JORDAN INVESTMENT COMMISSION

الأردن هيئة الاستثمار

Pre-Feasibility Study

Establishing a Stem Cell Bank Project

Madaba

April, 2017

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Madaba Governorate

1. Executive Summary

This study aims at determining the pre-Feasibility study of establishing a Stem Cells Bank in Madaba Governorate, particularly in the area of "Lub" near the American University in Madaba. The following table shows the preliminary indicators of the project.

Table 1: Initial indicators of the stem cells bank Project

Project Name	Stem Cell Bank
Sector	Health Services
Governorate	Madaba
Region	The area of "Lub", near the American University in Madaba
Products/Services	• The extraction and examination of Stem Cells • Preserving human Stem Cells
Project Description	The project is based on establishing a Stem Cell bank in the Governorate of Madaba. The bank offers the services of examining and preserving Stem Cells through the child's umbilical cord immediately after his/her birth, or through dental pulp of deciduous teeth of the child. The participants who are planning to preserve these cells will benefit from them in the future, in treating a number of incurable diseases that might infect them or a member of their family. The estimated bank area is approximately 2,500 m^2, with a capacity of approximately 5,500 samples. It is expected that the number of subscribers in the first year will be about 320, and will grow up to about 598 annual in the tenth year, when the accumulated number of subscribers will cover 100% of the capacity in the tenth year, to reach 5500 subscribers.
Target Market	• Jordanian Citizens (residents and expatriates). • Citizens of Arab states.
Investment Cost	The investment cost of the project is JD 3.45 million
The Average Return On Investment	The average return on investment(ROI), during the ten years is about 23.3%
Internal Rate Of Return	The internal rate of return (IRR) for the project is about 17.3%
Average Added Value Of The Project	The average added value to the project in ten years is about JD 550 thousand
Risk Assessment	The Sensitivity Analysis indicates a low risk in case of 10% increase in investment cost, whereas a high risk in case of 10% increase in operating costs, or 10% decrease in revenues.

The Project Justifications	• Medical development in the Kingdom. • The employment of educated labor. • The importance of Stem Cells, and their ability to treat several diseases. • Lack of competitors in the field of Stem Cell banks, with the exception of one competitor.
Partners/Stakeholders	• Ministry of Health. • The Ministry of Industry and Trade (company registration). • The American University in Madaba.

2. The Macroeconomic Environment

2.1 An Overview of the Hashemite Kingdom of Jordan

The Hashemite Kingdom of Jordan is a landlocked country surrounded by land except at its southern extremity at the port of Aqaba, where that area is the only sea exit area in Jordan. The Kingdom is bordered at its west side by Palestine and the Mediterranean Sea, at its south and east by the Kingdom of Saudi Arabia, at north east by Iraq and at north by Syria.

Figure 1: Map of the Hashemite Kingdom of Jordan

Jordan is marked by three climatic zones from west to east including the Jordan Valley, most of which lies below sea level and is considered subtropical, and upland areas to the east of the Jordan Valley, ranging in height from 100 to 1500 meters above sea level and this is one of the areas dominated by Mediterranean climate, and the desert areas stretching to the east of the highlands.

The total area of the Kingdom is approximately 89.3 thousand square kilometers, and the semi-desert conditions prevail in over 80% of this area where there are some wet lands settings like Azraq Basin.

The kingdom is divided administratively into twelve governorates distributed into three regions: the Northern Region (includes the governorates of Irbid, Mafraq, Jerash and Ajloun) while the Central Region (includes the governorates of the capital, Zarqa, Balqa, Madaba) and the Southern Region (includes the governorates of Karak, Tafila, Ma'an, Aqaba), and the major cities are Amman (the capital), Zarqa and Irbid.

2.2 Population

Based on the General Census of Population and Housing in 2015, the population in the kingdom amounted to about 9.5 million people with a population density of 107.3 inhabitants per km^2, where the Capital City knocked off other governorates by population amounting to about 4 million people and a population density of 538.8 inhabitants per km2, mainly because Amman is the most attractive governorate for Jordanians and for those coming to Jordan from other countries, followed by Irbid Governorate with a population of 1.8 million people, and then Zarqa Governorate with a population of 1.4 million. Tafila Governorate which is considered to be the least populous governorate whose population is about 96 thousand people.

Table 2: Number of population and population density in the Kingdom for 2015

Governorate	Population (people)	Area (Km^2)	Population density (people/ km^2)
Central Region			
Capital	4007526	7,579	528.8
Zarqa	1364878	4761	286.7
Balqa	491709	1120	439.0
Madaba	189192	940	201.3
North Region			
Irbid	1770158	1572	1126.1
Mafraq	549948	26551	20.7
Jerash	237059	410	578.2
Ajloun	176080	420	419.2
Southern Region			
Karak	316629	3495	90.6
Tafeileh	96291	2209	43.6
Maan	144082	32832	4.4
Aqaba	188160	6905	27.2
Total of Kingdom	9531712	88793.5	107.3

Source: Department of Statistics, Jordan General Population and Housing Census, 2015

On the other hand, the population growth rate has reached about 3% in 2010 and increased to 9% during the years 2013 and 2014 and then dropped a little during 2015 to reach about 8%, according to demographic surveys for the Department of Statistics. The reason for the high growth rates is attributed to the influx of large numbers of refugees from Syria to the Kingdom which resulted in a marked decline in per capita real GDP index by 5.4% to JD 1,197.4, based on the Statements of the Central Bank of Jordan.

The unemployment rate among Jordanians also witnessed a rise by 1.1 percentage to reach to 13%, due to the structural imbalances that the labor market is suffering from and the acquisition

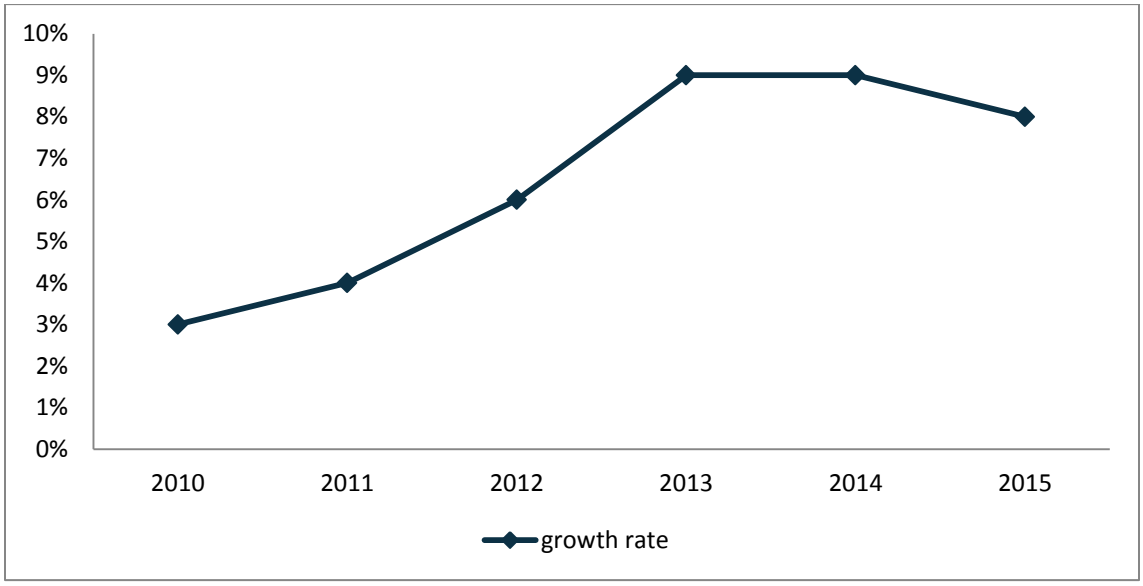
of the low-paid foreign workers on a large number of new jobs in the economy, according to the Central Bank of Jordan.

Table 3: Number of population and population growth in the Kingdom, thousand

	2010	2011	2012	2013	2014	2015
population	6698.0	6993.0	7427.0	8114.0	8804.0	9531.7
growth rate	%3	%4	%6	%9	%9	%8

Source: Department of Statistics

Figure 2: population growth rate in the Kingdom



2.3 Economic Indicators in the Kingdom [1]

Countries across the Middle East are still suffering from instability and closure or partial closure of borders; including the borders of important markets for the Kingdom's products. These factors led to a decline in the performance of many of the economic sectors, including the external sector, national exports, touristic income, and Foreign Direct Investment (FDI), and they contributed to a slowdown in the economic growth to about 2.4% in 2015, compared to 3.1% in 2014. The growth achieved in 2015 came from growth across several economic sectors, especially in the finance, insurance, and real estate services; the transport, storage, and communications services; the mining industry; the manufacturing industry; and the agriculture sector. These sectors contributed a combined 1.8 percentage points (or 75%) of the growth rate achieved during 2015, reflecting the diversity of the economic growth sources in the Kingdom.

Additionally, the general price level registered a decline in the prices of oil, commodities, and other related services in the global markets. Therefore, the general price level, measured by the relative change in the average consumer price index deflated by 0.9% in 2015, compared to the inflation of 2.9% in 2014.

The budget deficit, after aid, increased by 1.2% to a record 3.5% of GDP, compared with 2.3% in the previous year. In addition, the Balance of Payments' Current Account recorded a deficit of 8.9% of GDP, compared with 7.3% in 2014. At the end of 2015, the net public debt amounted to 22,847.5 million Jordanian Dinars (85.8% of the GDP), with an increase of 5.0% of the GDP. However, the total public debt reached 24,876.5 million Jordanian Dinars (93.4% of GDP). This increase resulted from financing both the general budget deficit and the guarantees for loans for the National Electricity Company and the Water Authority, as well as the slowdown of economic growth during 2015. The indebtedness of the National Electricity Company and the Water Authority recorded 6.7 billion Jordanian Dinars at the end of 2015.

On the monetary and banking front, most monetary indicators experienced positive development in performance in 2015, primarily in the Central Bank's foreign reserves, which maintained comfortable levels that amounted to about $14.2 billion. The dollarisation rate decreased, which reflected positive demand for Jordanian Dinars in comparison to other major foreign currencies. With regards to the activities of licensed banks, the outstanding balance of credit increased by 9.5%, to reach 21,103.5 million Jordanian Dinars at the end of 2015. The total deposits registered with licensed banks increased by 7.7%, to reach 32,598.5 million Jordanian Dinars at the end of 2015. The increase in deposits came as a result of the high dinar deposits, which increased by 2,001.4 million Jordanian Dinars (8.3%), and higher foreign currency deposits, which increased by 336.1 million Jordanian Dinars (5.4%).

[1] The Central Bank of Jordan

Furthermore, many of the external sector indicators registered a drop in performance in 2015 due to the deepening instability in the region and almost full closure of the borders with Iraq and Syria. However, the drop in oil prices in the global markets contributed to the decline in the Kingdom's imports bill for energy, as it dropped by 40.6%, which in turn contributed to a decline in total imports and the trade deficit by 11.4% and 14.0%, respectively. Thus, the Current Account, excluding aid, declined to 11.9% of GDP, compared to 12.4% in 2014.

The Current Account deficit increased after aid, to reach 2,365.6 million Jordanian Dinars (8.9% of GDP) in 2015, compared with a deficit of 1,851.7 million Jordanian Dinars (7.3% of GDP) in 2014. This decline is due mainly to the decline in total exports by 6.6% and the decline in surplus in the services account by 27.7%, as touristic income decreased by 7.1%, and the decline in the surplus in the current transfers account decreased as a result of reduced foreign aid.

Capital and financial accounts resulted in a net inflow of 1,593.7 million Jordanian Dinars in 2015, compared to 909.0 million Jordanian Dinars in 2014; this was due to the Kingdom's higher net obligations towards the outside world. Foreign Direct Investment registered a net inflow of 909.4 million Jordanian Dinars, and the reserved investment registered an inflow of 918.4 million Jordanian Dinars due to the Kingdom issuing Eurobonds that are worth $2.0 billion in the global markets. The withdrawal of bank loans on behalf of the Central Bank increased the use of funds from the International and Arab Monetary Funds by 543.3 million Jordanian Dinars. This led to the registration of a surplus in the overall Balance of Payments of 328.7 million Jordanian Dinars during 2015, compared to a surplus of 1,550.7 million Jordanian Dinars during 2014.

According to the Central Bank of Jordan, the increased international investment at the end of 2015 showed an increase in the external net liabilities of the Kingdom, which reached 24,357.5 million Jordanian Dinars, compared with 22,578.8 million Jordanian Dinars at the end of 2014. This was due to an increase in the external balance of assets and financial liabilities for all of the economic sectors in the Kingdom, which reached to 18,657.9 million Jordanian Dinars and 43,015.5 million Jordanian Dinars, respectively, during 2015.

Table 4: main economic indicators 2011 to 2015 in millions of dinars

	2011	2012	2013	2014	2015
Population (millions)	6.993	7.427	8.114	8.804	9.532
Unemployment rate	12.9	12.2	12.6	11.9	13.0
Production and Prices					
GNP at current market prices	20,288.8	21,690.0	23,611.2	25,141.2	26,289.6
GDP at current market prices	20,476.6	21,965.5	23,851.6	25,437.1	26,637.4
The rate of growth in GDP at constant market prices (%)	2.6	2.7	2.8	3.1	2.4
The total national disposable income at current prices	23,743.5	24,774.9	28,424.5	30,302.1	30,234.7
The rate of growth in gross national disposable income at current prices (%)	4.7	–0.2	8.6	3.1	–2.4
Change in the index of consumer prices (%)	4.2	4.5	4.8	2.9	–0.9
The change in the GDP deflator (%)	6.4	4.5	5.6	3.4	2.3
Money and Banking					
Exchange rate of the Jordanian dinar to the US dollar	1.410	1.410	1.410	1.410	1.410
Money supply (P2)	24,118.9	24,945.2	27,363.4	29,240.4	31,605.5
Net foreign assets of the banking system	9,370.1	6,665.5	6,923.4	7,932.3	8,137.3
Net domestic assets of the banking system	14,748.8	18,279.7	20,440.0	21,308.1	23,468.2
Net debt of the government	6,701.4	9,461.3	10,494.8	10,473.9	11,386.4
Private sector debts (Residents)	14,925.0	15,953.6	17,222.5	17,852.8	18,704.5
Other factors [(1)]	–6,877.6	–7,135.2	–7,277.3	–7,018.5	–6,622.7
Deposits in dinars at licensed banks	19,119.1	17,711.1	21,003.0	24,013.1	26,014.5
Foreign currency deposits at licensed banks	5,258.8	7,258.6	6,590.2	6,247.9	6,584.0
Rediscount rate (%)	4.50	5.00	4.50	4.25	3.75
Treasury bills interest rate for 6 months (%)	3.232	3.788	-	-	-
Public Finance					
Total revenue and foreign aid	5,413.9	5,054.2	5,758.9	7,267.6	6,796.4
Ratio to GDP (%)	26.4	23.0	24.1	28.6	25.5
Total spending	6,796	6,878.2	7,077.1	7,851.1	7,722.9
Ratio to GDP (%)	33.2	31.3	29.7	30.9	29.0
Overall deficit/savings (on an accrual basis)	–1,382.7	–1,824.0	–1,318.2	–583.5	–926.5
Ratio to GDP (%)	–6.8	–8.3	–5.5	–2.3	–3.5
Net outstanding balance of the domestic public debt	8,915.0	11,648.0	11,863.0	12,525.0	13,457.0
Ratio to GDP (%)	43.5	53.0	49.7	49.2	50.5

	2011	2012	2013	2014	2015
Outstanding external public debt [2]	4,486.8	4,932.4	7,234.5	8,030.1	9,390.5
Ratio to GDP (%)	21.9	22.5	30.3	31.6	35.3
Foreign Trade and Balance of Payments					
Current account	–2,098.8	-3,344.9	-2,487.7	-1,851.7	-2,365.6
Ratio to GDP (%)	–10.2	–15.2	–10.4	–7.3	–8.9
Trade balance (Deficit)	–6,261.7	–7,486.6	–8,270.1	–8,495.6	–7,249.3
Ratio to GDP (%)	–30.6	–34.1	–34.7	–33.4	–27.2
Commodity exports	5,684.5	5,599.5	5,617.9	5,953.6	5,558.3
Imports of goods (FOB) [3]	11,946.2	13,086.1	13,888.0	14,449.2	12,807.6
Balance of services (net)	896.0	1,332.3	1,209.5	1,778.9	1,286.4
Income account (net)	–187.8	–275.5	–240.4	–295.9	–347.8
Current transfers (net)	3,454.7	3,084.9	4,813.3	5,160.9	3,945.1
Capital and financial account (net)	2,298.9	3,808.9	1,811.1	908.9	1,593.7
Direct foreign investment in Jordan (net)	1,055.0	1,074.3	1,281.2	1,426.7	905.1

Source: Monthly Statistical Bulletin, Central Bank of Jordan

1. Includes the debts of public and financial institutions and other factors, as shown in the Monetary Survey Agenda.
2. This represents the total balance of drawn loans, minus total repayments.
3. Does not include imports of non-resident entities.

2.4 The Jordanian Investment Environment

Investment Law No. 30 for 2014

Investment Law no. 30 for 2014 is considered an appropriate legislative framework to attract foreign investments and stimulate local investments. It is considered a competitor to other investment laws in the region because it contains many advantages, incentives, and guarantees, and it offers a range of incentives and benefits in and outside the Development and Free Zones. The law includes a series of public provisions, such as foreign investment guarantees (depositing and withdrawal of capital, investment management, and transfers) and the inadmissibility of the disbarment of investment property. The law offers provisions to settle investment disputes, protection, and encouragement of mutual investment agreements between the Kingdom and other countries.

The following shows the major incentives granted by the law:

❖ **Incentives and Benefits outside the Development and Free Zones**

- The production inputs for the industrial and crafts sectors are exempted from customs duties.
- The return of the general sales tax on the production inputs for the industrial and crafts sectors within 30 days.
- Production inputs and fixed assets of the industrial and crafts sectors are exempted from customs duties and are granted a reduction in general sales tax to 0%.
- Returning to the sales tax on the services needed to practice economic activity within 30 days.
- The goods that are necessary for the economic activities of the following sectors are exempted from customs duties and are subject to 0% general sales tax:
  - Agriculture and livestock, hospitals and specialised medical centres, hotels and touristic facilities, touristic entertainment and recreation centres, call centres, scientific research centres and laboratories, art and media production, convention centres and exhibitions, transfers and/or distributions and/or extraction of water, gas and oil derivatives, air transport, maritime transport, and railways.

❖ **Incentives and Benefits inside the Development and Free Zones**

- 5% income tax on the income generated from economic activity within the Development Zone.
- 5% income tax on income generated from economic activity in the industrial sector.
- Tax exemptions that are granted in the Kingdom on goods and services exports.

- Reduction of sales tax to 0% on goods and services that are used by the establishment in order to exercise its activity inside the Development Zone.
- 7% sales tax on specific services provided by a registered company in the zone when these services are consumed in the zone.
- Exemptions from customs duties except for a specified number of goods.

❖ **The Reduction of Income Tax in the Least Developed Areas for Regulation No. 44 for 2016**

- The reduction of income tax in the least developed areas for Regulation No. 44 for 2016 was approved. It aims to create an attractive environment for investments that promote economic development through the reduction of income tax outside the Development Zones and in the least developed areas in the Kingdom. The regulation specified the areas that are considered least developed and identified the activities that are excluded from this reduction.
- Under the provisions of Articles 4 and 5 of this regulation, the areas that were categorised as least developed and enjoy the reduction in income tax are divided into four categories; each category enjoys a reduction in income tax on their activities for a period of 20 years.
- Category A includes the Northern Valley District, Deir Alla District, Shouneh Al-Janoubieh District, the Southern Valley District, Rweished District, the Northern Desert District, the North Western Desert District, Al-Azraq Province, Al-Jiza District except for the borders of the new Al-Jiza municipality, Al-Moakar District except for the borders of Al-Moakar municipality, and the Governorate of Aqaba except for the Aqaba Special Economic Zone. The reduction rate for this category is 100%.
- Category B includes the Governorates of Maan, Tafileh, Karak, and Ajloun. The reduction rate for this category is 80%.
- Category C includes the Governorates of Jarash, Mafraq, and Irbid except the borders of the Greater Irbid Municipality. The reduction rate for this category is 60%.
- Category D includes the Governorates of Madaba, Balqa, Amman except for the Greater Amman Municipality, and Zarqa except for the borders of Zarqa Municipality and Russaifeh Municipality. The reduction rate for this category is 40%.

❖ **Trade and Free Trade Agreements**

The most important agreements are:

- Jordan joining the World Trade Organisation in 2000, which led to the opening of the markets of 150 countries for Jordanian exports in goods and services, and provided new opportunities of access to other countries within a clear and transparent environment of laws, regulations, and procedures.
- A series of regional trade agreements, such as the Jordan Partnership Agreement with the European Union, Agadir Agreement, Free Trade Arab Agreement, the free trade agreement between Jordan and the European Free Trade Association, and the adoption of the Euro-

Mediterranean simplification of the rules of the Origin System, which includes the decision to simplify the rules of the origins of Jordanian products between Jordan and the European Union came into effect on July 19, 2016, and will remain in effect until December 31, 2026.

- A series of bilateral trade agreements with many countries, such as the free trade agreement between Jordan and the United States of America, the Qualified Industrial Zones Agreement, the free trade agreement between Jordan and Singapore, the free trade agreement with Turkey, the free trade agreement with Canada, and many other agreements.
- Jordan has signed more than 35 agreements with Arab and foreign countries in order to prevent double taxation between Jordan and these countries, thus protecting investors' rights.
- The Agreement of Promotion and Protection of Investments and the Movement of Capital between the Arab Countries was signed in 2000 with 11 Arab countries who are members of the Arab Economic Unity Council, in order to establish an appropriate environment for investments and economic cooperation between investors in the Arab countries, thus pushing and stimulating investment activities by providing encouragement and mutual protection for Arab investments.

Human Development Report for 2015

The Human Development Report that was issued by the United Nations Development Program in 2015 showed that Jordan fell 3 points to number 80. Please note that Jordan's place on the Human Development Report index value has improved slightly.

Global Competitiveness Report

The Kingdom's rank has improved by one point in the Global Competitiveness Report for the year 2016/2017, at 63 out of 138 countries compared to 64 out of 140 countries in the 2015/2016 report. It is considered an insignificant improvement, especially because of the reduction in the number of countries participating in this year's report. Amongst the Arab countries, Jordan was ranked after the United Arab Emirates, Qatar, the Kingdom of Saudi Arabia, Kuwait, and Bahrain, who were ranked 16, 18, 29, 34, and 39, respectively.

Doing Business Report

In the Doing Business Report that was issued by the World Bank Group, Jordan is still ranked 118, up one rank from the 2016 report, because of the variation in the performance of the different sub-indicators. Jordan ranked ninth among the Arab countries; the United Arab Emirates was ranked first among the Arab countries at 26, followed by Bahrain at 63 and Oman at 66.

2.5 The Economic Environment in the Short and Medium Term

Risks analysis implemented by BMI indicates that the Jordan's political and economic risks in the short and medium term are less than the overall average of the world and the Middle East. The state's risks and the operational risk are estimated to be within the acceptable levels. The international institutions' forecasts point out that the economic and foreign trade indicators are expected to achieve acceptable rates of growth with the exception of the continued increase in internal and external indebtedness.

Table 5: Assessment of short and long-term risks

	Long term		Short term		Operational risks	State risks
	political	Economic	political	economic		
Jordan	63.1	39.2	66.6	46.2	58.7	55.4
Turkey	60.2	49.4	58.4	56.9	55.9	56.1
Egypt	53.3	45	52.4	48.7	42.9	47.5
Lebanon	45.8	54	55.4	53.5	44.2	49.5
West Bank and Gaza	33.1	38.1	32.2	36.5	32.5	34.3
Syria	22.9	24.4	22.4	23.6	29.3	26.1
Regional average	49.4	46.9	51.2	48.7	46.6	48.3
global average	64.1	50.7	61.3	51.9	49.8	54.6

Source: the economy and state risks, IHS, 15/09/2016

Table 6: The most important key economic indicators 2016-2020

Indicator	2016	2017	2018	2019	2020
The growth rate of GDP	2.6	2.7	2.8	3.2	3.1
GDP (in USD billions)	39.6	42.1	44.8	47.8	50.9
Population (In millions)	9.8	10.1	10.4	10.7	11.0
Consumer Price Index (% change)	-0.7	1.8	3.3	4	3.2
Exports (in USD billions)	7.3	7.6	8.2	8.8	9.6
Imports (in USD billions)	18.3	19.2	20.1	21.3	22.8
Foreign direct investment, the net value (in USD billions)	1.5	1.5	1.6	1.6	1.7
Foreign direct investment, the net value (% of GDP)	3.7	3.7	3.6	3.4	3.3
Foreign exchange reserves (in USD billions)	13.9	14.9	15.7	16.8	17.7
Total external debt (in USD billions)	24.4	27.8	30.7	33.7	36
Total external debt (% of GDP)	61.6	66	68.6	70.4	70.6
Total external debt (% of foreign currency earnings)	127.3	138.3	143.6	147.5	147.8

Source: the economy and state risks, IHS, 15/09/2016

3. Market Study

3.1 Project Description

The project is a Stem Cells Bank, where Stem Cells are preserved for a certain period of time. These cells will be extracted from the newborn's umbilical cord blood immediately after his/her birth, or from dental pulp of deciduous teeth of the child. Then, these cells are preserved until needed in the case of a person or a member of his family got infected with a disease that can be cured with these cells. Therefore, the patients chances to get cured increases. Stem Cells can treat the following diseases:

- Leukemia disease
- Chronic leukemia
- Pathological disorders in the bone marrow
- Myelodysplastic Syndrome
- Lymphoproliferative disorders
- Imbalances of genetic mononucleosis
- Inherited platelet disorders
- Imbalances in cellular storage centers.
- Histological imbalances
- Phagocytosis disorders
- Congenital disorders of the immune system.

3.2 Expected Services Description

The expected project services include the following:

- The services of extracting Stem Cells from umbilical cord blood of newborn babies immediately after their birth, and preserving those cells.
- The services of extracting Stem Cells from dental pulp of the child's deciduous teeth.
- Examining samples of extracted Stem Cells.
- Preserving healthy reservable Stem Cells samples.
- Making the extracted Stem Cells renew themselves, and creating new useable cells from them.

3.3 The Market Size

Demand for preserving Stem Cells services is influenced by the following factors:

- Population growth.
- Average per capita income.
- Number of births in hospitals (natural childbirth and Caesarean section).
- Increase awareness among people regarding the importance of preserving Stem Cells.
- The educational level of the people and its development.

- Openness to the outside world, and recognizing the importance of preserving Stem Cells in the future.
- The Increased number of incurable diseases that can be treated for the individual or a family member through Stem Cells.

The demand for preserving Stem Cells varies according to the following criteria:

- The prices of providing the service.
- Storage place of the cells (inside or outside the Kingdom).
- Distinguished marketing of certain centers compared to other centers.
- Agreements with hospitals particularly specialized maternity hospitals.

Global Demand

It can be said that the demand for Stem Cells services including treatment, preservation and research is increasing dramatically. The size of the treatment market by Stem Cells reached about us$ 2.7 billion in 2011 (as reported by the Global Market Report for Stem Cells Techniques (2012-2022) – "Visiongain"), while the size of the global storage and preservation market of Stem Cells in the same year amounted to about us$ 1.1 billion. Whereas the expected market size of treatment by Stem Cells is estimated at about us$ 4.6 billion in 2016.

The estimated size of the storage and preservation market of Stem Cells is estimated at us$ 1.4 billion. Therefore, the estimated total market size of Stem Cells including treatment, preservation and all support operations amounted to us$ 8.8 billion in 2016. These estimates are based on the total annual market growth rate amounted to 10.6% during the years (2011-2016). The following table shows the development of the Stem Cells market size between 2011 and 2016.

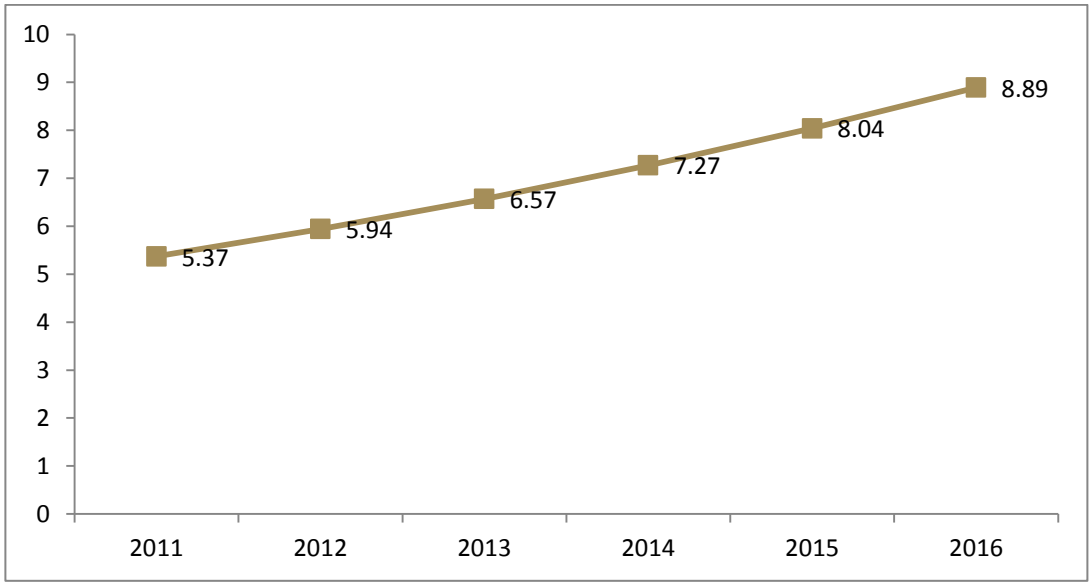
Table 7: The development of the Stem Cells market size during the years (2011-2016)

Items	Market Size (US $ billion)			
	2011	%	2016	%
Stem Cells treatments	2.72	51%	4.65	52%
Stem Cells storage and preservation	1.12	21%	1.41	16%
support operations for Stem Cells	1.53	28%	2.82	32%
Total	5.37	100%	8.88	100%

Source: Global Market Report for Stem Cells Techniques (2012-2022) – "Visiongain"

The following figure shows the development of the overall market size of Stem Cells during the years 2011 - 2016 based on the annual growth rate of the overall market, which amounted to 10.6%. The remarkable growth in the global demand for Stem Cell treatment, preservation and other services can be easily noticed.

Figure 3: Development of Stem Cells market size during the years (2011-2016)



Source: Global Market Report for Stem Cells Techniques (2012-2022) – "Visiongain"

Local Demand

It is worth noting that the reason behind the increased need for having Stem Cells banks in Jordan is the development of medical treatment techniques recently in Jordan, through the presence of several specialized therapy centers using Stem Cells. The Centers include the Stem Cells Therapy Center at the University of Jordan, who has attained a number of achievements in the field of therapeutic scientific research by conducting 14 research projects. The Centre has also spared no effort to invent many treatments and therapies, for cases which were difficult to heal such as burns, birth defects and several elderly diseases. In addition, Jordan is proud of having King Hussein Cancer Center, which is one of the largest cancer treatment centers in the region, as Stem Cells are considered one of the most significant methods of treating many cases of cancer, especially blood cancer (leukemia). King Hussein Cancer Hospital has the Department of Cell Therapy and Applied Genomics, which uses a technology based on therapy by cells and genome sciences in Jordan and neighboring countries.

The Head of the Department of Cell Therapy and Applied Genomics, and the President of the Research Council, and the Consultant of the molecular and immune diagnostic diseases sciences at the King Hussein Cancer Center, pointed out that a number of medical conditions, such as blood cancers, immune deficiency, metabolic disorders and other diseases require a treatment by Stem Cells transplant, which is considered the only therapy for such cases. He added that the

number of patients who need Stem Cells transplants at King Hussein Cancer Center is a hundred per year. Internationally, he pointed out that the number of healthy people whose their genetic data are available worldwide reach 22.5 million people, and the number of stored umbilical cord samples in banks worldwide is 602,432 samples that exist in 519 institutions worldwide, and there are 72 database of Stem Cells in 52 countries, and the number of umbilical cord banks is 48 banks in 33 countries.

According to what experts in the field of Stem Cells in Jordan have reported, the realized benefit from the existence of banks of Stem Cells in Jordan comes from that patients who were treated with Stem Cells in the Jordanian medical centers relied on the imported cells from the American and European banks, which has increased the cost of treatment, due to the high cost of cells transportation and preservation until they reach treatment or research centers.

The demand for Stem Cells preservation services is measured by the rate of cases which preserve the cells from the annual birth cases in hospitals. The following table shows the birth rate per year in the Kingdom.

Table 8: The Birth Rate per Year

	Hospital type	Annual birth cases
Ministry of Health hospitals		76,250
Public universities	Jordan University Hospital	4,827
	King Abdullah University Hospital	2,030
Royal Medical Services Hospitals		32,811
Private hospitals that are not specialized in obstetrics		39,628
Private hospitals that are specialized in obstetrics*		3,500
Total births in the Kingdom		159,046

Source: Ministry of Health, annual report 2015

* Estimated percentage through a questionnaire conducted by a study team with hospitals 2017.

The study team conducted a field survey on a sample of hospitals. The survey results showed that most (or even all) of the cases in which Stem Cells are preserved at the birth of new babies came from the private sector and private hospitals. Particularly the major hospitals and those specialized in obstetrics, such as Alamal Hospital and Farah Hospital, which constitute the largest proportions of Stem Cells preservation cases. The estimated percentage of cases that preserve Stem Cells in Alamal Hospital amounted to 10% annually of the total births in the hospital. This percentage was estimated at 4% of the total births in Farah Hospital. The estimated percentage of the cases that preserve Stem Cells in all private-sector hospitals was about 3% of the total births. The following table shows the most significant private-sector hospitals that record cases of preserving Stem Cells in the kingdom.

Table 9: Percentage of estimated cases that preserve Stem Cells in private hospitals in the Kingdom

Hospital name	Annual birth cases (estimate)	The estimated number of cases which preserve Stem Cells annually	The percentage of cases that preserve Stem Cells annually
Alamal Hospital	2,000	200	10%
Jordan Hospital	3,000	40	1.3%
Farah Hospital	1,500	60	4%
Amman Surgical Hospital	720	2	0.27%
Istiklal Hospital	1,800	5	0.27%
Specialty Hospital	1,500	36	2.4%
Istishari Hospital	1,200	45	3.8%
Other private-sector hospitals	31,408	942	3%
Total private-sector hospitals	43,128	1,330	3%

Source: Field research study by the team.

Based on the foregoing, it is expected that the potential demand for preserving Stem Cells is slightly higher than the current demand, with an increase in the volume of demand as the years progress due to the following reasons:

- Growing community awareness about the importance of Stem Cells in the treatment of many diseases.
- The growing number of centers specialized in preserving stem cells, and Stem Cells therapy centers.
- Intensifying promotions process concerning the preservation of Stem Cells, which would spread the culture of preserving Stem Cells to use them in therapy.
- Developing the marketing techniques to market the services of preserving Stem Cells in local banks, and Developing ways and methods to increase the number of community members turning to preservation process.
- Increasing the strategic alliances with private hospitals with a high incidence of births, which in turn will help spread Stem Cells preservation percentages.

Overview of Main Competitors

Local market needs of preserving Stem Cells are met through one local center, and several foreign centers in America, UK and Germany. It is worth mentioning that the first Stem Cells banks were established in some neighboring countries, such as Saudi Arabia, Egypt, Lebanon and the UAE. The following are the main competitors, locally and at the neighboring countries, which could be indirect competitors, especially if their prices are competitive.

Stem Cells Bank – Jordan

Company Name	Stem Cell Technology Bank "BabyCord"
Location	Jordan, Amman - Airport Highway
General Description	Stem Cell Technology Bank is the first bank concerned with preserving Stem Cells in Jordan. The Center has two main laboratories, through which Stem Cells are extracted from the samples; a laboratory for cells from the umbilical cord, and the other for cells from dental pulp. At those labs, the mother Stem Cells from the sample are examined, and in case the Stem Cells (1) have the ability to produce different types of cells that the organs, blood, tissue and the immune system are made up from, (2) have the ability to assist in the treatment and replacement of damaged cells with another healthy ones, (3) have the ability to strength the immune system, in such cases these cells will be preserved at the Center. The Bank space is about 1100 m², with a storage capacity of about 3,000 samples at the Stem Cells Preservation Lab.
Main Services	▪ Examining and preserving Stem Cells from the umbilical cord ▪ Examining and preserving Stem Cells from the dental pulp. ▪ Making the existing Stem Cells renew themselves, and creating new useable cells.

Stem Cell Banks in Neighboring Countries

Company Name	Cell Safe Bank
Location	Egypt, Alexandria
General Description	The Cell Safe Bank is the first bank concerned with preserving Stem Cells in Egypt, and it was established in 2009. The Bank has a capacity of approximately 3600 samples. Storage and preservation fees at the Bank ranges from (us$ 1957 - us$ 2069) in the case of a onetime payment, while the payment value ranges from (us$ 1442-us$ 1503) and an annual fee of us$ 113 in case the payment method is in instalments basis.
Main Services	▪ Examining and preserving Stem Cells from the umbilical cord ▪ Making the existing Stem Cells renew themselves, and creating new useable cells.

Company Name	Reviva Medical Center
Location	Lebanon, Beirut
General Description	The Reviva Medical Center was established as a center for the provision of medical services in the region, and to provide advanced and innovative therapies based on Stem Cells. The center offers comprehensive services for patients and visitors from across the Middle East and North Africa. The center is located in the Middle East Health Center in Lebanon, which is one of the leading hospitals in Lebanon. The Centre is an official partner of the Lebanese University, which sponsors many researches in the field of Stem Cells. Besides Stem Cells preservation service, the Center offers the process of Stem Cell therapy, both from cells preserved in the bank or from other foreign banks.
Main Services	▪ Examining and preserving Stem Cells from the umbilical cord. ▪ Stem Cell therapy. ▪ Stem Cell research.

Company Name	Umbilical Cord Blood and Stem Cells Bank / King Faisal Specialist Hospital
Location	Saudi Arabia, Riyadh
General Description	The bank was established in 2006 at the King Faisal Specialist Hospital and the Research Center in Riyadh as a national bank for collecting and preserving stem cells units extracted from umbilical cord blood to be an effective alternative of importing the units of international medical banks. As in many cases it is difficult to find matching units for Saudis patients, due to genetic variation between different races. In addition, the Umbilical Cord Blood and Stem Cells Bank at King Faisal Specialist Hospital and the Research Center in Riyadh began achieving local self-sufficiency of stem cells since 2013. For the first time since its establishment. The Bank's specialists conduct four different types of stem cell transplant operations that include (1) Autologous transplant (2) transplant from a family member donor (3) transplant from imported units donated for the World records for bone marrow donors (4) transplant from units of the Umbilical Cord Blood Stem Cells Bank's stocks in the Specialty Hospital, which is characterized of being a public national bank, as the bank does not preserve units exclusively for the donor or a member of their families, but rather the preserved samples are in general available to patients in need.
Main Services	▪ Examining and preserving Stem Cells from the umbilical cord ▪ Stem Cell therapy.

Company Name	Cells4Life
Location	UAE, Dubai
General Description	The bank was established in 2002, first in the United Kingdom as the first bank to preserve stem cells in the United Kingdom. The bank is characterized of having a number of agents in many countries of the world. The MedCells Company located in the UAE, is the the official agent for the bank in the Middle East. The Company has agents in a number of countries, such as Bahrain, Saudi Arabia, Egypt, Qatar and Kuwait, to attract recipients of services from all over the Middle East. The Cells4Life Bank is characterized of preserving the entire store umbilical cord at the baby birth, so as to increase the ability to produce new stem cells, and to increase the number of stem cells that can be used. The cost of preserving stem cells varies according to the number of the years of service and preservation that the subscriber will receive, whether he/she preserves stem cells, stem tissue or the baby's entire umbilical cord.
Main Services	▪ Examining and preserving Stem Cells from the umbilical cord. ▪ Examining and preserving tissues or parts of the umbilical cord. ▪ Examining and preserving the entire umbilical cord. ▪ Prenatal testing (without surgery) to ensure the baby health before birth. ▪ Examining stem cell tissue to determine their degree of matching with other individuals from outside the family to be used for treatment.

3.4 The Price Analysis

The following table shows the prices of services provided by the local center, as these prices are slightly higher than the average world prices.

Table 10: Prices analysis of the stem cell preservation services in Jordan

Service	Price/Cost	Duration of Preservation
preserving stem cells from the umbilical cord	JD 2400	20 years
preserving stem cells from dental pulp	JD 2880	30 years

3.5 Marketing Strategy

Target Market

The project targets the following customers:

- Local customers from various governorates (middle and high income).
- Customers from neighboring countries.
- Local hospitals.
- Foreign hospitals.

Expected Services

The expected project services include the following:

- The service of preserving stem cell from the umbilical cord and placenta.
- The service of preserving stem cells from deciduous teeth.

Expected Prices

The project pricing strategy includes the following:

- The service of preserving stem cells from the umbilical cord and placenta at a cost of 2200 JD (with the possibility of paying by installments)
- The service of preserving stem cells from deciduous teeth at a cost of 2500 JD (with the possibility of paying by installments)

Promotion

The promotional strategy of the project includes the following:

- Strategic alliances with private hospitals, particularly hospitals with a high incidence of births.
- Designing attractive website and social media page.
- Brochures to be distributed to hospitals.
- Advertisements in local newspapers at the beginning of the project.

Selling

The project selling strategy includes the following:

- Direct reception of customers through phone calls.
- Selling through local hospitals.
- Selling through foreign hospitals.

The Expected Market Share

The following table shows the expected market share of the project in the first ten years of establishing the stem cells bank.

Table 11: Market share of the project

statement	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Sixth Year	Seventh Year	Eighth Year	Ninth Year	Tenth Year
Number of births in the private sector	43128	44206	45311	46444	47605	48795	50015	51265	52547	53860
percentage of stem cells preservation cases per year	3%	3.1%	3.2%	3.3%	3.4%	3.5%	3.6%	3.7%	3.8%	3.9%
Total number of customers	1294	1370	1450	1533	1619	1708	1801	1897	1997	2101
The Bank's share of the expected number of customers	320	400	500	575	592	610	622	635	647	* 598
Market share(%)	25%	29%	35%	38%	37%	36%	35%	34%	32%	29%

* The number will slightly decrease in the tenth year, due to the fact that the project will reach its maximum capacity, as the investor can make an expansion for the project without the need to establish a new laboratory due to the presence of the current laboratory.

4. Technical Study

4.1 Stem Cell Storage Technology

The banks of stem cells extracted from newborn umbilical cord, which are internationally recognized since 1988, have recently gone into effect. The idea of establishing such banks depend on the extraction of stem cells from newborn umbilical cord. It is well known that any embryo contains stem cells in its composition, and when embryo development is complete, part of those cells will remain in umbilical cord blood, which is obtained at birth and then stem cells are extracted. The number of stem cells found in each umbilical cord extends from six to eight million, which is sufficient to treat an adult leukemia patient. The treatment and therapy with stem cells is conducted through injecting them in the bone marrow, as they will turn into medullary cells that are able to reproduce blood, and the success rate of such operation is more than 95%.

Steps and Stages of Storage

- Registration: This step precedes the birth process, as the newborn parents will be provided with the steps that will be followed, and how the extraction and storage processes will be conducted. Registration is preferably conducted a month prior to baby's birth, and parents will receive the sample extraction bag that is used to extract the umbilical cord blood at birth.
- Prenatal: a month prior to baby's birth, a blood sample from the mother will be taken to examine diseases and viruses that she might has.
- At Birth: a blood sample from the umbilical cord will be taken immediately after birth by a specialist doctor, and be put in the baby's blood sample bag, as the blood shall be collected before the doctor cut the child's umbilical cord, and the duration of blood draw will not exceed five minutes. Such operation is performed without any interference or disruption to the birth process.
- Safe and rapid delivery to the laboratory: The sample will be placed in a special designated and secure incubators, which is monitored through a device called (Temperature logger's) that monitors and records temperatures to ensure they reach the optimal environment in accordance with the international standards, and the sample will be delivered to the laboratory within 24 hours .
- The separation of stem cells: When the sample arrives in the laboratory, the umbilical cord blood are then separated using automated devices, and a test for the sample vitality will be conducted as well as determining the number of stem cells in the sample. When confirming the sample safety, then it will be divided into two parts in the case of an immediate need for part of the sample, and then the separated sample will be preserved in a safe storage place.

- Lifetime safe storage: The baby's sample is defined through an internationally defined barcode, and the separation process is conducted through automated devices, so there is no room for an error or a loss of a sample. Upon the completion of the sample separation, it is then stored in a long-term cooling system inside liquid nitrogen tanks and a room to monitor the temperature.
- Following-up: After the sample is stored, all its information and internationally defined barcode are approved and documented in order to facilitate its follow-up process.

Techniques and Devices Used

- **Completely sterilized draw system**: during birth, a specialist doctor takes blood through a special draw container, and the draw process is like a blood samples draw, and it takes less than five minutes. A 100% sterilized system will be used that complies with the principles of the safety management and occupational health.
- **Transport process**: a digitally temperature recording technology through the transportation room is used to ensure the safety and the arrival of the sample in the appropriate degree temperature according to international standards. In addition, a report of the transfer process and temperature will be attached to the report of the number of stem cell extracted from the umbilical cord blood.
- **Separation on the same day**: According to the recommendations of the World Health Organization, the time difference between the draw process and the separation of umbilical cord blood affect the efficiency of the sample, as they set a maximum time limit of 48 hours until sample separation. The separation process is conducted through an automatic system called (Sepax2), which is an automatic device used to separate the stem cells individually, as the samples are separated for each baby severally, and it is considered a safe and sterilized device in a closed environment.
- **Storage**: Samples are stored through a device called (BioArchive), which is the only automated device in the storage and retrieval system, for storing and preserving stem cells samples in liquid nitrogen using a computer control technology.
- **Cooling**: each unit is entered to the system through an external aperture, to be transferred into the optimum cooling room to preserve stem cells. Cooling is considered the principle that the storage process based on, where the separated cells are preserved into tanks at a temperature that reach (-196 °C) and that work on liquid nitrogen, in addition to a room to monitor temperature.
- **Documentation**: The documentation process is isolated from the cooling room to ensure the stored samples are not affected by the process of preserving new samples. Documentation is conducted through connecting the separation device to another device that will charge and connect it to the computer provided with software specialized in documenting all the sample data that has been separated.
- **Monitoring**: The temperature for each sample will be monitored and recorded through a device called (Temperature-Loggers), where the sample is monitored to ensure the optimal environment in accordance with international standards.

4.2 The Designed Project Capacity

The following table shows the designed capacity of the project. The designed capacity of the project will be about 5,500 samples, as it will be fully covered.

Table 12: The designed capacity of the project

Item	Number
Absorptive capacity	5,500
The accumulated number of customers	5,500
% of customers on the absorptive capacity	100.0%

The following table shows the project required area. In order to reach the designed capacity of the project, it requires the purchase of a land with an area of 4000 m^2, and construction of buildings with a total area of 2,500 m^2. In addition to the external works that will cover an area of 2000 m^2. It can notice that this is a relatively large area compared with the absorptive capacity so that buildings and facilities can be expanded to increase revenue starting from tenth year of the project.

Table 13: Required area for the project

item	Area (m^2)
The Land	4,000
Buildings	2,500
External Works	2,000

4.3 The Required Fixed Assets

The following table shows the material resources required for the project.

Table 14: Required areas for the project

item	unit	price	Value (JD)
The land m^2	4,000	25	100,000
Buildings m^2	2,500	300	750,000
Equipment, Supplies and Laboratories	-	-	2,000,000
Furniture and Office Supplies	-	25,000	25,000
Information Technology	-	15,000	15,000
Other assets (means of transport, external works, power adapter)	-	-	100,000
Total			2,990,000

* The numbers are estimated from the market study

4.4 The Required Human Resources

The following table shows the human resources required for the project, where the number of required staff is about 25 employees with total salaries of 216,240 JD annually.

Table 15: Human resources required for the project

Item	Number of Employees	Salary (JD/ monthly)	Total Salary (JD/ annually)	Operational (JD/ annually)	Administrative (JD/ annually)
Director General	1	3,500	42,000	-	42,000
Director of Finance and Administration	1	1,500	18,000	-	18,000
Technicians	2	1,500	36,000	36,000	-
Marketing and Sales	2	800	19,200	-	19,200
Laboratory Administrative	3	500	18,000	18,000	-
Accountant	1	500	6,000	-	6,000
Laboratory Technician	5	600	36,000	36,000	-
Nurse	2	450	10,800	10,800	-
Receptionist	3	350	12,600	-	12,600
Security	4	280	13,440	-	13,440
Collector	1	350	4,200	-	4,200
Total	25		216,240	100,800	115,440

The following table shows the general job description of the required jobs in the project.

Table 16: Job description of the required jobs in the project

Job	Job Description
Director General	The Director General shall perform the following tasks: ▪ Participating in the development of the bank main objectives, and participating in their formulation. ▪ The approval of plans and executive programs after being reviewed and verified, as well as the initial approval of the implementation budgets. ▪ Attending meetings of the Board of Directors and the formulation, and legalization of the recommendations and decisions issued, and developing appropriate plans. ▪ Chairing and managing the Bank's periodic meetings, and issuing appropriate decisions based on the facts provided. ▪ Initial approval of promotions and salaries at the end of each year. ▪ The final approval of the annual budget. ▪ Initial approval of the executive contracts longer than six months. ▪ Representing the bank in front of third parties, as well as representing it at events, parties and official interviews.
Director of Finance and Administration	The Director of Finance and Administration shall perform the following tasks: ▪ Participating in the development of the bank's main objectives, and participating in their formulation. ▪ Preparation of sub-plans and executive programs for financial management, so as to achieve the main objectives of the institution. ▪ Participating in the meetings of senior management, and expressing opinion on the results and decisions. ▪ Participation and active attendance at the periodical meetings of the management. ▪ Following up the implementation of financial management plans. ▪ Participation in the preparation of financial management procedures. ▪ Proposing the promotive, remedial and preventive measures that would improve the work performance of his/her department. ▪ Proposing the appropriate institution's annual budget within the limits of the available resources, based on a budget. ▪ Reviewing all vouchers and approving them, and issuing the release order. ▪ Conducting the periodic inventory of the Treasury, in collaboration with the Treasury teller. ▪ Controlling, archiving and maintaining all financial documents, and following-up their validity. ▪ Archiving and saving complete copies of all financial documents, whether they are in favor of the company, or as a liability on the company.

Job	Job Description
	▪ Reporting the weekly, bimonthly, monthly, semi-annual and annual reports to the Director General, and discussing these reports in the periodic meetings of senior management.
Marketing and Sales Employee	The Marketing and Sales Employee shall perform the following tasks: ▪ Implementing sales strategies, and conducting all measures that contribute to the increase in the number of subscribers. ▪ Researching and analyzing various financial, technological and demographic factors, in order to obtain marketing opportunities and reduce competition to a minimum. ▪ Developing a plan for the activities of advertising and promotion. ▪ Contacting other advertising agencies to implement advertising campaigns. ▪ Ensure the achievement of effective monitoring of the marketing activities, and take corrective procedures that ensure the achievement of marketing objectives according to the established plan. ▪ Assessing the market feedback towards the advertising programs, in order to reconsider the marketing strategies and the changing competitiveness.
laboratory technician	The Laboratory Technician shall perform the following tasks: ▪ Examining the raw materials arrive to the bank, in the event they violated the specifications. ▪ Preserving stem cell samples in the appropriate conditions, and in accordance the procedures laid down. ▪ Conducting experiments and research required to develop the samples in cooperation with specialists in this field. ▪ Documenting all data and procedures performed by him/her, in accordance with the procedures established. ▪ Periodic examination of the samples, and making sure of their preservation and safety process. ▪ The application of the safety conditions and directives regarding the samples, and protecting them from damage. ▪ Developing the samples, achievements and failures data, and reporting them to the lab management.
Accountant	The Accountant shall perform the following tasks: ▪ Preparing vouchers of the bank's work. ▪ Preparing disbursement documents and issuing checks. ▪ Preparing accounting entries duly. ▪ Registering the transactions of domain names, and following them up financially. ▪ Preparing the payroll, advances and other financial statements. ▪ Preparing the monthly and quarterly tables (expenses and revenues). ▪ Maintaining the confidentiality of information.

4.5 Special Requirements

The following table shows the general and special requirements for the Stem Cells Preservation Centers, which must be considered for the development and implementation of the project. These requirements are adapted from Stem Cells Regulation No. (10) for the year 2014.

Table 17: General and special requirements for the Stem Cells Preservation Centers

Item	Statement
Committee members	The Project owner shall submit a license application for the Stem Cells Preservation Bank to the Directorate of Health Professions and Licenses. Based on the recommendation of the Minister, a committee will be formed consisting of the Director of the Blood Bank Directorate, the Director of the Directorate of Health Professions and Licenses the health professions, an Obstetrics & Gynecology Specialist Doctor named by the Minister, two doctors from the University of Jordan, a Hematology Specialist Doctor from the Medical Services, a Specialists Doctor from the private sector named by the Doctors Syndicate, a dentists from the private sector named by the Dental Association, The head of the department concerned in pharmacological studies, Legal Counsel from the Ministry and a member from the Ifta Department. The Committee shall elect its Chairman and members, and shall perform the duties and powers, and shall report its recommendations to the Minister of Health to take the appropriate decision.
Stem cell sources	in terms of their origin, Stem Cells are divided to the following: ▪ Human embryonic stem cells that are extracted from fertilized human egg outside of the womb for a certain period of time, starting from the date of pollination and ending in five days from the start of the successive divisions. ▪ Human adult stem cell, obtained from the following sources: - Umbilical cord blood extracted immediately after birth. - Deciduous teeth. - Various tissues of the human being after birth. - The embryos of legal abortion, spontaneous abort, Adherent Placenta, Umbilical Cord, placenta and its membranes and Amniotic Fluid, whether is inside or outside the womb. - Human Pluripotent Stem Cells, which are the somatic adult cells that are stimulated by the genetic programming technology to become stem cells, provided that they are not be grown in woman's womb, and are not used for human reproduction. - Stem cells produced by the technology of transferring somatic cell nuclear to unfertilized eggs, provided that they are not be grown in woman's womb, and are not used for human reproduction. - Hybrid Stem Cells that result from the integration of the human Deoxyribo Nucleic Acid (DNA) with a non-human cell, provided that they are not be grown in woman's womb, and are not used for human reproduction.

Item	Statement
Duties and Powers of the Committee	▪ Reviewing the licensing requests and applications of the Bank. ▪ Visiting and inspecting the bank regularly, and monitoring its compliance with license terms. ▪ In accordance with the legislation in force. ▪ The investigation of complaints referred by the Minister. ▪ Assigning two or more members of the Committee to inspect the bank prior to licensing. ▪ Determining the amount of the allowance received by the bank in exchange for its services. ▪ Proposing any modification to the system. ▪ Preparing the instructions set out in this system, and submitting them to the minister for approval. ▪ Any other tasks mandated by the Minister. The Commission shall meet at the invitation of its Chairman, or his deputy in case of his/her absence, every three months or whenever the need arises. The Committee meeting considered legal in the presence of the majority of members, and the president or his deputy shall be among those present. The decisions are taken by majority, and in the case of a tie vote, the side in which the Chairman of the Committee or his deputy voted with will pass the decision. Obtaining and using Stem Cells in exchange for a material reward is prohibited. Based upon the recommendation of the Committee, The Minister determines the cases in which donation is prohibited.
Ministry terms and conditions after the establishment of Stem Cell Bank	In the event of conditions completion, the Committee will recommend the Minister to approve the establishment of the Stem Cells Bank, provided that: ▪ Conducting laboratory testing specified by the Committee prior to storage process. ▪ The storage shall be within the Kingdom. ▪ The bank shall be administratively, financially and technically independent from private hospitals and medical centers. ▪ Conclusion of an insurance contract between the bank and one of the insurance companies operating in the Kingdom holding to have insurance on the inventory, provided that the contract terms will cover any other requirements issued with instructions. ▪ Obtaining and using Stem Cells in exchange for a material reward is prohibited. Based upon the recommendation of the Committee, The Minister determines the cases in which donation is prohibited
The Instructions of collecting cells from umbilical cord blood	▪ The stem cells are collected from the umbilical cord blood after the baby is out of the mother's womb, and are separated from the placenta under the supervision of a specialist doctor and under the conditions and technical requirements necessary for this procedure.

Item	Statement
	▪ The specialist doctor should ensure collecting the stem cells with easy medical procedures, and must give an order not to collect cells or stop collecting them in specific cases under a decision issued by the Minister upon the recommendation of the Committee. ▪ The hospital, where stem cells from umbilical cord blood are collected, shall develop a special record that includes the following: (1) the name of the person whose cells are being collected, (2) the quantity of cells being collected, (3) the date when the cells were collected and (4) any other data, as determined by the Minister Based upon the recommendation the Committee. ▪ The doctor shall verify and confirm the serial number of the stem cells container in the patient's file when is given these cells. ▪ All the information relating to stem cell is confidential, and shall not be disclosed except in cases required by the legislation in force. ▪ The unused stem cells, which are provided by the bank, shall be returned to the bank, for the appropriate action to be taken in accordance with the scientific standards.
Procedures of canceling or suspending the license	Based upon the recommendation of the Committee, the Minister shall have the right revoke the license or suspend it for the following reasons: ▪ If the license was given to the bank based on incorrect data. ▪ If the licensed bank did not meet any of the license terms. ▪ Bank violation of any of the system provisions and the regulations issued thereunder. In case of canceling the license based on the above terms, the Commission shall take the necessary measures to preserve the stored cell in the bank. Note: procedures related to adult stem cells, which are used to treat diseases that approved by medical practice and based on medical evidence, are excluded from the application of this system.
Instructions and provisions of stem cells	Based upon the recommendation of the Committee, The Minister shall issue the necessary instructions to implement the provisions of stem cells, including: ▪ Technical requirements and specifications. Devices and equipment to be provided by the Bank, and the qualifications of its employees. ▪ The foundations of the bank's overall quality management, including quality management, and the requirements of safety and confidentiality of its work, including laboratory testing necessary to ensure the safety of the samples. ▪ Documenting the Information, and organizing the files and records in the bank. ▪ Stem cells disbursement from the bank.

4.6 The Required Licenses

Conditions for obtaining a license

To get a Stem Cells Preservation Center or Bank licensing, it is required to be one of the following:

- A human doctor or dentist who holds a profession practicing license, and has an academic certificate issued from a recognized university in one of the disciplines related to stem cells.
- A company or institution registered with the Ministry of Industry and Trade, provided that one or more partners are doctor or dentist.
- Public institution of public interest, or Doctors Syndicate or Dental Association.

Bank License Terms

- Providing adequate area
- Providing appropriate services facilities
- Comply with occupational health and safety conditions

General Terms[2]

- The Center is managed by a doctor or a dentist or who holds a doctoral degree in any branch of the Life Sciences from a recognized university, provided that he/she has published researches on the subject of stem cells, or has supervised graduate studies on the subject of stem cells, or holds a doctoral degree with a thesis subject in stem cells from a recognized university, and shall be accountable in front of Ministry of Health for the services he/she will provide.
- The Center shall provide the Ministry of Health with a list of services prices it provides, and they shall become effective only after the approval of the Minister upon the recommendation of the Committee.
- The ministry receives a one-time license fee amounted to two thousand JD.

The instructions of isolating, proliferating and differencing of adult stem cells in the laboratory[3]

- Device called “CLASS A BIOLOGICAL SAFETY CABINET”, and shall be calibrated by an accredited institution.
- At least two suitable incubators.
- Cooling facilities using liquid nitrogen and a degree of -80 °C and 6 °C.
- Two licensed laboratory technician.

[2] Instructions No. (9) For the year 2016 of stem cells Regulation No. (10) for the year 2014
[3] Instructions No. (9) For the year 2016 of stem cells Regulation No. (10) for the year 2014

- Technical Supervisor who holds a Doctorate degree in any of the medical and biological sciences, with an experience in the field of stem cells, or a doctor who holds a high specialty certificate in Hematology.
- The availability of public facilities and waiting halls.
- Providing documentation of medical laboratory information, and organizing files and records.

Instructions of collecting cells from umbilical cord blood

- When collecting umbilical cord blood, priority is given for the health of the mother and fetus.
- The process of collecting the umbilical cord blood shall not affect the process of birth, for the purpose of increasing the quantity of umbilical cord blood.
- The collecting process shall be conducted using sterilized tools and surfaces.
- Blood is collected by the licensees authorized to practice the profession by the Ministry of Health who include doctors, nurses and laboratory technicians who are trained on collecting procedures.

Instructions of transporting and shipping of umbilical cord blood units from the umbilical cord blood collecting site to the Bank[4]

- The main bag for collecting blood is placed in a secondary sealed plastic bag to ensure no leakage from the main bag.
- Umbilical cord blood units are placed in an external container, to maintain the temperature of the umbilical cord blood unit, and to ensure the safety of the cells during transport and shipping.
- The external container shall be made from a material that bears leakage of the contents, shocks, the changes in pressure and other conditions and accidents that may occur during transport or shipping.

Instructions and regulation of Stem Cells distribution from the licensed Stem Cell Bank[5]

- Stem Cells are examined to verify the safety of the storage, and to verify they are free of bacterial and fungal contaminants before distribution and to issue a detailed report. Upon completing all these procedures, Stem Cells are then given to the Beneficiary.
- Stem cells are distributed upon the request of the treating doctor and the beneficiary, according to the form approved by the Minister.
- The treating doctor for the beneficiary determines the causes and reasons for requesting blood units, and he/she shall type his/her full name, and shall refer to his/her specialization and place of work, and shall stamp it with his/her own stamp.

[4] Instructions of collecting cells from umbilical cord blood No. (3) for the year 2014 of Stem Cells Regulation No. (10) for the year 2014
[5] Stem Cells distribution from the licensed Stem Cell Bank Regulation (6) for the year 2016

- The patient or his representative shall sign an informed consent form to obtain the cells in accordance with the form approved by the Minister.
- The Bank shall be responsible for the transfer of cells within a designated container, so as to ensure they would not be damaged during transport.
- The distribution and the use shall be documented, according to the forms prepared by the concerned employee in the Bank.
- Forms and decisions issued by the Minister for the distribution of stem cells from the bank are adopted.
- The Minister shall issue the necessary decisions to implement the provisions of these regulations based upon the recommendation of the Minister.

4.7 Project Timetable

The following figure shows the timeline to implement the project, which amounts to 24 months, as follows:

Stage	The first year (in months)												The second year (in months)											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Studies																								
Approvals Licensing and the registration of the company																								
Construction and cleaning																								
Equipping and furnishing																								
Employment and Commissioning																								
Total Duration	24months																							

5. Financial Study

5.1 Financial Assumptions

The following table illustrates the financial assumptions of the project.

Table 18: The Financial Assumptions of the Project

Item	Assumption
Inflation Rate	3%
Financing Structure	Equity constitutes 75% of the investment and loans constitute 25%
Interest Rate	10%
Working Capital	JD 400 thousand
Pre-Operating Expenses	2% of total investment
Tax Rate	20%
Direct operation expenses and electricity	28% of total revenues
IT cost	JD 4 thousand in the first year, with 5% annually increase
Maintenance Cost	JD 4 thousand in the first year, with 5% annually increase
Staff Benefits	25% of salaries
Annual Salaries Increase	8%
Assets Depreciation Rate	4%-20% of the asset value
Other Operation Expenses	JD 2,000 in the first year, with 5% annually increase
Accounts Receivable	5% of revenues
Inventory	5% of operation expenses
Annual Depreciation	JD 202,000

5.2 Investment Cost

The project's Investment cost is estimated at JD 3.5 million distributed among fixed assets of JD 3.0 million, working capital pre-operating expenses totaled of JD 469 thousand.

The following table shows the project's Investment cost.

Table 19: the project's investment cost

Item	Value (in thousand JD)
Fixed assets	2,990
Pre-operating expenses	69
Working capital	400
Total	3,459

5.3 Financing

The project will be financed with the shareholders by 75% which is estimated at about JD 2.6 million, while the other 25% of the project investment cost will be financed through bank loans of about JD 864.8 thousand.

The following table shows the financing structure for financing the project.

Table 20: Project financing schedule

Item	Value (in thousand JD)	%
Equity	2,594.4	75%
Loan	864.8	25%
Total	3,459	100%

5.4 Revenues

The following table shows the total revenues of the project, where it is noted that the revenues in the first year amounts to about JD 560 thousand, and increased to reach up to JD 1.57 million in the tenth year.

Table 21: The Expected Revenues

Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capacity	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500
Number of customers	320	400	500	575	592	610	622	635	647	598
Number of accumulated customers	320	720	1,220	1,795	2,387	2,997	3,619	4,254	4,902	5,500
% of customers from capacity	%5.8	%13.1	%22.2	%32.6	%43.4	%54.5	%65.8	%77.3	%89.1	%100.0
Service price for 20 years	2,500	2,575	2,652.3	2,731.8	2,813.8	2,898.2	2,985.1	3,074.7	3,166.9	3,261.9
Annual earned Revenue 70%	1,750	1,803	1,857	1,912	1,970	2,029	2,090	2,152	2,217	2,283
Un earned Revenue	750	773	796	820	844	869	896	922	950	979
Total revenue	800,000	1,030,000	1,326,125	1,570,795	1,666,456	1,767,944	1,857,402	1,951,386	2,050,126	1,951,623
Annual earned Revenue 70%	560,000	721,000	928,288	1,099,557	1,166,520	1,237,561	1,300,181	1,365,970	1,435,088	1,366,136
Un earned Revenue	240,000	309,000	397,838	471,239	499,937	530,383	557,220	585,416	615,038	585,487
Percentage of Annual earned Revenue from previous years	-	%5	%5	%5	%5	%5	%5	%5	%5	%5
Annual earned Revenue from previous years	-	12,000	27,450	47,342	70,904	95,901	122,420	150,281	179,552	210,304
Total Revenues – Thousand JD	560.0	733.0	955.7	1,146.9	1,237.4	1,333.5	1,422.6	1,516.3	1,614.6	1,576.4

Note: 70% of revenues were recorded in the same year and 30% in subsequent years over 20 years

5.5 The Projected Costs

Operating Costs

The following table shows the project's operating costs.

Table 22: Operating Costs

Operating Costs (in thousand JD)										
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Paid commissions	28	36	46	55	58	62	65	68	72	68
Direct operation expenses and electricity	156.8	205.2	267.6	321.1	346.5	373.4	398.3	424.6	452.1	441.4
Salaries	60.5	80.6	100.8	110.9	122.0	134.2	147.6	162.3	178.6	196.4
Staff Benefits	15.1	20.2	25.2	27.7	30.5	33.5	36.9	40.6	44.6	49.1
IT Cost	4.0	4.2	4.4	4.6	4.9	5.1	5.4	5.6	5.9	6.2
Depreciation	202.0	202.0	202.0	202.0	202.0	202.0	202.0	202.0	202.0	202.0
Maintenance	4.0	4.2	4.4	4.6	4.9	5.1	5.4	5.6	5.9	6.2
Others	2.0	2.1	2.2	2.3	2.4	2.6	2.7	2.8	3.0	3.1
Total	472.4	554.6	653.0	728.3	771.4	817.7	863.2	911.8	963.8	972.8

Administrative Expenses

The following table shows the projected administrative expenses of the project.

Table 23: General and Administrative Expenses

General and Administrative Expenses (in thousand JD)										
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Salaries	92.4	115.4	127.0	139.7	153.7	169.0	185.9	204.5	225.0	247.5
Staff Benefits	23.1	28.9	31.7	34.9	38.4	42.3	46.5	51.1	56.2	61.9
Staff Incentives	22.4	29.3	38.2	45.9	49.5	53.3	56.9	60.7	64.6	63.1
Stationery	4.0	4.2	4.4	4.6	4.9	5.1	5.4	5.6	5.9	6.2
Professional Fees	4.0	4.2	4.4	4.6	4.9	5.1	5.4	5.6	5.9	6.2
Marketing Expenses	5.6	7.3	9.6	11.5	12.4	13.3	14.2	15.2	16.1	15.8
Other Expenses	3.0	3.2	3.3	3.5	3.6	3.8	4.0	4.2	4.4	4.7
Amortization	69.2	-	-	-	-	-	-	-	-	-
Total	223.6	192.5	218.6	244.7	267.3	292.0	318.3	346.9	378.2	405.2

5.6 Projected Financial Statements

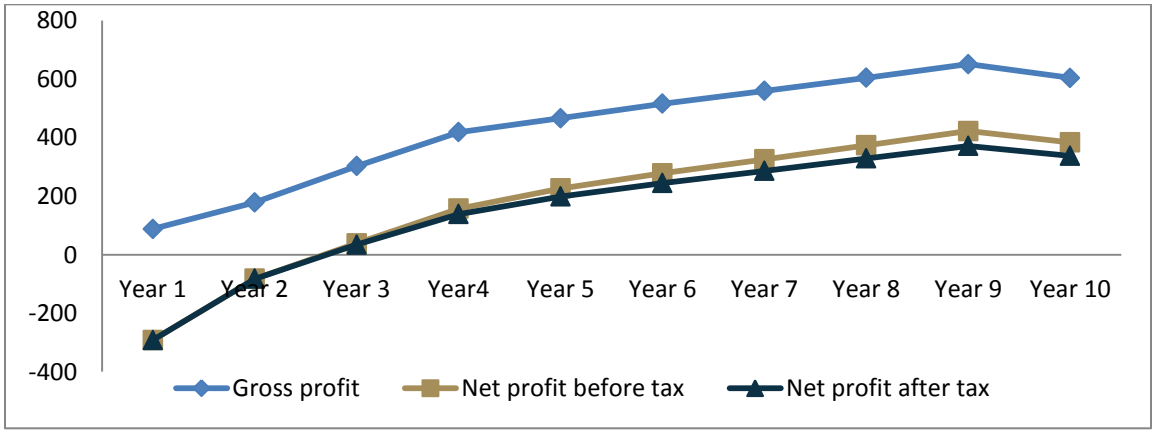
Income Statement

The following table shows the projected income statement of the project. It indicates that gross profit will increase from JD 87.6 thousand in the first year to JD 603.7 thousand in the tenth year. The net profit before tax will also increase from JD 38.8 thousand in the third year to JD 383.4 thousand in the tenth year, and the net profit after tax will increase from JD 34.1 thousand in the third year to JD 337.4 thousand in the tenth year.

Table 24: The Projected Income Statement

Income Statement (in thousand JD)										
Item	Year 1	Year 2	Year 3	Year4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues	560.0	733.0	955.7	1,146.9	1,237.4	1,333.5	1,422.6	1,516.3	1,614.6	1,576.4
Operating costs (cost of sales)	472.4	554.6	653.0	728.3	771.4	817.7	863.2	911.8	963.8	972.8
Gross profit	87.6	178.4	302.7	418.6	466.0	515.7	559.4	604.4	650.8	603.7
Administrative expenses	223.6	192.5	218.6	244.7	267.3	292.0	318.3	346.9	378.2	405.2
Net profit	(136.0)	(14.1)	84.0	173.9	198.7	223.8	241.1	257.5	272.6	198.5
financial expenses	86.5	69.0	51.5	34.0	-	-	-	-	-	-
Other revenues		0.8	6.2	17.5	27.5	54.3	84.4	116.4	149.8	184.9
Amortization	69.2									
Net profit before tax	(291.7)	(82.2)	38.8	157.5	226.2	278.1	325.6	373.8	422.4	383.4
Tax	-	-	4.7	18.9	27.1	33.4	39.1	44.9	50.7	46.0
Net profit after tax	(291.7)	(82.2)	34.1	138.6	199.0	244.7	286.5	329.0	371.7	337.4

Figure 4: Projected Income Statement



Projected Balance Sheet

The following table shows the projected balance sheet of the project during the first ten years. It indicates that total assets will increase from JD 3.5 million in the year of incorporation to about JD 7.6 million in the tenth year. The Total liabilities will increase from JD 930 thousand in the first year to about JD 4.8 million in the tenth year. Moreover, the Shareholders' Equity will increase from JD 2.6 million in the year of incorporation to 2.8 in the tenth year.

Table 25: Projected Balance Sheet

Projected Balance Sheet (in thousand JD)											
Statement	Year of incorporation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year10
Assets											
Cash	400	21	156	438	687	1,358	2,111	2,909	3,746	4,622	5,560
Receivables		400	515	663	785	833	884	929	976	1,025	976
Inventory		24	28	33	36	39	41	43	46	48	49
Other Assets	-	-	-	-	-	-	-	-	-	-	-
Total Current Assets	400	444	698	1,133	1,508	2,230	3,036	3,881	4,767	5,696	6,584
Fixed Assets	3,059	3,059	3,059	3,059	3,059	3,099	3,099	3,099	3,099	3,099	3,099
Cumulative Depreciation	-	271	473	675	877	1,079	1,281	1,483	1,685	1,887	2,089
Pre-operating expenses	-										
Net Fixed Assets	3,059	2,788	2,586	2,384	2,182	2,020	1,818	1,616	1,414	1,212	1,010
Total Assets	3,459	3,232	3,284	3,517	3,690	4,250	4,854	5,497	6,181	6,908	7,594
Shareholders Equity and Liabilities											
Unearned Revenue		240	549	947	1,418	1,918	2,448	3,006	3,591	4,206	4,792
Long Term Loans	865	690	515	340	-	-	-	-	-	-	-
Total Liabilities		930	1,064	1,287	1,418	1,918	2,448	3,006	3,591	4,206	4,792
Shareholders Contributions	2,594	2,594	2,594	2,594	2,594	2,594	2,594	2,594	2,594	2,594	2,594
Retained Earnings		(292)	(374)	(364)	(322)	(262)	(189)	(103)	(4)	107	208
Shareholders' Equity	2,594	2,303	2,220	2,231	2,272	2,332	2,405	2,491	2,590	2,702	2,803
Shareholders Equity and Liabilities	3,459	3,232	3,284	3,517	3,690	4,250	4,854	5,497	6,181	6,908	7,594

Cash Flow Statement

The following table shows the projected cash flow statement of the project during the first ten years. It indicates that the cash flow from operation will increase from JD 310 thousand in the second year to JD 1.2 million in the tenth year; while the Cash at the ending period will increase from JD 400 thousand in the year of incorporation to JD 5.6 million in the tenth year.

Table 26: The Expected Cash Flows Statement

Cash Flow Statement (in thousand JD)											
Statement	Year of incorporation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year10
Operation Activities											
Net Profit	-	(292)	(82)	34	139	199	245	286	329	372	337
Depreciation	-	271	202	202	202	202	202	202	202	202	202
Change In Working Capital	-	(184)	190	245	345	450	477	510	536	563	634
Cash Flow From Operation	-	(204)	310	481	686	851	924	999	1,067	1,137	1,174
Investing Activities											
Fixed Assets	(3,059)	-	-	-	-	(40)	-	-	-	-	-
Cash From Investing Activities	(3,059)	-	-	-	-	(40)	-	-	-	-	-
Financing Activities											
Capital (Equity)	2,594	-									
Loan	865	(175)	(175)	(175)	(340)	-	-	-	-	-	-
Dividends		-	-	(24)	(97)	(139)	(171)	(201)	(230)	(260)	(236)
Cash Flow From Financing Activities	3,459	(175)	(175)	(199)	(437)	(139)	(171)	(201)	(230)	(260)	(236)
Net Cash Flow	400	(379)	135	282	249	672	753	798	837	877	938
Cash At The Beginning Period	0	400	21	156	438	687	1,358	2,111	2,909	3,746	4,622
Cash At The Ending Period	400	21	156	438	687	1,358	2,111	2,909	3,746	4,622	5,560

5.7 Financial, Economic and Social Analysis

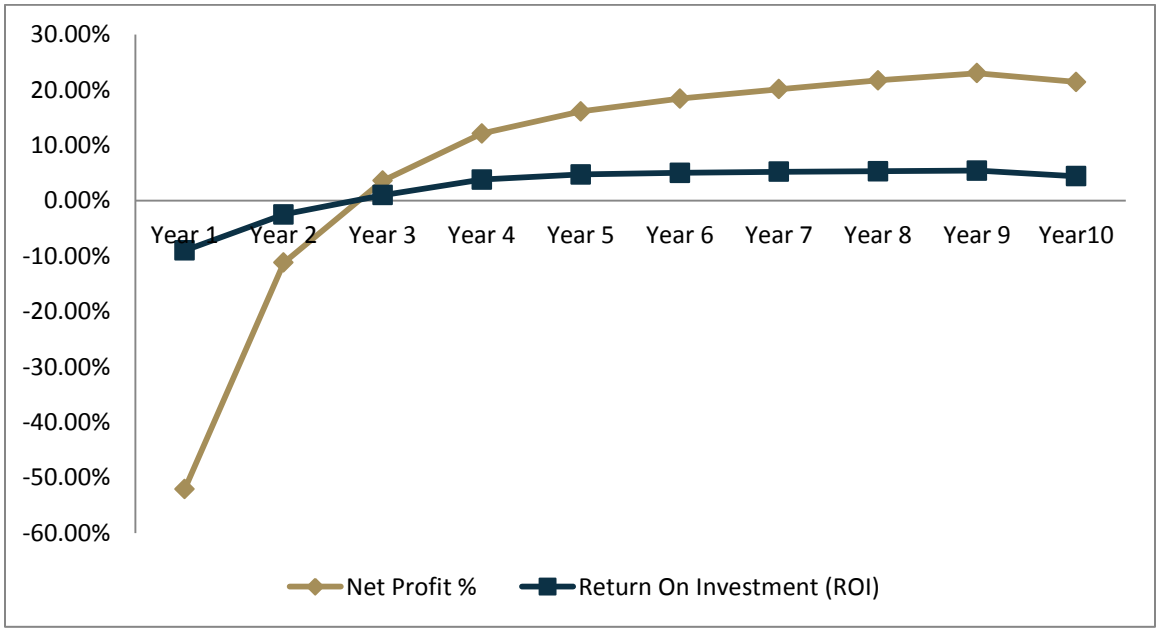
Financial Analysis

The following table shows the financial analysis of the project. It indicates that the net profit ratio will increase from 3.6% in the third year to 21.4% in the tenth year, and the return on investment will increase from 1% in the third year to 4.4% in the tenth year.

Table 27: Financial Analysis

Financial Analysis (In Thousand JD)										
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year10
Assets	3,232	3,284	3,517	3,690	4,250	4,854	5,497	6,181	6,908	7,594
Revenues	560	733	956	1,147	1,237	1,333	1,423	1,516	1,615	1,576
Profits	(292)	(82)	34	139	199	245	286	329	372	337
Capital (Equity)	2,594	2,594	2,594	2,594	2,594	2,594	2,594	2,594	2,594	2,594
Net Profit %	-52.1%	-11.2%	3.6%	12.1%	16.1%	18.4%	20.1%	21.7%	23.0%	21.4%
Return On Investment (ROI)	-9.0%	-2.5%	1.0%	3.8%	4.7%	5.0%	5.2%	5.3%	5.4%	4.4%
Return On Capital (ROC)	-11.2%	-3.2%	1.3%	5.3%	7.7%	9.4%	11.0%	12.7%	14.3%	13.0%
Net Profit On Revenues	-52.1%	-11.2%	3.6%	12.1%	16.1%	18.4%	20.1%	21.7%	23.0%	21.4%
Assets Turnover (Time)	0.173	0.223	0.272	0.311	0.291	0.275	0.259	0.245	0.234	0.208

Figure 5: The Financial Analysis



Economic Analysis

The following table shows the economic analysis of the project during the first five years, we conclude that:

- The Internal rate of return is 17.3%. It exceeded four times the return on assets, which means the economic feasibility of the project
- The present value of the project reached about JD 3.5 million. It exceeds the investment value with JD 20 thousand, which means the economic feasibility of the project.
- The profitability index of the project reached 1.34 times, which means that the expected value of the project will increase by one time the investment value, which proves that the project is feasible.
- The project payback period is 6.4 years.

Table 28: the Economic Analysis

Economic Analysis (in Thousand JD)											
Item	Year of incorporation	Year1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year10
Net cash flow from operating and investing activities	(2,594)	(379)	135	306	346	851	924	999	1,067	1,137	1,174
terminal value						-	-	-	-	-	2,803
Net Cash flow	(2,594)	(379)	135	306	346	851	924	999	1,067	1,137	3,976
Internal Rate of Return (IRR)	17.3%										
present Value	3,476										
Net present value	881										
Profitability Index (Time)	1.34										
Payback period (Year)	6.40										

Social Analysis

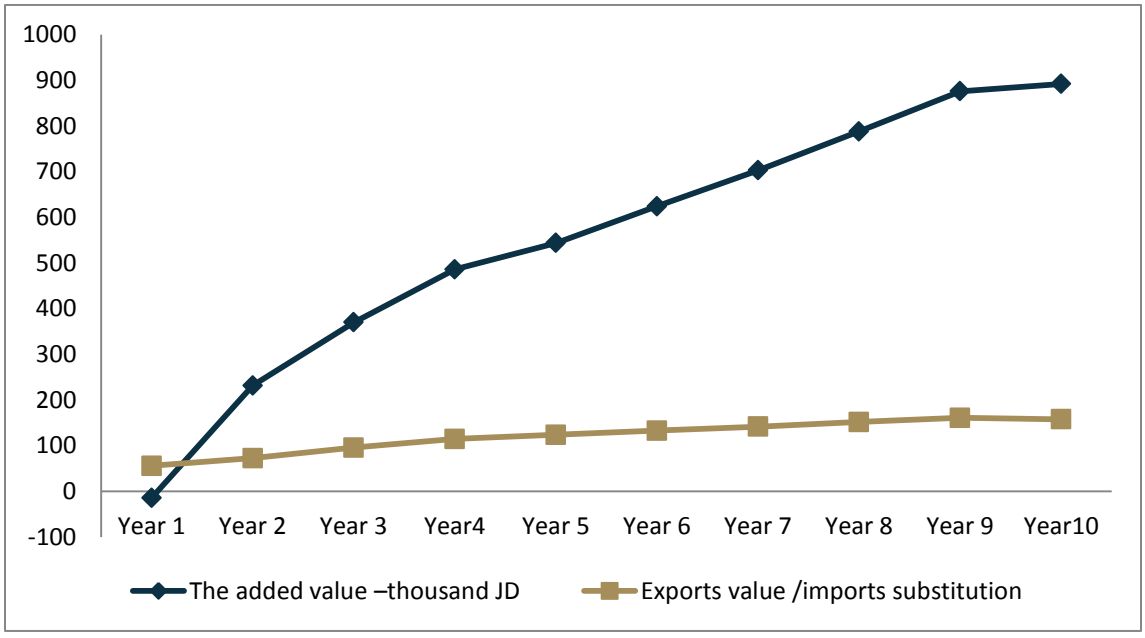
The following table shows the social analysis of the project. It is noticed that the number of staff required for the project will increase from 25 employees in the first year to 39 employees in the tenth year, where all employees in the project are Jordanian employees.

The added value of the project will also increase from JD 232 thousand in the first year to JD 892 thousand in the tenth year. The income tax will also increase from JD 5 thousand in the third year to reach JD 46 thousand in the tenth year.

Table 29: the Social Analysis of the Project

Social Analysis										
Statement	Year 1	Year 2	Year 3	Year4	Year 5	Year 6	Year 7	Year 8	Year 9	Year10
Number of Employees	25	26	28	29	30	32	34	35	37	39
Jordanian employees	25	26	28	29	30	32	34	35	37	39
The added value –thousand JD	(14)	232	370	486	544	624	703	788	876	892
Income tax –thousand JD	-	-	5	19	27	33	39	45	51	46
sales tax value –thousand JD	-	-	-	-	-	-	-	-	-	-
Exports value /imports substitution	56	73	96	115	124	133	142	152	161	158

Figure 6: The Social Analysis



6. Risk and Sensitivity Analysis

6.1 Risk Analysis

The following table shows the risk matrix analysis that may face the project.

Table 30: Project Risk Matrix

Risks	Type of Risks	Risk Assessment
Financial Risks	▪ **Credit Risk** Credit risk represents the risk of the company's financial loss as a result of the customer's default of the contractual obligation or that of the party dealing with the company through a financial instrument. These risks are mainly caused by trade receivables and others. ▪ **Liquidity Risk** Liquidity risk is the risk resulting from the company's inability to meet its financial obligations at time. The company's liquidity management is to ensure as much as possible that the company always maintain enough liquidity to meet its obligations as they become due and payable in normal and emergency conditions without incurring unacceptable losses or risks that affect the company's reputation. ▪ **risk of currency fluctuation** Currency risk is the risk of the fluctuation of the value of	▪ The financial risks that may face the company are low, because the company payment method is cash ▪ There is moderate risk of currency exchange, because some of the company sales and purchases from foreign markets ▪ There is no risk of inflation because the company's pricing is based on a annual basis

Risks	Type of Risks	Risk Assessment
	financial instrument, due to fluctuations in foreign currency exchange rates. ▪ **inflation risk** It is the risk associated with the possibility that the inflation or the rise in the cost of living might lead to the decrease the real value of the investment.	
Business risk (sector risk)	▪ **Strategic Risk** It is the risk resulting from taking bad decisions by the company's management, or implementing the decisions in a wrong way, or not taking the decisions at the right time; which leads to losses or causes loss of alternative opportunities. ▪ **Legal and Regulatory Risks** These risks are reflected as a result of non-compliance with laws, guidelines and instructions governing the work. Legal risks are caused by the company's break of the laws governing the work in the state in which the company operates. While regulatory risks arise from the company's violation of laws and standards issued by the regulatory authorities. ▪ **Reputation Risk** Reputation risk arises from influential negative public	▪ The risks are considered moderate before the company's establishment, because of getting the approval of the official authorities such as municipality, health ▪ Reputational risk is very high, as the company deals with very sensitive issues related to medical process ▪ Market risk in the short term will be moderate because of the low competition from other companies

Risks	Type of Risks	Risk Assessment
	views which result in great losses of customers or money. It includes the actions of the company's management or its employees which project a negative image of the company, its performance and its relationships with customers and other stakeholders. Reputation risk also results from circulating rumors about the company and its activities. ▪ **Competition Risk** Competition risk results from domestic and external competitors and reduces sales and profits.	
Operational Risk	Operational risk involves losses resulting from the failure of internal operations, human resources and systems. It includes: ▪ **IT Risks** They are losses arising from downtime or systems failure due to the infrastructure, information technology, or the lack of systems, and any failure or malfunction in the systems. They include: the crash of computer systems, breakdowns in communication systems, programming errors, computer viruses and opportunities losses due to breakdown.	▪ Operational risks are very low, for the company will contract with specialized technical bodies to develop the required information systems, in order to manage operations ▪ Competitive salaries will be paid ▪ Information security plan will be put in place to safely keep the company information

Risks	Type of Risks	Risk Assessment
	▪ **Human Resources Risk** Losses caused by employees or related to them (intentionally or unintentionally). It also includes acts that are intended as methods of cheating, abusing property or circumvent the law, regulations or company policy by officials or employees, as well as losses arising from the relationship with the customer, shareholders, regulators and any third party.	
State Risk	State Risk includes politicians' interference, civil unrest, wars, financial and monetary policies and high level of debts.	▪ State Risk is considered to be low, due to security and political stability; international reports indicate that State Risk is low both in medium and long terms

6.2 Sensitivity Analysis

First: Increase of Investment Cost By 10%

The following table shows the results of the sensitivity analysis when investment cost increases by 10%.

Table 31: Investment Increase by 10%

Index	Base	Impact	Change
Internal Rate of Return (IRR)	17.3%	15.9%	1.4%
The Present Value at a discount rate of 13% (in Thousand JD)	3,476	3516.1	-40.1
Net Present Value at a discount rate of 13% (in Thousand JD)	881	656.4	224.6
Profitability Index (Time)	1.3	1.23	0.07
Payback period (Year)	6.4	6.70	-0.30
The Net Profit Ratio – an average of 10 years	73.0%	7.4%	65.6%
Return on Investment - an average of 10 years	23.3%	2.3%	21.0%
Return on Capital – an average of 10 years	60.4%	5.6%	54.8%
Net Profit On Revenues - an average of 10 years	73.0%	7.4%	65.6%
Assets Turnover (Time) – an average of 10 years	2.49	0.23	2.26
The added value - an average of 10 years (in thousand JD)	550	558	-8
income tax - an average of 10 years (in thousand JD)	26	27	-1
sales tax - an average of 10 years (in thousand JD)	0	0	0

The above analysis refers to the feasibility of investment in the project, in light of the high cost of the total investment of the project, which increased by 10%. It is noted that:

- The internal rate of return reaches 15.9%, which is considered high for investment purposes
- The new payback period is 6.7 years, and it is reasonable for recovery purposes
- The return on capital is 5.6%, which is suitable for investment purposes

Second: Reducing Revenues by 10%

The following table shows the results of the sensitivity analysis when reducing revenues by 10%.

Table 32: Reducing Revenues 10%

Index	Base	Impact	Change
Internal Rate of Return (IRR)	17.3%	13.9%	3.4%
The Present Value at a discount rate of 13% (in Thousand JD)	3,476	2780.5	695
Net Present Value at a discount rate of 13% (in Thousand JD)	881	186.1	695
Profitability Index (Time)	1.3	1.07	0
Payback period (Year)	6.4	7.10	-0.70
The Net Profit Ratio – an average of 10 years	73.0%	-2.5%	75.5%
Return on Investment - an average of 10 years	23.3%	0.0%	23.3%
Return on Capital – an average of 10 years	60.4%	1.6%	58.8%
Net Profit On Revenues - an average of 10 years	73.0%	-2.5%	75.5%
Assets Turnover (Time) – an average of 10 years	2.49	0.24	2
The added value - an average of 10 years (in thousand JD)	550	435	115
income tax - an average of 10 years (in thousand JD)	26	13	13
sales tax - an average of 10 years (in thousand JD)	0	0	-

The above analysis shows the low sensitivity of the project in case of reducing the revenues or demand by 10%. It indicates that:

- The internal rate of return is 13.9%, which is considered high for investment purposes
- The new payback period is 7.1 years, and it is reasonable for recovery purposes
- The return on capital reaches 1.6%, which is considered low in the short period but it expected to be high after the seventh year

Third: Increasing the Operating Costs by 10%

The following table shows the results of the sensitivity analysis when increasing the operating costs by 10%.

Table 33: Increasing the Operating Costs by 10%

Index	Base	Impact	Change
Internal Rate of Return (IRR)	17.3%	15.0%	2.3%
The Present Value at a discount rate of 13% (in Thousand JD)	3,476	3008.9	467
Net Present Value at a discount rate of 13% (in Thousand JD)	881	414.5	466
Profitability Index (Time)	1.3	1.16	0
Payback period (Year)	6.4	6.90	-0.50
The Net Profit Ratio – an average of 10 years	73.0%	0.9%	72.1%
Return on Investment - an average of 10 years	23.3%	0.8%	22.5%
Return on Capital – an average of 10 years	60.4%	3.2%	57.2%
Net Profit On Revenues - an average of 10 years	73.0%	0.9%	72.1%
Assets Turnover (Time) – an average of 10 years	2.49	0.26	2
The added value - an average of 10 years (in thousand JD)	550	476	74
income tax - an average of 10 years (in thousand JD)	26	18	8
sales tax - an average of 10 years (in thousand JD)	0	0	-

The above analysis shows the feasibility of the project in light of increasing the operating costs of the project by 10%. It indicates that:

- The internal rate of return is 15%, which is considered high for investment purposes
- The new payback period is 6.9 years, and it is reasonable for recovery purposes
- The return on capital is 3.2%, which is considered low in the short period but it expected to be high after the seventh year