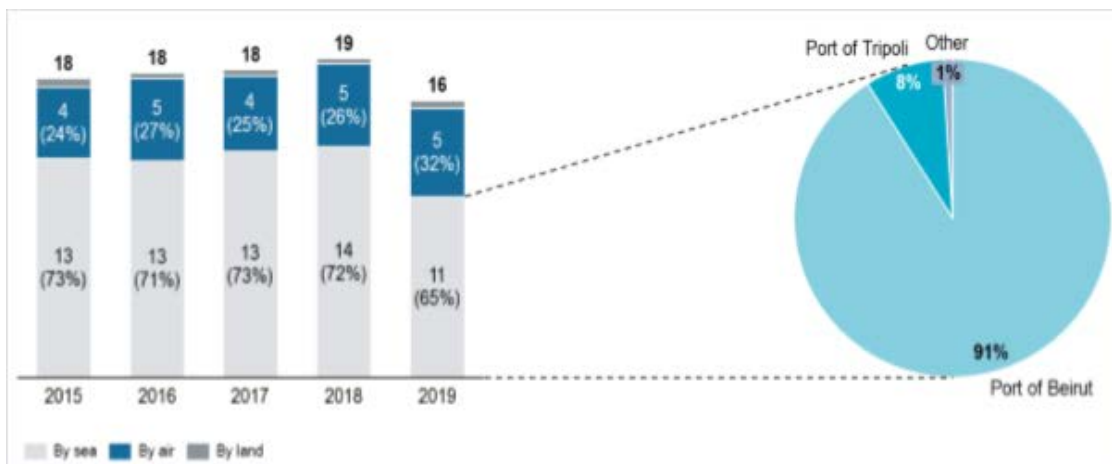
Port traffic and volume analysis

Traffic development-Historical analysis

The activity in the Middle-East recorded a decline over the last two years, including 0.6% decrease in value of total imports and 9.4% decrease in value of total exports from 2019 to 2020, due to global trade tensions, and the increasing volatility of the oil and gas market. Hence, the biggest importing and exporting countries in the region by value are the UAE, KSA and Turkey. While these countries benefit from a positive trade balance, others like Iraq and Lebanon suffer for a major trade deficit.

Trade development in Lebanon

According to the Investment Development Authority of Lebanon (IDAL), imports to Lebanon benefit from the country's low tariffs. However, both imports and exports have suffered a declining since 2012 as a result of the Syrian conflict, and since 2018 also due to the Lebanese economic crisis.



Source: Lebanese Customs

For the past five years, close to 75% of Lebanon's trade activities by value were by sea as the port of Beirut was responsible for around 90% of these activities. However, and since the explosion at the Port of Beirut, the Port of Tripoli has been playing a significant role in Lebanese trade.

Main origins of imports

Demand for goods has changed due to the economic crisis. In details, in 2017 Lebanon's top import partners by trade value were China, followed by Italy and the United States, but in 2019 and after the crisis the top three import partners by traded value were the United States, Greece, and China.

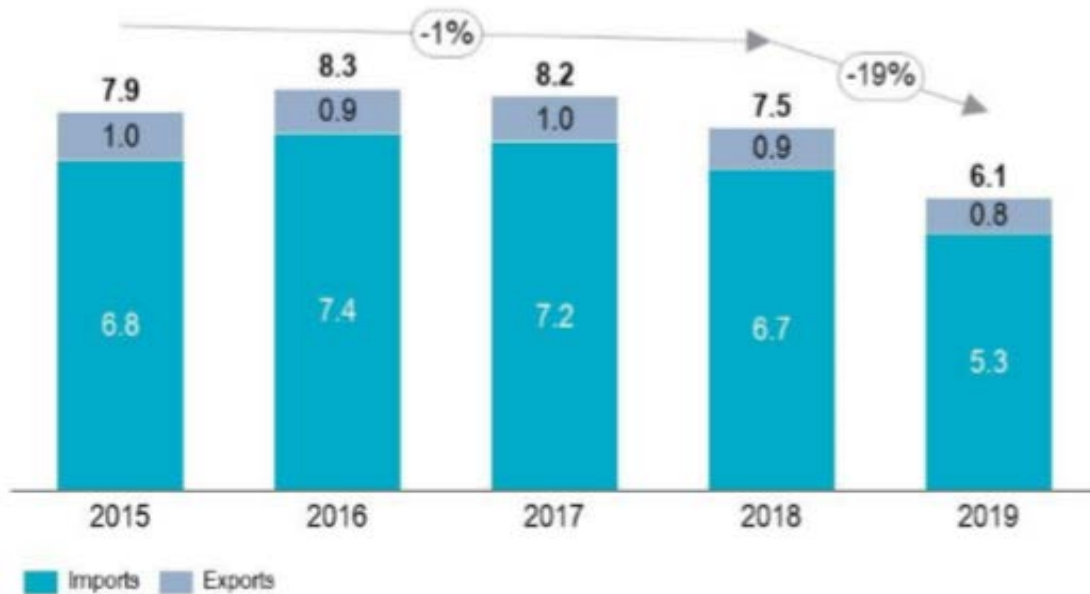
Main destinations for exports

Lebanon has limited level of exports. In terms of value, top export partners in 2019 were Switzerland and the UAE followed by KSA. In terms of metrics tons, Syria was the main export destination (mineral fuels and oils), followed by Greece and Egypt (mainly cast iron and steel).

Trade at the Port of Beirut

The overall trade volumes by weight consist of approximately 90% imports and 10% exports. In 2019, total trade volumes recorded a significant decrease, with a drop about 20%. As a result Port activities and revenues decreased, reflecting the lower trade volumes handled by the port.

Total volumes of traded goods (imports and exports) at POB



Source: Lebanese Customs, Port of Beirut, Roland Beger

The explosion in August damaged the port and brought practically all operations linked to the non-container cargo terminals to a sudden standstill. While the container terminal remains operational, trade flows have fallen below those of previous year. As such, the outlook for cargo is highly negative, as not even half of the trade volumes seen in previous years were reached by November 2020.

Local demand (import and export)

Imports at the Port of Beirut constitute approximately 90% of all trade volume by weight, of which about 65% is container cargo and 35 percent general cargo and dry bulk.

Total volumes of main import commodities at POB



Source: Lebanese Customs, Port of Beirut, Roland Berger

As shown, in 2019 Lebanon entered a severe economic crisis, this led to a downward trend in both GDP and consumption figures.

Container Cargo represents a total share of about 65% of import tonnage. The main commodities mainly foodstuffs and beverages (mainly vegetable, beverages and daily products)

General cargo makes up approximately 20% of total imports by weight. The most imported commodities are base metals, accounting for around 65%. Since 2016 there has been a significant annual decline in general cargo coming into the country of around 18% per year. As a result general cargo volumes were lower in 2019.

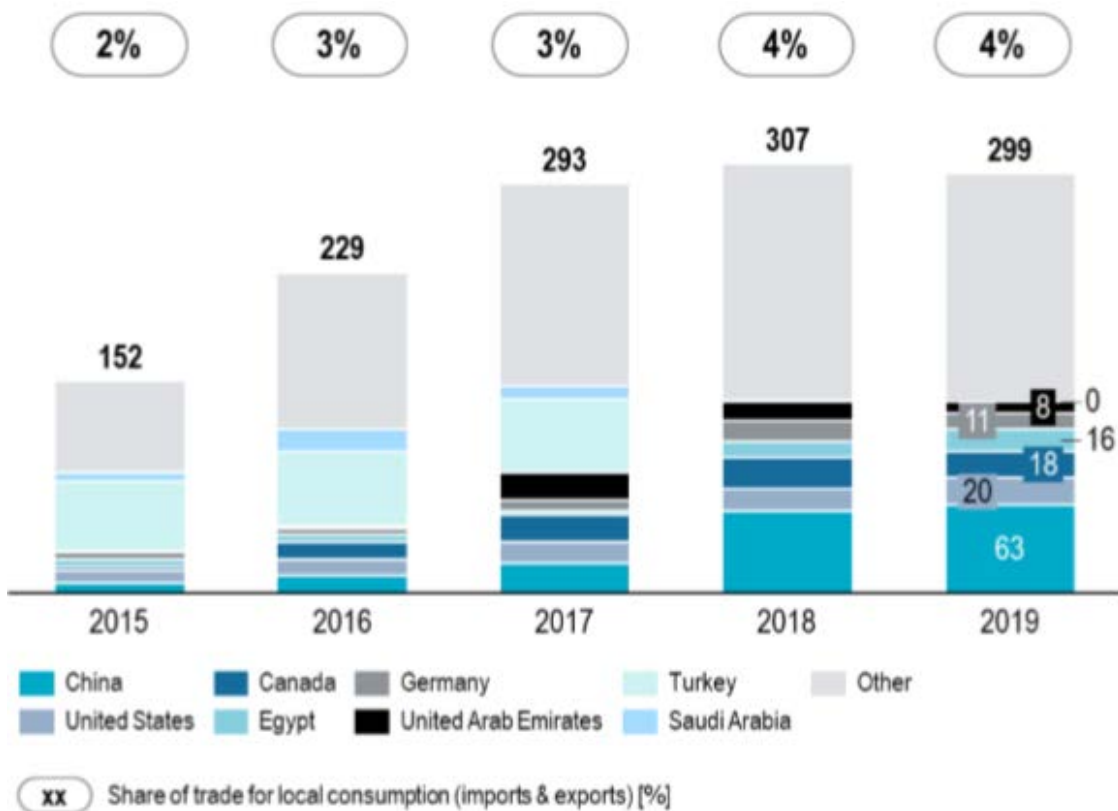
Export assessment

Lebanon is an import-oriented country whose exports are limited to a just few goods and industries. On average across the years 2015-2019, 25% of exports by weight were exported as non-container cargo while 75% were transported in containers.

Transit

Transit trade refers to foreign goods (imports and exports) that enter national territory but are not used for local consumption. The volume of transit trade grew from 2015-2019, however, it still constitutes a relatively small share of overall throughput at the port when compared to volumes of total domestic trade, at most 4%.

Total transit trade by country destination at POB



Source: Lebanese Customs, Roland Berger

Traffic-Forecast analysis

The World Bank and Oxford Economics estimated that by the end of 2020, Lebanese GDP will have decreased by almost 25%. This macro-economic outlook has direct implications for the port of Beirut.

Demand forecast: the volumes through the Port of Beirut were relatively stable from 2015 until the start of the economic downturn in 2018. This direct link between the economic development and trade volumes serves as the basis for our demand forecast.

For import trade, the forecast consist of foodstuffs and beverages, base metals, glass, cement, ceramics, organic materials, and agriculture and forestry, together representing about 70 percent of all imports. For export trade, foodstuffs and beverages, base metals, agriculture and forestry goods, organic materials, and rubber and plastics, together representing about 80 percent of all exports

Overview of main drivers

Drivers and related indicators

- Gross Domestic Product (GDP) growth:**
There is a significant expected contraction of 25% in 2020, followed by another estimated 3% decrease in 2021 for the Base scenario. In the Reform scenario, a 3% increase is assumed in 2021. From 2025, gradual growth is forecast of about 2.5% year-on-year. The Reform scenario estimates GDP to return to historical levels by 2024, while this level is not reached by 2030 in the Base scenario
- Consumer spending:**
Consumer spending is expected to decline by 33% in 2020, followed by a gradual increase reaching around 6% in 2026 for both Base and Reform scenarios. Stable 5% growth is reached in the years leading up to 2030
- Tourism:**
Tourist arrival numbers are predicted to drop by 83% in 2020 but assumed to recover after the COVID-19 pandemic with an average growth rate of 6% per year
- Construction industry:**
Construction activities show a significant decrease of 62% in 2020 and are forecast to further decrease in 2021 in the Base scenario. The Reform scenario estimates an increase in 2021. Both scenarios project a stabilized growth rate of 6% in the years leading up to 2030
- Gross National Income (GNI) growth:**
A decline of almost 18% is expected in 2020 followed by a further decline of 2.4% in the Base scenario in 2021, whereas growth of around 0.5% is projected for the Reform scenario. The Reform scenario also projects GNI to recover to pre-crisis levels in line with GDP in mid-2020s
- Population:**
The population is expected to decline by 0.4% in 2020, followed by a further gradual decline of about 1% year-on-year to reach around 6 million inhabitants by 2030
- Refugee population:**
The refugee population is assumed to decline steadily over the coming years by around 2% year-on-year on average, reaching approximately 1 million refugees by 2030
- Agriculture industry:**
Agriculture industry is sustained in 2020 with no growth but is estimated to increase gradually, reaching 5% in 2023 following the multiple crises. This growth rate is followed by a slight decrease, stabilizing at 3.6% in 2030
- Main export market GDP growth:**
A decrease in real GDP for Lebanon's main export destinations (KSA, Qatar, Iraq and UAE) is projected in 2020, followed by a steady recovery to reach growth levels of around 3% by 2030
- Manufacturing Gross Value Added (GVA):**
A 75% contraction in manufacturing GVA is estimated in 2020, followed by a further decrease in 2021, before increasing to about 5% growth in 2022 in the Base scenario. The Reform scenario estimates growth of around 9% starting 2021 in line with the growth in GDP, reaching double-digit growth in 2023. By 2030, the growth levels stabilize at around 9% in both scenarios

----- Indicator implicitly driven by GDP growth

Source: Desk research, World Bank Development Indicators, Euromonitor, Trading Economics, Bank Audi Lebanon, FAO, Roland Berger

Two scenarios for GDP growth

Continuation of status quo (Base scenario): GDP is forecast to contract in 2020 (-25 percent) and 2021 (-2.3 percent), return to positive real GDP growth in 2022 (+1.3 percent) and 2023 (+2.3 percent), then settle at annual growth of around +2.5 percent from 2025 onwards.

Reform & revival scenario (Reform scenario): This scenario assumes serious political and economic reforms, such as those laid out by the IMF and the World Bank in the latest Lebanon. Carrying out these reforms could make double-digit growth possible in 2022 and 2023. The 13 percent real GDP growth figure for 2022 is adapted from the recovery behavior of Lebanon's GDP after the 2006 war, the ramifications of which were similar to those of the current economic crisis, the global pandemic and the August 4 explosion.

Overview of real GDP growth scenarios

Real GDP growth scenario	Unit	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Base scenario growth	(%)	-25.0%	-2.3%	1.3%	2.3%	2.7%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Reform scenario growth	(%)	-25.0%	2.5%	13.0%	10.5%	8.0%	5.5%	3.5%	2.5%	2.5%	2.5%	2.5%

Source: Euromonitor, Oxford Economics, Bloomberg, desk research, expert interviews, Roland Berger

For the total traded volume, the decrease in trade volumes in 2019 and 2020 is projected to continue into 2021, and trade volumes are estimated to only pick up again in 2022. However, this is expected to happen slowly and previous traffic levels at the port will most likely not be reached by 2030. In the Reform scenario, demand is predicted to increase from 2021, with historical volumes from 2018 and 2019 being reached within seven to eight years.

For imports, in the Base scenario, the accumulation of multiple crises primarily affects domestic consumption, while domestic demand, tourism and manufacturing pick up only slowly. The Reform scenario, by contrast, foresees a full recovery of import volumes within the ten-year period, with a gradual increase in volumes from 2021.

Total volumes of imported goods – Base and Reform scenarios at PoB



Source: Lebanese Customs, Port of Beirut, Roland Berger

As to exports, in the Base scenario, only partial recovery is foreseen at the end of the ten-year period. In the Reform scenario, however, growth could be around seven percent, and 2015-2017 volumes could be reached again by 2026-2027, with potential for further growth thereafter.

Total volumes of exported goods – Base and Reform scenarios at PoB



Source: Lebanese Customs, Port of Beirut, Roland Berger

Governance models

Overview of port administration models globally

Four primary port administration models have emerged over the years, each with its own pros and cons. We may classify them by degree of governmental control for each key port function. The main characteristics where they differ are: (i) ownership of infrastructure, (ii) ownership and operation of superstructure, (iii) management of dock labor and (iv) various other functions, including type of cargo handled. The four different models are called "public service port", "tool port", "landlord port" and "private service port"

Degree of involvement of governmental entities in the four port administration models

	Public Service Port	Tool Port	Landlord Port	Private Service Port
Public control	[Progressive bar from left to right]			
Infrastructure	●	●	●	○
Superstructure	●	●	◐	○
Labor	●	◐	◐	○
Other facilities	◐	◐	◐	◐
Strengths	<ul style="list-style-type: none"> > Unity of command for development & operation > Ease of land bank acquisition 	<ul style="list-style-type: none"> > No duplication of infrastructure/equipment investments > Avoidance of union labor problems 	<ul style="list-style-type: none"> > Loyal terminal operators due to investments > Flexibility in coping with market requirements > Higher efficiency 	<ul style="list-style-type: none"> > Investment flexibility > Market and competition oriented
Weakness	<ul style="list-style-type: none"> > Limited labor flexibility > Lack of competition and innovations > Wasteful use of resources > Not customer oriented 	<ul style="list-style-type: none"> > Split operation of equipment & service for cargo handling > Weak financial positions cargo handling companies > Risk of under-investment > Lack of innovation 	<ul style="list-style-type: none"> > Complex coordination and risk of over-capacity > Risks of under-investments and congestion > Port authority may step in too late if terminals fail 	<ul style="list-style-type: none"> > Risk of focus on profitability instead of economical needs > No control over economic development related to port > Large cost of buy-back > Risk of speculation

Legend: ● Full government control, ○ Zero government control

Implications for the Port of Beirut

According to the study, the Port of Beirut should increase private sector participation by transitioning from a tool port to a landlord port. This would enable private sector participation in reconstructing the port, while the ownership of the infrastructure would

remain with the Lebanese government. The government should set up a Port Authority to replace the Temporary Committee. Additionally, contracts should be signed between the Port Authority and the private operators. The precise type of partnerships and number of private players will depend on the overall strategic plan developed for the port, which is discussed next.

Port of Beirut Development Strategy

Strategy options - analysis and selection

Needless to say, Port of Beirut serves the local market, and its future role and its future location are two key aspects for its strategic options. In more details, the study presents three different strategic options for the port: rebuild as before, right-size, and relocate.

Options regarding the port' s location:

Rebuild the port as it was before	Rightsize the port	Relocate the port
<ul style="list-style-type: none"> > Inflicting very minor changes on operations > Making the port fully operational with a short lead time and with less complexity 	<ul style="list-style-type: none"> > Focusing operations to maximize efficiency > Leveraging current operational terminals at the port > Decreasing traffic congestion and pollution > Repurposing parts of the land for additional development > Capturing demand in proximity to the port 	<ul style="list-style-type: none"> > Minimizing traffic congestion around the port area greatly > Maximizing the potential of repurposing the land in the center of Beirut
<ul style="list-style-type: none"> > Missing the opportunity to repurpose some prime real estate > Deepening traffic congestion and pollution in Beirut 	<ul style="list-style-type: none"> > Requiring political alignment 	<ul style="list-style-type: none"> > Disrupting an ecosystem that is dependent on the port > Requiring political alignment > Requiring a suitable substitute space

Recommended

Source: Roland Berger, HPC

Undoubtedly, rightsizing the port would be the most appropriate option. It ensures the possibility of focusing operations and maximizing efficiency, while it delivers economic prospects. In addition, rightsizing the port respects the long history of the port within the Beirut city, however it does require some changes and as such it would definitely need political support in the country.

Business development strategy

The examination includes an assessment of the current situation of the port terminals and an analysis of the forecast demand.

➤ *Current status of the port area:*

The main types of cargo handled at the port are the container terminal, general cargo area, dry bulk area and other areas. The below figure summarizes the current status of the four major areas of the port after the August explosion.

Current status of the port' s four major terminals:

Containers	General cargo	Dry bulk	Other areas
<ul style="list-style-type: none"> > Container terminal is fully operational (4 cranes requiring maintenance parts) > Management contract of the current operating company ended > Capacity limitation due to storage space 	<ul style="list-style-type: none"> > Terminal can operate at 65% capacity > Quays 9 and 10 have been damaged > Storage areas at the terminal are destroyed > Numerous service providers are active 	<ul style="list-style-type: none"> > Terminal can operate at 65% capacity > Quays 9 and 10 have been damaged > Grain silos to be demolished > Storage areas at the terminal are destroyed > Numerous service providers are active 	<ul style="list-style-type: none"> > Warehouses at the free zone are damaged > PoB does not have a liquid bulk terminal > No dedicated Ro-Ro terminal (including ferries), usually handled at general cargo terminal > PoB had an MRO center
<ul style="list-style-type: none"> > No major handling challenges > Storage space needs to be revised 	<ul style="list-style-type: none"> > Major handling and storage challenges 	<ul style="list-style-type: none"> > Major handling and storage challenges 	<ul style="list-style-type: none"> > No major challenges; however, inflicting cost pressure on handling

Note: Traffic lights indicate the need for and severity of intervention and solutions

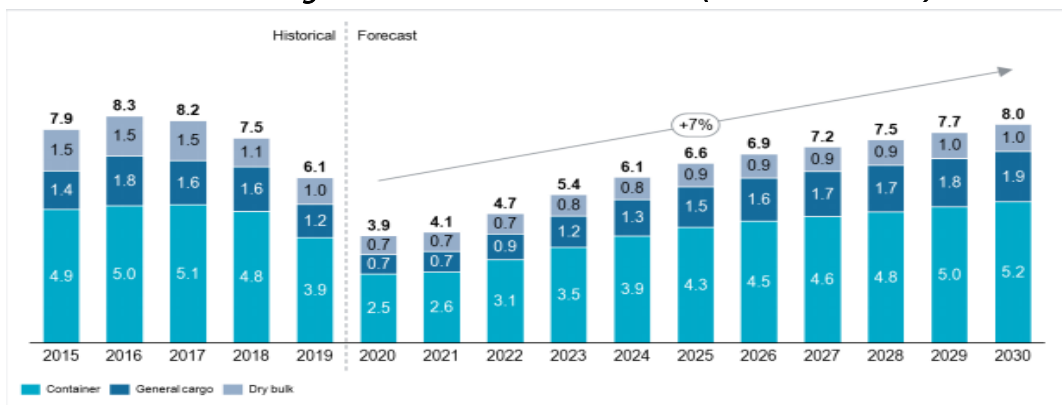
Source: Desk research, Roland Berger, HPC

➤ Demand forecast and economic outlook

Two possible economic development scenarios offered by the demand forecast. The base scenario and the reform scenario. The first one projects a slow process of economic recovery in which pre-crisis level of the economy will not be reached within the next ten years. While, by contrast, the second scenario reflects a boost in the country’s economy that can be initiated only if political and international support, investments and financial aid are enabled.

However, in both scenarios the trade volumes is not expected to exceed previous levels of pre-crisis period.

Total volumes of traded goods – Reform scenario at POB (m ton: 2015-2030)



Source: Lebanese Customs, Port of Beirut, Roland Berger

The future focus of operations defines what business strategy to adopt. Moreover, the demand forecast above determines also the types of cargo that will be most in demand. Container cargo should be a main business focus in terms of trade volume. Interesting to note that transshipments could also be a further interest that leads to higher container volumes at the port. In addition, a separate terminal would be necessary to manage the

demand on general cargo. Lastly, a significant share would account for the dry bulk with both clean dry¹ bulk and dirty dry² bulk.

➤ **Strategic business development options**

The study identified two options for business development. Option A that will reduce the storage areas at the port for general cargo and dry bulk, in addition it will make room for a different use of the land. Option B will ensure also the reduction of storage areas at the port for general cargo and clean dry bulk, while it will move the handling and storage of dirty dry bulk out of the city.

Strategic business development options and required operations by terminal

	Containers	General cargo	Dry bulk	Other terminals
<p>BD¹⁾ Option A Reducing port storage areas</p>	<ul style="list-style-type: none"> > Enact operational improvement (security, traffic infrastructure management) > Widen the container backyard to ease congestion 	<ul style="list-style-type: none"> > Restore infrastructure and build transfer stations > Reduce storage facilities at the current port area and relocate closer to cargo demand 	<ul style="list-style-type: none"> > Restore infrastructure for clean & dirty bulk & build transfer stations > Reduce storage areas (dirty and clean) 	<ul style="list-style-type: none"> > Restore free zone area and logistics free zone and explore potential options to expand current operations > Dedicate berths for Ro-Ro/ferry/cruise terminal, military, maritime and vessel services and marine services (marine police, coast guard, etc.)
<p>BD¹⁾ Option B Reducing port storage areas & moving out dirty dry bulk</p>			<ul style="list-style-type: none"> > Restore infrastructure for clean bulk > Move out dirty bulk > Reduce storage areas (clean) & build transfer stations 	

1) Business development

Source: Roland Berger, HPC

The above two options have different requirements concerning the use of space at the port. Moreover, the required berthing length and port land is related to several requirements with regard to connectivity and implementation. The study assesses these dimensions at a high level and identifies the preferred business development option for the Port of Beirut. In this context, option B is hereby the best business strategy. This option paves the way for professionalizing operations, maximizing efficiency and making the best possible use of the available land.

Spatial development strategy

The spatial plans presented by this study were produced by HPC and Roland Berger. On this basis, the study provided three high level plans that demonstrated the possibilities available for the Port of Beirut concerning location of the terminals as well as future expansion.

¹ Grains for domestic food supply
² Serving industrial and other purposes

Spatial Development Options			
	Option 1	Option 2	Option 3
	Rightsizing the current area	Expanding container storage and logistics operations into first landfill area	Expanding non-container terminals and logistics activities into both landfill areas
Container Terminal	Allocating quay 16 for container terminal	Allocating quay 16 for container terminal	Allocating quay 16 for container terminal
Multipurpose Terminal	Deepening container backyard Allocating quays 11, 12, 13 and 14 for general cargo, clean bulk and Ro-Ro	Expanding container storage into landfill area Allocating quays 13, 14, and 15 for general cargo, clean bulk and Ro-Ro	Expanding container storage by reclaiming basin 4 Mocing berthing operations into landfill area
Free Zone & Storage Area	Expanding free zone area to include activities south of basin 3	Expanding free zone and logistics operations in landfill area	Expanding free zone and logistics operations in landfill area
Repurposed Area	Allocating areas for urban development and/or port related industries	Allocating areas for urban development and/or port related industries	Allocating areas for urban development and/or port related industries

Source: BLOMINVEST Bank, Roland Berger – A Strategic Study

On the whole, all three suggested options have both advantages and limitations. In this sense, the study does not make a recommendation as to which option should be selected. However, one of the key issues for the development of the port is its **governance structure**. In fact, the study offered various options for a revamped governance structure at the national, port management and port operations levels.

At present, it is not possible to make a recommendation about the segmentation of the different operations, the type of partnerships that can be set up and hence the number of private sector players to be involved. This will only be feasible when the port development plan is decided and agreed upon. It is important, however, that these future partnerships should be based on open and transparent processes and systems.

Strategic Roadmap for the Port of Beirut

Financial modeling and analysis

The study provided a financial analysis based on an assessment of historical trade volume at the Port of Beirut and the forecasts for future traffic in the base and Reform scenarios. Moreover, it took into account both the historical performance of the different revenue streams and their forecast values through 2030. Adding on it presented forecasts for operating expenditure (OpEx).

➤ **Port revenue**

Revenues of the Port are calculated based on a function of price per volume, and three elements are needed for estimates for the period through 2030. Price, Port traffic volumes, and vessel traffics. Moreover, the Port of Beirut has five main revenue streams.

The five main revenue streams of the PoB:

Port Revenue Streams				
Port dues on vessels	Port dues on cargo	Handling and hire of equipment	Storage	Other
cover berthing and mooring activities	Tariffs on cargo channeled through PoB	Fees are outlined in detail and specific services priced separately depending on the cargo type (in USD/Ton or USD/TEU)	Fees are based on cargo type and duration of storage	this category is included as a separate revenue stream
Tariffs depend on the length of the vessel & average stay at the port	Container cargo: local and transshipment containers are priced per TEU	Relative activities to hire of equipment related to discharge/loading charged in USD/hour	Port dues (include the first nine days of storage) charged per additional storage day, depending on the cargo type and the number of days required	Related to administrative processes
Tariffs are in USD per meter per day, in 5 length categories and have a minimum due	Non-container cargo: general cargo and dry bulk are priced per ton depending on weight of the cargo	No standard handling package		
	Tariffs also depend on type of commodities			

Source: BLOMINVEST Bank, Roland Berger – A Strategic Study

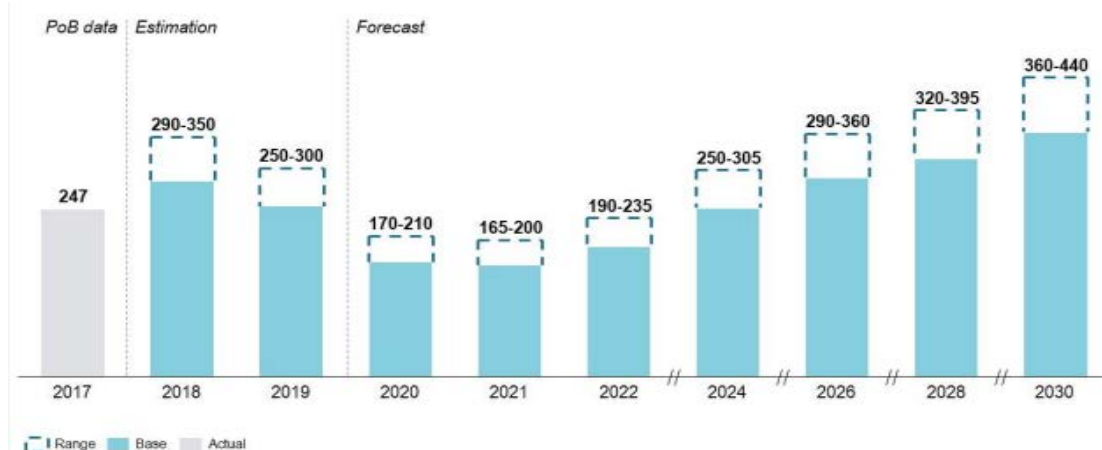
Estimated average tariffs by revenue stream:

	Estimated average tariff
Port dues on vessels [USD/vessel]	
Length group 1: 0-75 m	1,110
Length group 2: 76-150 m	2,151
Length group 3: 151-225 m	1,938
Length group 4: 226-300 m	1,686
Length group 5: > 300 m	3,425
Port dues on cargo (specific tariff charged by the Port of Beirut, based on commodity type)	
Containerized cargo [USD/TEU]	
Containers for local consumption	95
Transshipments	10
Non-containerized cargo [USD/ton]	
General cargo	8
Dry bulk clean	3
Transit	2
Handling	
Containerized cargo [USD/TEU]	
Containers for local consumption	125
Transshipments	60
Non-containerized cargo [USD/ton]	
General cargo	7
Dry bulk clean	7
Transit	7

Source: Port of Beirut, Roland Berger

The revenue estimates can be used to derive an overview of business at the PoB and its development over the next period. As demand is essential for revenues, however economic development of Lebanon is as important. Total revenues are estimated to reach USD 360-440 million by 2030. Again, it is important to note that the overall performance hinges on the state of the Lebanese economy as well as on the trade volumes being channeled through the port. The next figure below illustrates the forecast development of total revenues at the PoB in the Reform scenario.

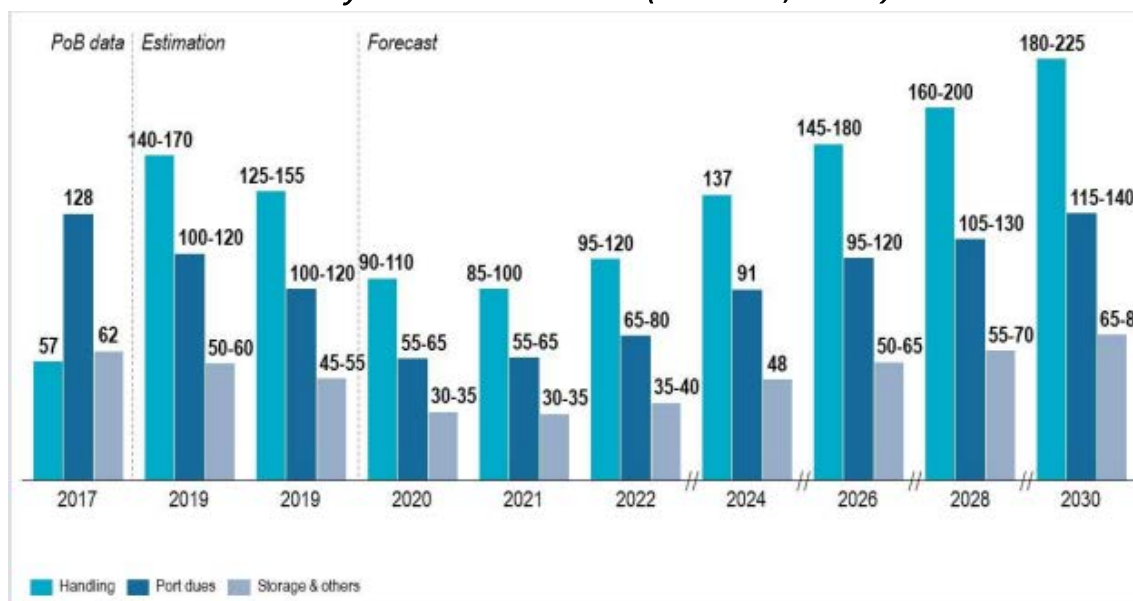
Overview of total forecast revenue at the Port of Beirut (2017-2030; USD m)



Source: Port of Beirut, Roland Berger

Adding on, handling fees grasped a large share of PoB’ s revenues, followed by port dues on cargo. If we compared these elements, we can notice that the share of revenues from port dues on vessels is relatively small, behind that of both storage and other revenues.

Overview of total revenue by revenue stream at PoB (2020-2030; USD m):

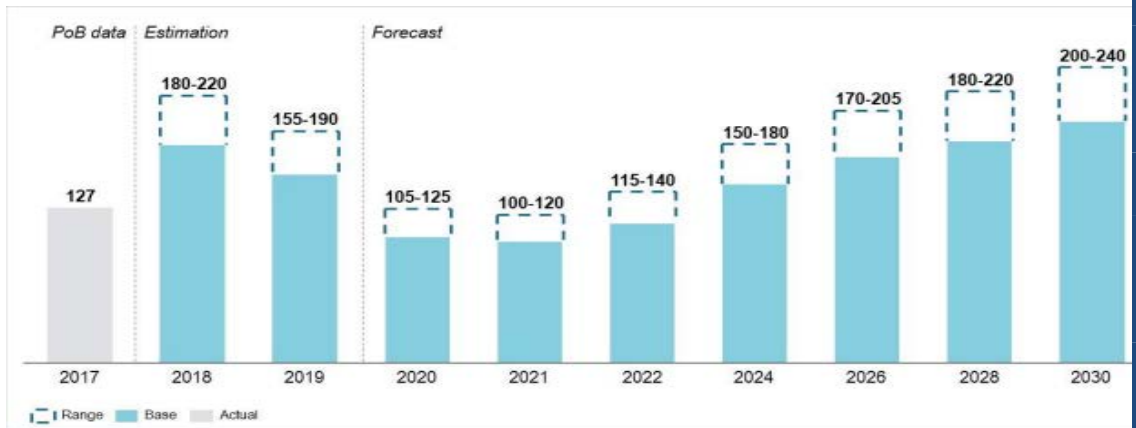


Source: Port of Beirut, Roland Berger

➤ **Port operating expenditures**

The port operating expenditures (OpEx) are closely linked to the revenue forecasts and assumptions for the share of the different OpEx items. Total operating expenditure is estimated to be around USD 105-125 M. In line with increased revenues, OpEx is estimated to be around USD 200-240 M in 2030. Overall, total OpEx will be at around 60% of total revenue in 2020 and it is expected to reach a target of 55% of total revenue by 2030 only if the operational improvements are implemented.

Overview of total OpEx at PoB(2020-2030, USD M):

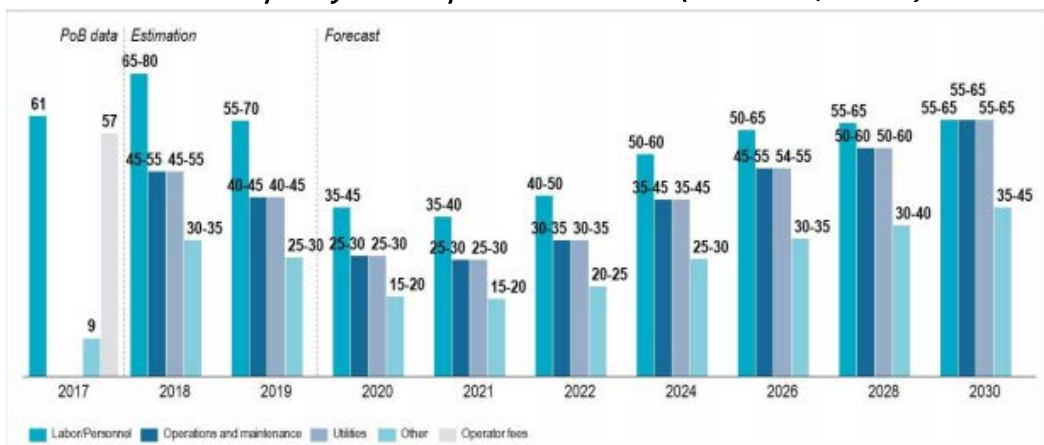


Source: Port of Beirut, Roland Berger

The main expenses of the PoB are personnel costs and it grasped 40% on average; the study assumed that staff efficiency will improve which will bring the share of personnel expenses to around 27% by 2030. Cargo terminal operator fees (51%), financial charges (1%) and provisions and other unspecified expenses (8%).

The below figure shows the breakdown of total OpEx by main expense items at the port.

Breakdown of total OpEx by main expense items at PoB(2020-2030, USD M):



Source: Port of Beirut, Roland Berger

Funding options

Undoubtedly, Port of Beirut is a highly valuable asset to the country’s economy. However, it is crucial that the governance structure of the port is revamped and a port development plan is agreed on to pave the way for various financing options.

However, before reaching out to potential financiers, the following key steps must be taken:

- Conduct a detailed prefeasibility study
- Obtain approvals and commitment to the chosen development plan
- Determine the number and type of investment partners
- Define the value proposition for each partner

As mentioned above, various options are available for the Port of Beirut. In fact, the private sector should be encouraged to continuously upgrade operations and invest in equipment and facilities once the government provides a fiscal space to encourage investments.

Other financing option can be provided through equity financing such as Macquarie or Brookfield, or by major EPC companies involved in infrastructure projects. Moreover, pension and sovereign wealth funds also offer equity financing, and commercial banks and pension funds offer debt financing.

Adding on, International Financial Institutions (IFIs) such as IFC, EIB, ICD and AIIB provide also financing for infrastructure. For instance, if PoB forms a public-private partnership (PPP) with private operator, IFIs could provide blended financing solutions based on a combination of market loans and grants (for example, interest rate subsidies, loan guarantees and technical assistance). The advantage of this is that the funding is adapted to the recipient's needs, which increases the volume, impact and economic benefit of such solutions.

Potential financing partners:

	Partner	Description	Advantages	Disadvantages	Expected IRR indicative ¹⁾	Examples selection only
Equity	Infrastructure funds	> Open/closed funds with focus on economic infrastructure projects	> Focus and expertise on infrastructure	> Partially very high expected returns	> 7-15%	Brookfield MACQUARIE
	Pension funds	> Open/closed funds with focus on long-term wealth maintenance and growth	> Long-term, stable investment preferences	> Require complex, long-term revenue guarantees	> 5-10%	KWAP
	Sovereign wealth funds	> Sovereign-backed fund, e.g. based on resource revenues	> Strong interest in diversifying portfolios, e.g. into infrastructure	> Potential politicization of projects	> 4-8%	GIC
	Major EPC companies	> EPC industry players focused on infrastructure delivery	> Synergies with EPC contracting and technical expertise	> Lack of risk diversification	> 7-9%	HOCHTIEF
	Terminal operators	> Port industry players focused on operations and business expansion	> Synergies with technical expertise	> Lack of risk diversification	> 5-10%	DP WORLD PSA
Debt	Commercial banks	> National, regional and international financial institutions with a focus on infrastructure	> Specific fit with infrastructure projects	> Higher credit terms than budget finance or IFIs	> 7-10%	Maybank CIMB
	Pension funds	> Open/closed funds with focus on long-term wealth management (e.g. via bonds)	> Long-term, stable investment preferences	> May require long-run revenue guarantees	> 5-10%	KWAP
Debt & equity	International financial institutions	> Bilateral or multilateral donor institutions working on infrastructure	> Good financing conditions and technical expertise	> Potentially lengthy and bureaucratic project management	> 2-6%	IFC AIIB

1) Expected IRRs are based on secondary research and expert interviews; these serve as indicative figures and may change according to each project's specification

Source: Desk research, Roland Berger

Conclusion and next steps

It is unanimously agreed that crises create opportunities. But in the case of Port of Beirut, time is of the essence especially as no action what so ever has been done on rebuilding the port of Beirut which is an essential step towards building back a better revitalizing Lebanese economy.

In particular, this study provided guidance to policymakers on the crucial additional requirements and options for reconstructing Port of Beirut. It also paved the way for financing this project. Ultimately, this study showed possibilities from inside and outside the country that can join forces to commence a new era for the Port of Beirut.

Urgent action is needed at both the national level and the level of the port itself. As detailed in this study, structural, economic, social and political reforms at a national level are critical in order to unlock the future development of the Port of Beirut and Lebanon as a whole.

Moreover, implementing the actions outlined in this study is a matter of urgency to restore trust and to make Beirut a safe and efficient economic hub for the region especially that on the first of September 2021, the Middle East region will witness a revolution in port activity due to the opening of the new Haifa port. Hence, this opening of the Gulf port will surely

have dramatic impact on the port of Beirut activity as it is the newest port in the world with the latest in port technology.

Finally, and with respect to the point raised in the previous paragraph, we believe the study has few short comings, notwithstanding its excellent and comprehensive nature:

- 1) The forecasts under the reform model are on the conservative side, since the outcome of reform could be very positive to an economy starved of reforms for more than 20 years.
- 2) The study should have more to say about the future connection/relations that the Port of Beirut should have with other ports in Lebanon, especially the Port of Tripoli.
- 3) Similarly, there should have been more say about the Port' s position vis-à-vis other ports in the region and the Mediterranean.
- 4) The **estimated** cost for each development option should have been presented along with the optional financing plan.

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