Lisbon School of Economics & Management
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MASTERS
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MASTERS FINAL WORK
PROJECT

ECONOMIC FEASIBILITY FOR THE PRODUCTION OF SYRINGES IN PORTUGAL

JOAQUIM SANTIAGO DE MIRA PONCE DENTINHO

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Quotes on the syringes' market in the Covid-19 Pandemic in Portugal.

"Portugal receives 33 million syringes and needles until 20 May, Infarmed confirmed the 'widespread shortage' of these materials, as happens worldwide, given the increase in demand. German manufacturer Henke-Sass Wolf said that, at the moment, demand 'is five times higher than before the pandemic and admitted that orders should increase further in coming months as the vaccination process evolves worldwide." Expresso (2021).

"The administration of the vaccines against the new coronavirus requires precision and the indicated needles and syringes are running out in all countries (...) more than 12.4 million syringes and needles will be delivered... in March, around 14 million will arrive (...) in May with 11 million units." Expresso (2021).

"If the concern with vaccine distribution failures has been a constant, this Saturday Correio da Manhã reports that this may also be jeopardised by the lack of syringes." Notícia ao Minuto (2021).

"The Syringe Exchange Programme - "Diz não a uma seringa em 2ª mão" has distributed more than 670,000 syringes (...) in the first half of 2019 (...) These are expressive figures that represent a 58% increase in the number of syringes distributed/exchanged, compared to the same period of the previous year." Serviço National de Saúde (2019).

Abstract

In the beginning of the Covid 19 pandemic, the World experienced a string shortage of syringes needles. The aim of this Master Final Work is to analyse the economic feasibility of a large factory in Covilhã, Portugal with the purpose of turning Portugal autonomous from other countries in the production of syringes.

The project is economically and financially viable, with a high internal rate of return (IRR) of 11.7%, a payback period of 7.75 years and an NPV, at the end of the period under analysis, of €1,335,983.

It is intended: To obtain a loan of €1,800,000, with a grace period of 24 months and a repayment period of 60 months after that. The present study was based on an exchange rate of $1 = €0,86, corresponding, on this date 30 September 2021. The study concludes that the project is economically and financially viable for the entrepreneur, while generating 75 direct jobs and allowing the autonomy of the country in the production of syringes.

Keywords: Syringes, Project Viability, Covid-19, Portugal

JEL Code: G3, I1; M1

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Acknowledgement

I am grateful for all the knowledge and experience ISEG has offered me for the past five years in helping myself and all of its students during their academic path and training them for the future ahead.

An enormous thank you to Professor João Carvalho das Neves who guided me through this thesis with all his knowledge and wisdom.

To my parents, thank you for all of the time and patience that you have invested in my education, to follow and complete my dream courses.

Paulo Vasco and Veronica Brito I am extremely grateful for the time you took from your busy schedules on helping me complete my thesis. Without your experience I would have been lost. Also, to everyone else involved in the process of completing this thesis, thank you.

To my friends, especially Guadalupe Calheiros, who pushed me until the end to be the best that I can, helping me through the tough patches.

Lastly, but no less important, to Emer, Gerry, Aoife and Danny Wynne who indirectly have helped me reach to this stage of my life, thank you.

To all of you, thank you, I couldn’t have done it without you.

1. Introduction – Executive Summary

The present study aims to evidence the technical and economic-financial feasibility of the project of creating a factory dedicated to the industry of disposable syringes, promoted by JDS - Material Hospital, Lda. and coordinated by its Administration.

The industrial complex will be implanted in Tortosendo Industrial Complex, Covilhã, on a plot of 10.000m², where warehouses will be built, with a total covered area of 2.800m² of which 2.500m² will be dedicated to production, technical areas, and warehouses, and the remaining 300m² will be the social area and offices.

The project aims to develop the industrial production of disposable syringes to supply for the Portuguese Market in various health units (hospitals, medical clinics, veterinary clinics, dental clinics, laboratories), as well as pharmacies. The project contemplates, essentially, the production of one type of disposable syringe with four different capacities (2 ml; 5 ml; 10 ml; and 20 ml), that are considered "simple" disposable syringe (Luer Slip). For the purpose of this study, we consider the value of each product similar to 75% of the average value of the products on sale in the Portuguese market.

A professional management team with recognised professional experience will support the project, led by the company's management.

Nowadays the market is mostly dependent on imports (from my calculations Portugal currently imports over 160,000,000 syringes), as there is no large producer in the Portuguese territory, ensuring that, with competitive prices, all production with quality has a guaranteed market and contributes to a significant reduction in imports. The strategic option of the company bets on a market positioning characterized by high-quality productions at competitive prices.

The competition of the products considered in the project is totally external, with limitations concerning the market needs, especially in this phase of the Covid-19 pandemic.

It is intended that this Portuguese production will compete with imported products. Due to the difficulty in gathering data on disposable syringes in the Portuguese market, the following work will be based on the figures and information collected by the study.

The promoters of the project, JDS - Material Hospital, Lda., have considerable knowledge of the Portuguese market, which includes adequate information on the existing commercial distribution channels.

The project is within the priority axes of the national development plan, pointing towards the growth of national production, production diversification, import-substitution, also contemplating significant direct and indirect job creation.

The study includes the presentation of the company in chapter 2, the explanation of the project in chapter 3, the analysis of the market comes in chapter 4 and chapter 5 includes the diagnosis of the business context. Then chapter 6 proposes the business plan and its evaluation and chapter 7 presents the conclusions of the study.

2. Company Presentation

2.1. Company Information

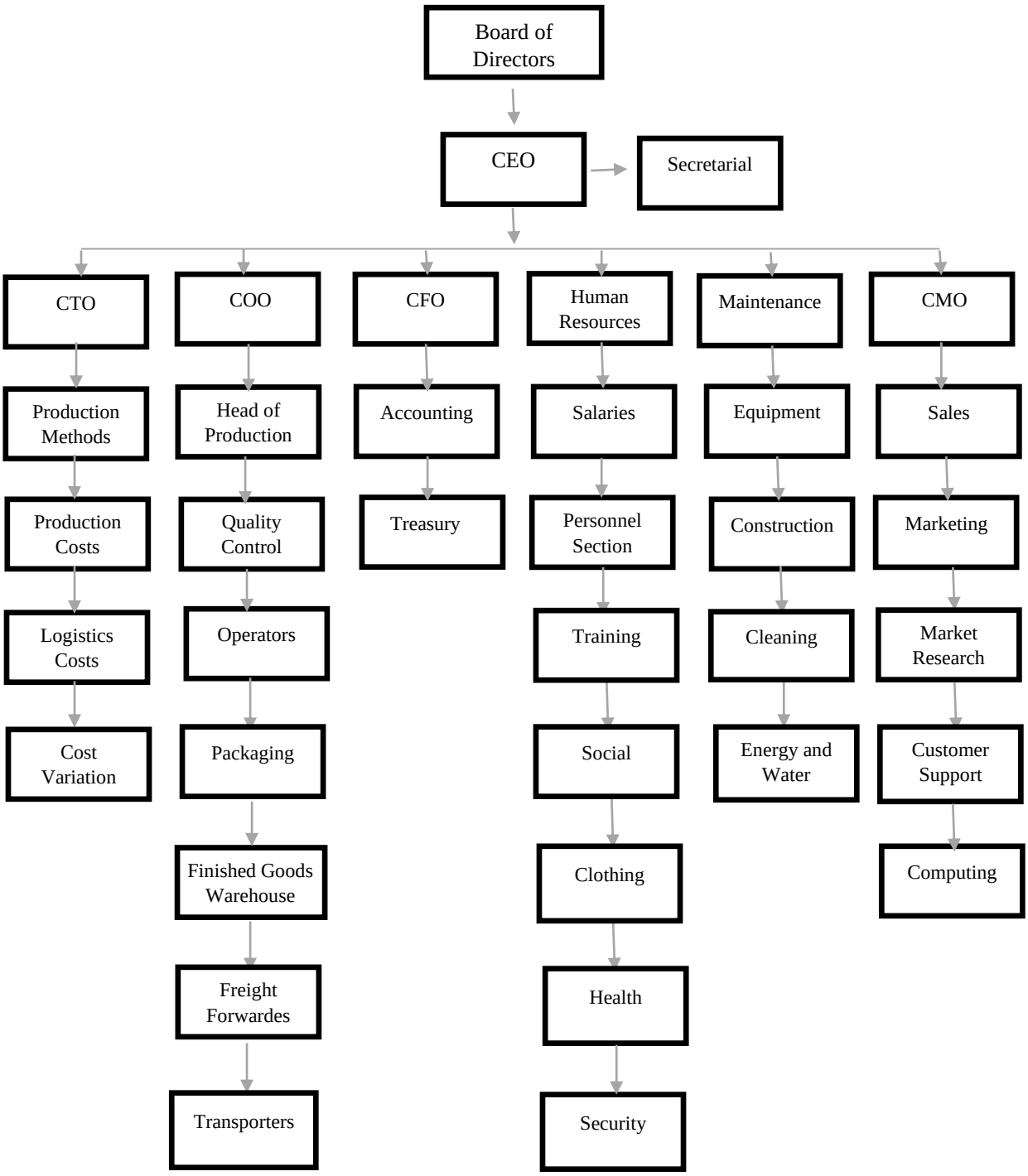
JDS – Material Hospitalar, Lda. will be created to develop business in the area of the health devices industry, having decided to turn the focus, especially, to the production of disposable syringes, after a careful and lengthy analysis of the market and its needs.

- Production Line for "simple" syringes (Luer Slip) – 2 ml;
- Production Line for "simple" syringes (Luer Slip) - 5 ml;
- Production Line for "simple" syringes (Luer Slip) - 10 ml;
- Production Line for "single" syringes (Luer Slip) - 20 ml.

The company will be set up in the form of a limited liability limited company, with a share capital of €50,000, divided into two equal shares, in the name of Joaquim Ponce Dentinho and Miguel Lopes Cavalheiro Ponce Dentinho amounting to €25,000 and fully paid up.

2.2. Organizational Structure

As the project develops within a company, the organisational structure and functions will evolve according to the following chart:



2.3. Managerial Experience

A talented technical team will be secured for the management team (in addition to the promoters):

- CEO: Joaquim Santiago de Mira Ponce Dentinho
- CFO: Paulo Jorge Horta e Vale de Figueiredo Vasco;
- CTO: João Maria Lobo Corte-Real Maldonado Correia;
- Maintenance Manager: Miguel Maria Gamito Ferreira Mateus Leal;
- Human Resources: Maria de Guadalupe Marques de Brito Madeira Calheiros;
- Administrative Manager: Maria Veronica Marques Brito;
- CMO: Duarte Tovar de Lemos Pais Ferreira

The effective contracting of the other technicians already referred to will depend on their continued availability on the date of the start-up of the company's activity

2.3.1. Keys to Success

Guidelines to Sustainability

Currently, one of the main keys to the success of any company, worldwide, is the constant concern with the guidelines of sustainability.

JDS - Material Hospital, Lda. will not escape the rule and has the obligation, as an innovative company with social, cultural, political, and environmental concerns, to define its main guidelines regarding sustainability. Thus, among others:

- Promote social involvement, inspiring and training all employees in sustainability;
- To actively contribute to social progress by improving working conditions for employees and donating syringes to developing countries;
- Each new product must contribute to sustainability;
- Maintain safe workplaces and improve health and hygiene;
- Reduce water consumption during production and when our products are used;
- Manufacture superior quality products at competitive prices;
- Create ways to enable lower water consumption with the use of our products, while maintaining quality and still allowing the full benefit to be obtained;
- Consume sustainable energies;
- Achieve customer confidence in our products, satisfying their needs;
- To achieve a cohesive team of employees, with defined objectives, with a desire and taste for working in the company;

- To act by the Law;
- Maintain high ethical standards.

2.4. Plan of Succession

Given the age of the promoters, there is no short-term succession plan.

3. Project Presentation

3.1. Location Study

The industrial facilities will be located in Tortosendo Industrial Complex, Covilhã. This location was chosen due to its cost-benefit situation. With access to electricity and water, it is near good connections which link it to the largest markets of syringes in Portugal (Lisbon and Porto) as well as close to a large, qualified workforce.

Figure 1 – Industrial Facilities location via Google Maps

The connections nearby will be the A23 as well as de N18 connections which will allow for easy delivery of raw materials into the factory as well as quick delivery of the finished product to the rest of the Portuguese market.

The industrial facilities are also nearby Beira Interior University, allowing for the opportunity of partnerships between JDS – Material Hospitalar, Lda. and the University in terms of internships and research and development. The Beira Interior University courses in our interest would be of health and engineering.

The land area is composed of 10.000sqm, with a pavilion area for industrial use of 2.500sqm and 300sqm of office space, social area, and technical areas.

Table I

Industrial Facilities	
Description	**Cost**
Industrial Facilities 2,800 sqm (2,500 sqm + 300 sqm)	785,000
Land	10,000

3.2. Electricity

The energy consumption of the company will be due to the operation of the equipment of the production lines, general lighting, and ventilation.

Electricity will be supplied through an existing medium-voltage line near the future premises, which will be sufficient to supply the plant and there is no need to reinforce the line. The estimated average daily consumption is 860 kWh/day.

The electricity supplier of our choosing would be Endesa, who offer a price of €0,1371 per kWh. Clean energy will be used where possible in all of the production.

3.3. Water

This is an industry that does not need to use much water, as consumption is limited to the hygiene and cleaning needs of the facilities and staff.

3.3.1. Possible Environmental Impact

We must make some considerations about the environmental impact of this project, knowing that any creation by man will inevitably have a change in the environment caused by the activity. Environmental impacts can be of two types: - positive or negative, being that the negative represents a break in the ecological balance, with serious damage to the environment.

The concept of environmental impact is commonly defined as a set of biological, chemical, and physical interferences in the environment carried out as a direct result of the human productive system, which has consequences on health, safety, the well-being of the population, either among humans or in biomes.

The accuracy of an environmental impact cannot be determined because the environment is a complex system. It is possible to make some estimates, through the EIA (environmental impact study) and RIMA (environmental impact report).

Almost all economic activities have an environmental impact. Examples of negative environmental impact:

- Pollution of the soil by irregular disposal of waste
- Pollution of rivers by toxic materials from industries
- CO2 emissions

We will make a synthetic analysis of the environmental impact of the activities to be developed by JDS - Material Hospital, Lda., taking into consideration most of the information patent throughout this study.

- Non-polluting industry, without significant emission of effluents
- Non-polluting industry, with solid wastes used for recycling.

As a conclusion, we will review the negative environmental impacts generated by economic activities and how the present project positions itself in them:

- Deforestation - non-existent.
- Erosion - non-existent
- Loss of biodiversity - non-existent.
- Freshwater depletion - non-existent
- Atmospheric pollution - almost none. Small CO2 emissions, due to the use of vehicles and alternative generators to electrical energy from the grid.
- Water pollution - Negligible, given the non-existence of industrial effluents and the installation of a Wastewater Treatment Plant.
- Desertification - Non-existent.
- Destruction of springs - non-existent. No impact.
- Waste generation - None, due to recycling.

We conclude by stating: - the project under consideration has a minimal environmental impact.

3.4. Production Process

The project aims at a low diversified industrial production, aiming at synergies in the productive and commercial areas, minimizing market risks, which contemplates 4 different products, each one with different capacities and measures, according to the specific needs of each client. For the purpose of this study, we worked with about 75% of the average value of each product on sale in the Portuguese market.

Like all other hospital products, the production of syringes naturally also goes through a strict quality process.

The raw material (plastic) is transferred to the injector machines, where it is injected into the moulds, then the plastic components come out of the injectors and are taken to the assembly.

The assembly process of the syringes is done in fully automatic machines, where the siliconization and engraving of the cylinders take place. In this assembly/packaging process, the machines fit the stopper on the rod and assemble the rod inside the cylinders. The syringe, after this process, is assembled and ready to be packaged individually, where it receives a plastic film and surgical-grade paper, which is used worldwide in medical and hospital products. The process of marking, assembly and packaging disposable syringes is composed of marking equipment, assembly equipment and packaging machines, used to mark the scale, assemble, and package the syringes. After sealing the packaging, the syringes are placed in cardboard boxes which are then sealed. All the products undergo a rigorous visual inspection and are then sterilised with ethylene oxide and nitrogen in a deep vacuum system in a sterilisation chamber. The aim is to produce around 14 million syringes per month from the third year of production.

Later on, and if justified, the promoter puts forward the hypothesis of including a production line for disposable screw-top type syringes (Luer Lock), needles and rubbers.

3.5. Products

With the Covid 19 pandemic, the world's syringe manufacturing facilities found themselves unable to produce enough syringes to meet the enormous demand, not only for the so-called "normal" needs but also to enable the delivery of vaccine doses. Therefore, as demand has increased, these production units will have to reassess their production capacities.

In addition, Portugal has only one major syringe manufacturer (Inserpor), which is unable to meet the needs of the domestic market in any way. The vast majority of syringes on sale on the Portuguese market are imported, which, as we know, is harmful to the balance of payments.

At the moment, due to the administration of the Covid 19 vaccine, there has been a much greater demand for low-capacity syringes, such as 1 ml and 2 ml.

Thus, JDS - Material Hospital, Lda., after a careful analysis of the Portuguese market needs, decided to dedicate itself more to the production of disposable syringes, given the

significant increase in demand resulting from the need for administration of anti-covid vaccines.

3.5.1. Disposable Syringes

Intramuscular, intradermal, subcutaneous, intravenous, or intravenous, intracardiac: these are some access routes of the human body which syringes can be used to insert liquid substances. In addition, we also have the syringes used to withdraw fluids from the body, such as blood.

In the past, they have been produced from various materials such as bone, silver, and glass. Glass syringes lasted for many years and were reused. In the 1970s, the first disposable syringes appeared. However, the conversion from glass to disposable syringes was slow and met with great resistance.

Until the early 1980s, knowledge about the transmission of pathogens through sharp materials used in procedures was rather vague. The alarm for this danger was sounded about 25 years ago, with the disclosure of the discovery of HIV.

The fact is that practically all healthcare workers use syringes and, although they are all very similar, they have many differences between them.

Thus, there are different types of disposable syringes. Disposable syringes serve a diverse variety of uses and are usually grouped according to their capacity in millimetres (ml) - (note: each 1 ml is equal to 1 cubic cm, which corresponds to 1CC, and the unit is equal to 0.01 ml).

Disposable syringes can be packed with or without needles in the same package and can also contain "thread" (Luer Lock) or "simple" (Luer Slip) nozzles. In practice, this means that they are threaded or only pointed tips.

The Luer Lock nozzle has a threaded tip and makes it difficult to detach the needle, which offers more security during manipulation of the human body, preventing the needle from moving out of place during use.

The Luer Slip nozzle has easy needle fitting and favours the manipulation of the fitting in catheters, vaccine applications, infusion of liquid medications and others. In the Luer Slip syringe, the needle is only inserted into the tip.

JDS - Material Hospital, Lda., intends, after exhaustive market research and despite existing several types of syringes, decided to dedicate itself to the specific production of disposable syringes with Luer Slip nozzle with 4 different capacities (2ml, 5ml, 10ml and 20ml).

However, regardless of their capacity, and always with the aim of producing a product above average and that complies with all the requirements set out in the applicable standards and technical regulations, JDS - Material Hospital, Lda. wants all disposable syringes to have the following characteristics:

- Smooth sliding of the plunger, avoiding accidental exteriorization;
- Internal siliconization (with the use of latex-free, medical-grade silicone oil), which ensures smooth gliding and precise control in drug aspiration and administration;
- That allows exact dosages, beyond the nominal volume;
- Clear black scale, printed in millilitres, for accurate measurement;
- Black piston, for easy recognition of the volume of liquid;
- Transparent syringe barrel, which simplifies the content check;
- Good tightness;
- Cylinder with retention ring, which avoids loss of medication during aspiration;
- Sterilised in ethylene oxide and individually wrapped.

3.5.1.1. Disposable Syringes Luer Slip – 2ml

This syringe is normally used to administer solutions for injection and blood collection. It is indicated to administer drugs intradermally and subcutaneously. They are the most commonly used syringes in vaccination campaigns. They are a device that allows the aspiration of only one fixed dose of vaccine.

Table II

Monthly Production of Disposable Syringes – 2ml	
Type of Syringe	**Value**
Disposable syringe 2ml	3,744,000
Selling Price	0,013

3.5.1.2. Disposable Syringes Luer Slip – 5ml

The 5 ml syringe, like the previous one, is divided into mm^3, but its division is 1 in 1 ml and each 1 ml is divided into 0.2 ml. It is also indicated to administer drugs intramuscularly and intravenously.

Table III

Monthly Production of Disposable Syringes – 5ml	
Type of Syringe	**Value**
Disposable syringe 5ml	3,744,000
Selling Price	0,021

3.5.1.3. Disposable Syringes Luer Slip – 10ml

This syringe has the same division as the 5 ml syringe, the only difference is that it is larger and indicated only for the administration of drugs intravenously. Applications are carried out through other medical devices, such as catheters.

Table IV

Monthly Production of Disposable Syringes – 10ml	
Type of Syringe	**Value**
Disposable syringe 10ml	3,744,000
Selling Price	0,03

3.5.1.4. Disposable Syringes Luer Slip – 20ml

This syringe is divided in mm^3 and is graduated 1 in 1 ml from start to finish. Commonly indicated to administer drugs intravenously and in enteral feeding. The applications are also carried out through other medical devices, such as catheters, being the intravenous route the most used.

Table V

Monthly Production of Disposable Syringes – 20ml	
Type of Syringe	**Value**
Disposable syringe 20ml	2,496,000
Selling Price	0,05

3.6. Inputs

The inputs per manufacturing line were calculated according to the production objectives, the relative composition of raw and subsidiary materials.

The main inputs used in the manufacture of disposable syringes are: polypropylene; colour concentrates; rubber or plastic stoppers; silicone; solvents; inks for printing scales, batch numbers and manufacturing date; paper for surgical-grade packaging; thermoformable film for packaging; epoxy resin with temperature drying; resin with drying via ultraviolet radiation; cannulas; cardboard boxes for packaging; ethylene oxide and nitrogen (used in the sterilisation process); wooden pallets and stretch film for protecting the assembled pallets.

Table VI

Weight of Syringe	
Type of Syringe	**Weight in kg**
Disposable Syringe 2ml	0,0036kg
Disposable Syringe 5ml	0,006kg
Disposable Syringe 10ml	0,0085kg
Disposable Syringe 20ml	0,013kg

We are estimating that 54% of sales are COGS. From there and given the weight of each syringe we calculated the amount of plastic required for each syringe, the remaining will be considered ink and packaging. Regarding the rubber stopper, each unit will cost on average $0,0012 equivalent to €0,001.

Table VII

Consumption Inputs per 100 syringes - 2ml Disposable Syringe				
Composition	**Unit**	**Quantity**	**Price**	**%**
Plastic	Kg	0,3	0,452	64,39%
Rubber	Qt	100	0,1	14,25%
Ink and Packaging	Lt	0,05	0,15	21,37%
Total			**0,702**	**100%**

Table VIII

Consumption Inputs per 100 syringes - 5ml Disposable Syringe				
Composition	**Unit**	**Quantity**	**Price**	**%**
Plastic	Kg	0,54	0,734	64,73%
Rubber	Qt	100	0,1	8,82%
Ink and Packaging	Lt	0,1	0,3	26,46%
Total			**1,134**	**100%**

Table IX

Consumption Inputs per 100 syringes – 10ml Disposable Syringe				
Composition	**Unit**	**Quantity**	**Price**	**%**
Plastic	Kg	0,79	1,07	66,05%
Rubber	Qt	100	0,1	6,17%
Ink and Packaging	Lt	0,15	0,45	27,78%
Total			**1,62**	**100%**

Table X

Consumption Inputs per 100 syringes - 20ml Disposable Syringe				
Composition	**Unit**	**Quantity**	**Price**	**%**
Plastic	Kg	1,24	2	74,07%
Rubber	Qt	100	0,1	3,7%
Ink and Packaging	Lt	0,2	0,6	22,22%
Total			**2,7**	**100%**

3.7. Labour

The project is expected to involve a total of 75 employees (direct employment), distributed quantitatively and functionally. An additional 40 to 50 people are estimated to be involved through indirect employment:

Table XI

Labour							
Staff	**Base Salary**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Board of Directors	2,500	1	1	1	1	1	…	1
CEO	2,500	1	1	1	1	1	…	1
CFO	1,450	1	1	1	1	1	…	1
Production Planning	1,400	1	1	1	1	1	…	1
CMO	1,300	1	1	1	1	1	…	1
COO	2,000	1	1	1	1	1	…	1
Production Technician	1,450	2	2	2	2	2	…	2
CTO	1,220	1	1	1	1	1	…	1
Logistics Technician	850	2	3	3	3	3	…	3
H.R. Manager	940	1	1	1	1	1	…	1
H.R.	800	1	1	1	1	1	…	1
Maintenance Manager	1,700	1	1	1	1	1	…	1
Maintenance Technician	1,250	1	1	1	1	1	…	1
Maintenance Assistance	800	1	2	2	2	2	…	2
Administrative Staff	840	3	4	5	5	5	…	5
Salesman	850	2	3	4	4	4	…	4
Specialized Operators	1,150	5	7	9	10	10	…	10
Laboratory/Quality Control	1,000	2	2	2	2	2	…	2
First Class Workers	1,050	7	11	13	14	14	…	14
Head of Packaging Section	850	3	3	4	4	4	…	4
Undifferentiated Workers	680	7	7	8	8	8	…	8
Drivers	900	1	1	1	1	1	…	1
Warehouse Personnel	800	4	4	5	5	5	…	5
Cleaning Personnel	119	4	4	4	4	4	…	4
Total	-	**54**	**64**	**73**	**75**	**75**	…	**75**

Gross Salaries will see an increase of 1.5% annually. This percentage represents the mean inflation of the last five years pre-COVID.

It is our aim that all our employees come to be responsible for their workstation, with confidence and integrity.

One of the bets of JDS - Material Hospital, Lda. is that its employees have a salary above the average and, at the end of each year, a productivity prize.

We have the absolute notion that our products and employees will be the basis of the success of JDS - Material Hospital, Lda. Therefore, JDS - Material Hospital, Lda. will always try to promote a working environment of trust and wellbeing. An important part of our commitment to employees is the Employee Rights Policy, following international labour standards. To achieve a cohesive team of employees, with defined goals, willing and happy to work in the company.

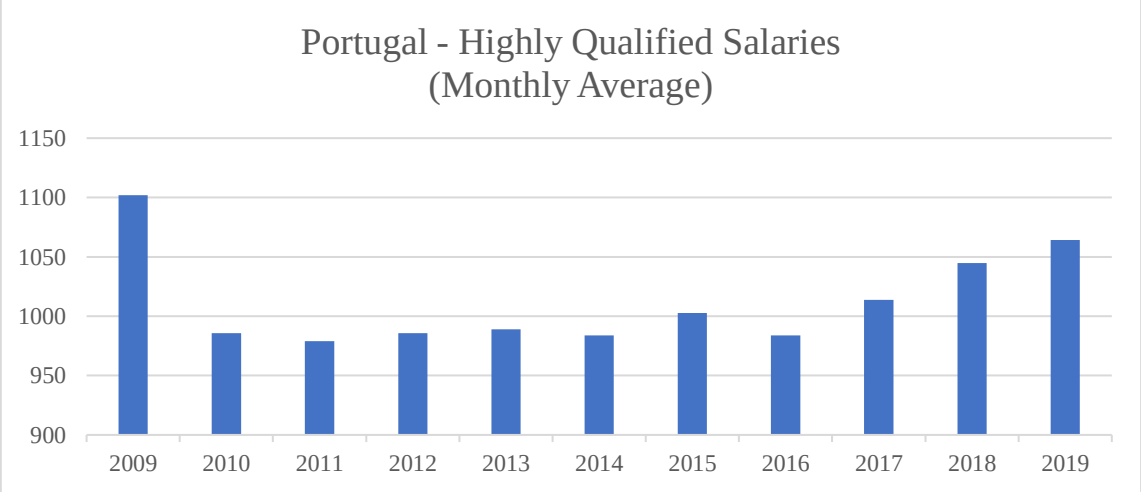


Figure 2 – Monthly Average High Qualified Salaries (Euro), Source: Pordata

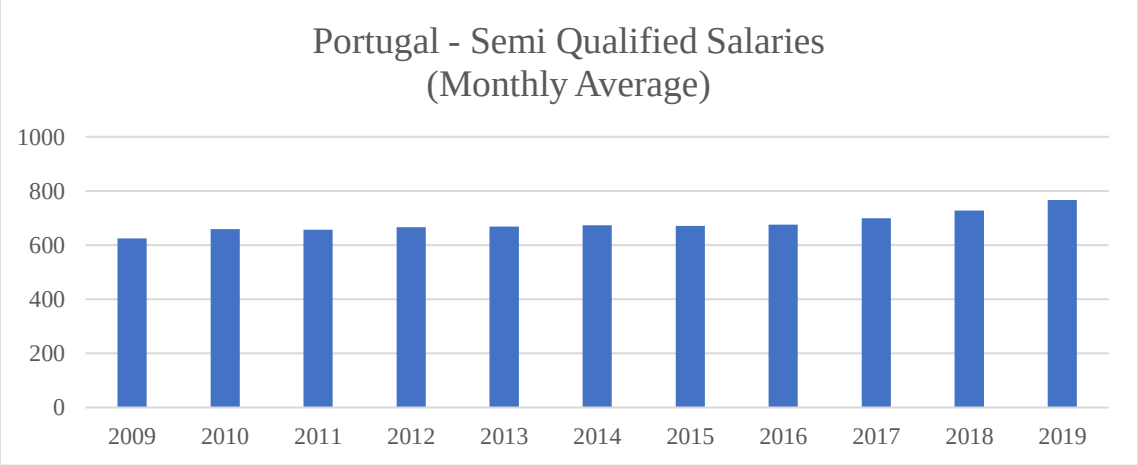


Figure 3 - Monthly Average Semi Qualified Salaries (Euro), Source: Pordata

3.8. Investment

Table XII

Total Investment	
Description	**€**
Tangible Asset	2,202,302
Intangible Asset	32,340
Working Capital	534,954
Total Investment	**2,769,596**

Under working capital, a minimum stock of raw materials of €236.142 is considered, corresponding to approximately 60 to 90 days of initial production (home stock + travelling stock). A further €280.879 comprising of three months of capital required to maintain staff salaries as well as ESSE.

3.9. Financing

Table XIII

Financing		
Origin	**Amount**	**Structure (%)**
Equity	969,596	35%
Debt	1,800,000	65%
Total	**2,769,596**	**100%**

The planned investment will have own resources coverage of 35%, being equivalent to €969.596 at the start-up of the project.

3.10. Debt Service

Table XIV

Annual Debt Service (ADS)							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 7**
Outstanding Capital (Beginning of Period)	1,800,000	1,800,000	1,800,000	1,440,000	1,080,000	…	360,000
Interest Rate	3%	3%	3%	3%	3%	…	3%
Annual Interest	54,000	54,000	54,000	43,200	32,400	…	10,800
Annual Reimbursement	-	-	360,000	360,000	360,000	…	360,000
Stamp tax (0,05%)	27	27	27	22	16	…	5
Debt Service	54,027	54,027	414,027	403,222	392,416	…	370,805
Amount Owed	**1,800,000**	**1,800,000**	**1,440,000**	**1,080,000**	**720,000**	…	**0**

It is intended to obtain financing, in €1.800.000, at the indicated rate of 3%, with a grace period of 24 months and a maturity of 60 months supported by a guarantee from a credit guarantee fund.

4. Market and Competition

4.1. General Market Analysis

The need for greater diversification of the economy has become increasingly evident, after consecutive years of record tourism revenue that boosted Portugal's economic growth. The decline of tourism together with the lack of competitiveness of national production may plunge the country into a severe crisis.

Programs such as Portugal 2020 and Industria 4.0 were set up to incentivise investment around Portugal with the hopes of diversifying and modernising the economy, with eventual effects on innovation, the increase of employment, an increase of exports, reduction in imports and on the development of economic growth. Due to the pandemic, the continuous economic growth Portugal was facing came to a halt conditioned by overcoming the restrictions on economic activity caused by the COVID-19 pandemic.

The importance of tourism in Portugal is evident but this crisis clearly showed that the country remains highly dependent on it, it is essential to quickly develop new sources of growth independent of the tourism economy, to mitigate the negative impacts of eventual situations of the same nature. In other words, the reinforcement and diversification of the non-tourism economy must continue to be the main focus of the process of economic development.

Efforts to diversify the economy have resulted in steady GDP growth in the industrial sector.

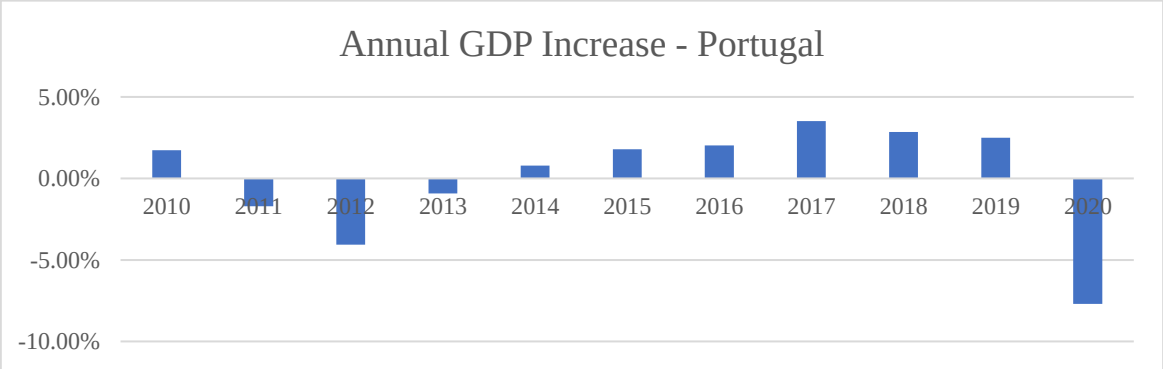


Figure 4 – Annual GDP Increase (%), Source: Pordata

The Portuguese economy is expected to grow by 3,9% in 2021 and 5,1% in 2022. Even though below the mean of the European Union in 2021 (4,8%), in 2022 the growth rate will be above the European Union's 4,5%. GDP per capita is provisioned to be €23,600 in 2021 and reach as high as €25,200 in 2023.

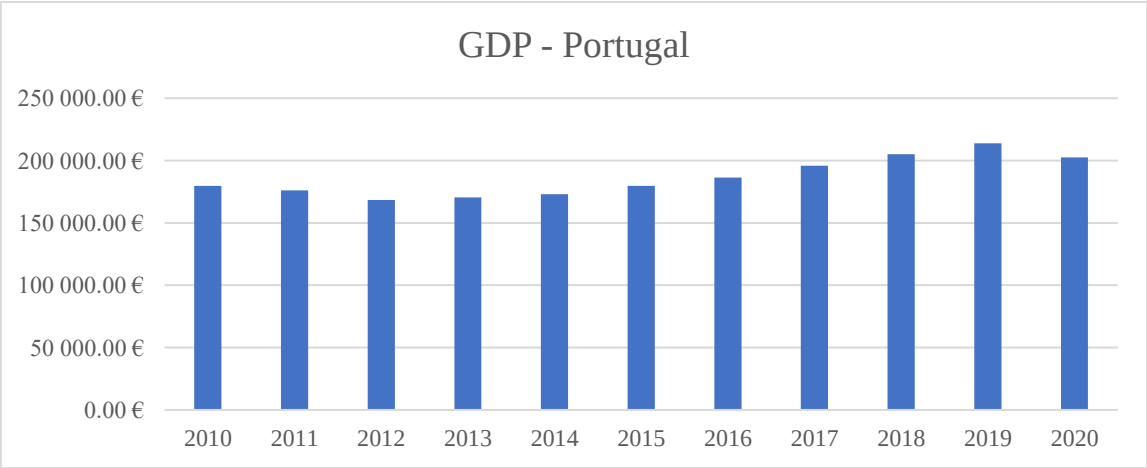


Figure 5 – GDP in millions (Euro), Source: Pordata

In terms of unemployment, Portugal is expected to face in 2021 an unemployment rate of 7,71%. Only in 2026 will Portugal be able to recover close to pre-COVID times with an expected unemployment rate of 6,51%.

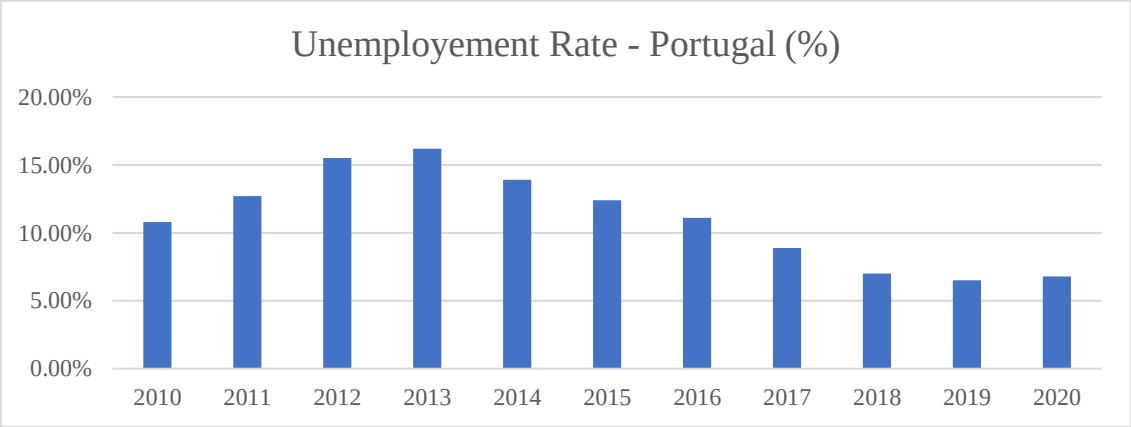


Figure 6 – Unemployment Rate (%), Source: Pordata

Over the next few years, the Portuguese government will have to face the enormous challenge of ensuring, on the one hand, the preservation of major macroeconomic balances and the sustainability of public accounts and, on the other, the availability of the financial resources needed to pursue heavy investment in economic and social infrastructure, without thereby jeopardising the financing of a process of growth and diversification of the economy that is intended to be driven essentially by the private sector. This is a very delicate balance, but one that will have to be maintained so that the objectives of development and diversification of the economy may be effectively achieved.

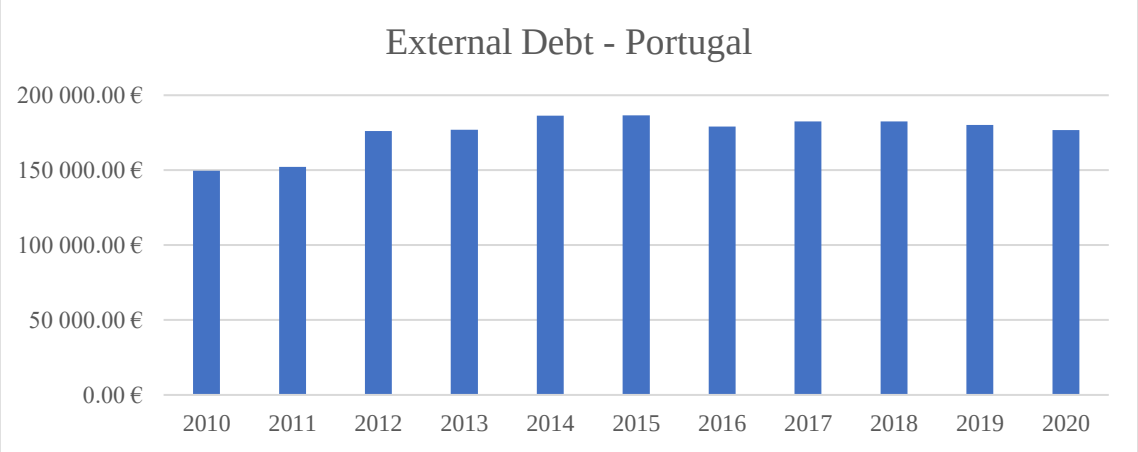


Figure 7 – External Debt in millions (Euro), Source: Pordata

Despite the continued development of the industrial sector in recent years, the market is still dependent on imports for all the products whose production is covered by this investment plan.

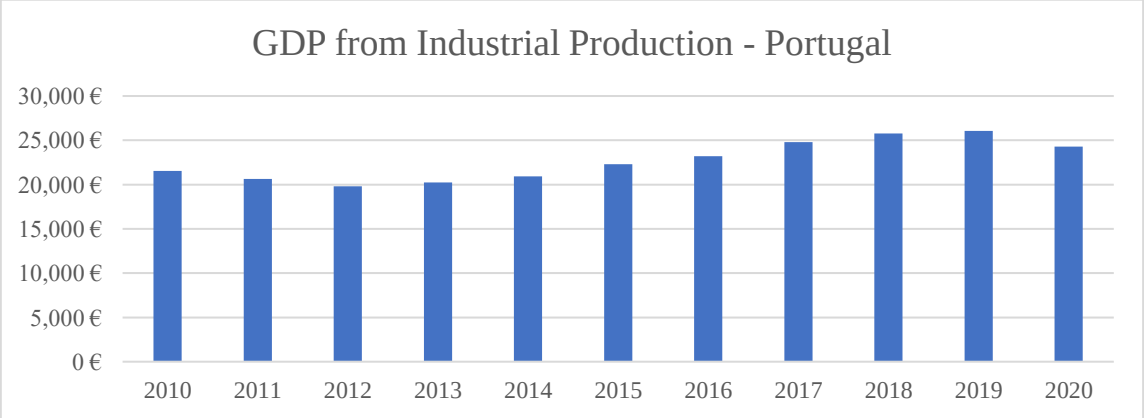


Figure 8 – GDP from Industrial Production in millions (Euro), Source: Pordata

A more detailed analysis of the evolution of Portugal's economy suggests that behind the figures for inflation, unemployment, GDP growth, public debt, etc. which some are not very encouraging, a series of public policy reforms are taking place, together with the strengthening of certain economic trends, which will hopefully indicate the construction of a new, more positive economic reality for Portugal.

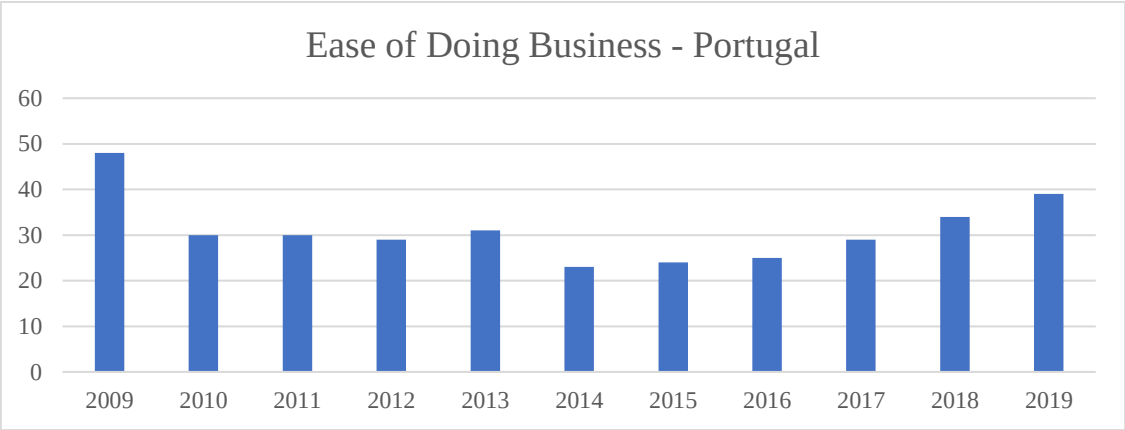


Figure 9 – Ease of Doing Business, Source: Trading Economics

Increasing the efficiency of public investment is necessary, but not sufficient, to sustain long-term growth. Portugal must also set the conditions for the private sector to play a more prominent role in capital formation and economic diversification. Better institutions and regulations facilitate diversification, sectoral reallocation of resources and improved product quality.

In terms of salaries, the national wage must undergo significant changes in order to create a critical mass of domestic demand necessary to sustain the diversification of the economy. To base future growth and the conquest of international markets on low salaries is to bet on a wrong model of competitiveness. Therefore, the qualification of human resources is strategically fundamental, as a reinforcement of labour productivity and as a support for the endogenization of knowledge and know-how.

There is a need to value work, entrepreneurship, honesty, productivity, diversification, and competitiveness, so that Portugal may increasingly become a self-sufficient country.

On a political level, poor governance and entrenched corruption undermine Portugal's development prospects. Improving governance should always be a main priority.

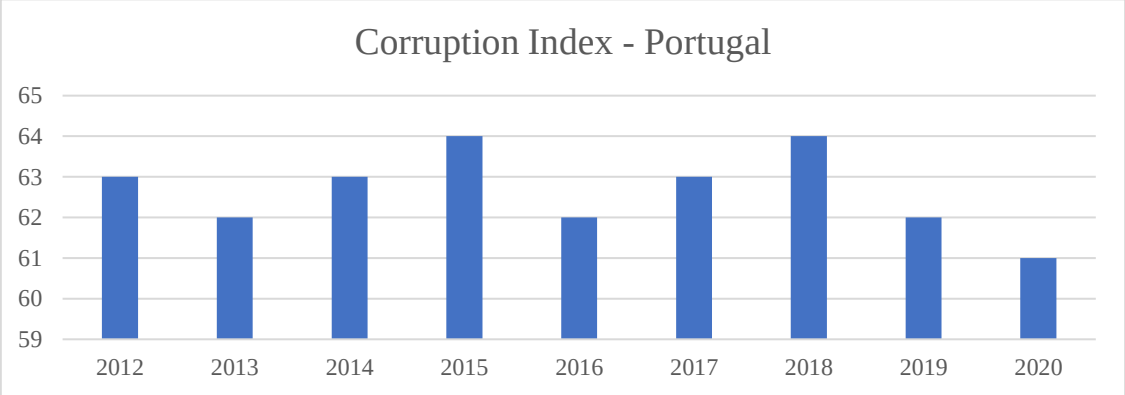


Figure 10 – Corruption Index, Source: Pordata

Overhauling the legal framework to improve competition in domestic markets and attract foreign direct investment (FDI) is also crucial. This new framework, if effectively implemented, will increase transparency, and establish a level playing field, which would consequently bode well for private sector development and economic growth.

Corruption can arise in the provision of public services (e.g. licensing) and, more specifically, when public officials in charge of enforcing property rights and other regulations are in a position to demand bribes. Corruption is similar to a distorted tax on the private sector and therefore raises production costs. Corruption also diverts resources from productive uses (e.g., human capital formation) to rent-seeking and less growth-generating activities.

Thus, political decisions will continue to be determined by efforts to increasing the private sector in the economy, diversifying the economy, and increasing investment flows, but these efforts will be constrained by the operating environment, which is still challenging.

We can therefore consider that, in this context, projects of the nature proposed by the company JDS – Material Hospitalar, Lda. are not only vital to the national economy but will not face significant market problems. As well as becoming fully independent from other countries of such an important medical tool.

From the graphs below we can analyse that in the years studied, Portugal has never experienced a positive trade balance. This outcome severely affects Portugal's economy and should slowly be reverted into more beneficial figures for Portugal's favour. Creating import substitution products and eventually with means to export those same products will allow for more balanced accounts for Portugal. Dr. Luis Soares (INFARMED) suggested that a way to revert this situation and protect as well as incentivise more production in Portugal should be an "autonomy cost", which is comprised of the differences of production between Portuguese firms and external firms (mainly from China). This cost would need to be incurred either by the Portuguese government or by the EU. By doing so, achievements such as generating employment, increasing economies, increasing knowledge, increased innovation, and so much more. To be more specific, Portugal should be independent on the production of their required demand for health products. The idea is that in the long term, this "autonomy cost" would not be a cost, but an asset.

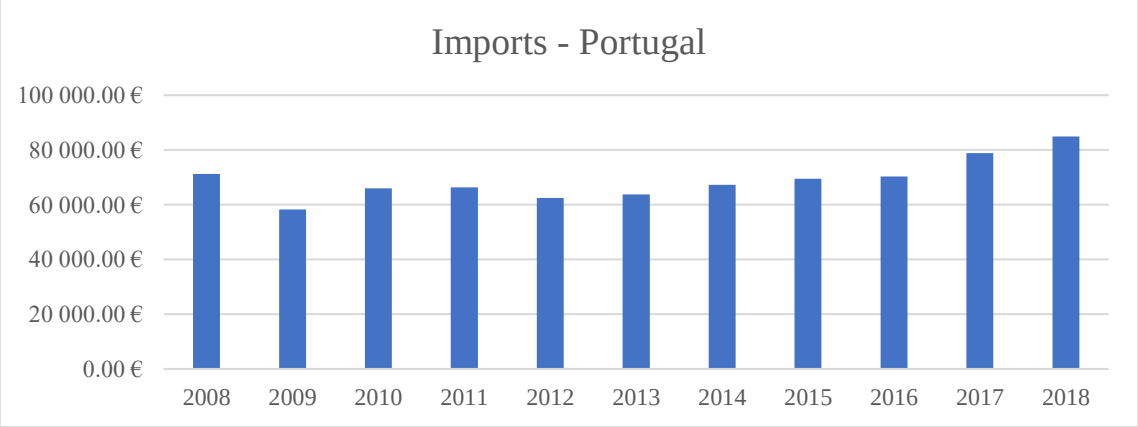


Figure 11 – Imports in millions (Euro), Source: Pordata

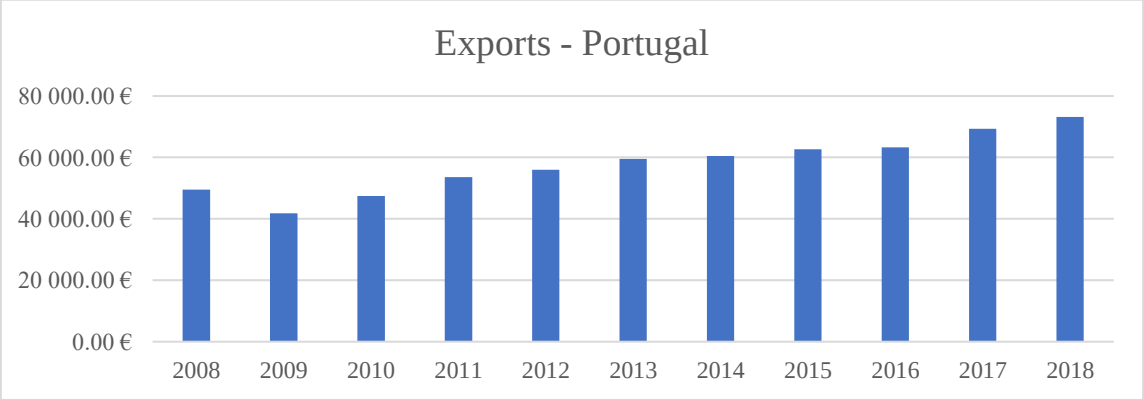


Figure 12 – Exports in millions (Euro), Source: Pordata

Due to the financial crisis Portugal faced, health expenditure decreased from 2010 until 2013, and since then it has seen a continuous increase. This trend of continuous increase does not seem to be ending any time soon and as the Portuguese population continues to age at an alarming rate, more expenditure on health will be needed.

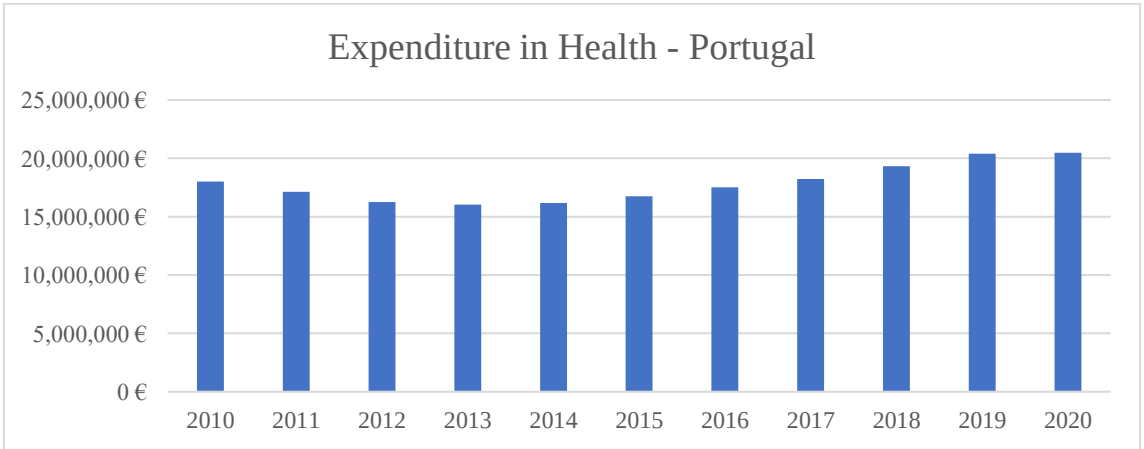


Figure 13 – Health Expenditure in millions (Euro), Source: Pordata

Portugal's decrease in population is due to two factors. Firstly, there are currently more deaths than births, and secondly, the huge wave of emigration occurring due to the lack of job opportunities we are facing. As we can see from the graph the population has steadily

decreased year after year, having a small pause during the pandemic due to travel restrictions and the return of many Portuguese citizens hoping to halt the pandemic in their home country.

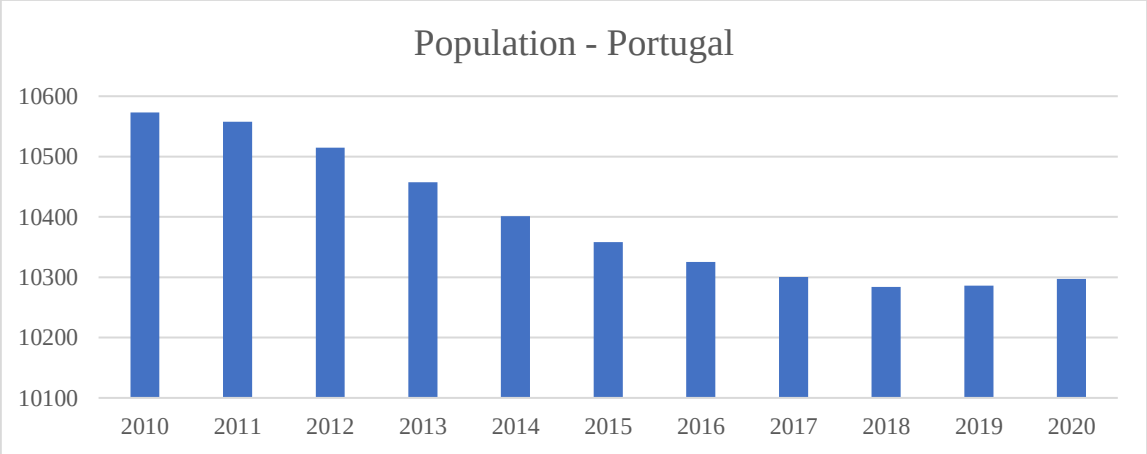


Figure 14 – Population in millions, Source: Pordata

The products to be produced by JDS – Material Hospitalar, Lda. will be little diversified and with few references:

- Disposable Syringe – 2ml
- Disposable Syringe – 5ml
- Disposable Syringe – 10ml
- Disposable Syringe – 20ml

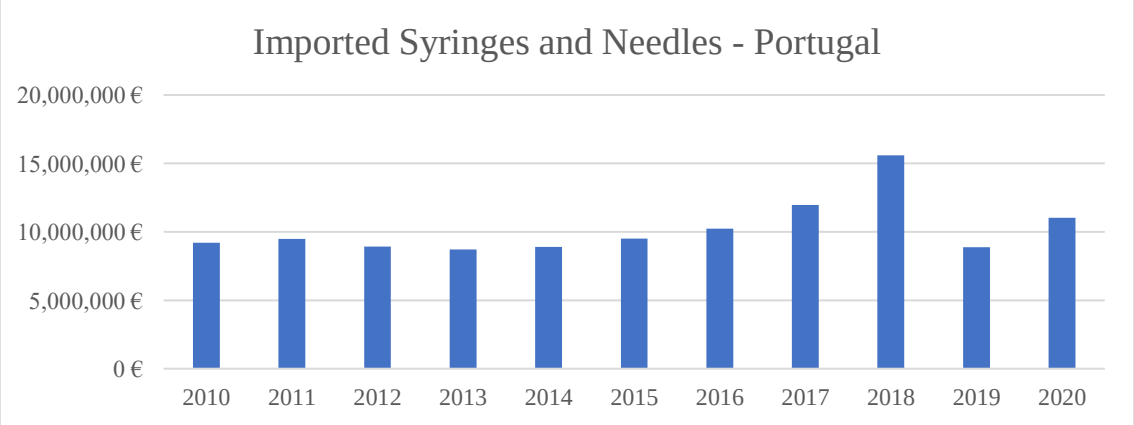


Figure 15 – Imported Syringes and Needles (Euro), Source: Trade Map

The value of syringes and needles imported by Portugal pre-COVID reached a value of over €15,000,000. This value decreased due to protectionism producers of syringes and needles decided to undergo to protect their country's needs. Leaving the needs of the Portuguese's health at risk.

4.2. Sales Forecast

We have considered constant monthly sales for the whole period under analysis, corresponding to the total placing on the market of the actual production.

Table XV

Sales Forecast							
Product	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Sales							
Disposable 2ml Syringe	350,438	467,251	584,064	592,825	601,717	…	698,318
Disposable 5ml Syringe	566,093	754,790	943,488	957,640	972,005	…	1,128,051
Disposable 10ml Syringe	808,704	1,078,272	1,347,840	1,368,058	1,388,578	…	1,611,502
Disposable 20ml Syringe	898,560	1,198,080	1,497,600	1,520,064	1,542,865	…	1,790,558
Sales Total	**2,623,795**	**3,498,393**	**4,372,992**	**4,438,587**	**4,505,166**	…	**5,228,429**
COGS							
Disposable 2ml Syringe	189,237	252,316	315,395	320,125	324,927	…	377,091
Disposable 5ml Syringe	305,690	407,587	509,484	517,126	524,883	…	609,148
Disposable 10ml Syringe	436,700	582,267	727,834	738,751	749,832	…	870,211
Disposable 20ml Syringe	485,222	646,963	808,704	820,835	833,147	…	966,901
COGS Total	**1,416,849**	**1,889,132**	**2,361,416**	**2,396,837**	**2,432,789**	…	**2,823,351**
Gross Margin	**1,206,946**	**1,609,261**	**2,011,576**	**2,041,750**	**2,072,376**	…	**2,405,077**
Gross Margin / Sales	**46%**	**46%**	**46%**	**46%**	**46%**	…	**46%**

Cost of goods sold are to be 54% of sale (35% for plastic and the remaining 23% for packaging, paint, disinfection, rubber…)

The percentage value of the gross margin on sales, 46%, ensures comfortable coverage of fixed production costs and the achievement of a net margin adequate for the sector. We are also considering that 20% off sales are for exportation.

Table XVI

Sales Distribution By Product	
Product	**Percentage**
Disposable 2ml Syringe	27.27 %
Disposable 5ml Syringe	27.27 %
Disposable 10ml Syringe	27.27 %
Disposable 20ml Syringe	18.18 %
Total	100 %

The following percentages of sales distribution are equivalent to the data gathered of syringes bought by various institutions. This information gathered will be assumed to be on a national level and therefore the prediction for quantities sold.

Sales Evolution Forecast

Without being overly optimistic, the company intends to sell all its production. Firstly because of its presence in the domestic market, without the upsets of stock-outs of imported competing products, and secondly because of the room for manoeuvre that the company has in terms of the price variable of its marketing mix.

Target market

Regardless of the commercial distribution circuits to be selected by the company it is considered that the company's final target market is the total population through the health industry.

Market Trends

Accelerated improvement of the rail network, providing better conditions for the distribution of the product, at a national level. Improvement of distribution circuits, from wholesale to retail.

Market Growth

Given the considerations already made in this analysis, significant market growth is expected, representing the country's slowly reopening and returning to pre-COVID times where the consumption of syringes was greater (over €7,000,000 annually and growing).

Market Requirements

We summarise some of the needs felt on the market:

- Ensuring a continuous market supply of an essential good;
- Ensuring the availability of quality products;
- Diversified offer of products;
- Availability of balanced products from a quality/price point of view;
- Consumer confidence in products, creation of an image for national production.

In conclusion, no constraints are envisaged in the total sale of the production, a fact reinforced by the positioning targeted for the marketing mix of the company, in the binomial price/quality: - above average quality / below-average price.

4.2.1. Marketing Mix

Table XVII

Marketing Mix Profile				
	Product	**Price**	**Placement**	**Promotion**
High Priority	●		●	
Priority		●		●
Low Priority				

In our marketing mix, the attribution of high priority will be given to, product and placement variables, and priority regarding the price and promotion variable, due to the nature of the products to be marketed.

Marketing objectives - the company aims to promote an undiversified range of consumer products and market them in the national and international markets.

In the first phase, with a timeframe that we estimate at between one and two years, the company will be essentially focused on the following specific objectives:

- Promotion of the image in the internal market, passing on the message of a modern, dynamic and competent company, producing quality products at competitive prices. The aim is to achieve recognition in the market as a whole;
- Development of training programmes in the area of industrial and commercial function, providing trainees with the necessary skills to perform the activities related to the activity developed. The aim is to achieve, in a full year, a minimum of 52 hours of training, i.e., 52 hours per worker (in groups of 10);
- Presence, as from the cruise year, at least 1 national fair/exhibition per year, promoting the company's image and making its products known.

Positioning - The company's positioning will be centred on the professional qualifications of its staff, where it will make a strong investment, and on the excellence of its products, in order to obtain the necessary market recognition.

It is not unreasonable to consider Quality Certification. ISO 9001 refers to the requirements of a quality management system with a view to effective customer satisfaction.

The growing interest in producing with Quality and demonstrating it is a positive differentiation that has been asserting itself in all areas of activity. The objectives to be achieved with the serious implementation of a Quality System under ISO 9001 are, among others:

- Facilitated penetration into new markets;
- Increased internal and external confidence in working methods;
- Maintaining the organisation as designed;
- Increased motivation of employees;
- Prestige;
- Greater control of "non-quality" costs and their reduction;
- Increased customer satisfaction;

The main objective of ISO 9001 is customer satisfaction, following the company's objectives.

Product Marketing Considerations - As defined in this study, the company will offer a little diversified set of products, to which it will associate high-quality standards and adequate packaging. The decision to produce a small number of diversified products has to do with the company's initial aim to penetrate the market and eventually in years to come expand to complementary products, e.g., needles.

Price considerations - The pricing policy will be established so that consumers have the perception of a price that is competitive to the quality offered, considering the financial capacity of the target population/consumer.

In this study, we indicate the prices to be charged, without prejudice to any adjustments that may have to be made.

Placement considerations - In the initial phase (start-up year) it will be limited to the north of Portugal and the greater Lisbon area, using its own logistical means, to reach the industrial market.

Promotion considerations - The marketing communication variable, of the company, will be divided into its components: - Institutional Advertising; Communication itself; and Public Relations, being, in this first phase, the dominant marketing variable.

The promotion mix should be established according to the strategies that will be selected.

Emphasis will be given to internal training in the area of Public Relations and Attendance, in order to transform each company employee into an important link in the chain of institutional communication.

4.3. Clients

4.3.1. Final Clients

Summarizing the data presented in point 4.0. the final target market is considered to be almost the entire population of the country, as far as the consumer market is concerned, targeted through pharmacies, as well as hospitals (both public and private), medical clinics, veterinary clinics, dental clinics, laboratories, and so on. It is also expected that 20% of sales will be sold abroad (exports), being the final clients the same already mentioned.

4.3.2. Wholesalers (distribution process)

The company has appreciable knowledge of the national distribution channels, which will correspond to its direct "customers". JDS – Material Hospitalar, Lda. potential customer is the health industry.

4.4. Price

The following prices are initial estimates of the four products we will be selling. We have obtained this figure by calculating the mean prices of all distributors with available data and subtracting a margin of around 25% (Assumption: 25% of the price is considered commission for the distributor). A marketing mix that is adequately performed will allow for a quick and manoeuvrable reaction towards competition.

Table XVIII

Products and Estimated Prices	
Products	**Price (€)**
2ml Syringe	0.013
5ml Syringe	0.021
10ml Syringe	0.03
20ml Syringe	0.05

4.5. Distribution Model

The company will ensure distribution logistics up to the best of its knowledge and capacity through its own means, with the fleet foreseen in the investment plan. In the case

of larger orders where transportation is an issue to deal with alone, using the transport market will be required.

4.6. Competition

Competition for the products considered in the production plan is internal and external but insufficient for the needs of the market, and no problems of any nature are envisaged in the marketing of all production equated.

We believe that the targeted domestic production will compete, without difficulty, with imported products. Without being overly optimistic, the company intends to sell all its production, mainly because of its presence in the national market.

4.7. Competitive Advantages

JDS – Material Hospitalar, Lda. will use the most up-to-date and advanced production technologies and will strive to assemble a production staff with proven track records in the industry. In any of the targeted products, there is no strong national competition.

The following factors should also be considered:

- National production - direct market presence
- Strong know-how of the sector
- Strict control on production
- Careful selection of subsidiary and raw materials
- Quality Certification
- Aggressive market penetration strategy.

4.8. Market Size

Given the considerations already made in this analysis, namely in point 4.0, we will only emphasise that significant market growth is predicted, representing the country's alignment with the consumption levels of countries with greater economic development and as a response to the continuous health expenditure growth predicted.

Of the €11,000,000 of syringes and needles imported in 2020, we are assuming that 45% of that number represents only syringes, giving us a potential market of €4,950,000.

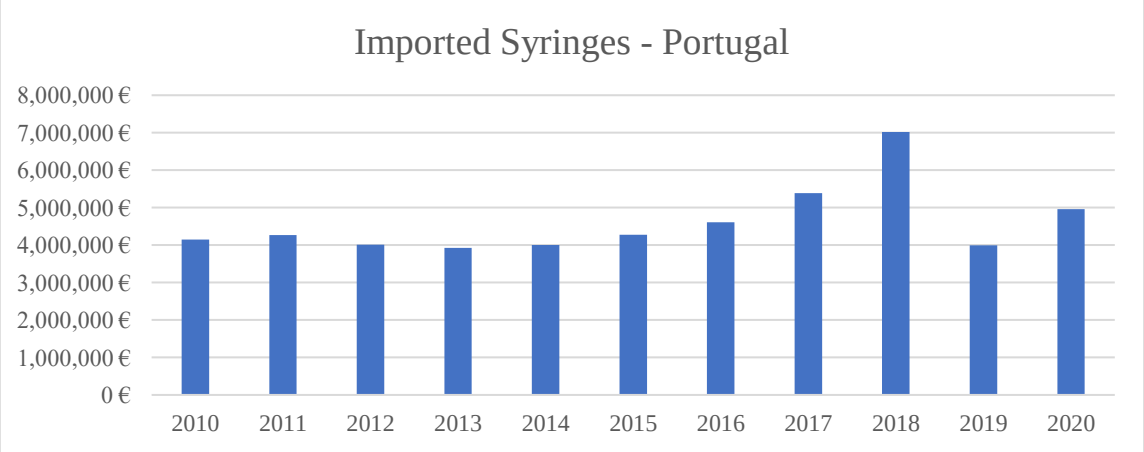


Figure 16 – Imported Syringes (Euro), Source: Trade Map

4.9. Commercial Strategy

The strategy to be adopted by JDS - Material Hospital, Lda.,. will be based on 3 fundamental pillars:

1. Knowing the market and the competition

The Portuguese market has, over the last few years, been dominated essentially by imported products.

The rivalry between competitors is usually evident in the price of the product, although, in the case of the Portuguese consumer, price is the factor that most attracts consumers. However, the competition for customers is not only reflected in the price. The rivalry also has an impact on the service provided and attention given to the customer, on differentiation and innovation strong influence on the purchase decision, due to the economic fragility of consumers.

Also, being a new and small business, huge attention to detail and care will be given to our initial customer (to create lasting bonds and security on our behalf) and as time goes in the long term hopefully, we are aiming to maintain this culture of thinking.

The strategy followed by the current importers has been to broaden the diversity of products, contrary to the strategy to be adopted by JDS – Material Hospitalar, Lda. which will concentrate on a reduced range consisting only of the most consumed products, disposable syringes - 2ml, disposable syringes - 5ml, disposable syringes - 10ml and disposable syringes - 20ml.

2. Dimensioning by goals

The strategy of JDS – Material Hospitalar, Lda., that defines the dimensioning of its production capacity involves a small diversity of products to be manufactured, as

previously mentioned, basically the products of greater consumption, betting on an appealing branding offering high-quality products at truly competitive prices.

3. Marketing and sales strength

As shown in the Third-Party Supplies and Services map, the funds allocated to the commercial area for the years studied in this paper will be:

Table XIX

Marketing and Sales							
Item	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Advertising	3,600	3,780	3,969	4,167	4,376	…	7,128
Public Relations	6,000	6,600	7,260	7,986	8,785	…	22,785
Sales Promotions	4,000	4,240	4,494	4,764	5,050	…	9,044
Consultancy	24,000	16,000	8,000	8,000	8,000	…	6,000
Representation Expenses	6,000	6,900	7,935	8,332	8,748	…	14,250
Total	**43,600**	**37,520**	**31,658**	**33,250**	**34,958**	**…**	**59,206**

As these amounts are directed towards the commercial/sales area, there is a strong commitment to publicising the product, through organising events, offering advertising gifts, publications on social networks, advertising in the media, sales promotions, etc...
The Commercial Department will be supported by a sales team who demonstrate a great knowledge of the national market and how it operates. This Commercial Department will be supported by 4 salesmen, 3 for the national market and 1 for the external market (predominantly countries members of the CPLP).

This shows that JDS – Material Hospitalar, Lda. is strongly committed to the commercial side of the business, which will enable it to rapidly penetrate the market.

5. SWOT Analysis

A SWOT analysis is an important tool to keep the business up to date on various aspects of internal and external factors. A SWOT Analysis will be frequently updated to identify and monitor the internal strengths and weaknesses, as well as the external opportunities and threats. At this stage of the project's implementation, a preliminary SWOT analysis was carried out, which we summarise as follows:

Table XX

Strengths	Weaknesses
• An essential product • Top of the line equipment and facilities. • High quality product. • Highly qualified personnel. • Lower transportation costs. • Decrease greenhouse gases.	• We will begin as an unknown brand. • Dependence on raw materials. • Not as much experience as our competitors.
Opportunities	**Threats**
• Growing demand for syringes. • Partnerships with CPLP (exports). • Partnerships with universities. • Governmental incentives and grants. • Government investment in infrastructures.	• High bureaucracy. • High entry costs. • Lack of initial trust from buyers.

6. Business Plan

Given the uncontrollable nature for the company of the time that may elapse between the request for bank financing and its eventual obtaining, the implementation of the plan will begin 135 days after the financing is obtained since the main equipment is already duly identified and negotiated with the suppliers (Smartell Technology Co., Ltd.), as well as all the raw material that will be necessary.

6.1. Investment Plan

The equipment to be acquired and the respective costs (on the date of the pro-forma invoices) are those shown in the following charts, with an estimated acquisition date weeks after the finance is obtained and then another 135 days later when the equipment will arrive. The industrial equipment will be purchased in dollars from China and will be fully guaranteed for 12 months.

6.1.1. Investment

Table XXI

Detailed Investment		
Description	**Amount**	**Amortisation Rate**
Land	10,000	0%
Facilities		
Industrial Facilities	785,000	5%
Industrial Equipment		
Syringe Moulds	159,513	25%
Injection Machine	245,950	12,5%
Equipment for Injection Machine	64,691	12,5%
Rotary Printing Machine	123,376	12,5%
3 Part Syringe Assembly Machine	109,268	12,5%
Syringe Blister Package Machine	135,362	12,5%
Equipment for Blister Package Machine	144,992	12,5%
Screw Type Air Compressor	19,839	12,5%
Eto Sterilizing Machine	109,889	12,5%
Vehicles		
Distribution Vehicles	54,720	20%
Service Vehicles	76,500	20%
Diverse Equipment		
Warehouse Racks	5,580	14,28%
Scales	3,285	12,5%
Electric Forklifts	32,400	16,66%
Pallet Holders	3,150	20%
Worktables	1,602	25%
Health and Safety Equipment	11,520	25%
Compressed Air Network	4,320	25%
Compressors	6,075	25%
Workshop Equipment	12,780	25%
Electric Installation	24,030	10%
Complete Laboratory	20,160	14,28%
Office Equipment		
Hardware	18,600	33,33%
Software	2,640	33,33%
Administrative Equipment	14,600	12,5%
WC Equipment	1,600	12,5%
Comfort and Decoration Material	3,500	12,5%
Several		
Commercial Projects and Studies	17,400	33,33%
Architectural, Engineering, Construction Supervision	12,300	33,33%
Necessary Working Capital	**534,954**	-
Total	**2,769,596**	-

The following industrial equipment was bought in dollars, the exchange rate used to date was $1 to €0,86 (this value will fluctuate with time and would need to be updated). The value for the industrial equipment includes the transportation costs and any other costs associated with their purchase.

6.1.2. Amortizations and Depreciations

Table XXII

Amortization and Depreciation							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Total Depreciation and Amortization	265,575	265,575	265,575	248,597	199,644	**…**	39,250
Accumulated Dep. and Amo.	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Investment Properties	-	-	-	-	-	**…**	-
Fixed Tangible Assets	254,796	509,593	764,389	1,012,986	1,212,631	**…**	1,996,027
Intangible Assets	10,779	21,558	32,337	-	-	**…**	-
Total	**265,575**	**531,151**	**796,726**	**1,045,323**	**1,244,968**	**…**	**2,028,364**
Values Balance Sheet	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Investment Properties	10,000	10,000	10,000	10,000	10,000	**…**	10,000
Fixed Tangible Assets	1,937,506	1,682,709	1,427,913	1,179,316	979,671	**…**	196,275
Intangible Assets	21,561	10,782	-	-	-	**…**	-
Total	**1,969,067**	**1,703,491**	**1,437,916**	**1,189,319**	**989,674**	**…**	**206,278**

6.2. Operational Plan

The production assumptions and their justification have already been presented. The company will operate the manufacturing lines at full capacity, and all production is considered to be below the total theoretical capacity of the equipment.

The full disposal of the targeted production was considered, given the reasons commented on the market and how national production has proved insufficient to meet the needs of consumption whose growth potential is enormous, and needs are vital. In point 4.2, the result of the expected sales was presented, associated with the respective COGS, given the unit costs of the inputs that result directly from the detailed production in point 3.5.

It is hoped and expected to start production at the end of 2022, reaching cruising speed at the end of 2024.

The operational plan is thus clearly defined and set out in the preceding considerations.

6.3. Financial Plan

Table XXIII

Personnel Costs							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Gross Salaries	751,324	889,084	1,006,964	1,037,794	1,053,330	…	1,222,433
Social Security Costs (23,75%)	178,439	211,157	239,154	246,469	250,166	…	290,328
Insurance (1%)	7,513	8,891	10,070	10,378	10,533	…	12,224
Other Costs with Staff	10,800	10,800	8,800	8,800	8,800	…	8,800
Total Personnel Costs	**948,077**	**1,119,932**	**1,264,988**	**1,303,411**	**1,322,830**	…	**1,533,785**

Table XXIV

Third Party External Supplies and Services Expenses							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Supply of Miscellaneous Materials	4000	4000	4000	4000	4000	…	4000
Equipment Maintenance and Repair	22,000	26,000	30,000	32,000	32,000	…	32,000
Communications	5,400	5,670	5,954	6,251	6,564	…	10,692
Energy	22,072	29,429	36,787	36,787	36,787	…	36,787
Equipment and Facility Insurance	368	342	318	296	275	…	133
Rents	9,600	9,888	10,185	10,490	10,805	…	14,521
Maintenance, Repair and Cleaning	8,000	8,240	8,487	8,742	9,004	…	12,101
Security	2,400	2,400	2,400	2,400	2,400	…	2,400
Fuel, Transport and Distribution	58,000	63,220	75,864	79,657	83,640	…	136,241
Advertising	3,600	3,780	3,969	4,167	4,376	…	7,128
Public Relations Actions	6,000	6,600	7,260	7,986	8,785	…	22,785
Sales Promotion Actions	4,000	4,240	4,494	4,764	5,050	…	9,044
Consultancy	24,000	16,000	8,000	8,000	8,000	…	8,000
Representation Expenses	6,000	6,900	7,935	8,332	8,748	…	14,250
Total ESSE	**175,440**	**186,709**	**205,653**	**213,873**	**220,434**	…	**310,081**

Table XXV

Necessary Working Capital Investment							
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Operational Assets							
Cash Reserve Security	280,879	280,879	280,879	280,879	280,879	…	280,879
Clients	218,650	291,533	364,416	369,882	375,430	…	435,702
Inventories	236,142	314,855	393,569	399,473	405,465	…	470,559
Total	**735,670**	**887,267**	**1,038,864**	**1,050,234**	**1,061,774**	…	**1,187,140**
Operational Liabilities							
Suppliers	118,071	157,428	196,785	199,736	202,732	…	235,279
State	82,646	97,799	110,766	114,154	115,866	…	134,468
Total	**200,716**	**255,227**	**307,551**	**313,890**	**318,599**	…	**369,747**
Working Capital Requirements	**534,954**	**632,040**	**731,314**	**736,344**	**743,176**	…	**817,393**
Investment in Working Capital	**534,954**	**97,086**	**99,273**	**5,030**	**6,832**	…	**7,929**

Table XXVI

Forecast Income Statement							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Sales	2,623,795	3,498,393	4,372,992	4,438,587	4,505,166	…	5,228,429
COGS	1,416,849	1,889,132	2,361,416	2,396,837	2,432,789	…	2,823,351
Gross Profit	**1,206,946**	**1,609,261**	**2,011,576**	**2,041,750**	**2,072,376**	…	**2,405,077**
Expenses							
Personnel Expenses	948,077	1,119,932	1,264,988	1,303,411	1,322,830	…	1,533,785
ESSE	175,440	186,709	205,653	213,873	220,434	…	310,081
Impairments	5,772	7,696	9,621	9,765	9,911	…	11,503
EBITDA	**77,657**	**294,923**	**531,315**	**514,702**	**519,201**	…	**549,709**
Depreciation and Amortization	265,575	265,575	265,575	248,597	199,644	…	39,250
EBIT	**(187,919)**	**29,348**	**265,740**	**266,105**	**319,557**	…	**510,459**
Financial Expenses	54,027	54,027	54,027	43,222	32,416	…	-
PBT	**(241,946)**	**(24,679)**	**211,713**	**222,883**	**287,141**	…	**510,459**
Income Tax (21%)	-	-	44,460	46,805	60,300	…	107,196
Net Income	**(241,946)**	**(24,679)**	**167,253**	**176,078**	**226,841**	…	**403,262**

Table XXVII

Break-Even Point							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Sales	2,623,795	3,498,393	4,372,992	4,438,587	4,505,166	…	5,228,429
COGS	1,416,849	1,889,132	2,361,416	2,396,837	2,432,789	…	2,823,351
Gross Contribution Margin	**1,206,946**	**1,609,261**	**2,011,576**	**2,041,750**	**2,072,376**	…	**2,405,077**
Break-Even Point	**2,454,976**	**2,857,256**	**3,217,959**	**3,319,670**	**3,376,467**	…	**4,033,410**
Sales – BEP / Sales	**6.43%**	**18.33%**	**26.41%**	**25.21%**	**25.05%**	…	**22.86%**

Table XXVIII

Cash Flow Statement							
Operating Activities	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
EBIT	(187,919)	29,348	265,740	266,105	319,557	…	510,459
Adjusted Taxes	-	(6,163)	(55,805)	(55,882)	(67,107)	…	(107,196)
NOPAT	**(187,919)**	**23,185**	**209,935**	**210,223**	**252,450**	…	**403,262**
Dep. and Amo.	265,575	265,575	265,575	248,597	199,644	…	39,250
Operational Cash Flow	**77,657**	**288,760**	**475,510**	**458,820**	**452,095**	…	**442,512**
ΔNWC	(534,954)	(97,086)	(99,273)	(5,030)	(6,832)	…	(7,929)
Total	**(457,297)**	**191,673**	**376,236**	**453,790**	**445,263**	…	**434,584**
Investment Activities							
CAPEX	(2,234,642)	-	-	-	-	…	-
Total	**(2,234,642)**	**-**	**-**	**-**	**-**	…	**-**
Financing Activities							
Issuance of new capital	969,596	-	-	-	-	…	-
Tax Shield	-	6,163	11,346	9,077	6,807	…	-
Interest Paid	(54,027)	(54,027)	(54,027)	(43,222)	(32,416)	…	-
ΔDebt	1,800,000	-	(360,000)	(360,000)	(360,000)	…	-
Total	**2,715,569**	**(47,864)**	**(402,681)**	**(394,145)**	**(385,609)**	…	**-**
Change in Cash	**23,630**	143,809	(26,445)	**59,645**	**59,654**	…	**434,584**
Beginning Cash	**-**	**23,630**	**167,439**	**140,994**	**200,639**	…	**3,425,020**
End Cash	**23,630**	**167,439**	**140,994**	**200,639**	**260,293**	…	**3,859,604**

Table XXIX

Free Cash Flow to the Firm							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
NOPAT	(187,919)	23,185	209,935	210,223	252,450	…	403,262
Dep. a Amo.	265,575	265,575	265,575	248,597	199,644	…	39,250
NWC	(534,954)	(97,086)	(99,273)	(5,030)	(6,832)	…	(7,929)
CAPEX	(2,234,642)	-	-	-	-	…	-
FCFF	**(2,691,939)**	**191,673**	**376,236**	**453,790**	**445,263**	…	**434,584**
FCFF Accumulated	**(2,691,939)**	**(2,500,265)**	**(2,124,029)**	**(1,670,239)**	**(1,224,977)**	…	**3,119,943**

Table XXX

Forecast Balance Sheet							
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Assets							
Non-current Assets							
Investment Property	10,000	10,000	10,000	10,000	10,000	…	10,000
Fixed Tangible Assets	1,937,506	1,682,709	1,427,913	1,179,316	979,671	…	196,275
Intangible Assets	21,561	10,782	-	-	-	…	-
Current Assets							
Cash and Bank	23,630	167,439	140,994	200,639	260,293	…	3,859,604
Cash Reserve Security	280,879	280,879	280,879	280,879	280,879	…	280,879
Inventories	236,142	314,855	393,569	399,473	405,465	…	470,559
Clients	218,650	291,533	364,416	369,882	375,430	…	435,702
Total Assets	**2,728,367**	**2,758,198**	**2,617,775**	**2,440,192**	**2,311,742**	…	**5,253,022**
Own Capital							
Realized Capital	969,596	969,596	969,596	969,596	969,596	…	969,596
Reserves	-	(241,946)	(266,625)	(99,372)	76,706	…	3,510,417
Net Profit of the Period	(241,946)	(24,679)	167,253	176,078	226,841	…	403,262
Total Equity Capital	**727,650**	**702,971**	**870,224**	**1,046,302**	**1,273,143**	…	**4,883,275**
Liabilities						…	
Non-current Liabilities							
Financing Obtained	1,800,000	1,800,000	1,440,000	1,080,000	720,000	…	-
Current Liabilities						…	
State and Other Public Entities	82,646	97,799	110,766	114,154	115,866	…	134,468
Suppliers	118,071	157,428	196,785	199,736	202,732	…	235,279
Total Liabilities	**2,000,716**	**2,055,227**	**1,747,551**	**1,393,890**	**1,038,599**	…	**369,747**
Total Equity and Liabilities	**2,728,367**	**2,758,198**	**2,617,775**	**2,440,192**	**2,311,742**	…	**5,253,022**

6.4. Project Valuation

Table XXXII

Cost of Equity	
Description	**Year 1**
Risk Free Rate	0.38%
Beta Levered	1.05
Market Risk Premium	6.00%
Country Risk Premium	2.13%
Cost of Equity	**6.28%**

Table XXXIII

Project Valuation							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
FCFF	(2,691,939)	191,673	376,236	453,790	445,263	…	434,584
Cost of Debt	3.00%	3.00%	3.00%	3.00%	3.00%	…	3.00%
Cost of Equity	6.28%	6.28%	6.28%	6.28%	6.28%	…	6.28%
Weight of Debt	71%	72%	62%	51%	36%	…	0%
Weight of Equity	29%	28%	38%	49%	64%	…	100%
Tax rate	21.00%	21.00%	21.00%	21.00%	21.00%	…	21.00%
WACC	**3.50%**	**3.47%**	**3.84%**	**4.29%**	**4.87%**	…	**6.28%**
Discount factor	1.00	0.97	0.93	0.89	0.85	…	0.47
PV	(2,691,939)	185,248	350,167	404,956	378,901	…	202,526
NPV	**1,335,983**						
IRR	**11.7%**						
Payback Period	**7.75**						

6.4.1. Other investment Indicators

Table XXXIV

GVA – Gross Value-Added Map							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Turnover	2,623,795	3,498,393	4,372,992	4,438,587	4,505,166	…	5,228,429
GVP (Gross Value of Production)	**2,623,795**	**3,498,393**	**4,372,992**	**4,438,587**	**4,505,166**	…	**5,228,429**
COGS	1,416,849	1,889,132	2,361,416	2,396,837	2,432,789	…	2,823,351
ESSE	175,440	186,709	205,653	213,873	220,434	…	310,081
Intermediate Consumption	**1,592,289**	**2,075,841**	**2,567,069**	**2,610,709**	**2,653,223**	…	**3,133,432**
GVA (Gross Value Added)	**1,031,506**	**1,422,552**	**1,805,923**	**1,827,877**	**1,851,943**	…	**2,094,996**
GVA / Turnover	**39.31%**	**40.66%**	**41.30%**	**41.18%**	**41.11%**	…	**40.07%**

6.4.2. Foreign Exchange Balance

Table XXXV

Foreign Exchange Balance							
Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**…**	**Year 15**
Foreign Currency Revenue							
Exports	524,759	699,679	874,598	887,717	901,033	…	1,045,686
Import Substitution	2,099,036	2,798,714	3,498,394	3,550,870	3,604,133	…	4,182,743
Total Revenue	**2,623,795**	**3,498,393**	**4,372,992**	**4,438,587**	**4,505,166**	…	**5,228,429**
Foreign Currency Expenditure							
Equipment Assets	1,112,880	-	-	-	-	…	
Raw Material and Subsidiaries	1,416,849	1,889,132	2,361,416	2,396,837	2,432,789	…	2,823,351
Expatriates Salaries	11,900	12,079	12,260	12,444	12,630	…	14,658
Total Expenditures	**2,541,629**	**1,901,211**	**2,373,675**	**2,409,280**	**2,445,420**	…	**2,838,009**
Foreign Currency Balance	**82,166**	**1,597,182**	**1,999,317**	**2,029,306**	**2,059,746**	…	**2,390,419**
Accumulated Balance	**82,166**	**1,679,348**	**3,678,665**	**5,707,971**	**7,767,716**	…	**30,143,278**

The accumulated balance of the foreign exchange balance (foreign exchange savings for the national economy) is over €7,700,000 at the end of the 5th year of activity, allowing the diversification of the national economy and an improvement in the balance of payments. We are assuming that 20% of sales will be considered external sales (exports).

7. Conclusion

The promoters of the project, partners in the company JDS – Material Hospitalar, Lda., have entrepreneurial and leadership experience.

The sector is within the priority axes of the national development plan, as we had the opportunity to mention. It is also considered a priority within Portugal 2020 and almost definitely Portugal 2030 (yet to be fully implemented) where some aims are to increase national production, import substitution and increase exports.

The project contributes to the diversification of the economy and import substitution and is designed to promote good industrial practices, thus contributing to the development and modernisation of the sector in which it operates.

The project will have an impact on the creation of direct and indirect jobs. Existing environmental rules will be respected.

Like most business plans, adjustments need to be made to realize a profit. As mentioned above and suggested by Dr. Luis Soares a cost needs to be created to expand the manufacturing industry in Portugal so that businesses that are not capable of competing with foreign firms (outside the EU) can have a chance; creating employment, economic growth, import substitution, increase taxes revenues, independence, improve standard of leaving, and so on.

Given our projections and assumptions the project is economically and financially viable, with a high internal rate of return (IRR) of 11.7%, a payback period of 7.75 years and an NPV, at the end of the period under analysis, of €1,335,983.

The company and shareholders shall provide all the guarantees deemed convenient by the financing entity. The guarantees that may be provided are appropriate, given the time limits for repayment of loans, as they may include a real guarantee on all assets assigned to the project and personal guarantees.

It is intended to: Obtain a loan of €1,800,000, within an adequate credit line, with a grace period of 24 months and a repayment period of 60 months.

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