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**"MARKET DYNAMICS AND M&A TRENDS IN THE ALTERNATIVE MEAT INDUSTRY:  
AN EMPIRICAL ANALYSIS ON FINANCIAL INVESTORS' PERSPECTIVE"**

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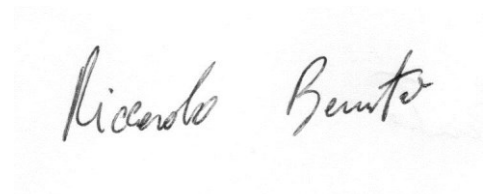
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A handwritten signature in black ink, reading "Riccardo Benito". The signature is written in a cursive style and is centered below the text "Firma dello studente".

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## **Introduction**

Meat has been one of the common foods of humankind for many millennia and an important part of food nutrition in different cultures. However, meat production places a heavy burden on the environment and therefore options are sought to reduce its consumption. Basically, the principal problems of meat production are four: (i) livestock breeding is the first source of carbon emissions on the earth, that is around 15% of the total pollution; (ii) massive use of antibiotics by the industry, thus a processed red meat is not good for the health; (iii) wasting in freshwater and a deforestation for cattle that leading to a mass extinction of wildlife; (iv) population should grow to 9.7 billion over the next 30 years, and continuing on this current path of production is impossible.

Therefore, one option is to let new meat substitutes take place of existing meat on the plate. Nowadays, there is an increasing global demand for plant-based and cell-based meat because people are more concern about their health and environmental problems, thus they want decreasing meat consumption especially in Western countries, however the actual amount of consumed meat has not yet decreased in a sufficient way.

The purpose of this thesis is to describe and analyze the alternative meat industry and which are the perspective and the contribution that financial investors bring to this innovative sector. First of all, the first chapter is composed by the description of the so-called meatless industry, main problems with the traditional meat production, what is a plant-based and cell-based food, an analysis of the current and future market and a short presentation of recent key players that have made and will make an impact in the market.

Second chapter discusses the literature about financial investors, the structure of the company, the methods utilized to evaluate potential ventures with a focus on venture capitals, which are the main source of funding for the alternative meat companies. This fact is due to that plant-based companies are the most developed in the market and so sustained by venture capital, but also private equity are involved. However cell-based companies are still in their seed/early-stage of life cycle, where the risk is very high and only angels and venture capitalists decide to invest.

After having introduced the literature, the thesis continue with the focus on a specific category of financial investors, that is the green and social investors. The chapter treats about the socially responsible investments, the importance to invest on eco-innovation realities, some data about the green investments, and information and profits of sustainable protein funds established by funds managers.

Finally, the last part is referred to an empirical analysis conducted in order to understand the perspective of the fund managers about the alternative meat industry. The analysis is composed by a first part in which a list of financial investors are identified through Mergermarket and S&P Capital IQ databases, and articles found online. Instead, the second part is composed by a contact with these type of financial investors through a survey built on open questions and collecting the data for analyzing the answers received.

In conclusion, after having managed the information, a discussion of the results is disclosed with a personal point of view about the alternative meat industry.



# 1. THE ALTERNATIVE MEAT INDUSTRY

## 1.1 What is a plant-based food?

In the recent decades, a lot of new technologies have been developed in several form for different scopes of utilization in the leisure time, work time and in the life of society. This last has significantly increased its requests, pretending more and more in terms of products and becoming more concerned about problems of health and environment.

A big problem has arisen in the food and beverage industry, where the attention is more focused by people for the wasting and non-healthy products existing in the industry. Especially, the matter is about meat. These issues bring to a development in the sector from the buy-side point of view and from the sell-side where new opportunities can be created with new technologies of products and new firm established by potential innovators.

An industry that was mainly affected by these changes is the meat industry, where the principal problems can be labelled as: notorious contributor to global warming and pollution; as the population is continuing to grow, remaining on the current path it is effectively impossible, especially since full meat products are undoubtedly inefficient of converting nutrients needing and feeding humans; the industry is the main user of antibiotics for livestock and so it is one of the biggest threats of social wealth and security; regardless of animal rights, it is well known that the majority of industrial farm keeps animals under awful conditions. However, we will discuss the problems of industry more in deep in the next part.

To the evidence of these facts, new products for curios and rebel consumers was created, known as **plant-based food**. As the name suggests, it is “simply” food created from plant, so based on vegetable protein where none living animals is involved, but is a sort of lab-food.

This type of food requires much less land and water that for the production of food-meat industry, does not require the use of antibiotics, almost near zero greenhouse emissions, and does not contribute to the utilization of fertilizers and deforestation. Some of the most famous world business visionary and venture capital investors have decide to trust in this new type of food, including people like Bill Gates and Richard Branson that have committed capital in the most popular companies as Beyond Meat, Impossible Foods and Memphis Meats. All three have revolutionized this new market and are the pioneers of it, which important investments and partnership with multinational companies have been made. The main difference among them is that the first two, that we are going to analyze more in deep in the last section, are focused on the plant-based industry, while the last one is focused in the cellular-meat/lab-grown meat.

To understand better the features of the product and the upside that can be born with it, it is useful to understand the history of the plant-based products and the potential customers.

Many of these companies that produce plant-based meat today, look like to plant-based milks of some years ago. The market for these took off in the mid of 2000s where the first products were only a soya-milk brand, and it was pushed a lot to be placed in the same shelves of normal cow's milk in the supermarket. Therefore, this position in the shelf was a marketing strategy that made consumers think of it as just an alternative variety of beverage that you can pour on cereal, rather than a substitutes product for people that hate milk or have some sort of allergies.

Accordingly to the article in *The Economist*<sup>1</sup>, plant-based milk, which include products made by almond, oat and hemp, now accounts for about 15% of the retail milk sales in the American market and above 8% in Britain. Over the past year nearly two-fifths of American households bought alternative milks. In Britain 20% of people, accordingly with analyzed data, swallow such products, but only a third of those did so because intolerance in their health or allergy. The rest of people affirmed that bought the different milks because it is more healthier and for ethical reason pursued by consumers.

This type of evolution in the milk sector is happen in a similar way to the meat sector. The meat industry, in the recent years, has started a competition with the plant-based meat industry and however it is still at inception.

A lot of Americans, who described themselves as carnivores, wanted to add more plant-based food to their diet for all the reasons that we have described above. A new terminology was created with the recent change in the consumer habits and so they are called *flexitarians*.

This new term means that they are not wholly vegetarian or vegan, but anxious to reduce their meat consumption nonetheless in favor of a more healthier life.

Usually, young people are the most flexible and many under 35 want cut the amount of meat that they eat during the year compared to older people that are more conservative and tend to be less open to new alternative products.

Even if meatless meat industry has developed in the recent years, we can find the first signs in the 1901 with John Harvey Kellogg, the inventor of cornflakes, was granted a patent for Protose. This sort of product was a “vegetable substitute for meat” made of peanuts and wheat gluten. For a long time, however, the market was very small, and the incentive for making it a good product for the market was modest. This could be an assumption because many early veggie burgers had the taste and flavor of heavily salted woodchips.

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<sup>1</sup> See more in “Fake moos – plant-based meat could create a radically different food chain” – *The economist*

Today, the plant-based food industry is much different, and the alternative makers are more ambitious in the existing market.

They want to create an alternative product, not a substitution product, for who have concerns about meat industry and who is not against it, but simply prefer to dispose an alternative.

Therefore, the aim is to outcompete the traditional meat industry. The researcher and scientists are designing the plant-based meats that taste a lot like the real thing.

The product, as mentioned above, is fully made by vegetable protein such as soya, wheat or legumes and other types of plants that can help to associate the “fake” meat to the “real” meat. We know that the full sensory experience of eating a slab of meat starts when the proteins, sugar and fats interact during cooking. The process in which the meat goes brown and release its flavor is known as Maillard reaction.

All new entrants in this new market try to imitate the “meaty” experience, besides the use of plant-based protein, with utilizing other raw materials. An example could be the burger of Impossible Foods that contains “haem”, an iron-rich molecule that exists in living thing to help protein carry oxygen or in the Beyond Meat’s burger we can find the beetroot to give a reddish hue and the ability to “bleed” with a bitten.

To get the texture of their plant-based burgers and nuggets right, manufacturers use a process called extrusion, in which the mixture of ingredients is pushed through a small hole to create meat-like fibers. However, real animal muscle tends to have more complex structure than anything extrusion can achieve.

In conclusion, we have described what is a plant-based food, especially in the alternative meat industry, theme of this thesis, and we also have seen how this product could be complex at our eyes, but at the same time the technology that must be behind the production and the benefits that this new alternative product can create for the whole society.

## **1.2 The retreat from meat**

In the recent years, the meat industry has continually grown. This is mainly due to an increase in demand from the buy-side. The consumers become more picky about the consumption of food, they want all types of groceries and other products available at any time and in any places they decide to go to eat it. For that reasons, the market growth a lot and consequently supermarkets and restaurants, especially fast-foods, have raised their demand to the production that responds with a huge increase in the production and in the technology process that affect the genetics of a single product.

Many of us already consume ultra-processed or modified foods that could be considered “unnatural”, such as packet soups, reconstituted meat products or sweets, like bubblegum. If

you look at how our attitudes towards food have already changed, it is clear that they are grounded in culture more than nature. In the 1950s, some considered the white bread and other complex process food more healthier and superior rather than unrefined products.

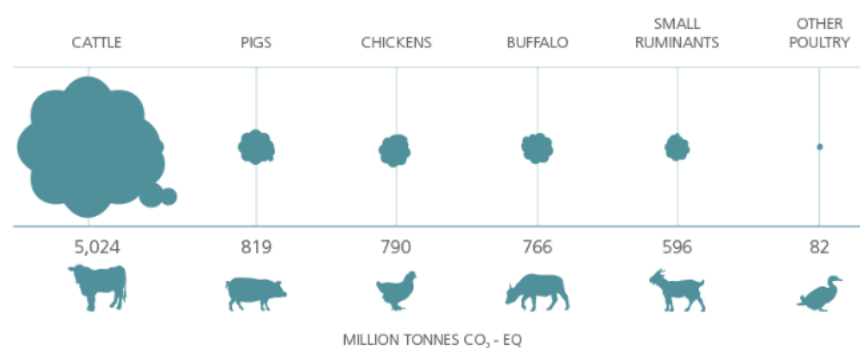
Later, frozen meals were seen as the revolution of the industry for the technology behind the production and scientist that provided genetically modified crops, they were labelled as brilliant for the sort of green revolution implemented with the promise of raising agricultural yields. Since the turn of the century, a trend for more natural and organic food has grown with protests against genetically modified food.

Globally, nowadays, demand for meat from animals is shooting up as people in developing countries grow richer and can afford to feast on flesh. In rich countries by contrast, an increasing number of people have decided to eat fewer animals, thus fewer meat in order to avoid all disadvantages that the industry and product itself create in the life of people.

All of this changes and requests has brought to some problems and they are widespread because involved the whole society in the world. The downside of this ongoing growth in production are much higher than the upside that could be only “limited” to satisfy the demand of the market.

*One big problem*, known by everyone, is that livestock farming is the first source of carbon emissions on the earth, that is around 15% according to Food and Agriculture Organization. So changing our diet could be the most effective way to reduce our carbon footprint.

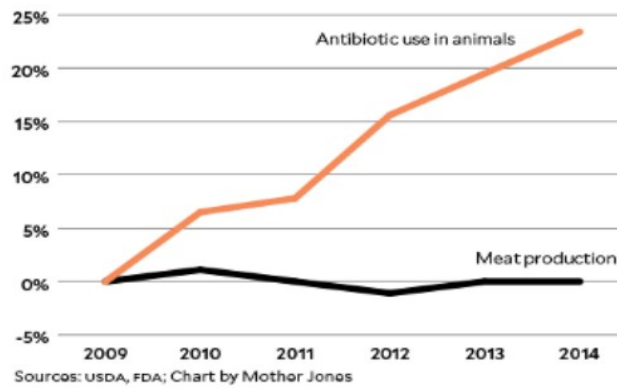
**Figure 1.1 Percentage of gas emissions**



Source: fao.org (<http://www.fao.org/gleam/results/en/#c303615>)

*The second problem* is referred to the massive use of antibiotics that industry uses to feed and treat livestock in few times in order to satisfy the demand arises from the market. Therefore, it is well known that the processed red meat is not a secure food for the diet. This type of problem estimates by WHO as one of the biggest threats to global health and food security at the moment, in which common infections and minor injuries can kill once.

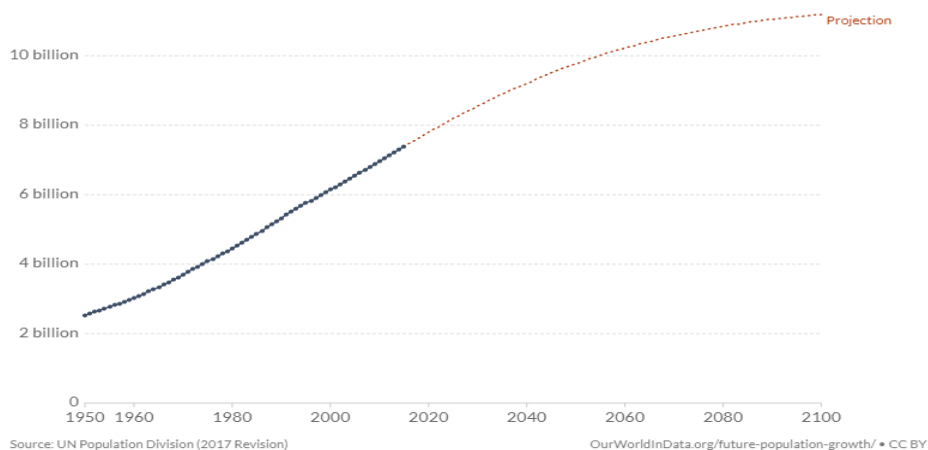
Figure 1.2 Percentage change in US farm antibiotic use between 2009 and 2014



*The third problem* is given by the wasting in freshwater and a deforestation for cattle that leading to a mass extinction of wildlife. Although the industry produces only the 18% of the world's calories and provide around 37% of the protein needing, rearing livestock, or producing the crops going to feed them uses the 83% of the world's agricultural land. The problem where leading to a massive global biodiversity loss, need a radical and efficient solutions that do not depend on the farmland expansion.

*The fourth problem* to consider related to the problem above is that by estimation the population should grow to 9.7 billion over the next 30 years, and continuing on this current path of wasting and production is impossible for all intents and purposes, especially if we think that meat is an inefficient way of covering all nutrients that humans required. Only about 3% of calories and 4% of proteins used to feed cattle going into steak that we consume.

Figure 1.3 Population growth in the world



The last problem, that is not really a problem but more a concern for some people is how the animal rights are viewed from the industry. We know that many of the industrial farms have

less concern about the treatment of animals when profits are the aim, and this brings to rear the cattle under conditions of cruelty.

Now, we are going to analyze the study made by (Hovhannisyan & Grigoryan, 2016) about the problems of the global meat production.

One of the main food security threats in the 21<sup>st</sup> century is the low level of gratification of daily consumed food with a wasting of it, which is increasingly escalating. In each country, the importance about having a healthy society by providing adequate food should be at the base of its objectives and tasks. A part of the main demographic challenges of the whole economy is the constant addition of groceries demand, conditioned by the annual growth of population, which is around of 83 million during the last 10 years.

The problems connected to the meat production and consumption have opened to new urgent solutions. About the 8% of the total energy consumed for food belong to meat, which coincides with the physiological consumption level around by 40% and this varies across different countries.

A lack of means for rational use of sources, degradation of natural pastures, anthropogenic disqualification of the environment, accessibility of the scientific achievements that can influence the production efficiency, internationalization of meat trade regulations, all of these should be the new mission for government and designated organizations.

The uncontrolled growth of the global population, disqualification and decrease in a number of fishery resources of the ocean, hyper-militarization of the global economy, reduction of agricultural land per capita and natural pastures degradation create serious threats to ensuring food security.

The purpose of the research, based on data from the last decade (i.e. 2004-2014), is to reveal important problems that are combined with evaluation of self-sufficiency of meat, indicators of livestock with production of meat, imbalance among demand and supply, how using resources.

The industrial revolution in the 20<sup>th</sup> century, in terms of introduction of genetic engineering, leading to a fast-growing breeding of animals, but it also makes huge impediments in terms of scientific development, where an efficient lifecycle is reduced to compensate investments and capital within the normative term.

The fact that daily-consumed energy per capita within 1974-2015 has reached from 2435 kcal/day to 2940 kcal/day. It equals to 250 million tons of beef-equivalent to approximately 525 trillion of calories. In case of increase and equitable distribution of foods, it would meet the needs of the Earth's growing population, whereas according to regions and countries might

vary from 1500 to 3800 kcal per day. As a result, the number of undernourished (less than 2100 kcal per day) population in the World exceeds 0.7 billion (about 11% of global population). But energetic self-sufficiency is not completely enough to evaluate the food security. Concepts concerning the latter are given by the provision of food rich in valuable proteins of animal origin.

More important indicator is the amount of consumed meat per capita, assortment structure, energetic equivalence, its role in the energetic value of total amount of foods and foods of animal origin.

**Figure 1.4 Production and consumption of meat in the world**

N	Indicators	Measurement units	2004	2008	2014	Growth rate (%)
1.	Production of meat total	million tons	260.3	280.1	315.3	21.1
1.1	Per capita production	kilogram	40.9	41.4	43.7	6.8
1.2	Per 100 ha agricultural land production	centners	46.2	49.8	55.0	19.5
2.	Meat consumption, total	million tons	259.0	284.0	314.3	21.3
2.1	Per capita consumption	kilogram	40.8	42.0	43.3	6.1
3.	Total consumption with regard of total production	%	99.5	101.4	99.6	–

The table clearly shows that during the last decade meat production has increased by 55 millions of tons that corresponds to an increase of 21.1%. Production of meat per 100 ha of agricultural land has increased by 9 cwt (Hundred weight), and per capita by 2.8 kg or 19.5% and 4.8% respectively. Production of 55 kg meat from 1 ha of agricultural land equals to 4-5 feed units not considering the feed costs for dairy production. It is known that grain with high energy content when used as forage loses its energy during meat production. In order to produce one kg meat containing 2000 kcal, it is required to use 8-10 kg grain with 30 thousand kcal energetic equivalence. No wonder, that poor countries with low level of self-sufficiency have high rate of population provided only with bread and potato.

Optimization of the meat production structure remains an important factor for the growth of its production, because the amount of forage necessary for the production of various types of meat is significantly different. The main source for the production of beef and mutton remain agricultural fodder lands (natural and sown), but the main forage for the production of pork and poultry are grains. Therefore, resources and the structure of meat production need to be optimized based on opportunities and expedience.

There are significant scientific achievements in the world practice concerning the scientific modernization of the livestock breeding system.

One real solution should be the innovative meat, where cattle are surpassed and lands for agricultural are a central points for the production of plant-based meat industry.

Another aspect to consider is the new outbreak, with important consequences in the health of people and especially in the economy of each country, where governments have to act promptly with expansion monetary policy leading by central banks.

According to the site Bloomberg, the pandemic brought to the biggest retreat for global meat eating in decades. The per-capita consumption and the drop of 3% from last year represents the biggest decline since the 2000s, according with data the overall demand is declining in many regions. That is a dramatic turnaround for the meat industry where come to rely on a steady growth for many years.

There is a wide range of factors contributing to this change of direction. The coronavirus pandemic has forced the consumer to cut down its grocery bill. In addition, restaurants shut down have hurt demand, since people stopped to eat meat out. In China, which account for a huge part of consumption, starts to be distrustful towards animal products since the government has suggested a possible link with the outbreak. Disruptions to plant production have also created supply problems for the industry.

At the same time, consumers have decided to cook at home rather than go out, as the lock down close many restaurant and other could close in the next future for economic problems.

This situation added a new hint for a possible structural change in the diet of people and thus eating more plant-based proteins. For years there is a climate that calling for a lower meat consumption, for all the reasons described so far, as problem of greenhouse gas emissions and disfigurement of environment.

In general, around the world there is a sort of intense process of change in meat consumption. For example, in Germany a survey has highlighted that in May the 26% of respondents ate meat or sausages daily, versus a 34% in previous year.

Therefore, the pandemic has accelerated shifts in consumers interests in food safety, traceability, and sustainability. Furthermore, the production costs will rise over the long term along with the land prices, thus many companies should look to curb their impact on the environment and shift away from deforestation to increase breeding of livestock, especially in Brazil where the lands are principally used for cattle and they have some problems with the pandemic.

### **1.2.1 What is the aim of the new industry?**

Nowadays, we know that natural meat is still the main source of food consumption in the society. By some estimates, 30% of calories consumed globally can be associated to meat products, such as pork, beef, and chicken. The global meat market is valued trillions at the



moment and can reach \$2.7T in the next decades. To meet this growing demand, the industry has evolved into a complex business that involves many sectors and sources.

However, as highlighted in the previous section, this constant growth has brought different problems, which affecting the security of environment and the health of people.

In addition, the recent outbreak across the globe has more shifted consumers behavior against meat and also the impact of the virus in the livestock farms has dealt major blows to the meat supply chain, which has faced billions of losses and the way to recovery is far away.

In contrast, start-ups focusing on plant-based protein and lab-grown protein have continued to growth through securing millions in financing rounds upon the pandemic. Demand for vegan products and alternative meat soared in the last months, with sales up more than 200% in few times.

Therefore, the meat production and supply chain could be simplified in easily way, as alternative protein products, such as plant-based meat and lab meat, could take place of farms and slaughterhouses.

In the past decade, the meat industry has seen massive consolidation through acquisitions and mergers of big companies in the market. Despite high deals in the sector, the meat industry faces a rising tide of challenges related to the business, environmental, and ethical concerns.

These big corporations have also begun the shift into plant-based food through acquisitions and finance new disruptive companies in the industry.

Meanwhile, startups and new companies start to develop innovative technology to manufacture plant-based products and to engineer meat in labs, due to the increasingly in popularity.

One of the largest alternative protein brands, Beyond Meat, which is focused on the production of plant-based burger, in 2019 went listed with a valuation around \$1.5 billion and its value is still growing at the moment.

In the 2020, the company has decided to enter in different markets around the globe, especially in China with great success and Europe that it will create a huge hub for the production of its plant-based products.

In the same year, it has closed partnerships with many big supplier food companies, such as KFC, Pizza Hut and Taco Bell, where its burgers and sausages have been included on menus.

The competitor, Impossible Foods, has also seen a great growth. The company is not public, so it has to raise funds through private funding rounds, where many investors participated with a total of \$1.3 billion disclosed capital. Also Impossible Foods has closed different partnerships with major brands of food, such as Burger King and Starbucks.

Plant-based burgers have seen a jump in their popularity, that it can be translated in more sales, more financing, and more market value for the companies under consideration.

The main aim of the new industry is to adjust all the problems that classic meat industry creates to whole society, already examined before, and above all, they are not producing for allergic individuals or vegan people, but the target are for both meat-based and plant-based diet. In particular, the objective is to increase options for vegetarians and vegans, and using the meat-like taste that their products try to replicate to help meat eaters to consume a sustainable protein that could be alternative to the flesh.

Therefore, the industry try to give a friendly alternative to the meat rather than a substitution that is a very slow process that will last for years.

Since that a plant-base burgers tends to provide the same number of calories of a similar “real” burger. Usually, plant-based meat contain less fat and more fiber. They also avoid the increased risk to contract cancer that, according to WHO, processed red meat is one of the principal cause.

A big difference between meat and plant-based meat is that the latter can continually improving. In fact, many companies began gathering feedback from customers, which asked for a better taste and facility to grill it themselves. Therefore, future interactions are planned in order to improve the product and reaching a better juice of burger, taste, and the possibility to cook in different way.

“The cow is not going to taste better, but plant-based meats will” said D. Lipman, the chief scientist at Impossible Foods.

However, to make a difference to the planet, meatless meat needs to be on billions of plates, not just millions. Thus one main goal of industry it to make partnerships, over the past two years both Beyond Meat and Impossible Foods have worked with chains such as Burger King, Dunkin’ and KFC, making sure that their brands feature prominently on menus.

A bigger test and goal to achieve is how patties appears in supermarkets, because people are more concerned about money than in restaurant. Retail price is still a problem, because a plant-based product can cost 3x times rather the same product in normal meat, even if the increasing competition should lower those prices.

Consumers diet for plant-based meat is bound to attract new start-up and so with cheaper offerings. In addition, increasing in the production of already companies can produce a fall in the price.

Another alternative meat product is the **lab-grown meat**. This is not plant-based, but is based on real cellular of meat, and participate to the innovation of the meat industry.

An important player is Memphis Meats, which produces meat from self-reproducing cells, thereby growing meat that is animal-based, but avoiding the need to breed and slaughter a lot of animals with all consequences. The company has raised more than \$200 million of funding and has started some partnership with some food chains.

Lab-grown meat could offer a promising and truly exciting alternative for the industry.

It requires 99% less land and 96% less water, does not require the use of antibiotics, generates up to 96% less greenhouse gas emissions, and does not contribute to deforestation or require the use of fertilizers and pesticides.

A lot of financial backers are in the industry and other will enter in the next future. Mainly, angels or VC are the starring because the risk is still high and only these type of financial investors can provide capital for their purposes. In any case, big corporations as Google or Amazon and their business leaders also participate as investors.

The industry, however, has faced obstacles, especially in the cell-based meat. Critical scientific, scalability and ethical barriers has come in. Thus, this pathway will be the future and the numbers show the reality.

### **1.3 Market analysis and empirical evidence**

Plant-based foods are a booming business. Food manufacturers ranging from startups to leading companies to the world's largest meat companies are innovating rapidly in this category. These next-generation of plant-based products, such as plant-based meat, lab-grown meat, egg, and dairy, are increasingly competitive with animal products on the key drivers of consumer choice: taste, price, and accessibility. As a result, a growing number of mainstream consumers are buying plant-based options. In fact, these products are a key driver of growth at grocery retailers nationwide, outpacing overall food growth by more than five times.

The plant-based milk is the most developed of all plant-based categories, followed by other plant-based dairy and then there is plant-based meat that is one of the fastest growing category in the last years.

The global market for meat substitute is fueled by the growing inclination of consumers towards plant-based dietary patterns. Meat consumption in developed countries as Europe and North America is gradually declining due to publication of various studies linking to a wrong consumption of red processed meat.

The plant-based meat industry has also witnessed popularity among individual, known as "flexitarians", who still consume meat and other animals derived, but seek to reduce the consumption of these products. Such consumers are often driven by the plant-based meat products because of ethical, environmental and health concerns.

The other important factor in the favor of meat substitution is the growing concern in the food security, where the global population will reach 9.7 billion by 2050 and sustaining this numbers is not feasible with the animal meat production, as well as it has a detrimental effect in the environment.

Plant-based substitutes of meat are thus emerging as the best sustainable solution for individuals that is trying to ensure food safety. Companies operating in this novel industry, are putting robust controls in the production along all the supply chain to communicate a sustainability as clear as possible.

If we are going to see the numbers of individuals in Europe that have choose a more healthier diet, according to Eurispes data, they are around a 6% of the total population. This movement is driven by countries as Germany and Sweden, where settle down around the 11%. Instead, concerned our country, the number of Italians who in 2020 declared that they had chosen to eliminate meat from meals is equal to 8.9% of the population: 6.7% of Italians are vegetarian, while the remaining 2.2% are vegan; these figures although relatively small are the highest ever recorded. There are no substantial differences between men and women in relation to the choice of being vegetarian or vegan. If up to a year ago, plant-based diets were almost exclusively the prerogative of the so called “millennials”, young people born between the in the mid-80s and 2000s, in 2018 these healthier individuals decreased up to 4%.

On the other hand, there was a shift into different Italian categories, where have increased their interests in this alternative products, especially who aged between 35 and 44 years old.

According with the date of The Good Food Institute, the total US plant-based food market in 2019 was around \$5.0B with a growth of 11% in the past year and 29% in the past two years. Instead, the plant-based meat in the US was worth more than 900 million in 2019, with a huge increase of 38% over the past two years.

If we look to more globally data, we have that the global meat substitute market size was around \$8.1 billion in 2019, while the Europe accounts for the 35% of the total revenues.

Today, the plant-based meat industry is reminiscent of the plant-based milk industry, one of the first alternative protein plant-based products, when it was in its early stages of rapid growth.

At the moment, the plant-based milk category accounts for 14% of all dollar sales in the retail milk market. Meanwhile, plant-based meat products account only for 2%, but has the potential reach the same percentage of the before category in few times, with an opportunity worth around \$8.1 billion.

Another important aspect to consider, to understand better the market, in the plant-based meat industry is the segmentation of the products. The market could be analyzed through different categories, such as by the type, source, or regions.

In the first category, the plant-based burger is the most sold item, and the chicken segment is the more fastest to growth since that proteins inside a plant-based meat chicken products is about the same while other nutrients may vary.

By source, the plant-based meat market is divided into soy, wheat, pea and many others.

Soy is widely used as a base ingredient for plant-based pork, beef, and chicken products, owing to its high protein content and meat-like texture. The growing health concerns associated with the consumption of animal protein-sourced foods and adoption of flexitarian and vegetarian diets are expected to drive consumption of soy as a source in the global market. For example, one main player in the novel industry, Impossible Foods, offers soy-based burgers and is backed by a strong distribution network in the US.

In 2019 after many feedbacks for improving the product, the company launched an upgraded version of its burger, which would have 30% less sodium and 40% less saturated fat.

#### **1.4 The potential growth of an alternative meat world**

It is quite clear that plant-based meat products and other alternative meat proteins are taking off. The numbers related to this novel industry cannot be put into question. The develop that they had in these recent years was always characterized by at least a double-digit growth.

Cost and scale are immediate considerations in moving these products from novelty purchases to normal product that you can find in the fridge at home. The issue is particularly urgent if we consider all critical problems that meat industry will create in the next future and when the global annual economic costs that meat consumption could rack up will be \$1.6 trillion, according with a study of University of Oxford.

We know that in comparison to traditional produced meat, “clean” meat production is more efficient, where features of the novel industry can take 99% less land, 96% of fewer greenhouse emissions, 96% less water use. The reasoning are very simple, rather than wasting food and energy to grow livestock, all energies are dedicated to improving the production of alternative meat in laboratory. Moreover, the new meat can be virtually created and grown anywhere, thus mitigating the need to clear vast land for the raising of livestock.

Nowadays, a factor that can be create criticality and has a wide range of improvement is the cost of the technology used to produce alternative meat products. However, plant-based meat have affordable costs than lab-grown meat.

According to HPR<sup>2</sup> interviews, a burger produced in a laboratory, has an initial price tag of €250.000, that is 75.000 times more expensive than an average Big Mac. The labor-intensive process, in addition to costs referred to pay technicians, prevents this meat from being currently available on the market.

Despite the benefits to health and environment, further price optimization will be necessary in the next years to be a good alternative to traditional meat and plant-based meat.

Customer acceptance of the product is another big question. They could have concerns about products and labelled them as “unnatural”. However, data shows that people accept more and more this new type of diet, and not only young individuals, but also senior persons start to be a significant increase. The more reasonable approach that we can identify in the next future is that people overcome this change, as they had made in the past with other alternative food products.

If we are looking to numbers, the estimated growth of the market is around \$18 billion by 2025 with a possible CAGR of 14.2% during the projected period. Therefore, the market will more than double of today in just few years. Countries with the feature of be more green, such as Nord Europe and UK, should reach the best results in the forecasted period. Meanwhile, the increasing of plant-based products in emerging countries are expected to drive this novel industry.

The real sign that alternative meat products may rule the future is that you can find them in the same shelf of real meat and you can choose them in the restaurant menu as alternative dishes. In addition, another reason to understand what market is aimed for, is that venture capital firms and corporate giants as Google, Microsoft, Nestlé, and many others, are ploughing millions in these categories. Actually, many start-ups and companies have received massive injection of capital from different investors and they are valued millions, even billions the most important companies as Beyond Meat and Impossible Foods.

## **1.5 Recent key players**

During the different sections illustrated above, we have mentioned several name of the main players that are inside the meatless novel industry. In particular, we have talked about the distinction between plant-based meat and cell-based meat companies.

Both aim to find real and sustainable solutions to the issues that traditional meat industry creates and will continue creating in the next years. The purpose is the same, even if the raw

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<sup>2</sup> Harvard Political Review - <https://harvardpolitics.com/>

materials and technologies used are different. Anyway, they can be assimilated in this novel industry, characterized by a meatless objective.

Furthermore, the plant-based foods is not completely new since that it is on the market in other forms, such as plant-based milk, but are the most developed and accepted products from the customers at the moment.

Thus, companies in plant-based meat market are most developed, even if they are constant improving themselves, and for this reason the attraction for venture capitals is very high.

Instead, lab-grown meat described above, is still quite premature to be admitted in the market as a possible alternative meat product, surely there is the need to improve a lot from the production costs side.

For all the reasons explained and accessible data, the plant-based meat category is the most worthwhile so far and so we are looking to introduce to main players with their achievement.

Two different cases will briefly be covered: a public case referred to Beyond Meat, where is the only listed plant-based meat company in the market, and a private case with its competitor Impossible Foods.

### **1.5.1 Plant-based players**

**Beyond Meat Inc.**, is a company founded in 2009 in Los Angeles by Ethan Brown. The purpose of the company is the creation of “The Future of Protein”, through plant-based burgers and meat, by departing from the animal ones, in order to be more sustainable, improve human health, fight climate changes, address global resource constraint and improve animal welfare.

The company shows a lot of strengths, as the focus on innovation and the brand mission aligned with the consumer trends.

Many investors realized that new ways of texturizing plant-based proteins, such as with Beyond Meat technology, could potentially be the innovation to the entire food and agriculture industry. Thus, high-risk, but high-reward nature of its potential prospective of growth had attracted different types of financial backers.

After receiving funding from big-name investors such as Bill Gates and Tyson Foods, and also first institutional investor as Kleiner Perkins in the first financing round in 2011, Beyond Meat began developing its first line of plant-based meat substitutes.

At that time, meat alternatives were more niche than an obvious consumer trend. However, the company made its first entrance into retail markets in 2013 with its first plant-based chicken substitute across the US country. With the popularity of its first for-retail product

quickly taking off, Beyond Meat went on to develop and launch a plant-based beef substitute as well just one year later.

Shortly thereafter, the company began partnering with restaurants in order to introduce new vegan and alternative traditional meat dishes that were made using Beyond Meat’s products. Over the years, Beyond Meat has partnered with a wide range of restaurants to help them develop flavorful alternative protein dishes that look and taste as if they were made using “real” meat. One of the more famous partnership was with Carl’s Jr, an American fast-food restaurant chain with more of 500 franchisees in different countries, where in 2018 launched the famous food product known as “Beyond Burger”, that was the world’s first 100% plant-based burger.

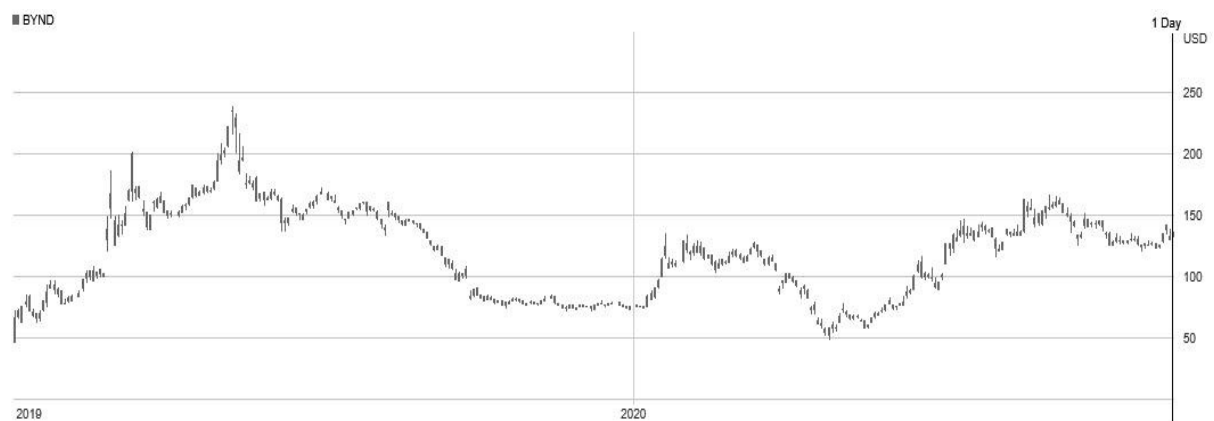
In addition to this well-known partnership, Beyond Meat has also partnered with dozens of other restaurants over the years in order to create a wide range of new vegan plates.

In 2019, it partnered with Dunkin’ Donuts to create another type of plant-based dish after the constant success of the “Beyond Burger”, the “Beyond Meat Breakfast Sausage”.

Another important partnership was agreed with KFC, that announced in August it would test “Beyond Fried Chicken” nuggets in its restaurants, the latest in a series of fast-food chains to try new meatless products with the company.

During the same year, a huge goal was achieved. Exactly in May 2019, Beyond Meat went public in order to raise more money. The IPO was settled in order to offer 62.44 million common shares at a public price of \$25 per share. However, few times after its debut, the company shares more than doubled in the Nasdaq, becoming the first plant-based food group listed on a leading exchange and the biggest-popping IPO for a US company that raised more than 200 million since 2000, according to CNBC data.

**Figure 1.5: Beyond meat stock value from its IPO**



Source: data provided by Refinitiv



The graph above clearly shows the success that Beyond Meat has created and is continuing to create today. Since its IPO in May 2019, the shares' value had a huge increase in few time due to the announcement made from the company regarding the prospective to bring their plant-based production in Europe and the new partnerships announced. For these reasons, the stock's value rise till overtakes the \$200 in less than 2 months, and thus the company, valued around \$1.3 billion in the private markets, rose to a market capitalization of more than \$12billion in July 2019 as investors bet on the their alternative meat products would steal a large stake in the business of traditional meat producers.

After this "gold period", the company, during the fall period, has faced a significant drop due to different reasons, and its value of shares fall below \$100. The first reason was given by some problems with suppliers to provide raw materials in time. Another reason was the pressure made by competitors, as Impossible Foods, Kellogg and Nestlé, by launching their products on the market. However, the more important reason for the drop was the expiry of lock-up period<sup>3</sup> where many important VCs as Kleiner Perkins or Obvious Ventures had the ability to cut their position and make capital gain for their investors.

The company, anyway, with the new year 2020 was able to return on its pre levels.

How we can see in the plot, in 2020 the lowest point was reached during the Covid-19 crisis due to different lockdowns where people were constrained to consume less, especially outdoor. As discussed above, the outbreak at the same time was a good opportunity for this novel industry, because the traditional meat industry was badly hit in terms of productions and sales. Thus, Beyond Meat has viewed its value to increase again, with stocks traded around \$150.

It is safe to say, therefore, that Beyond Meat has certainly enjoyed a high degree of success. For Beyond Meat founder Ethan Brown, though, taking Beyond Meat to the highest levels of success was always about more than just the money. In many ways, Beyond Meat was founded as a direct response to the many health and ecological problems that the world now faces. By making plant-based foods that look and taste like real meat, Beyond Meat is able to do its part to change consumer habits for the better without forcing the consumer to feel as if they have sacrificed something in the process.

From an environmental standpoint, Beyond Meat is certainly doing an extraordinary job. According to a life cycle assessment (LCA) of the Beyond Burger conducted by researchers at the University of Michigan, the Beyond Burger that Beyond Meat developed for Carl's Jr

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<sup>3</sup> Founders, early private investors, such as Angels and Venture Capitals, who invest into a company before it goes public are restricted from selling shares between 90 to 180 days after IPO.

generates 90% less greenhouse gas emissions over the course of its production, requires 46% less an energy to produce, and has 93% less impact on land use than a burger that is made using a quarter-pound of real beef.

In addition to producing products that are more sustainable and better for the environment, Beyond Meat is also doing its part to make us all healthier as well. One of the primary issues with the average American diet today is the overabundance of red meat. While undeniably delicious and fine in the right moderation, red meat was never meant to be the principal element of the human diet, especially processed meat. By developing products that taste like red meat but are made entirely out of plants, Beyond Meat is helping to shift consumer habits in a way that does not feel like sacrifice, helping in such a way for a better future that is healthier for the planet.

Another important case of success in the plant-based meat industry is given by **Impossible Foods**. The company in the recent years, together with its primarily rival Beyond Meat, has reshaped the meat sector with burger and other stuff made with vegetable protein.

Impossible Foods was founded in 2011 by Patrick O. Brown, a biochemistry professor at Stanford University's medical school, to end the use of animals to make food and all problems related to breed them. Therefore, the startup aim to make meat directly from plants.

The founder had the knowledge needed to disrupt a set of products that were all either soy, pea, or wheat-based protein pieces that did not come close to real beef in terms of texture or flavor. The business strategy seemed simple enough: find plant-based molecules that, when combined, would create a patty that mimicked beef in a better way better than any of his competitors in any aspect.

What makes Impossible Foods sustainable, however, is their extreme internal secrecy on the remainder of the recipe, controlling the supply chain by producing some of their key ingredients, and a distinct strategy on how to sell their product that is very different from their competitors.

Impossible Foods already has an established an image because of their mission and how they market their products to the public. The food produced has to be sustainable and delicious, otherwise it will not be able to thrive in the anchored competitive food industry. Their website claims to use "96% less land, 87% less water, and with 89% less greenhouse gas emissions than ground beef production"<sup>4</sup>. The other key position that start-up takes in their brand image is their target audience. Alternative meat products typically target vegans looking for good, sustainable sources of protein. While Impossible Foods does attract that audience, they also

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<sup>4</sup> <https://impossiblefoods.com/mission>

want to target lovers of real meat burgers. Their goal is to draw more people away from beef consumption, since part of their vision of the future.

However, they have spent several years of research to recreate the smell and taste of traditional piece of flesh. In 2016, they have launched their first product, known as “Impossible Burger”, made from plants for people that want an alternative product, but still love the meat itself.

After the launch of their product, the company chose to enter into restaurants market. Unlike most competitors, the company is producing and selling their product uncooked. It is allowed chefs to take an Impossible Burger and treat it like raw ground beef. By choosing to enter the market via higher-end restaurants, Impossible Foods set themselves apart from rival brands. Other plant-based burgers do exist in the form of the Beyond Burger by Beyond Meat. However, this type and most other plant-based burger products are sold in grocery stores.

In 2019, while Beyond Meat made its debut on the Nasdaq in May, the company met the increasing demand from customers by partnering with big food chains as White Castle and Burger King. After some feedbacks, a new 2.0 burger was launched in their menu, known as the “Impossible Whooper”, which looks and cooks almost exactly like a beef.

The ability to scale up production, bring the company to release their products on grocery stores and create new types of plant-based meat food.

At the start of this year, Impossible Foods has unveiled two new products since the original burger in 2016: the “Impossible Pork” and the “Impossible Sausage”. Today, the company products are served in more than 15.000 restaurants around the world and it is testing a new Burger King breakfast just made with sausage form by plants.

Moreover, to expand more its presence, the plant-based firm has closed a deal with Disney to serve Impossible plant-based meat at Disneyland parks.

Another important aspect to consider, when we talk about the private case of Impossible Foods, is about the different rounds of raising funds that have characterized the company, from its inception when it was a start-up to nowadays, which is a solid company with important financial backers that trust in its mission.

Since its foundation in 2011, the company have raised millions of dollar from several types of venture capital and private financial investors. It has gained a lot of money in order to develop its products and expand its brand worldwide. All these financial rounds have led the company in an over billion valuation.

One of the most important financing round was closed in March 2020. The funding announcement comes as the novel coronavirus outbreak hits hard, with schools, restaurants and shops in many states closing and consumers emptying shelves at grocery stores.

One of the top venture capital firm Sequoia has spoken about the recent event that called “black swan”<sup>5</sup> and urged all the startups world, included its portfolio of companies, to be careful with cash and try to raise more in this difficult period.

However, Impossible Foods have raised another \$500 million in this series F funding round. This new financing was led by venture capital funds as Horizons Ventures and Khosla Ventures, which bring the company’s total value to \$1.3 billion since it was founded nine years ago.

According to the founder, after this round, in a statement said “To do that, we need to double production every year, on average, for 15 years and double down on research and innovation. The market has its ups and downs, but the global demand for food is always there, and the urgency of our mission only grows. Our investors not only believe in our mission, but they also recognize an extraordinary opportunity to invest in the platform that will transform the global food system.”

Therefore, we can extrapolate that raising new money is very important for the mission of the group and for boosting the brand.

Moreover, a news of August 2020 concerns to the most recent raising founds established by the company. This round, known as Series G, has landed another \$200 million in the pockets of Impossible Foods. All of this was made less than six months after it raised the largest investment ever for a food tech startup, bringing total fund raised since its founding in 2011 to \$1.5 billion. However, after all these funding rounds, a possible public quotation of the company seems not to be in the short term, despite the success of the rivalry Beyond Meat has made since its IPO.

These several investments, particularly during this difficult period, makes us realize that plant-based meat and lab-grown meat companies have been gaining traction with many consumers becoming more aware of the environmental impact of industrial animal.

### **1.5.2 Cell-based players**

**Memphis Meats** is the currently most important player in the lab-grown meat sector and participates with its different products to the alternative meat industry.

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<sup>5</sup> A black swan is an unpredictable event that is beyond what is normally expected of a situation and has potentially severe consequences to the economy by negatively impacting markets and investments.

After more than a decade researching the potential of cell-based meat, cardiologist Uma Valeti, M.D. and cell biologist Nicholas Genovese, Ph.D., concluded that it was a truly viable solution with the potential to redefine our food system for good. Therefore, they founded Memphis Meats in 2015 with a company's goal of feeding 10 billion people by 2050, and countless more beyond that, while preserving the environment and offering consumers additional choices in meat, poultry and seafood.

They have an "unusual" business plan: grew "clean" meat using stem cells, eliminating the need to breed or slaughter animals. The company had already produced beef, chicken, and duck, all grown from cells. There were many potential advantages of growing meat without animals that we have already considered.

Interest in cell-based meat production and other meat alternatives has increased amid growing awareness of the environmental impact of traditional livestock agriculture.

Thus, after much trial and error, and a growing number of patents, they hosted their first tasting event in December 2015. On the menu: a meatball. This time the giant agribusiness firms took notice. At the end of 2016, Tyson Foods, the world's largest meat producer, announced that it would invest \$150 million in a venture capital fund that would develop alternative proteins, including meat grown from self-reproducing cells. In August of 2017, agri-business giant Cargill announced it was investing in Memphis Meats, and also important names as Bill Gates, Jeff Bezos, Jack Ma, and Richard Branson were willing to bet in this novel start up. This led Memphis Meats in a \$17 million Series A round of financing. Their money was used to build up Memphis Meats' already formidable trove of intellectual property and to fine-tune the process of combining cells to produce the tastiest steaks and patties, and drive down the cost.

However, the first meatball cost was \$1200 and in the following year a pound of Memphis Meats takes around \$2,400 to produce, in part because of the expensive growth mediums needed to culture cells. To make cultured meat a commercial reality required bringing costs down substantially. Scale and learning curve efficiencies would drive that cost down. Valeti had faith that the company would soon make cultured meat not only competitive with traditional meat, but more affordable. "It is not crazy to think you might one day be able to brew meat at \$1 per pound." said one of the founders. Some skeptics believed the bigger problem was not production economies, but consumer acceptance. Growing meat rather than whole animals had, after all, inherent efficiency advantages. Considering livestock produces around 18 per cent of all man-made greenhouse gas emissions - a bigger contributor to global warming and environmental degradation than all forms of transportation – this could have a huge impact. Furthermore, conventional meat production cannot scale to feed the world's

growing population and appetite for meat. Global consumers already spend nearly \$1 trillion per year on meat, and demand for meat is expected to double in the coming decades.

A recent news is that in January 2020 the start-up raised another \$161 million in a new round of financing. The latest round of fundraising is led by SoftBank Group, Norwest and Temasek. It also includes flashy investors as Tyson and Cargill.

That brings the company's total funding above \$180 million. For this reason, Memphis Meats is the most known and financed company attempting to source meat from animal cells rather than by slaughtering animals.

Theoretically, cultured meats should appeal to the same type of customer who is interested in plant-based meat alternatives. Unlike plant-based protein, which is widely available, cultured meats are still a mystery to most consumers, and will probably remain so for some time. These investments takes the start-up one step closer to selling its product, but it is still a long way off from hitting store shelves.

**Mosa Meat** is another important player in this novel alternative meat industry. Motivated by an increased awareness of animal welfare, antibiotic resistance, and the environment, a wave of young startups are racing to build businesses that can make lab-grown meat an affordable reality; their enthusiasm is given by the fact that biotech is an exponential technology, its development is speeding up rapidly, while its expense is decreasing) meaning this could be a possible solution. For these reasons, Dr. Mark Post (now their Chief Scientific Officer), a professor of physiology at Maastricht University made history when he created the world's first lab-grown burger. The burger, which was cooked and eaten live on air in London in 2013, cost €250,000 to make and was funded by Google co-founder Sergey Brin. While it received mixed reviews from its tasters, the project prompted Mark Post to create Mosa Meat in 2015, a Dutch start-up focused in the alternative meat industry, especially in the segment of lab-grown meat. Lab meat, also called cultured meat, clean meat and cellular meat, is muscle tissue that is taken from animal stem cells and grown in vitro. A single tissue sample from a single cow can be used to make an almost limitless number of burgers.

In 2018, the Netherlands-based clean meat company making slaughter-free beef from cattle cells, raised €7.5 million in funding from investors including M Ventures (Merck's venture capital arm) and the Bell Food Group, which is the largest meat company in Switzerland.

Merck and Bell Food Group join the ever-growing list of Big Food and biotech companies investing in cultured meat companies. Tyson Foods has funded the main rival start-ups of Mosa Meat, they are both Future Meat and Memphis Meats, which also counts Cargill among its investors.

This investment is strategic for Mosa as well, beyond the obvious money part. The funding will support the development of an industrial process to produce meat in the lab at larger scales, one of the main problem of the cultured meat, in order to reduce its price, and to prepare for the construction of a pilot production plant that could produce over 100 tons of lab-grown meat per year.

Besides the high costs of the product and the fact that consumers are not quite so convinced by this new technologies to create meat as could be the plant-based technologies, governments regulations is another barrier to commercialization. No jurisdiction has approved cultured meat for consumption, and data on large scale consumer safety tests has yet to be released.

However, something has changed in recent years and in Europe the regulation process of “novel foods” usually takes about 18 months. According to Sarah Lucas, head of operations at Mosa Meat, her company will apply for regulation in 2021. “We aim to be in restaurants by 2022, and in supermarkets several years after that,” she says. “There is still a significant amount of work to do to scale up so it’s hard to be more specific than that about when we’ll be in supermarkets. We’re working hard to do it as soon as possible.”

Mosa Meat expects to introduce the first product made of lab-grown meat in the market by 2021. This will be a premium product that could be then followed by less expensive products as the company scales up production.

The aim is to reach the cost of producing a Mosa Meat hamburger around €9, and so the cost of a hamburger in the supermarket will be around €1, and through projecting further efficiency improvements the venture will be able to bring the price down to that level in the next five-seven years.

## 2. VENTURE CAPITAL LITERATURE

### 2.1 What is a VC and how does it work?

A venture capital is a financial business set up by people, which usually had an investment background, known as venture capitalists and its primary feature is to fill a void between sources of funds for innovation and the lower-cost sources of capital available to ongoing concerns. For this reason, it is defined as a financial intermediary because it is very similar to a bank that takes money from clients and lends it. In a similar way VC raises money from investors and makes good investments in private companies with attractive growth prospects. Entrepreneurial firms that are characterized by consistent negative cash flow, intangible assets and with highly volatile prospects are unlikely to close a deal with a bank for a debt financing. For many of these “fragile” companies the only chance to receive a capital grant is through VC or similar types of intermediaries that invest in high-risk and potentially high-reward projects by purchasing private stakes in it.

The typical organization structure of a venture capital is the limited partnership, composed by venture capitalists as general partners and investors as limited partners where they get different roles and commitments.<sup>6</sup>

The venture capital in its investment strategy has the focus only in the private companies, different from public companies where shares can be traded in an exchange public market, e.g. NYSE or NASDAQ, while the private cannot. The main aim is to analyze and figure out the best potential investment in a business that VC can be finalized in order to exit after some years, usually 5 to 7, through selling the company or bring it to an IPO.

The private investments mentioned above usually are viewed as alternative investing where differ from traditional investing in stocks and bonds and where the focus is on early-stage investments in start-ups.

The proceed of VC is to build a business rather than acquire existing one through the internal growth with a direct support, the active role of monitoring and helping their portfolio of companies usually taking a position on the board of directors to endorse at the highest level of business, in addition the VC can perform value-added services by attracting talented people that otherwise the young companies can't afford with its reputation.

Although the common belief of a VC investment is to support “the idea born in a garage”, the truth is different and variegate. For a clarification, as (Metrick & Yasuda, 2011) illustrate, we

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<sup>6</sup> We discuss the structure more in deep in the part 1.2



can divide the portfolio of companies into three broad stages: early-stage, mid-stage (also called expansion-stage), and late-stage.

**Seed/start-up stage financing** (before the early stage): relatively small amount of capital provided to an inventor or entrepreneur in this stage. If the initial steps are successful, this may involve product development, market research, building a management team, and developing a business plan.

**Early stage financing:** This stage provides that products are mostly in testing or pilot production. Companies must start to make market studies, develop a business plan and be ready to conduct the firm. This stage usually involves a first round of financing that includes venture capital fund. The networking capabilities of a VC is used more in advanced stages when the business is defined entirely.

**Expansion (Mid) Stage Financing:** at this point is required the working capital for the expansion. The company has started to develop and place on the market its product even if it can be showing a negative profit. Other institutional investors are likely to be included with VC in a second round of financing and where the capital raised will be used to plant expansion, marketing, and improvement of product. The role of venture capital switch from an advice role to a more strategic role.

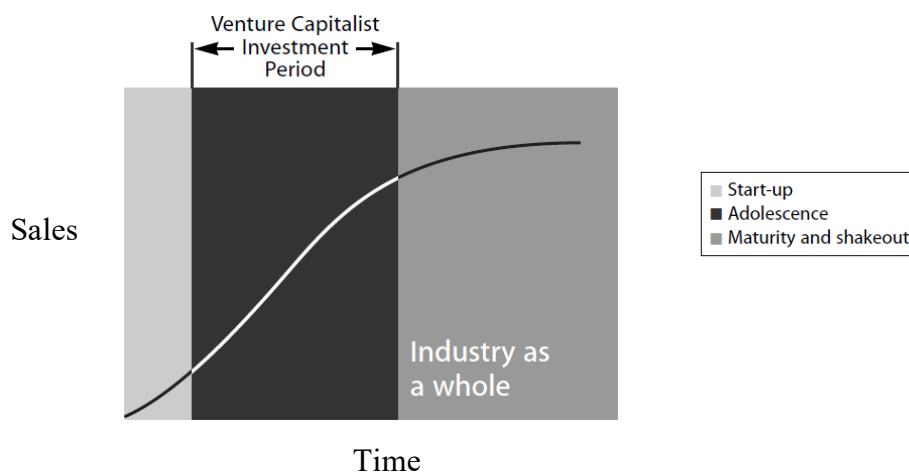
**Later stage:** the company in this stage has reached a stable growth. It could be shown negative profits, but is very rare that it occurs because it is more likely to be profitable. Positive cash flow can include companies to consider a possible future IPO.

Another myth is that “The venture capitalists invest in good people and good ideas. The reality is that they invest in good industries” (Zider, 1998, p.133). In practice, the analysis brings on by a VC is concentrated in the industry S-curve that it can be reflected in the business curve. In effect, the venture capitalists focus mainly on the middle part of the curve in order to avoid both early stages where all are still uncertain and the later stages when competition is inevitable, and the growth rate starts to slow. In this part, especially in the early phase, it can be very difficult to understand and figure out the winners from losers because the financial performance looks a lot similar.

Probably the key for VCs in these phases is given by timing. Entering in the right time can bring a lot of rewards, on the other hand lead to important losses.

How we can see in the graph<sup>7</sup> below, roughly 80% of the investment goes into the preliminary phase of a company life cycle where the potential growth is very high, the reward and risk of failure is critically as well.

Figure 2.1 Industry S-curve



Looking at the graph, we can gather that as long as the VC is able to exit from the company before it tops out, the return could be very good with low risk in case of right investment at all. There are many variants behind the logic of a start-up deal, but the general features are always the same that incorporate a protection for its investors in case of ample downside and a priority position in case of a second round of investments in case that the deal is about a winner. In other words, in case of failure the venture capitalists are the first claimer to receive back at least assets, patents and technology. Other types of protection could include a blocking rights or disproportional voting rights over very important decisions, e.g. selling company or timing of IPO, or in addition the clauses take form of antidilution, i.e. ratchets. In this case, there is a sort of protection in favor of investors from an equity dilution when the company is constrained to raise money with a lower valuation than its original position. However, if the company is performing well, the investors can enjoy the upside to inject more money in it at a predetermined price that is below the market price and bring their stakes at higher level.

## 2.2 The structure of a VC

During the last decades of venture capital industry, the main organization structure that has prevailed is the limited partnership company form<sup>8</sup>. Usually they are conducted by

<sup>7</sup> Figure 1.1 about the S-curve of industry illustrated in the Harvard Business Review by (Zider, 1998)

professionals known as **general partners (GPs)** for a limit period of time around 10 years and, on the other part, there are the **limited partners (LPs)** of a VC fund that are mostly composed by institutional investors, such as pension funds, large corporations, university endowments.

In the first round of raised, the LPs of the fund commit themselves to provide capital in a schedule period of time at the discretion of GP and this period of capital provision is known as capital calls where the total capital promised is the *committed capital* to the fund. Once the necessary capital has raised, professionals “close” the fund and start to analyze and invest in private companies. This window of time is called *investment period* and the VC can only make follow-on investments in current portfolio of companies. In addition, the GP usually invest a percentage around 1%-2% of the committed capital to be fully involved in a good manage of the fund and have a straightforward concern with external investors.

### **2.2.1 Limited partnership model**

Limited partnerships are the most common form of organization in the venture capital industry where the investment in the private company takes from 5 to 7 years to bring to reward in exit time, therefore the limited partnerships last around 10 years with a possible extension for some fewer years. This type of structure is replicated in similar way in countries where it is prohibited for legislation reasons in the manner of achieving the same results.

There are various reasons for the popularity of limited partnership model in the private funds. One cause is the establishment by contracts that are easier and more adaptable for different and international investors in respect of a normal formed entity governed by articles. Another reason is obtaining limited liabilities and avoid an additional tax burden where the important advantage is in term of tax-exempt: capital gains taxes is not paid by the limited partnership, but taxes are paid only by the taxable investors. In fact, the mainly investors in the fund are, as discussed before, pension funds, natural persons and university endowments that are exposed to different regimes and can take advantage in term of tax benefits because the profits pass through the partners and may lead to different exclusive tax exempt for institutions involved.

In the venture capital fund, the institutional investors are the general partners that granted limited liabilities that can hit the management, but at the same time they are not involved in the day-to-day operations of the fund; the founder and who manage the VC are the

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<sup>8</sup> This type of structure is used a lot in PE too for a deeper view see (Cumming & Sofia, 2014)

professionals know as general partners involved in a fully liability. To be protected and mitigate agency problems<sup>9</sup> investors decide to impose some covenants on the general partners. As mentioned in the study of (Metrick & Yasuda, 2011), the first major backer for the success of the VC activity were pension funds as limited partners, more precisely they have provided around a 44% of the committed capital in the sector. In addition, in the recent years many other supporters have played an important role in the development of the industry. These players include investment banks and insurance companies, where taken together they have provided around a 18% since 1980. University endowments have a total of 17% with a higher return during the years for their active role as consistent investors since the limited partnership was formed in the early 1970s. In the last decades, an important role is given by natural persons and families, but in the recent years their participation slightly falling mainly the reason is given by the long-time horizon of VC that is more attractive for institutions rather than individuals. As the last contributor there are corporates that since the beginning have played a small role as limited partners.

A special mention is to assign to *fund-of-fund (FOF)*, this player is typically organized in a limited partnership structure and share the same rules that we can find inside a venture capital or private equity fund. The main purpose that can differentiate from other types of fund is that it invests directly in funds that invest in private companies, i.e. investing in PE or VC rather than deploy its money to invest directly in the private firms.

Although the day-to-day management is restricted to general partners and the involvement of limited partners could be limited by law and contract, it is important to remember that the limited partners are really partners in the fund. Certain LPs are prized as long-run fidelity investors, because they held industry experience, patient to ride the investment and a good communication with GPs. For all this reasons, the fundraising and management task become more easier, yielding in money and time savings for both parties. Therefore, it is not accident that institutions held a position in the board of VC funds. This have brought, in general, a raise in the compensation and many other investors have started to make pressure to have more clear information about performance and a disclosure about compensations, but many VCs abhor to public information disclosure, so a few of important GPs have start to bar public investors from their funds.

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<sup>9</sup> The agency problems are conflict of interests inherent any relationship where one party act in its interest and not in the interest of both.

Before to discuss about the fund returns and differences in compensation between GPs and LPs, it is important to point out the covenants imposed by parties in the fund. We know that institutional investors do not have much time to carry out all tasks inherent the management of a fund that can space from the screening phase to the investment legal procedure phase. Hence, different investors commit capital to the venture capital so the professional managers can manage the whole process. The limited partnership, as mentioned above, involve an assignment of rights and responsibilities through a sign of a long-term contracts among parties that is around 7-10 years. The purpose is to define all potential liabilities and agency problems in order to mitigate them and setting the rights and obligations in the contract in the form of covenants that could be represented in different way for the case that is discussed. Now, we discuss about the four categories of covenants based on the study of (Gompers & Lerner, 1996) plus some changes and one addition category by (Cumming & Sofia, 2014).

- 1) **Authority of fund manager regarding investment decisions:** the restriction mitigate the agency problems, it is important since the institutional investors cannot (as by law they are limited from interfering, otherwise they lose their protection status) interface in day-to-day operations. First, restrictions on the size of investment in portfolio companies because otherwise a fund manager can lower his effort costs associated with diversifying the investors' capital among different numbers of private companies. Second, there are a lot of limitations about the ability of the manager to borrow money in form of debt from other financial players and use it alongside the capital committed. In case of using this channel to raise money can bring to a leverage fund and expose institutional investors to high risk. Third, restrictions based on co-investment by another fund managed and by fund investors. These prohibitions mitigate the conflict of interest in the allocation about different opportunities to investors of the fund, as well limit the managers to bail out the poor performing investments of friend fund. Fourth, limits about the reinvestment of capital gains obtained from good investments. Some managers could have an incentive to pursue a strategy of "fame not fortune" in terms of creating their reputation on achieving many IPO as possible, with the risk of losing profits made till that point. Fifth, restrictions in the independence of fund managers making important decisions for the fund and for the divestment decisions as well, e.g. terms and timing of exits.
- 2) **Restriction on GP's powers:** covenants inside this category is focused also at limiting the agency problems with the separation of roles in ownership and control during the

process. The restriction is focused on co-investment of personal fund of fund manager in order to limit the incentive to swap the attention by the professional in entrepreneurial firms, where it is able to invest and so creating a distorted incentives to spend the most time in allocating efforts in the companies that he is directly involved with its financial rather than aim at maximize the value of the overall portfolio (this is not in the interest of institutional investors).

Another aspect is referred to the sale of fund interest by the fund managers, since the financial interest of limited partners should be compromised by the addition of new capital injected by new institutional investors and as consequence the loss of commitment of general partners.

Last restriction can concern the fact that the contract is stipulated with specific fund managers and the investors pretend that their committed capital is in the hands of people whom they have started the whole partnership.

- 3) **Covenants relating the types of investments:** limitations pertaining the investment type ensure for the institutional investors a sort of grant in a way that is consistent with their objectives and desired return/risk profile inside the company.

Restrictions include investments type as: investment in other venture capital, investment in companies related to the interest of fund manager, leveraged buyouts, foreign/public securities not in line with the profile of fund.

They are very important, otherwise who manage the fund has free agency to pursue its strategies that is suitable with his interests regardless focus on the whole interest of fund and be consistent with investors' scopes.

- 4) **Fund operation:** covenants in this category are designated to cover the sale of fund interests by fund investors, administrative aspects, restrictions against raising a new fund in different form (different of category 2), provisions to have the power by investors to remove, through the voting right, the fund manager without cause.

The restricting sale of fund interest by fund investors is setting in the way that the action of fund manager pertains to administrative aspects of all investors rather than focus on the things that fund managers cannot do. Hence, the different categorizations for seemingly related actions.

- 5) **Limitation of liability of the fund manager:** while the categories described so far regarding covenants about activities of fund managers, this last category is more focused in favor awards of limited liabilities of the fund managers. They can have a limitation in responsibilities in the event of disappointing returns, restriction of accountabilities if the fund manager and investors fail to provide the committed capital

in the pre-agreed time and limited in case the fund manager is found to be mismanaging the fund during all the investment, management process and whole tasks referred to the fund itself.

### 2.2.2 Fund returns and compensation of venture capitalists

The venture capital industry has composed by four main players: innovators/entrepreneurs who need funding; institutional investors that desire high returns; investment bankers that follow the process of exit and who need companies to sell and the venture capitalists who want make money from the management of the fund and create a market for the other three figures.

In general, for financing a start-up for some years, the fund expects ten times return of capital over five years. Therefore, to be an attractive VC for the institutional investors the rate is necessary to deliver an average return above 20%/30%.

VCs spend their time in different way of other types of financial intermediaries, but the common thing that are important at the sight of external investors is the measure of their investment return. If you try to find some information about the single returns of venture capital in the industry, you will notice that is difficult to gain specific insights about it for the simple reason that are confidential data enclosed between fund managers and investors. Hence, these private data are reported in ways that are not comparable with other returns in the market and so use standard benchmarks.

However, there are some sources that can be used to analyze and identify the industry level return for VC and then could be compared with the market.

It is important to know some basic definitions<sup>10</sup> that are essentials to understand how calculate and where return comes from, especially are important: the periodic return where the time is usually referred to annual return, but is also commonly used the quarterly return as reference; the compound return that is used for multi-period return and where it can be used to know the annualized returns; the return expressed either in the form of gross return or in the form of net return where is subtracted fees and interests.

Another important distinction to clarify is the historical/realized returns as percentage earned in the past and the other one expected return based entirely in in the forecasted period.

There are two important indexes:

- **Sand Hill Index**, created by a studied of (Woodward & Hall, 2003), is built from a database of portfolio companies. Sand Hill Econometrics (SHE) began by combining

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<sup>10</sup> For a deeper explanation see (Metrick & Yasuda, 2011)

the databases of the two main industry trackers, VentureSource (a division of Dow Jones) and Venture Economics (a division of Thomson Financial). From here, SHE added information from other industry sources, from its own base of consulting clients (LPs in VC funds), and from exhaustive searching of web resources. Sand Hill Econometrics discontinued the index in December 2008 after it reached a licensing agreement with Dow Jones. A new index called the DowJones Index of Venture Capital (comprising VentureSource and Sand Hill Econometrics' proprietary data) will be launched in 2010. It provides a lower bound for the gross returns to the industry based on the periodic returns for each month and this index has superior performance to the NASDAQ.

- **Cambridge Associates U.S. Venture Capital Index**<sup>11</sup>, founded by Cambridge Associates (CA) that acts as an intermediary between the LP and GP for both the initiation and management of the partnership relationship. This function gives CA access to information for its studies. To construct its index, it starts with the quarterly reports that it can gain from its activity in the VC industry. These reports give valuations for the unrealized portfolio companies and summarize the cash flows in and out of the fund. CA then aggregates the total value (realized and unrealized) from each fund in each quarter. By combining these totals across quarters, it is able to compute an aggregate return and build an index. Because the cash flow available includes management fees, the index is based on the net returns and not gross as Sand Hill. This Cambridge index provides an upper bound for the net returns to the industry and has a superior performance rather than NASDAQ.

These indexes are used to multiply the returns to arrive a compound return for the whole period of investment. It is a very common procedure to calculate the return of different assets as stocks, bonds and also for other types of portfolio managers. This calculation seems reasonable for the industry, but it is difficult to apply to single fund. The main problem is that VC have different capital invested in different period of time and could happen a misleading in the moment of calculation of the computing returns for understand the possible return.

To solve this problem, it is necessary to have a disposal different method from the index used for the industry. Hence, to analyze the level of performance of a VC the two main measures could be the **Internal Rate of Return (IRR)**, which effectively weights each dollar equally and starts from the whole stream of cash flow, but at the same time has some weaknesses as it does not make distinction between realized and unrealized investments and this can be bring

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<sup>11</sup> See the site of Cambridge Associates <https://www.cambridgeassociates.com>



to a misleading in calculation; the other measure is the **value multiple** that is helpful for a quickly calculation of the investment performance and for calculating the carried interest.

Venture capital limited partnership agreements clearly define the compensation over the fund's life to be paid to the venture capitalists. Typically, the agreement highlights a percentage of the total value of the fund as an annual management fee and a percentage paid out to fund managers based of the performance realized of the investment during the period agreed. Contractually the compensation is particularly important in the venture capital setting, the individual partnership agreements are rarely negotiated during the relation process. In fact, as we know, limited partners are not directly involved in the managerial activities of the fund and as consequence they are very sensible in setting the compensation between them and general partners that are fundamental figures to bring on the investment.

In general, according to (Gompers & Lerner, 1999b) and (Metrick & Yasuda, 2010) venture capital funds in US, and probably in Europe, have a fixed management fees of around 1%-3% of the total committed capital (usually differ from countries to countries and due to national legislation), that is why fund managers have an incentive to raise more capital as possible, but at the same time bring more risk and it is not in the incentive of institutional investors; and the performance fees of typically 20%. The investment in the fund takes around 5 years and they are illiquid because their focus are private companies, therefore the fee of management should meet foreseeable overhead arising from the investment process and divestment process in order to be carried out by the fund managers prior any profits earned at the end.

On the other hand, fees based on the performance gained by the venture capital should be align the incentives of fund managers with those of institutional investors.

Sometimes, managers of a limited partnership in a venture capital face a reduction in their provision, which lower the risk exposed by general partners in the event of a bad performance or something that could affect their position. Hence, from the fund managers' perspective, this "claw back" is the exact opposite form of an incentive for limited partners.

Another aspect to consider is that the compensation between the parties, in such a way, is related. In an exit event, such as an IPO, fund managers can decide either distribute cash of the sale process or provide shares in the new listed company to their investors. This decision is very important and affects both parties in the timing of payment via realization of capital gains that bring to a tax burden for institutional investors. Therefore, since they are involved in the deal of the realized compensation, it is worthwhile to consider that fund managers and institutional investors compensation are linked among them.

As described above, funds are structured in order to guarantee a right income to limited partners while they are running the business. The agreement is to give a management fee of around 2% of the total capital pool, but the real upside for them lies in the appreciation of their portfolio investments where an 80% is distributed to investors and remaining 20% to venture capitalists. This compensation structure is known as the “2-20” formula.

To achieve these results, venture capitalists must manage the money in the best way. In an ideal world all the investments would be winners, but the reality is that the odds of failure is very high in this type of industry. On average, businesses that you decide to bet succeed only one in ten times. Given these data, in a portfolio of companies only 10% of companies are real winners and this number can cover and give a gain for the other failures.

**Figure 2.2 break out of a portfolio performance for 1000\$**

	BAD	ALIVE	OKAY	GOOD	GREAT	TOTAL
\$ INVESTED	200	400	200	100	100	1,000
PAYOUT YEAR 5	0	1X	5X	10X	20X	
GROSS RETURN	0	400	1,000	1,000	2,000	4,400
NET RETURN	(200)	0	800	900	1,900	3,400

Given those probabilities in figure 1.2 (Zider, 1998), we can understand how the venture capitalists spend their time in order to gain the best possible efficiency bringing them to a higher return in terms of fixed management fees and where they can affect more, performance compensation.

Little time is required to who are defined real winners or the worst performers, called “numnuts” (no money, no time). Instead, fund managers allocate a significant amount of time in the middle companies.

Usually, venture capitalists switch their time from one activity to another one. They have to find new investors that bring fresh money to the VC, attract new deal to ample the entrepreneurial firms to invest in, manage the capital to allocate it in wisely way among different investments and move it to the most successful deals, being the advisors in exit plan. A good venture capital has the ability to allocate its time in efficient way between the various tasks. Assuming, as example, that each of partners in a VC has at disposal ten companies to manage and work around 2000 hours per year, the time spent for each company should be relatively small and this is another reason to focus only on the “middle” companies. If we

consider that a 40% of time is fully dedicated acting as consultant and director of company under management, then limited partners have only 80 hours per year a company that it means at almost 2 hours per week.

Therefore, the image of the venture capitalists as a fully efficient advisors is at odds with the reality of the scheduled numbers illustrated above. The incentive for the fund managers is to manage as much money as possible to gain a good fee and having a wide range of performance commission. The more money they must manage, the less time they can left to act as entrepreneurs and counsel. In fact, nowadays, the size of fund is ten time larger than the past and the fund managers have to focus in bigger investments and, for this reason, not surprisingly they are more advisors and less entrepreneurs given by the few time at disposal and few knowledgeable about specific industry rather than the founders.

### **2.3 The way for fundraising**

In order to fully understand the cycle of industry and related venture capital, we have to explore the process of raising capital, which are the determinants that can influence decision in the supply and demand part.

The process of fundraising could seem complex because is composed by hundreds of pages and documents that have to address any possible liabilities. The choices made in structuring funds can have a lot of implications and behavior among parties involved.

At this point, we know that all venture capital funds are designated to be self-liquidating, that is exit from investments after 5-7 years and generate a liquid gain. The need to have a medium- long horizontal to reach the objectives pre-fixed, imposes a well discipline in investors forcing them to wait the right moment even if in the portfolio there are some underperforming firms. On the other hand, there is a pressure to raise additional money and this bring to rush not ready firms taking the public market only to demonstrate a good performance to potential new investors, but it is a selfish attitude from the point of view of venture capitalists.

One reason that could bring institutional investors take the decision to give its money to a venture capital is the uncertainty of environment and information gaps about investment industry. Most pension funds and endowments are composed by small staffs and they own several billion to invest. Hence, they have a sort of faith in the venture capital funds to manage the capital, and to strengthen it limited partners and general partners have gradually developed mechanism to ensure the maximum value for both parties. For instance, an

incentive for having a good management is the “carried interest”<sup>12</sup> that helps the agency problems and information asymmetries by ensuring all parties gain if the investment over performed. It is not strange that pension funds and endowments decide to hire advisors who play consultative role in choosing the right funds (VC, PE, mutual funds, ...) with well-defined objectives that fit with their policy.

In addition, venture capitals are increasingly hiring placement agents who facilitate the fundraising process.

Understanding the determinants that affect the commitments and capital inflows is a primary thing to do. Various factors may affect the level of fundraising, according to (Poterba, 1989) many changes observed in the venture capital fundraising could arise from changes in the demand and supply of industry. By supply of venture capital, we mean the relative desire of the insitutional investors to commit their capital into the sector. The demand is given by the number of good ideas that needing venture capital to boost themselves. In the study, it argues that a decrease in the capital gain taxes can increase the committed capital in the funds, even though the gross part of capital would come from tax-exempt investors.

Thorough his model, he highlights that a drop in the industry tax rate can affect in good way the willingness of people to become entrepreneur and as consequence run a start up that will require venture capital fund to grow. This increase in entrepreneurial’s spirit bring on to an increase in the venture capital fundraising.

Instead, for (Gompers & Lerner, 1999a) the supply of venture capital is determined by the willingness of investors to provide funds to venture firms. The willingness of investors to commit money to venture capital is dependent upon the expected rate of return on venture investments. Higher expected return lead to a great desire of investors to supply venture capital. The rate of return cannot be measured in the early stage because returns from the investments can be only observed in the moment of disposal of it or bring to public the before private firms valuated at cost.

Because close substitutes to investment in the venture capital funds exist in the form of single securities or a combination of them, investors pretend to receive a particular high return that just compensates the riskiness of the investment in exchange of the committed capital.

One source of an upward slope of the curve about capital fundraising is the differential taxes. Given that the capital gain in the exit is taxable, investors subjected to higher taxes would

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<sup>12</sup> It is the other compensation, as well as fixed fees, destined to venture capitalists that correspond around the 20% of the fund’s performance.

require a progressively higher expected rates of return to attract them to invest in the funds versus some tax-free security.

There are other macroeconomic factors that can influence the fundraising. The committed capital could be affected by both the overall health of economy and available alternative investments that are present in the market.

It is proved that if the economy has a good growth rate and continue to growth rapidly, there could be more opportunities for aspiring entrepreneurs to set up its own companies and, as a consequence, increase the demand for venture capital funds.

Optimal indicators to understand the way of growth in fundraising could be the return in the stock market, the growth in countries GDP and the expenditures put into place by governments and firms in the industry to develop the overall market.

Especially, the interest rates in the economy may be an important proxy to affect the supply side of venture capital funds. An alternative investment with a medium-low risk is the return given by bonds, if the interest rates associated is high, the investment is attractive for institutional investors and endowments that may prefer this type of commitment for their capital.

The last parameter to consider is the performance of the fund that determine the ability of venture capitalists to raise capital from external investors. The pattern during the year of management in terms of reputation, age, and size, may also have a good impact to raise fresh money and facilitate the assignment for fund managers.

## **2.4 How an investment process works**

Principally, before deciding to invest money in one entrepreneurial firm, there are some steps to achieve in order to identify the best company that fit with the purpose of the venture capital fund and to avoid all possible liabilities during the process.

These steps, usually, included the **screening phase**, drafting and signing the **term sheet**, the **due diligence** process, and the **closing** phase.

According to the research of (Metrick & Yasuda, 2011), the exact process for each stage can vary across different venture capital. At the base, there is not a common best practice to develop each stage, and it is difficult that a standard will be established. Nevertheless, the existence of a formal process is correlated with the size of the VC fund.

Funds composed by just few limited partners is more likely that the decisions are made in a sort of group where all managers are informed and participate in all stages of the process, from the screening to the due diligence. For mid-size fund larger than five partners, the decision taken internally become unwieldy, and it is more common to see a deal driven by a

little group of managers, with the full partnership investing on the basis of a written memo and presentation by the leader partner of the deal. This type of firm size tries to schedule their investment decisions on a weekly basis, where all partners participate in person or via internet meeting. For the larger fund in the industry, regular meetings of the entire partnership are difficult to carry out and sometimes not feasible to organize, therefore commitment decisions are usually made by a committee of senior partners. If there is an investment committee, then a written memo becomes an important way for other principals to communicate among each other.

One aspect that have an impact on the success of VC fund is the quality of prospects at the screening stage, also known as deal flow. The generation of a high-quality deal flow is a major challenge for managers and takes a big chunk of time and energies to make in practice by venture capitalists.

There are a lot of different sourcing strategies, every fund implements its best approach, in general the better the reputation is recognized to the venture capital firm, the better will be the deal flow and the less work is required to managers to achieve it.

In fact, top-tier VCs gather a list of proper companies through the force of their reputation, as entrepreneurs want the more famous fund attached to their company. Hence, these top tier one VCs receive the majority of the deal flow through either direct referral, so the prestige achieve, from the close contracts or repeat entrepreneurs.

One the deal flow is settled, the next step for a VC is to perform the initial screen. Although some investments may be screened with informal conversation among parties involved or from informal information received by a third-party source, most of the investments are screened using a business plan prepared by entrepreneurial firm. In general, the business plan reflects all crucial data about the company in a summary form; it usually includes a short, but detailed description of the strategic plan of the company, its presence in the market with potential competitors, and the background of the management team. For early stage companies, the projections illustrated in the strategic plan focus on the uses of funds in the short time while for later-stage companies the projections are focused on financial statements.

It is difficult to gather quantitative information about the screening phase, but some elements can be useful to understand better the initial screen. These two key elements are the “*market test*” and the “*management test*”.

The first one refers to address whether the entrepreneurial firm could lead to a large exit in the future. Generally, the common believed is that the large market is one that could sustain a big company with a valuation of several millions within few years.

A new company could be associated to an existing market if it can enter in some way a take a piece of the overall “pie”. If, for example, a firm develop a new operating system, the potential market is very large due to the large customers in it, but is quite difficult that can overwhelm existing systems of affirmed large companies such as Microsoft.

Hence, for a better understanding, the market test requires science and art. The first component is more important if you are looking for businesses entered in already established market, even if with a novel product. Instead, it is more important the second component when VC is evaluating new markets while screening the potential start-up, for two reasons: products already in the market are too much premature to have a profitability path or there are no developed products in the area.

A successful case in history that addressed a completely new market was eBay, where few VCs had long-vision to invest.

On the other hand, Google is an example for existing market. In the 1999, in the first and only round of VC investment conducted by the company, the space of “internet search” was already old news with many portals that have already implemented this tool.

Betting on Google was a challenge in its superior technology that could disrupt the existing one through leading a shift in consumers habits. This kind of investment made by VCs required more a business vision in form of art than science.

The evaluation of management team, i.e. management test, is most qualitative than quantitative about the screening phase that should be carried out in the due diligence as well.

Many VCs consider that evaluate people in the company is one of the most important part in investment process and the success or failure is driven by the management team. In evaluating the management of a startup, fund managers must judge the individual’s capabilities and behaviors of individuals and of the team. When VCs assess individuals, they carefully study the personalities and backgrounds in order to determine whether the person get the abilities to carry out the assigned role in the company and adding value to achieve the objectives. The easiest case occurs then people inside the company own previous experience in similar role, which is the main reason that repeat successful entrepreneurs are the most quoted in the market. The research of the strongest management is quite distributed among VCs. The common quote is “Invest in strong management with an average business plan than an average management with a strong business plan”. This mantra is sustained by the fact that it is easier for a great management team to adapt themselves into new business rather than an average team to carry out a great idea.

To summarize, the screening phase is the first step and a crucial one. In case of a poor performance the deal flow can be ruined. As disclosed above, different approaches are applied

to this phase, some VCs hire junior professionals to handle the task bringing more time to analyze different entrepreneurial firm, but at the same time the job could not do so well due to the inexperienced; while the senior fund managers can focus more on later stages, such as monitoring the portfolio of companies.

A typical signal of intention to invest by VC is made by offering a term sheet with all requests to the company. The firm may respond in different ways: signing the term sheet, rejecting it completely, or negotiating some parts of the document providing changes in its interest. Whether parties agree on the term sheet, then they decide to sign it and the VC continued with the investment process which it has to activate the due diligence phase, usually this last phase is assessed a period of exclusivity disclosed in the term sheet.

This phase, the contracting stage, is a crucial part of the investment as the contracts are at the basis of the relationship between entrepreneurial firm and the fund manager.

Term sheet is not a binding document and for this reason it could be the starting point of a faith negotiation. Rather, it used to establish areas of agreement before the parties have their lawyers involved to develop a formal binding agreement. In the case it has binding consequences, the parties are obligated to take as reference the document for all future negotiations. The use of term sheet enables the entrepreneur to have a clear understanding the terms of the possible deal, is designated to protect VCs from liabilities, which may occur through negligence of company's managers of malice in the case of self-dealing, and more importantly saves the parties from drafting an expensive contract as the main terms are presumed to be accepted by both as less hours should be spent in the future to negotiation. Hence, the general picture of the term sheet is to describe the basement of the deal and provides protections from all possible future liabilities by setting the conditions that must be agreed among parties.

On the other hand, a *shareholder agreement* is the legally binding contract set up by shareholders of the company which figures out the future terms of the relationship among the existing shareholders and the new venture capital shareholders.

Instead, a *subscription agreement* between the venture capitalists and the company, different from the document mentioned before which refers to an agreement only between the shareholder of the company, tries to set out terms of subscription: type of shares, rights obtained as a result of be a new owner (decision rights), cash flow (payoffs to the entrepreneur and the VC), and the terms of payment.

A lot of studied have been made to understand better all the caveats inside the contract terms, included the term sheet. (Kaplan & Strömberg, 2003) studies find that preferred equity and



cash flow rights, as voting right and future financings as well, are often contingent on observable financial and non-financial performance. They show that venture capitalists include clauses to mitigate potential hold up among parties and they pretend to retain control of the management firm in case of poorly performance. If the performance improves, the entrepreneurs regain their initial rights and control. The importance of the issue is to assess whether or not convertible preferred equity is the optimal option, and this is given by to understand the pros and cons of this decision and all lies into the performance of the company. In case of bad performance and preferred equity the downsides are shared among VC and entrepreneurial firm, otherwise only company is affected by the development.

Another mechanism used by venture capitalists to protect themselves from future performance is to stage the investment. Prospects for the firm are periodically reevaluated. The shorter the duration of an individual round of financing, the more frequently the venture capitalist monitors the entrepreneur's progress and the greater the need to gather information. The role of staged capital infusion is made to keep the attention higher of owner for performance and reducing potential losses from bad decisions.

Referred to the last part, another document which term sheet is composed is the Charter, known as *Certificate of Incorporations*, a document filed with the modality in which the company will be incorporated. It establishes all rights, privileges, restrictions, and preferences referred to the company's stocks.

Investments that make it through the screening phase and then the parties find an agreement for the phase of term sheet, now they are subjected to a preliminary level of due diligence.

As described above, the screening stage is about identifying the best candidates to continue the investment process while the term sheet document tries to build how the deal should be composed in all its parts.

Both phases are dominated by optimism, in contrast with the due diligence phase. The due diligence stage is all about rough questions among parties and try to discover all potential liabilities that can bring to a downfall of the investment process.

The first part of this phase is referred to the meeting between VC and the company management. This pitch meeting is very important for the venture capitalists because it is the first time that parties are face-to-face, and the VC can finally assess the abilities of the management. For many companies, the investment process could end right there in case of lack of satisfaction.

Those who pass the first meeting phase, the next stage of due diligence can take different forms, but usually a basic scheme is common among VCs.

Conducting the due diligence process bring to important costs for fund managers that can include external consultants to review information, external legal professional and financial advisors, and the resources and time employed by venture capitalists. For this reason, prior to fully enter in the process, some restrictions are drafted. The agreement discloses that in the event that deal is found unviable as a result of the exposure of a critical omission on the part of the entrepreneurial firm during the due diligence, then the entrepreneurial firm will bear part of the cost. This is to ensure that the entrepreneurial firm acts sincerely and legitimately during the process.

Many term sheets include a period of exclusivity, giving the VC some time to complete diligence while the company is restricted from negotiating with other potential investors. In recent years, with less competition and more wary investors, there has been an increase in the level of attention of diligence.

Before to start, they both firm a sort of *confidentiality agreement*, also known as *non-disclosure agreement (NDA)*, for not disclose crucial information outside the investment process in order to preserve sensitive data. Once signed the document, the due diligence can start effectively. Overall, in this part the VC aims to check every part of the company's story with data in the hand and try to figure out every possible liability from several perspective that can undermine whole efforts so far.

The second due diligence step is usually necessary to have a better understanding of the target, realize if the deal is worth it and negotiate a fair price and fair contractual projections.

A *data room* should be prepared by the seller contained all relevant information about the company and required by the VC. The data room has some rules and restriction, such as time and place for analyze the data, limited amount of people to have access and others.

There are pros and cons to set up a virtual or physical data room. The first ones are: efficiency where many parts are involved; important for multijurisdictional deals; keeps track of all access and data viewed; and less costly. The second ones are: more expensive; possibility from the buyer to bring with him some confidential information, even if it is not permitted.

After passed these phases, now is the turn of closing phase. In this stage *a letter of intent* is signed which both parties agreed about all terms and conditions to realize the deal. The document is very useful, because it is efficient: The parties focus on the key terms to check the viability of the deal, if there is a disagreement on basic concept then they do not have to waste more time and money. In conclusion, it should set forth the steps, roles and timing of the future negotiation, usually it is not a binding document yet, but it could have a nature of binding agreement anyway and it is important to disclose it.

At this point, the last thing to do is to adjust the deal for the final two steps: *signing* and *closing*. The final document is the share purchase agreement or a similar of this, which is not necessary for transfer the ownership, but its importance derive by the fact that the VC is basically buying a box that want to be sure that the content of that box, for which is paying a price and it have spent a lot of efforts, is warranted effectively.

The two steps mentioned before could seem similar, but in reality is not, exactly.

The signing step occurs when the agreement is complete in all its part and is executed by the parties. There is now a binding agreement between the parties, but the transfer of the ownership and the payment of the purchase price are scheduled for a later date.

The closing step occurs whereby the transaction is completed, full ownership is transferred in exchange of the price negotiated.

At the end, the investment process is entirely completed and now the only thing to do is to monitor and manage the entrepreneurial firm to schedule an exit date to transform the investment in profit.

As we saw in the part 1.3, successful exits are critical to ensuring attractive returns for investors and, in turn, to raising additional capital. However, investors' concerns about exiting investments and their behavior during the exiting process itself can sometimes lead to severe problems for entrepreneurs. The influence of exists on the rest of the private equity cycle suggests that this is a critical issue for funds and their investors.

The exiting of venture capital investments also has important implications for social welfare. Concerns about exiting may also adversely affect firms once they are financed by venture capitalists, the fund, as viewed in precedence part, is liquidated in few years (5-7 years). Thus, if institutional investors cannot foresee how a company will be mature enough to take public or to sell at the end of a decade, they are unlikely to invest in the firm.

Hence, the main exiting strategies are: selling grew up company or going public with an IPO. In the first case the best solution is to find a potential acquirer that usually is a PE or other types of funds.

The second case, that is the most widely used, is to assist the company for listing in a public market where the timing is fundamental in order to avoid any possible losses due to a low interest from investors, and to gain the best possible deal by liquidating the investors of the fund with an increased in the reputation of VC for a future raising capital.

## 2.5 Evaluation methods

Typically, entrepreneurial firms do not have significant cash flow to pay equity or interest on debt and the data could seem negative in the first years of investment. Therefore, venture capital fund investments are valued mainly on the basis of the possible capital gain realized upon the exit event, so the dissolution of the fund. Exits occur 5-7 years after the inception of investment, hence it is important for venture capitalists make a valuation of a firm in the right way to consider all potentials of the resources over the investment life cycle.

More traditional investment valuations are based on the data available in that moment and hypothesize some possible evolution of the performance of the company. Instead, for VC the assessment is quite exclusively based on the expected exit value which is rather challenging to predict in view of information asymmetries and potential agency costs. It is noteworthy that over the life of the venture capital fund, venture capital fund managers are required to regularly report valuations of un-exited investments, and returns of exited investments, to their limited partner institutional investors.

The purpose of this part is to highlight the typical methodology used by fund managers in the evaluation process, known as **venture capital method**, and two other possible methods, **discounted cash flow** and **comparables**, used rarely in the VC industry and more appropriate for private equity market.

### 2.5.1 Venture capital method

The most common valuation strategy used by fund managers to evaluate their investments is the so-called venture capital method. This assessment refers to a wide range of implementations, all of which share four main elements: **exit valuation**, **target returns**, **expected retention** and **required investment**.

The main difference is given by the exact set of steps and ordering of steps. We are looking on these steps, illustrated by (Metrick & Yasuda, 2011).

- 1) The first element refers to an *exit valuation* of the company. It is a forward-looking assessment and should reflect the expected value of the company at the time of exit for venture capitalists, where the exit is usually considered to be an IPO or a similar sale to other funds.

A lot of techniques are employed to estimate the hypothetical exit value. In each case, the focus lies in the successful exit after some years of investment. The reason is given by the fact that at time of exit, the company should obtain most of its profits.

The definition of successful exit is not immediately understood. It would be wrong to focus on rare outcomes, because a lot of expected value of the company is contained mainly in a modest success, and in case of ignoring this type of successes the estimation will not end up with a good profile.

On the other hand, successful exit does not mean “everything except liquidation”. Many VC investment companies end up being acquired with few liquidations going to shareholders. Hence, the focus of the venture capital method is to ignore lesser payoffs and turn the attention on the places where the payoffs are significant.

Therefore, the best definition for a successful exit is “an IPO or a competitive sale”, where the last one refers to a sale that is better than bring the company to an IPO.

Firms where a possible listed in a public market in unrealistic from the outset point of view, because the potential market is more limited, then a competitive sale could seem the best option and where many interest parties are involved.

Once we have defined the notion of a successful exit, the next step is to estimate the value of the company upon this success. Two principal approaches come into play: *relative valuation* and *absolute valuation*.

In the first one approach, we have to find a set of companies that could be presented as comparable to our company at the time of exit. The criteria to determine the comparability are usually based on the similarities in the industry, similarities in financials and in the growth potential. After identified the comparable, now we compute various ratios based on some accounting measure.

There is not a common rule about the best multiple to use, choices are usually made on the industry standards where the guiding principle it to use multiples that are the most consistent across companies.

Although the relative valuation, shortly illustrated above, uses comparable companies to evaluate our reality, the second approach, that is absolute valuation, reflects a deeper analysis by using the discounted cash flow model<sup>13</sup>.

The underlying idea of this technique is to determine the value of the company by forecasting future cash flow and discounting them with an appropriate rate.

Both of approaches have their strengths and weaknesses with a careful analysis conducted in any case. An addition short cut can be used, that is to refer on the valuation for successful exit made in the same industry. For example, an IPO conducted in some market with an average valuation of \$300 million, then the analysis could assume that the \$300 million as the exit value of our company.

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<sup>13</sup> See DFC and comparables in section 1.5.2

- 2) The second element is the *target return*. It is associated to a discounted rate that we need to convert the future valuation in today valuation.

When we talk about the target return, we are referring to the successful investments made and not to the cost affronted by the VC to make an investment. In the VC method, solely successful cases are considered otherwise the effective value considered is zero.

If we consider  $p$  as the probability of success, then the expected value is represented by the following equation:

$$\text{Expected value at exit} = \text{exit valuation} * p$$

And if this exit is expected after  $T$  years, with no further rounds of investment, then the present discounted value is:

$$\text{Present discounted value} = \text{exit valuation} * p/(1+r_{vc})^T$$

where  $r_{vc}$  is the cost of capital (it may be exchange with the target return) and all the expression  $p/(1+r_{vc})^T$  represents the effective discount factor for the exit valuation.

- 3) The third element of the venture capital method is the expected retention. In this method, conversely to the DCF, usually accounts for negative cash flow before the terminal date and a reduction in the ownership percentage for previous investors. As described in previous parts, more than one round of investment can take part of the company cycle. For example, if a VC purchases 5M of Newco's 20M shares in a Series A investment, then a 5M Series B round will reduce the Series A stake from 25% to 20%. In that case, we would say that the Series A investors have a *retention percentage* of  $0.20/0.25 = 80$  percent. Even if the same VC participates by purchasing 1.25M shares of the Series B, thus maintaining a 25 percent stake over the two rounds, the impact on the 5M share Series A investment remains the same.

Hence, if we expected all future rounds to be made at a fair market price, it is necessary to account for future reductions when analyzing the first investment.

To compute the retention we start with the number of shares outstanding after the current round of investment. This shares total must also include the founders' shares and any options. The reason is given by that at the successful exit all shares will be issued. The next step is to estimate the number of new shares issued at an IPO,

assuming that a post-IPO valuation is used as successful exit. The ratio of new + current shares becomes the expected retention. This estimation should be done by applying data on successful exits and past experiences.

- 4) The final step to face in any VC method is to make an *investment recommendation*. It is based on a comparison among investors' costs and their benefits. In the standard approach, we have that the costs of investors are just the money previously invested. To figure out the benefits, the value of their shares in the company, it is necessary to assess the total value of the entrepreneurial firm. The overall valuation is effectively the present value of the exit valuation computed before, with an additional adjustment for the retention percentage. The total valuation gives us a valuation of the whole business, but it is difficult that investors own the entire percentage in the firm. Hence, we need to identify the partial valuation associated to the VC's investors.

If it is used the *standard method*, the investment recommendation is based on comparison between costs and the benefits, while if we consider the *modified method*, first thing to do is add management fees to the investors' costs and then subtracted the carried interest from the benefits before making the investment recommendation.

Valuation is not an exact science even in the best conditions. Nevertheless, the investment recommendation step is critical for the valuation process, and it should not be ignored.

A complete VC method should provide outputs based on a wide range of inputs, so that the value can be more precisely as possible, and investors can understand the sensitivity of the valuation.

### 2.5.2 DCF and Comparables analysis

There are other two types of analysis used to evaluate a company and so used as the exit value, the first important input, in the venture capital method. These two approaches are: **discounted cash flow (DCF)** and **comparables analysis**.

The first one, the DFC analysis, is focused on the exit date of VC from the company that could be translated into an IPO or in a successful sell. The exit phase marks the finish of the *venture period* and the beginning of the adolescence phase, with a *rapid-growth period* and after many years the company reach the maturity, entering in a *stable-growth period*.

At time zero, when the VC decides to invest, there is the necessary to estimate the exit value at the end of the venture period. This period is long some years, as we know, 5-7 years.

Hence, the purpose of the exit value is to estimate the forecasts made on coming years in the rapid and stable period. Therefore, in estimating the exit value, VC must imagine the company in the future years and try to figure out how long is the period of the rapid growth before entering into maturity phase. In order to estimate the typical length of periods, some hints come from by looking at historical data and/or comparing the revenue growth of newly listed companies some years after their IPOs with some adjustment.

However, revenue growth at the industry is not only the signal that a company has entered a stable-growth period. A good VC analyst should also consider the company's return on capital and the operating margins. Usually, during the rapid-growth period, the company expect to have a return above the cost of capital, even if these returns are not expected to be realized until several years.

DCF analysis is the most used as valuation method. In case of an accurate utilization of inputs, it reflects the most genuine valuation of a company. For this reason, most financial analysts and investment bankers make DFC method a centerpiece of their valuation. There are many different types of mode, but key concepts are the same at the end.

All DCF model have to key inputs: the *discount rate (D)* and *cash flows (CF)*. To estimate the discount rate part there are several options, but the most used is the average cost of capital for the company's industry (*WACC*).

The concept of the cash flow is to report the cash that is actually generated by the business. More precisely, it considers the cash generated by operating assets, income, and expenses, without considering the non-operating assets which include excess cash, marketable securities and anything that is unrelated from the operating point of view.

Therefore, the definition of operating cash flow is:

$$CF = EBIT(1-t) + depreciation\ and\ amortization - CAPEX - \Delta NWC$$

where

*CF*= cash flow; *EBIT*= earnings before interest and taxes; *t*= tax rate; *CAPEX*= capital expenditures; *ΔNWC*= net working capital (*Δ* net current assets – *Δ* net current liabilities).

Let us examine more in clue each item that compose the equation. The *EBIT (1-t)* represents the total after-tax income produced only by operating assets of the firm, without considering non-operating income and expenses. Depreciation and amortization are added because they are non-cash expenses and otherwise would reduce *EBIT*. On the other hand, capital expenditures, investments in equipment made by the company, require a cash out. For this reason, we subtract it. The last item is the change in the working capital, if it goes up some



extra money will remain in the business, and so this will reduce the cash flow. Thus,  $\Delta NWC$  is subtracted in the equation.

Cash flow calculation is focused for the past years and inputs are easily available. However, in DFC valuation, it is necessary to make forecasts for the next 3-5 years. This is not quite difficult because the forecasts will be driven by few common assumptions.

At some point will be difficult try to calculate the future expected cash flow, therefore a *continuing value*, also known as *terminal value*, should be calculated for all years after the forecasted period. It is simply calculated as:

$$\text{Continuing value} = \frac{\text{CF of the last forecasted year} \cdot (1+g)}{(r-g)}$$

where  $g$  is the growth rate and  $r$  the discount rate (WACC).

After made all these steps we can calculate the **value of the firm at exit**, by discounting every cash flow calculate by the discount rate in order to have the value at the present.

$$\text{NPV of firm at exit} = \frac{CF_{t+1}}{(1+r)} + \frac{CF_{t+2}}{(1+r)^2} + \dots + \frac{CF_{t+n}}{(1+r)^n} + \frac{CV}{(1+r)^n}$$

where  $CF_n$  is the cash flow in year  $n$ . Note that is used  $r$ , as WACC, in real term, that is nominal rate minus the inflation rate. We use  $(1+r)$  at denominator to discount at the present each cash flow and their sum give us the Net Present Value of the firm.

The second approach, the comparables analysis, mainly focuses on identify similar companies in the public market to assess our company. Among VCs, comparables analysis is by far the most popular method of exit valuation. There is some support for this popularity, as the simplicity rather than DFC and less calculus to be done. Nevertheless, a prudent analyst should perform bot valuation analysis. To form a valuation multiple, it is necessary numerators and denominators to create a useful ratio that can be predictive for the valuation of a comparable firm. Usually, numerators comprise **enterprise value (EV)** and **market capitalization**, while denominators are proxies for cash flow.

To find comparables companies in the market, we must search for companies with similar levels of investment opportunities, discount rates, and an EBITDA/EBIT.

For the analysis, there are some principal multiples that must take in consideration:

- *EV/EBITDA*: EV is the total market value of the securities of the company. It is popular among leveraged-buyout investors. It can particularly useful for evaluating industries that have wide variation in their depreciation practices.
- *EV/EBIT*: Similar to the ratio above, but have different cash flow interpretation.
- *EV/Revenue*: It is used for a quick and dirty analysis and it appears divorced from any cash flow. Nevertheless, this measure provides a useful valuation ratio, particularly for high-growth industries favored by VCs because companies have negative EBIT/EBITDA while revenue is never negative.
- *P/E*: The ratio price to earnings, is the most know multiple. The “price” of ratio is referred to the price of a single share, and “earnings” refers to earning per share. The P/E ratio can be obtained by dividing net income into market cap.
- *P/B*: This measure is also popular among professional analysts. Similar to P/E ratio, the price to book ratio is referred to price per share at numerator and book value per share at denominator. The numerator uses only the market cap and not the whole enterprise value. The idea is that if it is below 1 then the equity holders would be best off by selling the company , repaying debts, and take the difference.

Although we have illustrated these ratios, this does not mean that other ratios cannot be used, and some can be more useful to such situation. The common rule is to start with denominator of interest and then applies the EV o market cap at numerator. Usually, if the denominator refers to a whole enterprise level, the EV is most appropriate, otherwise market value is more correct in case of equity holders’ value.

## 2.6 Other types of financial backing

To give a financial support to entrepreneurial firms exist other types of individuals and funds that decide to invest their time and money to help a portfolio of companies to develop and bring them to a successful exit, that is listing with an IPO or selling to other financial institutions. Venture capitals, as described in the first section, are mainly focused on the early stage investment where risks are more high and so compensation is correlated. Instead, other types of financial investors have different purposes, with different risks and profits.

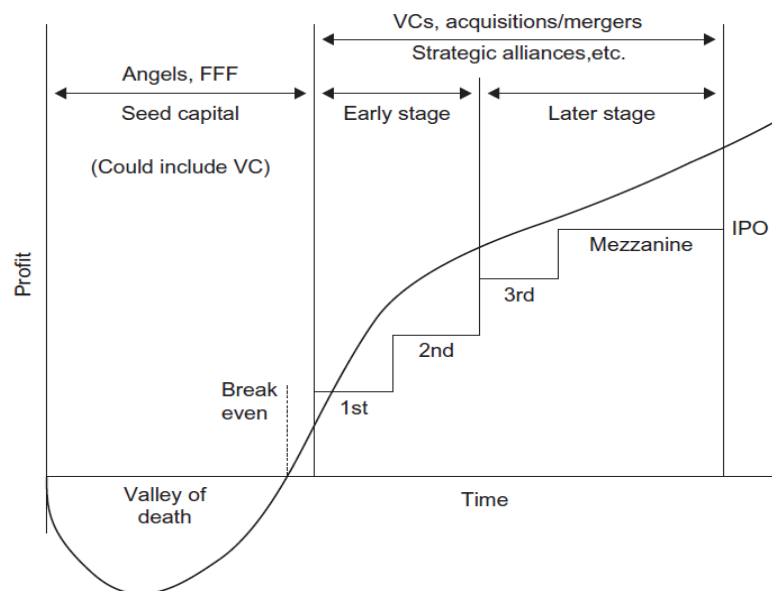
In this last section, we are going to illustrate other two types of institutional investors: **private equity fund** and **business angel**. We highlight the similarities and differences with a VC because several times they are confused among themselves without emphasize their features to understand their purpose.

## 2.6.1 VC vs Business Angel

Angel investors are wealthy individuals who invests in entrepreneurial firms and share expertise among them. Some angel groups imitate professional investment funds, some affiliate with universities, while others engage in for-profit philanthropy. Although angels perform many of the same functions as venture capitalists, they invest their own capital rather than that of institutional and other individual investors.

Definitions of stages of development in venture capital and other types of financial investors are usefully viewed in the common picture shown below.

Figure 2.3 Stages of investment decisions time (Cumming & Sofia, 2014)



How we can see in the figure, the seed capital/early stage are characterized by Angels and VC investors. Usually, prior to seeking and obtaining venture capital finance, entrepreneurs who just started their business, often obtain capital from FFF: friends, family, and “fools”. The term “fools” refers to high risk associated to an investment in nascent stage firms and the “valley of death” where firms requires a lot of money but show negative cash flow for years and the percentage of failure is very high. Another type of backer is the Angel that also are source of capital for entrepreneurial as alternative and usually prior of a venture capital finance. Instead, the term “mezzanine” refers to investment in the late-stage firms that are close to an IPO which is the first time that a firm sells its shares to the public market.

In general, VC are often confused to angel investors. Angels are similar to VCs in some way, as we can see in the figure 1.3, they share the same firm stage investment, but differ because angles use their own capital and thus they doesn't raise capital from external investors and commit themselves to invest it as a mainly characteristic of a VC.

There are many types of angels. At one extreme we have wealthy individuals with none background in the investment industry. At the other end are groups of angels with important background who together provide capital to entrepreneurial firms. In that latter case, they look like as VCs, but remain the fact that they use their own capital and thus decisions can be different. This bring to a lower cost of capital and can invest in deals that would not work for a VC. Although the total capital flow is similar, angels tend to focus more on younger firms.

## **2.6.2 Similarities and differences with a Private Equity**

Before we have built the line that divides a VC fund from an Angel, because usually there is confusion among them. Now, in this last part, we are going to describe a private equity fund, and which are the things in common and not with a venture capital fund.

Definitions of venture capital and private equity have differed over time and across countries. Generally, the term private equity is associated to an asset class of equity securities in companies that are not listed in a public market and so their stocks are not traded in a stock exchange market. Both private equity and venture capital funds invest in the private equity market, therefore in companies that you cannot find in the public market. The difference being venture capital fund invest mainly in the seed/early-stage private investments rather than PEs that are more focused in the mid-stage with companies more stable in their growth and less risky. A characteristic of most venture capital investments is that firms requires cash, but they do not have positive cash flows to pay dividends or interest on debt. Instead, investee companies of PE have more likely positive cash flow to use it for different purposes.

Another common feature is that they invest with a view toward capital gain and exit. The most sought exit is an IPO or a trade sale, where the company is sold into its entirety to another company or fund.

During the lifetime of the investment, which is almost the same (5-7 years) for both, the return is higher for the venture capital funds because they invest in the early stage with high growth rate. Usually, it is above 30% to attract investors for the riskiness to invest in this type of entrepreneurial firms. Instead, PE funds have a return around 20-25% because companies are more financially stable and more stable is the growth rate.

For median 1-year rolling horizon IRRs by fund type, venture capital has not performed as well as private equity or other comparable asset classes in recent years.

Second, venture capital investments tend to be more counter-cyclical relative to private equity investments as there are relatively more venture capital deals when IPO markets are weak.

Venture capital deals take a longer time to bring to fruition and as such investors invest more heavily in venture deals with the expectation that they will be ready to exit when IPO markets are at a peak (Cumming et al., 2005)

Private equity funds are also buyout investors with a key feature of almost always taking the majority of control, in contrast with VC funds that usually take minority stakes in their portfolio companies. Furthermore, PE could be also distressed investors, which, as the name suggests, they focus on troubled companies.

## **2.7 Green and social financial investors**

After have explained the classic financial investors and especially who are concentrated in the early stage investments, known as venture capitalists, it is necessary to describe a category of financial investors that decide to participate in the so called green finance, where the purpose is to invest in all companies which affirms to be “sustainable and green” in order to shape real wealth to serve long-term needs of the whole society.

Green finance then refers to any financial instruments whose proceeds are used for sustainable development projects and initiatives, environmental products and policies under the single goal of promoting a green economic transformation toward low-carbon, sustainable and inclusive pathways.

Promoting green finance on a large and economically viable scale helps ensure that green investments are prioritized over business-as-usual investments that perpetuate unsustainable growth patterns. Green finance encourages transparency and long-term thinking of investments flowing into environmental objectives and includes all possible sustainable development criteria.

Green finance covers a wide range of financial products and services, which can be divided into investment, banking and insurance products. The predominant financial instruments in green finance are debt and equity. To meet the growing demand, new financial instruments, such as green bonds and carbon market instruments, have been established. However, renewable energy investments, sustainable infrastructure finance and green bonds continue to be areas of most interest within green financing activities.

Nowadays, many financial investors, especially private investors, have decided to be more green and be the first supporters for all innovative start-ups and companies that can have an impact in specific industries. The purpose of these green and social investors is the financing of investment in all financial sectors and asset classes that integrate environmental, social and governance (ESG) criteria into the investment decisions and embed sustainability into risk management for encouraging the development of a more sustainable economy.

The adoption of ESG considerations in private investments is evolving from a risk management practice to a driver of innovation and new opportunities that create long-term value for business and society. However, mobilizing capital for green investments has been limited due to several microeconomic challenges; for example, there are maturity mismatches between long-term green investments and the relatively short-term time horizons of investors. Moreover, financial and environmental policy approaches have often not been well coordinated. Nevertheless, governments are more and more concerned to the environmental problems and they offer a range of financial approaches that help to increase capital flows, especially in the private sector. Furthermore, today a growing number of large institutional investors and private financial investors are incorporating ESG metrics into their capital allocation and stewardship criteria.

As long-term committed of capital, they recognize a mandate to consider whether the companies they own today will maintain a strong connection both with their financial customers and extended communities as environmental and social challenges increasingly impact the way we live and work. They also recognize that companies that commit to addressing these urgent issues stand to realize greater business opportunities in the future, and thus will achieve higher returns for their important shareholders.

It is not easy for investors to assess a company's ESG performance, but the institutional investors that are more concerned about the future are those that actively engage with companies through helping them in the development for the new environment, instead of simply investing and liquidating them.

To protect themselves against possible exposures, investors have understood that they cannot longer treat sustainable financing as a niche sector. Asset managers, too, are increasingly shifting from policies that seek to avoid risk by excluding specific securities, in favor of strategies aimed at benefiting from companies that perform better on ESG. Examples include impact investments, such as low-carbon indices and green bonds.

According to the site CNBC, a study published in January by three researcher of HEC Paris Business School, Toulouse School of Economics and MIT, showed that investors are willing to pay \$0.7 more for share in a sustainable company. The study revealed also that firms that exercise a negative impact are valued \$0.9 less per share than those considered socially "neutral".

Anyway, in the next chapter, we are going to describe and illustrate more in deep the socially responsible financial investors with particular attention about the group of venture capitalist that bet only in the green innovative start-ups and in one niche inside, indeed sustainable protein funds.

### 3. SUSTAINABLE INVESTMENT FUNDS

In this chapter we are going to illustrate and analyze the world of sustainable protein funds. The importance to set up this type of investment, recalling the SRI (Socially Responsible Investments), is given by the economic, social, and ecological catastrophes caused by business activities have awakened many investors and entrepreneurs to be more responsible and reconsider their business concept.

Besides the economic responsibility, that venture capitalists have towards their financial backers, a fund managers have also to take in consideration the social and environmental responsibility nowadays. Therefore, many VCs decide to establish exclusive funds dedicated to this peculiar mission and at the same time create very good returns.

In particular, this part is mainly focused on the alternative meat industry, which tech-food start-ups that are the principal players with their vision and the potential to be strong companies that can be affirmed their presence in the market, through products and brand.

Moreover, it will be highlighted the importance role that financial investors play on entrepreneurial firms with their investments and management skills.

#### 3.1 Socially Responsible Investments

Venture capital and Private equity fund managers have begun to differentiate themselves through the area of social responsibility. The focus of *socially responsible investment* in private equity is particularly timely. For example, Kleiner Perkins, one of Silicon Valley's leading venture capital fund managers, hired the Nobel Peace Prize Winner in 2007 to assist them in their focus on this new type of investment.

There has been growing trend toward socially responsible investment practices. The direct intersection between socially responsible investment and venture capital is important, because institutional investors capital allocation as well as the venture capitalists' funds seeking the right way to undertake socially responsible entrepreneurial activities.

Institutional investors have various motivations in their investment strategies when deciding to allocate capital to equities, bonds, derivatives, and alternative investments, such as venture capital or private equity. Portfolios are specifically designed to optimally trade-off risk and return by the allocation of the portfolio to appropriately diversified combinations of assets, with consideration to institutional and regulatory factors, and possibly behavioral biases and decision-making processes. Following upon the potential effect behavioral biases and decision-making processes may have on an institution, this could influence current and projected levels of asset allocation. According to the study of (Cumming & Sofia, 2014), their

try to ascertain the potential trend toward investing in a more specialized form of alternative investments, socially responsible venture capital or private equity, also sometimes referred to as sustainable funds.

The purpose is that two central elements influence socially responsible institutional investments in the private sustainable funds: 1) the institutions' internal organizational structure and 2) the institutions' external environment in terms of internationalization. The intuition underlying the two main hypotheses applies not only to socially responsible investment in private funds but also to other asset classes.

However, the study is focused on socially responsible investment in venture capital and private equity because it is a new "alternative" asset class that is now being closely scrutinized internally by investors as well as externally by media for its diversification properties and consistent annual returns.

An effective socially responsible investment program should incorporate the objective to gain the maximum possible return for stakeholders in the company, at an acceptable risk, with the idea of combining social, moral, legal, and environmental concerns. Any decision made by management, or the board of directors, will affect each stakeholder differently. As such, decisions on important policies regarding investment and asset allocation, which will directly affect the returns of the institution, are not taken lightly.

In a financial institution where there is decentralized investment decision making, where a general investment team comprising employees compete with one another, each employee is more likely to seek to maximize expected returns as this is the most obvious performance indicator to the management and less likely to risk adopting potentially less profitable socially responsible investment. Instead, in an organization where investment decisions are centralized through a Chief Investment Officer (CIO) with the board of directors, it is more probable that innovative, thus untested and risky socially responsible investment policies should be approved and implemented.

This suggests that the presence of a CIO who will take the "ownership" and the responsibility for the decisions can facilitate a socially responsible investment policy.

Moreover, there are incentives for compliance with norms of corporate social responsibility that institutions are more likely to comply when they recognize that their stakeholders prefer follow such policies.

Overall, the first hypothesis is that socially responsible investment programs are more likely to be adopted by institutions that centralize investment decision making.

Instead, second hypothesis relates to the extent to which an institution that internationalizes its investments bring to be more concern about social problems.



Socially responsible investments are not only on the rise as a result of increasing social awareness by institutions but also primarily as a result of the increasing public interest in social responsibility.

Thus, the public perception is that institutions need to “return to society”, a sense of social responsibility that has been given to them by their stakeholders.

On the other hand, there are two primary factors that may lead to a greater focus on this investment policies among them with an international investment focus according to (Dunning, 2003). First, larger corporations and those with an international or multinational presence typically face public scrutiny with regard to their socially responsible investment policies. Second, long-term returns to socially responsible investments, particularly for international investments over the long run, are reported and viewed as very favorable by a significant number of institutional investors.

The primary objective of institutional investors’ asset allocation is to achieve the most optimal trade-off of risk and return. The achievement of this objective, however, could differ in accordance with specific characteristics. For example, a pension fund and a bank will have different funding and solvency requirements, assets and liabilities, and extent of regulations. Different institutions may exhibit differences in internal objectives, stakeholder demographics, and sensitivity to regulatory oversight and accounting rules.

As we already known, private equity and venture capital fund managers are financial intermediaries between institutional investors and entrepreneurial firms. Institutional investors do not have the time and specialized skills to carry out due diligence in screening potential private firms in which to invest.

The pronounced risks, information asymmetries, and agency problems associated with investments in small, illiquid, and high-tech entrepreneurial firms, especially in the socially responsible investments which require more extensive due diligence, is a primary explanation for the existence of private investment funds leading by venture capitalists with specialized set of skills to mitigate such problems.

Investments in alternative funds can be carried out in different manner. Usually, the fund-of-funds, that was already illustrated in the first chapter, tends to be less socially responsible because they have different standards which one of the objective is the only profit maximization.

It is obviously that higher will be the expected returns in a possible socially responsibility investment, the greater will be the allocation of capital to these investments made by the fund managers.

### 3.2 Green venture capital and sustainable protein funds

In the past few years, socially responsible investments, described in section above, have emerged as a successful type of financing scheme, but many eco-oriented start-up companies remain under-funded. Apparently, environmental innovations have only recently caught the attention of an important financial sector, such as venture capital.

Increasingly, VC is being directed towards entrepreneurial ventures that demonstrate various aspects of sustainability in terms of environment and society. Thus, many venture capitalists had decided to setup the venture as a **green VC**: a high-risk financial capital provision for eco-innovative entrepreneurial firms, which offers the potential of good financial returns in exchange of committed capital, as well as contributing to sustainable development.

This recent interest in sustainable solutions may be an indirect result of the successes and popularity of socially responsible investments (SRIs), which have so far been mainly channeled into mutual funds.

Indeed, there has been a phenomenal growth of such funds and the amounts invested, a rapid proliferation of investment and analytical products catering to this segment.

We know that eco-entrepreneurship generates benefits for a sustainable development, might be best created by smaller, faster moving firms usually characterized by start-up businesses. However, the success of this type of investments in the recent years, especially in the last decade, has bring more attention to eco-oriented businesses that means into caught the attention of most important venture capitalists.

Recently, many firms use the words “ecological”, “green” and “environment” as a way of promoting their products and brand. On the other hand, other firms purposely do not market themselves in this way yet, because probably they assume it would be more difficult to them to secure financial funding, even if the entire society is facing to a sustainable impact.

An important aspect to consider is that the so-called socio-oriented start-ups tend to face different issues rather than those labeled as environmental start-ups. This reason is given by the fact that most of them have their principal markets based in developing countries, and it is more easily obtaining funding, especially from venture capitals and philanthropic people. Many of these ventures, most of the time, are founded as well as funded by philanthropy sources, which moves away from profitability with focus on innovation for sustainability.

Venture capital is wrongly often recognized as a normal way of financing start-up companies, independently of kind of business, normally having a short-term perspective, where the speculation seems the right way. Sustainable development, on the other hand, is concerned with the direction and the actual content of companies’ products, services and practices, having a commitment to long term orientation.

However, a business-oriented understanding of sustainable development tries to find the link between environmental and social activities performed by firms and their financial performance. Indeed, investing in green innovations is expected to create some sort of value for the investors in a venture capital fund.

Although green VC can be considered a type of socially responsibility investment, it could not easily to use the same criteria for the selections on the right investments. This is due because since that venture capitals focus on early-stage investment, the start-ups often is only made by the founders and some other people with the idea in their hands, which consists in an innovative product or service, with an good impact in the environment and health in this specify case. Nevertheless, in most cases, the production has not yet reached, and the commercialization phase is far away.

Thus, as we have analyzed in the first part of the thesis, the focus of venture capitals that are principally entrepreneurial firms, could be considered concept firms. Normally, they do not have a management system, supply chain features or environmental/social reports.

The evaluation, already highlighted, made by fund managers about the environmental and economic aspects of the invested companies' businesses should be based on different grounds, more referred to do with the expectations in the next future, rather than the actual financial and social performance of the company.

Therefore, it would appear that a green VC's mission orientation depends on the content, direction and effects of startup company in which it decides to financially invest.

One approach to decide if an innovative venture is really eco-innovative and aims at a green mission, is that of to assess the future environmental and health implications of its products or services that eventually can generate. According to (Rennings, 2000), eco-innovations can be defined as measures of relevant actors (firms, politicians, unions, associations, private households), which: 1) develop new ideas, behavior, products and processes, applying or introducing them and 2) contribute to a reduction of environmental burdens or to ecologically specified sustainability targets.

A typical general example about green innovation financed by many venture capitals is the manufacturing of wind turbines for the generation of electricity. Wind energy can be considered a type of green VC investment because it is an emerging business sector, often led by early-stage companies, with the obvious benefits of using renewable energy and zero emissions during the use phase of turbines.

Of all the new renewable energy technologies, wind power has made the most significant commercial progress. Today, many start-up has developed in companies, wind energy is much

cheaper than nuclear power and competitive with all other forms of fossil fuel-based power generation.

In our case the investments are relative the alternative meat industry, so an example of sustainable innovation are all of these companies that help to improve the sector and are trying to solve several problems related with the existing industry, which already explained more than of time to understand better the future impact and the contribution lead by their technologies.

### **3.2.1 Mainstream VC e green VC**

Another study of (Randjelovic, et al., 2003) is important to mention. They have analyzed the differences between green VC and mainstream (non-green) VC funds. Though this study was made in the booming period of green sector and it was still at its inception, several aspects are common in the market today. However, at the same time, several issues are changed due to the higher attention imposed in the recent years on environment and health lead by people and institutions with economic stimulus. For these reasons, today the green VCs are very solid and affirmed on the market with high investments in it.

The study highlighted the main quantitative and qualitative differences through several interview made to venture capital in different countries, especially US and Europe.

The first important difference that they have found is referred to the investment size. In 2000, mainstream VC investment in Europe and the USA totaled €154 billion.

Compared with this figure, green VC was in its infancy, estimate that in 2000 green VC accounted for approximately €33 million in Europe and €67 million in the USA, which represents only 0.08% of the total amount invested by the VC industry.

Another aspect is the total number of active mainstream VC companies in Europe and the USA that is around 1600, while the number of green VC firms in Europe and the USA is much smaller. At that time they found 20 European and around 25 US companies dealing with green VC.

While the average amount of mainstream VC invested was about €120 million, some sources interviewed estimated that approximately only €1.1 million was usually invested in eco-oriented start-ups in Europe.

Environment prerogatives are another aspect, as one could expect, one of the core difference between mainstream and green VCs.

Old-style VCs usually include environmental issues in their investment decision procedure as a risk factor only. Environmental issues are seen as a risk carrier or a potential liability to

the start-up. Often, external consultants are hired to assess environmental risks related to the specific potential investee company in due diligence procedures.

Sustainable VCs, on the other hand, consider that capacity in eco-innovations have to add value to an enterprise, besides the risk reduction factor. Hence, it can be said that green VCs have the potential to generate double profits, the creation of both low environmental impacts and financial returns. After targeting eco-innovations, the decision investment procedure is basically the same as in the mainstream VC industry.

The last main difference between the two types of financial investors is found in the type of target investment. In the 2000s mainstream VC managers tend to invest in fast growing sectors, such as IT or communications. On the other hand, data of the study shows that green investors currently invest in the following groups of technologies: wind, solar and wave energy; desalinization and water recycling; organic agriculture; fuel cells and industrial process technologies.

The study mentioned above have also analyzed the possible issues, very up to date as well, which prevent a good relationship among eco-innovative entrepreneurs and green venture capital. However, we have to consider some adjustments because in the recent years several improvements was settled. The most prominent barriers are:

- *Lack of a proper network.* Since entrepreneurs and VC firms normally find each other via active networks, the lack of a good network can certainly represent an impediment for the start of such relationships.

Today, many network are created to meet the needs of both parties. Groups, formal networks and incubators existing as meeting point.

- *Different meanings for “sustainability” and “environment”.* Many eco-entrepreneurs and green investors mentioned that environment and/or sustainability is perceived as less profitable, and even as a costly burden, which hampers the chances of getting funding. However, the increasingly perception of social environment, existing in the market nowadays, bring important investments from big companies and important philanthropies, as mentioned in above sections, even if it is truth that be green is viewed less profitable for the really slow process of transformation and production.
- *Lack of a good business plan.* According to some venture capitalists, funding for startups is often refused because entrepreneurs submit a bad business plan. For venture capitalists, a bad plan reflects an incomplete or inconsistent business concept, a lack of essential data.

- *Lack of expertise and skills.* Lack of skills and expertise is a problem on both sides of sustainable investment. On one side, the research showed that fund managers refused to finance eco-innovations because they did not understand a particular technology or the particular industry which eco-entrepreneurs wanted to enter. On the other side, venture capitalists have the opinion that founders lack the business skills, such as marketing, management or financial competences, which are necessary to run their businesses.

This is a problem that has always been among the parties. However, in the recent years increasingly VC are specializing in a particular sector and hiring consultants to reach the best knowledge for investments in the right technology.

- *Lack of potential market breakthrough.* Many eco-entrepreneurs are refused financing because their technology seems not to have the potential to be commercially viable within the time expected by investors. Financing may also be refused for start-ups that are expected to compete in a mature industrial sector.

This is the main question that all investors have to ask themselves, from hedge fund to angels. They have to understand if it is worth to commit their capital, and so the investors' committed capital, in that disruptive startups because it has the potential to affirm itself in the market or avoid doing so.

According to the existing problems presented above, when compared with the broader categories of VC, green VC is expected to have some intrinsic uniqueness. Obviously, there are also many common issues faced by both types of investment. Because green VC is, in essence, a niche market in the broad area of VC investment.

In any case, we have to assert that many of the problems faced by green VC are resolved compared to the past as the field becomes more sophisticated and the market has learned about the business opportunities within sustainable development.

Apparently, recent big deals success in sustainable industry have boosted a lot the attention and capital towards earlier stages of financing start-ups. The investments industry have learned and needs to learn more about eco-innovations companies with the respective technologies. On the other hand start-ups have learned how to meet the two demands through different communication channels, as networks and incubators, and need to keep on learn about sustainable VC and other innovative finance mechanisms.

We know that the sustainable start-ups have many loopholes with high risks associated with them. As a consequence, financial investors that operate in one of the riskiest zones of investment, they expect to be compensated for this risk by high returns on their investments.

Furthermore, after a sustainable alternative fund successfully sells the shares of eco-oriented start-up in the stock market, by exiting the investment, it certainly will be in a better position to justify the investment in eco-innovation, as well as to attract more investors.

In this respect, a “sustainable company” would be a selling argument for investors, where it lowers costs and liability risks, as well as demonstrating an interest in creating value over the long term. All of this brings to an increasing number of investors searching for sustainability attributes in companies.

### **3.2.2 Sustainable protein funds**

According to the argument of our thesis, related to the alternative meat industry, **sustainable protein funds** are established and are linked to a sort of green investment company, which was explained in detail above by relying on two studies. They are principally found by venture capitalists with specific mission of sustainability in food protein industry, for improving the environment and health of the whole society.

As we have already seen in the first chapter, the global food system, which includes meat sector, provides billions of people with energy, protein and other nutrients to support daily life. Yet, it is also a major source of greenhouse gas emissions, it is depleting natural resources and fails to secure healthy diets for all communities around the world. For these reasons and others, there is an urgent need to transform the food system, especially the meat industry, to achieve sustainable goals.

Central to the discussion on transforming the global nutrient system is protein. Proteins are essential for the human body; therefore, consuming adequate protein is vital to ensuring basic human health. Generally, in developing regions many people today consume more protein than biologically necessary. This overconsumption of proteins is charged on a greater consumption of animal proteins instead of plant proteins.

Therefore, in developed countries, there is a clear need and a tremendous opportunity, to reach the right protein levels and rebalance the protein mix by promoting the production and consumption of plant proteins products and lab-protein alternative to traditional meat.

As such, many strategies to achieve a transformational shift in the food system are viewed as an opportunity from the entrepreneurial side, as well as many venture capitals are necessary to develop this sustainable global system to ensure the accessibility for people across different cultures and incomes. Thus, venture capitalists see a big opportunity to shape the future and at the same time make high profits with the new disruptive technologies in the industry, and so be able to attract many institutional investors to their doors.

The right way to do it is to setup specific funds, known as *sustainable protein funds* or *alternative protein funds*, which aim at investing in all of early stage companies related to protein food, like some already describe in above sections, that have a good idea, innovation and products to penetrate the market, and make “sustainable profits”.

Nowadays, more and more venture capital around the world is focusing on alternative meat industry, and so in the sustainable protein products.

Especially during and after the COVID-19 pandemic the attention was driven on healthy food. The pandemic has started to erode confidence in the supply chains for traditional animal protein and the virus has also highlighted possible issues for the supply chains for the plant-based products. This means that plant-based food unfortunately is not a wholly secure product, overall if there are shocks to the system like in this period.

Forecasts are hard to make, and let us remember that none cell-based protein products are actually in the market due to their high development costs and because they are at inception of life cycle sector. However, it is this kind of scenario-planning that could be critical in the type of returns which VC funds could make from the great rush to alternative proteins.

For all these reasons, many fund managers have settled up the so-called sustainable protein funds: they are funds mainly created by venture capitalists, which investing in early stage plant-based and cell-cultivated meat companies that detain a vision of sustainability in terms of food, in some cases can include diary and fish companies as well.

These type of funds works in the same way that a normal and traditional fund of a venture capital operates. Identify the most promising star-ups in the plant-based and lab-grown food that can disrupt the market, investing money, that correspond to the committed capital of institutional investors, in exchange a percentage stake in the business. Helping them to develop their brand with the aim of exiting after some years through selling the company to another fund or listed it through an IPO, thereby gaining profits to distribute.

In any case, we discuss more in deep the sustainable protein fund system and the related alternative meat industry in the last chapter. Interviews and survey will be submitted to several financial investors in this sustainable industry, where we could have right definitions and information about alternative protein funds from the fund managers involved.

### **3.3 More green more profits**

Building a green company in the recent years has become very common. Many entrepreneurs has chosen to be green to contribute to a better world and try to exploit a new emerging market. If one part has decided to set up a startups towards selling sustainable products, on the other hand the venture capital did not just stand back and watch.



From the investing point of view, many financial investors have decided to drive their fund with properly green mission, especially in the function of new entrepreneurial firms arose in the sector.

Green ventures represent a way through which entrepreneurship can fulfill the call for a greener and more environment-friendly business orientation, providing practical and innovative solutions to environmental problems.

As a result, the number of born-green ventures is growing fast, leveraging both economic and environmental benefits, and such ventures have attracted the attention of both policy makers and venture capitalists.

However, these new companies still face severe capital constraints, at least comparable to the ones of all the other new high-tech innovative ventures. The barriers are caused by the existence of information asymmetries between ventures and capital markets, particularly the credit ones.

Debt capital providers are typically not able to cope with the above challenge and rarely engage in financing high-tech ventures, which results in venture capital firms being the most suitable financial intermediary to provide capital to high-tech entrepreneurial firms according to (Gompers & Lerner, 2001).

Thus, ventures need to compete for the scarce financial resources and signal their quality to potential investors. By doing that, they can distinguish themselves from the pool of other ventures and secure the investment of private investors, as venture capitals.

VCS may more likely invest in green ventures, compared to other high-tech ventures, because green activities represent emerging and promising businesses, also legitimated by media and governments.

On the other hand, green companies may lead to higher risk, uncertainty, and both technical and managerial complexity, compared to the other high-tech ventures, due to the nature of the environmental technologies and the early stage of the sector.

We refer to green ventures as high-tech ventures using green technologies in their businesses or offering green products or services. As such, green technologies comprise a wide range of innovations, including renewable technologies using renewable energy sources, energy storage, distribution and management technologies, recycling and waste technologies, industrial processes, and technologies for capture, storage, and treatment or disposal of greenhouse gases, more precisely in our case the green venture are all companies that contribute with their products to revolutionary the food sector, especially the meat industry.

More broadly, green technologies are defined as technologies that provide, directly or indirectly, environmental benefits when compared to the traditional used technologies that they are supposed to substitute.

Despite the fact that green technologies and products or services have been under development for the last couple of decades, the so-called green sector is still argued to be in its nascent stage in terms of commercialization and market acceptance. The green paradigm has gained a prominent relevance relatively recently with the urgency of climate change and severe depletion of natural resources.

In the last years, insufficient attention has been dedicated to understand the ability of born-green ventures to access external finance and whether their characteristics may act as market signals for external financiers. This financing issue appears to be extremely relevant because this new companies are capital constrained, despite of favoring regulations and active governmental support directed to environment-friendly businesses.

VCs are considered to be the most suitable source of capital for high-tech ventures, including the born-green ones. Worldwide investments in the green technologies significantly grew and the share of green deals as a percentage of all VC deals has risen for an order of magnitude from 1 to 10% from 1996 to 2010 according with (Cumming, et al., 2013).

In the case of green high-tech ventures, ambiguity is coupled with considerable uncertainty derived from the extremely high technological and managerial complexity, the longer investment duration, and the strong reliance on strictly regulated markets characterized by regulatory volatility and unstable prices.

VC firms desire to invest in emerging sectors to capture a potential big idea and meet high expectations for their limited partners, which tend to be subsequently emulated by other investment firms, who typically follow the leading trends set by the most reputable ones.

The green businesses and related technologies by their nature entail high risks, yet coupled with the promise of supersized returns. Moreover, the combination of accelerated depletion of natural resources making the prices of the resources unstable and global warming making the environmental regulation progressively more stringent provides strong incentives to invest in green technologies. This means that with market pull and policy push mechanisms for the green businesses are expected to strengthen by time.

Finally, VC partners might find investing in green ventures more appealing even for ideological or emotional motives.

In order to better understand the relationship among green ventures and green VCs, we are going to analyze a study made by (Mrkajic, et al., 2019), which tested whether born-to-be-green represents a signal toward potential financial investors on a sample of independent,

unlisted, high-tech entrepreneurial firms. The study made two hypotheses based on all declarations above described: 1) Born-to-be-green is a positive signal for VCs and increases the likelihood to receive capital, when compared to non-green ventures; 2) Born-to-be-green is a negative signal for VCs and decreases the likelihood to attract capital, when compared to non-green ventures.

The first hypothesis is driven by all the factors described above, which highlights the advantages to invest in the green ventures when they are set up for specific purposes. The second hypothesis highlights the opposite, and the reasons are several. First, green technologies intrinsically entail extremely high technological complexity, as a result, the complexity accentuates the causes of capital market imperfections. Second, as the green sector is in its infant stage, the managerial slack is inevitable, thus increasing the uncertainty of the new venture success. Third, green ventures, even when successful, typically require longer time than non-green ventures to become profitable, causing the extension of the investment duration, that exceeds the traditional time-to-return, approximately 7-8 years, VCs promise to their stakeholders. Fourth, the green sector is different, green IPOs have historically been extremely rare and so risky exit opportunities might create too high entry barriers for VCs. Lastly, as in any other emerging sector, there is an important lack of historical track-record for green investments, and a lack of proven frameworks for evaluating green ventures' potential.

Finally, the study has tested the hypotheses, illustrated above, on a sample of 361 Italian, independent, unlisted, and high-tech entrepreneurial firms that are less than 25 years old, founded between 1983 and 2008. At the end, the results showed that born-to-be-green does not influence per se the likelihood to receive funds. In other words, other things being equal, ventures that perform green-based activities and use green technologies are not more likely to access the VC market. However, the study find that entrepreneurs who run an immediately green business, do not transform it later and position their venture in a green sector are more likely to get VC funding, with an estimated marginal effect of + 7%.

### **3.3.1 Funds and profits on sustainable protein market**

In relation to our thesis, now we assert about the possible profits made by venture capital funds when they bet on the alternative protein start-ups, and the attention moves towards this new industry for the future ahead.

We have already illustrated all the motivation that this last crisis brought advantages to the alternative meat industry, in terms of customers and investments.

However, it is usual that during times of crisis, investors used to retreat into tried and trusted safe havens, such as gold or long-dated government bonds, while sustainable investing was viewed as a fashion or something of a luxury during uncertain times.

On the other hand, companies taking care of their stakeholders while monitoring externalities are benefiting from their commitment. Funds investing in companies with strong environmental, social and governance (ESG) policies have outperformed their benchmarks not only this year but over recent years. From a risk management perspective, backing those companies is logically the right decision to make.

In the previous sections, we have evidenced those companies which performed well during the recent years and height of the COVID-19 crisis have demonstrated superior product, health, safety and workforce policy scores. Firms that truly value their stakeholder relationships will be well placed to emerge stronger from this crisis.

It is increasingly likely that in an environment where cutting dividends is both financially prudent and “the right thing to do”, we could see more private alternative funds investing into solutions both innovative and virtuous sustainable instead of maintaining their investments in legacy businesses that we know offer decreasing profitability.

In this setting, sustainable investment funds are confirming their efficiency in managing underlying risks and delivering more resilient returns, precisely because they support and finance companies acting for the wellness of the planet and society. For investors, there is a clear rationale and opportunity to consider sustainable investment funds as those investments capable of delivering robust returns in a post-COVID environment.

For all these reasons, bet on alternative protein startups is the right choice to make profits for venture capitalists nowadays.

Indeed, alternative protein startups had a big year in 2019. The sector had its first IPO, its first unicorns<sup>14</sup>, precisely Beyond Meat before its public listing and Impossible Foods reached the “title” in this year after the latest fund-raising rounds. Moreover, a raft of new products hitting and expanding into the market through numerous channels, including grocery stores, food producers, and fast-food giants.

Globally, meat production is expected to continue increasing, but that does not mean we are all inflating the significance of the meat alternative consumption trend, however. The number of conscious meat consumers, “flexitarians” and “reducetarians” is also rising, and with them the demand for ethical and environmentally sustainable alternatives to factory-farmed animal products.

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<sup>14</sup> A unicorn is a term in business world to indicate a privately held startup company valued at over \$1 billion.

According to the site F&A Next, more than 16 billion in venture capital funding backed alternative protein companies between 2009 and 2018, which 80% of that has been invested since 2017. A number of new funds launched this year, pledging to support the growth, and drive a profit, from the alternative protein sector, including AgFunder's own New Carnivore fund. Private equity firm Paine Schwartz is eyeing the plant-based revolution with \$1.5 billion fifth fund.

Corporate food and agriculture giant Cargill, meat heavyweight Tysons and others have been investing in the sector directly and through corporate venture funds.

This eruption of activity did not come out of nowhere, but it has been simmering for years. US based meat-free burger giants Impossible Foods and Beyond Meat launched their products in grocery stores and restaurants back in 2016, when alternative protein companies comprised only \$160 million of the \$4.6 billion global agri-tech market.

What is happened in the past few years is a remarkable diversification of the meat alternatives market. Two plant-based ventures, Impossible Foods and Beyond Meat, may dominate headlines, but a notch down from them and from their visibility and financial aspect are established other companies addressing consumer demand for alternative protein products from a multitude of angles.

This revolution created an emerging trend, where others in the meat alternative side of the market are using funds raised to convert existing animal-based farming and processing facilities into manufacturing units for plant-based and cellular grown alternatives.

The products inside of alternative protein startups are not totally making grow out of the ground, even if their base ingredients are plants. They could be processed and engineered to a significant extent in many cases. But cultivated meats take food engineering to an entirely new level. Companies like Memphis Meats in the US and Meatable in the Netherlands are using animal cells to grow actual beef, pork and chicken products that do not require any animals to be slaughtered.

None of these companies' products have yet made it to market because they have still prohibitive costs, costing hundreds of dollars per pound to produce. But some believe that with more investor support, they can get pricing down to below \$10 per pound. Consumers and investors alike will find out soon.

The numbers, indeed, justify the vision and investment that many alternative private funds have decided to undertake.

According to the site Bloomberg, a record of capital was invested in companies which produce plant-based meat and dairy alternatives or cell-cultured meat during the first half of year 2020.

Hoping to find the next Beyond Meat, venture investors have more than doubled their bets on alternative protein makers this year, raising more than \$1 billion from institutional investors for startups that focus on everything from lab-grown meat to protein derived from plants.

Producers of plant-based meat, egg and dairy alternatives raise around 80% of the total in funding at the start of 2020, while cell-based meat companies received in funding the remaining 20%.

More specifically, the most important alternative meat startups raised about \$1.4 billion from venture investors in the first seven months of 2020, according to a report of Farm Animal Investment Risk & Return, mentioned in the Bloomberg's article. Venture investments in plant-based meat and dairy alternatives soared to \$1.2 billion this year, up from \$457 million in all of 2019, while investments in companies that grow cell-based meat more than tripled to \$290 million from \$75 million last year.

The venture investors backing this space range from companies like Cargill Inc. and General Mills Inc. to pension funds, but they are mainly venture capital firms. As a group of investors, they are betting that faux meat can scale up production quickly to meet a new generation of climate-conscious eaters, but companies also have to invest heavily in marketing and technology to help replicate the look of a hamburger.

Venture investors are hoping to replicate the performance of Beyond Meat Inc., whose shares are up about 400% since its initial public offering in May 2019, so they are backing a wide variety of startups.

This year's biggest funding deals included Beyond Meat rival Impossible Foods, which raised \$500 million to support expansion of its vegan burgers, and with last round has reached a valuation nearly \$2 billion.

Investors also are providing financial support to alternative protein makers that are not as widely available to consumers, including the \$161 million for Memphis Meats, which grows cultured meat from cells in a lab.

However, even if the green sector, and in this case the "green" meat could be the new heaven to beat the financial market in terms of profits with participate in a global social life change, the risks are still very high. Entrepreneurial ventures bet in the space are still risky as low percentage of startups mature and compete with each other for customers. In addition, there is also the increasing presence of big food companies such as Tesco and Unilever.

Nevertheless, alternative meat industry is flying off the grocery shelves amid concerns about recent pandemic. Often is not mentioned as much about the novelty and power of these products, plant-based meat and especially lab-grown meat. They are convenient, create

excitement, and they are adaptable to many customers. There are no barriers to expand, because are suitable for any diet.

In effect, plant-based meat purchases rose more than 200% during the year and, as highlighted in the first chapter, the market will reach around \$20 billion by 2025 and this results in a broad opportunity for venture capitals to invest immediately.

### **3.4 Sustainable funds as accelerators for sustainable start-ups**

Nowadays, to address global sustainability challenges, major investments are required in sustainable businesses that deliver social and environmental results. Although interest in eco-friendly businesses is rising a lot in the recent years, these enterprises are not yet common and widespread. Venture capital investments have a key role to play in the development of sustainable start-ups.

Besides the financial support, venture capitalists provide business advice and network support. Key success factors should include a well-known business model innovation, collaborations and a strong long-term vision, whereas failure factors derived mainly from lack of suitable investors, a strong incumbent in the specific industry and a short-term investor mind-set. Sustainable start-ups should focus on social business model innovation, find opportunity in new technology, funding platforms and develop multiple business cases to create success beyond the green and social movement.

The role of sustainable venture capitalists and their alternative private funds is that of help prove the success of sustainable enterprise formats, mitigate financial risk through targeted investments and exercise patience by balancing financial with social and environmental returns.

Generally, venture capitals are in the first line in nurturing entrepreneurship and new ventures. In fact, entrepreneurship has been recognized as a major conduit for sustainable products and services, and new ventures are viewed as an answer to many social and environmental problems. As such, venture capital may be viewed as an important catalyst to develop sustainable businesses, those that contribute positively to the environment and society while generating a profit.

A growing population, associated with changing consumption patterns creates significant pressures on health, welfare and the natural environment. To create a sustainable global society, the development of billions of people needs to be addressed. Many problems must be solved in the next few time, such as agricultural productions will need to be doubled without increasing resource used, deforestation need to be halted while increasing yields and lowering

livestock breeding, and carbon emissions need to be decreased worldwide while delivering better solutions for doing it.

One of the common misconceptions has been that sustainability is equal to “a waste of money” and it is only a capital cost without return. However, the reality is different because even if the focus is towards the social benefits that could be implemented, this does not mean that profits are not created, on the contrary they are linked to these types of challenges.

Usually, companies that seek to protect and enhance their supply of natural and social capital will gain a competitive advantage in the coming years. Hence, sustainability can also be viewed as a good business opportunity.

Smaller sized organizations are resource scarce, have a lower degree of formalization and lack of public visibility and reporting priorities, but a dynamic, entrepreneurial style of management and the closeness of the managers to the innovation process can drive sustainable innovations. Indeed, SMEs and especially start-ups, can be the ideal incubators for eco-innovation, and can bring to new market, less environmentally damaging products, services and processes.

Principally, eco-innovative start-ups differ from conventional start-up companies in their pronounced value-based approach and intention to initiate social and environmental change in society. They try to seek to manage the so-called triple bottom line: they balance economic health (economy), social equity (people) and environmental resilience (planet) through their venture behavior.

Therefore, sustainable financial investors with their sustainable funds, who contain committed capital from institutional investors, have the difficult tasks of identifying businesses, which have the potential to generate economic returns while creating positive environmental and social impacts. Rather than only maximizing profits, the triple bottom line needs to be considered, which creates challenges for investors.

Other actors can support growing businesses, as governments and corporation. Governments can operate directly either as a venture capitalist or indirectly through policies to make investments in sustainable ventures attractive. Corporate venture capital refers to equity investments of large corporations in entrepreneurial ventures, which originated outside the corporation with a globally view. However, since that the main ventures that are innovative and can bring to a better society with its solutions are young and in the early stage of their life cycle, as could be cell-based players in the alternative meat industry, venture capital funds continue to be the first source of financing.

In relation to our thesis about alternative meat industry, we can refer to the study made by (Bocken, 2015), because they are a specific type in the sustainable industry with players from



buy-side and sell-side point of view very similar to other sustainable realities. The paper could be the base for a wide understanding about the relation between sustainable financial investors with their sustainable funds, especially venture capitalists, and start-ups that are pioneer in a friendly eco-system. More precisely, the impact role that venture capitals have on ventures.

The process actuated in the report was to interview several sustainability venture capitalists, sustainable entrepreneurs and accelerator platforms about the theme mentioned above.

After collecting data from interviews, other important data was extrapolated with some supplementary websites and reports.

The results discovered that the key role of venture capitalists, in addition to the primary purpose of providing funding, is to use their business awareness to help start-ups develop a strong business case while creating positive impact on society (e.g. health) and on the environment (e.g. significantly reduced waste and air pollution).

The interviewees recognized that the power of incumbent firms provides an important barrier to a young firm's success and that most start-ups “just fail”. Therefore, the role of venture capitalists is to assist in providing financial support, develop an understanding about the market and the demand for a product with expertise making early connections with customers. However, even if this study is very in line with the argument of thesis, in the next chapter, through an empirical analysis aim at engage several fund managers, we are going to analyze more in deep the perspective of financial investors in the alterative meat industry.

#### **4. EMPIRICAL ANALYSIS**

In the past few years, socially responsible investments have emerged as a successful type of financing model. Apparently, environmental innovations established by ventures have only recently caught the attention of important financial investors, especially who works through alternative investments.

With regard to the sustainability, the emerging alternative meat industry have its importance in the society and in the investments sector nowadays.

A growing population paired with changing consumption patterns creates significant pressures on health and on natural environment. Many problems about the traditional meat production, already deep illustrated in previous chapters, have to be fixed to create a sustainable global society.

The development of billions of people needs to be addressed, the cost of externalities need to be lowering, agricultural production need to be increased without waste more resource, deforestation need to be halted while use it for yields, and carbon emissions need to be drastically reduced while continue the food production.

Therefore, major investments are required in sustainable business that deliver alterative meat production results, in order to address these global sustainability challenges.

Although the interest in this new type of business is on the rise, on the other hand this market are still in its inception and so products are not yet widespread.

The research area for creating the right product in the alternative meat industry is still emerging, especially in the cell-based segment which they are experimenting in laboratory and only financially backed by venture capitalists for the uncertainty that characterizes them.

Instead, plant-based meat ventures are in the market for much longer and their products are already in the restaurants and supermarkets' shelves. Therefore, being in a more developed phase, the financial investors are composed mainly by venture capital fund because the products are new and always looking for a better taste, but the support and interest from some private equity has become more present.

The thesis has deepened into the novel industry of the sustainable meat production, pointing out the difference between plant-based and cell-based product, the disposal of the market and the future expectation about it. Subsequently, a literature about the principal financial investors was covered through all its aspects and then a focus on the sustainable and green financial investors with their funds was illustrated, especially the sustainable protein fund concentrated for the revolution on the meat industry. The dissertation also covered the main

problems faced by the production at the moment as well as the potential interest from alternative investment funds on this type of ventures.

In this last part of the thesis, we are going to analyze and better understand all aspects of the alternative meat market through the financial investors' perspective. Finally, an open questions survey with all relevant topics of the industry was established and sent to a list of venture capital and also some private equity to get an overview from their point of view.

#### **4.1 The scope of the analysis**

One of the main mechanisms for financing the innovative meat ventures is through alternative investment funds. Mainly, they are composed by venture capitals and private equities due to the highly uncertainty of the sector and the early stage in which companies reside.

Increasingly, financial investors is being directed towards entrepreneurial ventures which demonstrate various aspects of eco-improvements and social benefits in the alternative meat manufacturing.

This recent interest in the sustainable protein sector shown by investment funds could be an effect related to the popularity of socially responsible investments and the huge problems that actual production continue to create. So far, this importance was undervalued and only few financial players was involved.

However, the phenomenon towards an exchange among normal meat and sustainable meat is getting stronger and so the amount of capital available to bet and invest in the industry is increasingly wider. A rapid proliferation of investments for the opportunity to make profits with a contribution of a better healthy society has resulted in an increase of assets under management and interest from venture capitalists.

For these reasons, establishing a list and getting in touch with principal financial investors in this novel industry is fundamental to understand the market, from demand and supply point of view. Indeed, they have a well knowledge about it because they have to analyze all pro and cons of the sector before investing in it.

This research investigates about the role that sustainable venture capital and private equity investors have on the niche of sustainability in the alternative meat industry, the information owned about the industry and their investees, key success factors and risk factors of the sector and the development of these products around the globe.

The analysis lies on the discussion with a number of financial specialists in the alternative investments' funds in the United States, Europe and Asia as well.

Initially, a search online through papers and articles was made to identify them, but being a private information and emerging sector the names displayed were very few.

Therefore a deep analysis through two M&A database Mergermarket and Capital IQ was activated in order to complete a right list of important financial players in the industry.

After reached the fund and receive the answers about the questions asked in the survey, the scope is to extrapolate all the data and information provided by the principals and partners of the designated investment funds.

All the information analyzed have been compiled with websites, company materials and other online interviews, thus subject a further reduction of bias of data. At the end, it will yield some results that confirm the already data highlighted in the previous chapters and new information will be discovered, analyzed and make a conclusion on them.

## **4.2 Research method**

Several studies have been conducted on cleantech and sustainable field. Specifically, on sustainable entrepreneurship and the role of some financial investors. However, the alternative meat industry is an emerging phenomenon and blew up in the recent few years, thus understanding all the aspects of this new industry and the role of financial players is still evolving. Indeed, it is difficult to find papers or research that treat this argument and the only data that you can find are referred to online article and interviews made principally to players that produce the alternative meat products and rarely from the investment side.

As already highlighted, sustainable protein ventures have quite different motivation and skills sets compared to conventional ones as well as sustainable venture capitalists with other normal private financial investors.

It is expected that sustainable financial investors, especially who invest in the alternative meat sector encounter specific challenges and opportunities to make profits while improving the supply chain and turn the tide for some existing problems.

In this empirical analysis, an inductive research method was used to investigate the knowledge, information and role of financial investors in contributing to sustainable protein meat ventures success.

Before searching for interview targets, it was necessary to identify the main players in the industry among the companies. More specifically, it was necessary create a list of names with the most important cell-based and plant-based players in the market, so that they can be used in the databases to identify those who had decided to invest in the company through a private agreement, since that the industry is still emerging and only one is listed.

After that, in order to gather more information about the industry and having a more specific clue of all aspects of the market, a semi-structured survey with essential open questions (twelve in total) was structured and sent to a contact of the sample of investment funds selected from a deep analysis on dataset and online articles. Given that the financial investors involved in this type of industry are not very large as numbers and capital management, and at the same time they are widespread around the world, the best solution to reach principals and partners in an easy way and increasing the ability of devote time to reflect and give a response was that of a direct email and direct message in a professional social network.

The questions was established in the shape of survey with the feature to be direct and accurate, in a way to be suitable for the thesis and give significant results from the point of empirical analysis.

The analysis of the primary list from databases of sustainable financial investors took place between June and September 2020, while the collection of data based with the contact of investors took place among September and October 2020.

To better understand the overall functioning of the alterative meat industry, the dynamics of the sector from the demand point of view, the macro-trends, competition and entry-barriers, success and failure factors, and the role of the involved financial investors, venture capitalists and principals in private equity firms were contacted.

The financial investors selected may not be described as the typical managers of funds, but rather those who want to make “sustainable” profits with their investments.

These investors may be referred to as “sustainable financial investors”, so investors that make an impact in the society. This particular group is still relatively small, because who decide to setup a specific fund to invest in the alterative protein products as could be the alternative meat industry, is difficult to identify especially for the pre-mature market and undisclosed private transactions in it.

However, a tailored technique was applied to discover the main financial players involved in the novel sector and starting a contact with them through a suitable open questions survey.

During the last months, the analysis was structured to be as efficient as possible and two phases regarding the identification of the contact list through an analysis of databases and the data collection with a subsequential analysis was established:

- **Phase one:** this first phase consisted of identification the main product players in plant-based meat and cell-based meat industry for utilizing them as reference in the databases and discover the financial investors that has committed capital in them. Two

databases have been used for the research: Mergermarket and Capital IQ. Furthermore, article online of important economic sites as Bloomberg, The Economist and many others was used to adjust and expand the list. After all, several Excel downloads in a deep analysis were analyzed to identify the right financial players and subsequently the excellent analysis a short listed of 61 funds with their contacts was created.

- **Phase two:** this second part of the analysis consisted of creation of the open questions survey, getting in touch with investors identified in the previous phase, collecting and analyzing the information received. These contacts included the more active investors in the alternative meat industry, especially venture capitalists because the early stage of the industry and some principals of private equity funds, but excluding angels and hedge funds for the difficult to reach them and avoid distortion for the thesis.

The data analyzed from the survey were accompanied with some supplementary data, such as reports shared by interviewees and article in their websites, to minimize possible bias and have more information at disposal.

The following sections will describe the precise method and databases utilized to find the right financial players, the way of the contact and the field of the industry covered by the survey.

#### **4.2.1 Identifying the financial investors to be analyzed**

Sustainable venture capitalists and other type of investors involved in financing, establishing and influencing the growth and development of ventures in the alternative meat industry were identified and invited to compile the open questions submitted through a survey.

First of all, a list of main active companies in the plant-based and cell-based meat industry was identified. The names were found and shortlisted through reports, paper and many online article about this new market.

After accomplish this task, the next step was to select the properly M&A databases that could be useful to detect the potential investors for the argument of thesis.

At the end, having the opportunity to access prestigious databases used by professionals' companies operating in corporate finance, the designated databases were essentially two:

- **Mergermarket** is a huge professional M&A database, owned by The Mergermarket Group, that is a media company specializing in corporate financial news and analysis. It provides the advisory, corporate and financial communities with actionable financial intelligence, analysis and data. Mergermarket subscribers include more than 3,500

advisory firms, investment banks, law firms, hedge funds, private equity firms and corporates.<sup>15</sup>

- **S&P Capital IQ** is a professional software and analytics related to the market of Capital IQ that is the research division of Standard and Poor's. It provides detailed research and analysis of the stock market to a variety of investing stakeholders. Capital IQ's web portal offers various software and data feeds to advisory firms, banks, corporations, investment managers, private equity funds, universities and more, providing overall market awareness and investment analysis.

It investigates financial news, market insights, company performance data and sector-specific data. The firm provides subscribers with intelligence on more than 62,000 public companies and 4.4 million private firms.<sup>16</sup>

In order to exploit the capabilities of the databases, several key words related to the alternative meat industry was used, such as “alternative meat”, “sustainable”, “alternative protein” and many others. In addition, the list of key players ventures in the market prepared some time before was utilized as a resource to find its investors.

One company at time was insert in the research bar to identify all the private transactions and investments made by venture capitalists and private equity funds.

Subsequently, several downloads of M&A transactions related to the characteristics inserted was managed through the use of Excel, so as to filter the financial players that really have a connection with the alternative meat market. In addition, having used the tools present in the software that allowed to skim the various investors, personally a second check was carried out on the various funds, which included looking directly on each website in the portfolio section to identify whether and in which alternative meat ventures had or have an active investment.

After doing this deep analysis, many investment companies have been excluded and also few hedge funds with billion of assets under management which invest in all possible stages of the life cycle of the company, such as early/mid/late stage, were not taken into account for the difficult to contact them and could bring distortions regarding the purpose of the dissertation, as well as for angels investors for the same reason.

Finally, the short list of 61 financial investors with offices in United States, Europe and Asia was created through the right selection of names on databases and inquiries on websites, this analysis was refined with materials found online in important economic sites related to interviews and studies made on the new meat market production.

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<sup>15</sup> <https://www.mergermarket.com/info/about-us-mergermarket>

<sup>16</sup> <https://www.spglobal.com/marketintelligence/en/solutions/sp-capital-iq-platform>

#### **4.2.2 Open questions survey, contacts and collecting data**

The open questions survey is the measuring tool intended to collect information on the fields that are the subject of interest for the argument of the thesis, consequently its correct preparation is fundamental so that the questions are free from errors and are arranged according to an efficient, but above all an effective structure.

It is a phase that should not be faced superficially since even the smallest nuance they can cause distortions and not insignificant variations in the results, as well as errors in the phase data collection for a misunderstanding about demand. In addition, the questions in relation were conceived in a concise and direct way to have an efficient answer and not be vague to waste time for those who gave the availability to fill in the various questions.

Based on the resources, the time available and the objectives, the best possible choice it was an open questions survey, as mentioned before, composed by twelve issues.

This type of survey is the best solution because is not a proper interview, but at the same have the same features because the time, commitment and the answers that the respondent must provide are very similar with a face-to-face interview.

Furthermore, this method had the preference above others for this type of thesis because take into consideration three reasons: (i) that financial investors involved are spread in different countries, so difficult to schedule in the right time a possible online meeting; (ii) the universe of target respondents is limited, so it is desirable that each investors involved deliver a wide range of information; (iii) and more important thing that drive this important decision is the time that principals and managing partner of the funds could dedicate to compile the whole survey to contribute with their information about their knowledge in the alternative meat industry.

To create the form to submit the open questions, I used Google Module, a powerful online survey software for the preparation of all the kind of questionnaires, data collection, data analysis and sharing of results. This online tool is very famous and used by many students, university and professionals for the intuitiveness and ease of creating what you need in short period of time without neglecting the importance of the research.

This choose was driven by the fact that this survey tool as its basic version was available for free and in addition being related to cloud computing system, the results can be viewed in real time and if necessary a possible modification could be implemented. Indeed, even if in the presentation of the survey, that was sent to all contacts, I have highlighted the fact that the information received was protected by privacy and not revealed to third parties because they are used only for academic purpose, many of those who answered ask me to be anonymous and so the only change made was the possibility to respond confidentially.



Generally, in cases of self-compilation, especially in case of structured survey, mainly quantitative and composed by multiple choice questions, which is not our case because it is composed by open questions and mainly qualitative, the main problems are the low rate of response and self-selection of respondents. In fact, we obtain information that risks being not always fully representative for all the participants selected. This happens because the characteristics and knowledge of respondents may differ from those of non-responders. Another problem is the impossibility of predicting the exact number of respondents.

Especially, in the case of open questions survey the limitations could be the difficult to analyze the findings because compiling results into tables or chart should be difficult being more qualitative questions, and if the issues are not write in a simple way and too much vague the respondents could be frustrate with their responses.

However, our survey is more structured as an interview because require time and commitment from the participant to answer to open questions. Therefore, the low rate of response mentioned before is not fully right in this case, a rate that is not much high is significative anyway because the answers are full of information than a classic structured survey.

The advantages are not lacking. Letting people answer in their own words can be empowering. Give your respondents the opportunity to really express their knowledge in a freeway. The absence of the interviewer allows you to avoid conditioning and the interviewee can choose the best time for reply. Furthermore, the data collected remained confidential and were treated anonymously, given the possibility to de-identifying the answers make the participants more likely to respond. From the point of view of the costs of data collection, they are very limited, and the time needed to filling out the survey is much lower than a face to-face interview. Finally, the possibility of error is reduced to a minimum, thanks to questions previously adjusted and reviewed many times in such a way as to be direct as possible and avoid any difficulties or doubts.

The survey is composed by twelve open questions that try to cover all important aspects of the alternative meat industry, to better understand it thorough the point of view of investors.

Principally, the main fields that demands treat are referred to trends of the market, key success factors and risk factors, all aspects of demand such as entry barriers, competition and other matters, financial investors' perspective about their subsidiaries, geographical presence and outlook of the new industry, and a final question about the alternative meat market in Italy.

After the preparation of the online form for the questions, it was checked and revised several times, so as not to overlook anything important and to make it as clear as possible. To

encourage active participation of the principals and managing partner in the compilation, it has been sent together with the link useful for compiling the survey a short presentation of the entire thesis project, explaining its nature and the purposes. In addition, to respect the privacy it was underlined that the information provided will be used only for academic purposes.

Once the presentation letter and survey were ready, the next phase of sending e-mails through my university account was activated and also a direct message with the professional social network LinkedIn to which I could not reach by e-mail because not available, giving them some time to response, after which a second sending, aimed at soliciting, was activated.

### **4.3 Findings**

In this second part, the results obtained from the open questions survey will be presented, addressed to the perspective of the alternative meat industry from the more important and selected financial investors (venture capital and private equity) point of view.

As already mentioned above, the research method was originally divided into two parts: the first part consisted in the collection through databases of some nominal information relating to investments funds with the purpose of creating a long list of them, where thereafter make a deep analysis a selected the more active in the market and who match with the thesis purpose; the second part, on the other hand, consisted of establishing an online open questions survey through the use of a drive software in order to be more efficient in collecting responses and reaching out the selected managers of funds, in addition getting in touch with them using different modalities explained before and after some time elaborating the data received.

In this part of paper, therefore, only the second part will be treated, i.e. the open questions survey, and the scope is to extrapolate all the relevant information that principals of funds provide me to understand better the alternative meat market in all its aspects, their position on the industry and the projections about their investees and this new market in which compete.

The survey, through emails and direct messages on LinkedIn, was sent in the between the half of September and the half of October. After 10 days a new message aimed at soliciting was sent to all contacts that do not provide me a response. Meanwhile, I received some positive response by filling out the several questions in the survey and very few negative responses in which they explained me the purposes to not filling out the survey, mainly due to the few time at their disposal in that moment and for the confidential information.

Reached the mid of October, that was the deadline established at the inception and highlighted in the presentation letter to all funds, the online survey has activated the feature of not receiving further replies in order to have the necessary time to elaborate the answers and

prepare some graphs and table useful for the preparation of the whole paper. This is another advantage to use a software in cloud computing to manage an online survey, structured with open questions.

**Table 4.1 List of financial investors that fill the survey**

Target	Current/Prior Investments	Brief description
BackBone Ventures AG	SuperMeat	BackBone Ventures stands for goal-oriented, profitable and sustainable support for promising start-ups through network, capital and expertise. Sustainability is essential and is achieved through innovation.
Beyond Impact Investing	Mosameat, SuperMeat, The Meatless Farm Co	Early stage venture capital, accelerating societal shift in favour cruelty-free and plant-based alternatives. Beyond Impact targets are companies based on the environmental imperative, health concerns and compassion for animals.
Big idea ventures	Beyond Meat	Big Idea Ventures is solving the world's greatest challenges by supporting the best entrepreneurs. They are a Venture Capital and Accelerator which invest in plant-based foods and cell-based meats.
Blue Horizon Corporation	Beyond Meat, Impossible Foods, Mosameat, SuperMeat, JUST	Investing in mission-aligned, tech-driven, healthy and innovative plant and cell-based companies. In addition, Blue Horizon focuses on being a strong capital partner for companies who already have a proven business model.
Fifty Years	Memphis Meats	Fifty Years is an entrepreneur-run early stage venture capital firm. Specifically, it invests in companies that will be both massively profitable and make a serious dent in achieving one of the sustainable goals.
Good Seed Ventures GmbH	SuperMeat, Meatable	Good Seed Ventures is a Venture Capital firm that exclusively invests in sustainable food tech. Share capital, network, and technological know-how to accelerate the supply of nutritious and safe food for everyone.
Lever VC	Mission Barns, The Better Meat Co	Lever VC is a venture capital fund making early stage investments in alternative protein companies: plant-based meat or startups creating real animal protein from cells. Backing the most talented entrepreneurs around the world to create the future of protein.
Moira capital partners	Cubiq Foods	Focus on the essence of private equity: project management. Investments in innovative companies pursuing high growth projects over a medium to long term horizon.
Stray Dog Capital LLC	Beyond Meat, Aleph Farms, Alpha Foods, Memphis Meats, Mosameat, SuperMeat	Venture capital fund investing in innovative, early stage companies across the food, beverage, and biotechnology sectors that are driving a healthier, humane, and more sustainable future.
Supernode Ventures	New Age Meats	Investing in entrepreneurs to help transform the way people live, work and socialize. Focus on company's first capital raise colloquially known as "pre-seed."
VU Venture Partners	Impossible Foods	The most scalable venture fund in the world. VU is a value add investor, its focus is most on Seed & Series A funds which have a strong investment team which provide useful insight on strategy.
TOT= 11		

At the deadline date, **11 financial investors** (see **table 4.1**) have completed the survey and the responses have been received, which compared to *61 total funds* (see the full list on appendixes) contacted correspond to a **response rate of 18,03%**. This value is higher than the average response rate of a normal survey carried out via online, which is usually around the 15% and because the open questions survey seems more an interview, in which few samples of people are selected to reach out them, rather than a structure survey. In fact, the main disadvantages of an online survey is a lower ability to obtain a higher participation. However, a notable advantage is the time. People who receives the request can fill out the questions when they prefer, without a real commitment of time in their busy journey. Furthermore, this type of analysis was chosen precisely for all the reasons explained in the section above, such as financial investors involved are spread in different countries and difficult to schedule, the universe of target respondents is limited, and time that principals and managing partner of the funds could dedicate to compile the whole survey.

Almost all of those who replied me expressed their willingness to remain anonymous in their statements, in contrast with a very few who do not express it. Therefore, to be respectful as possible, the answers elaborated will refer to an anonymous sample.

### 4.3.1 Findings from survey

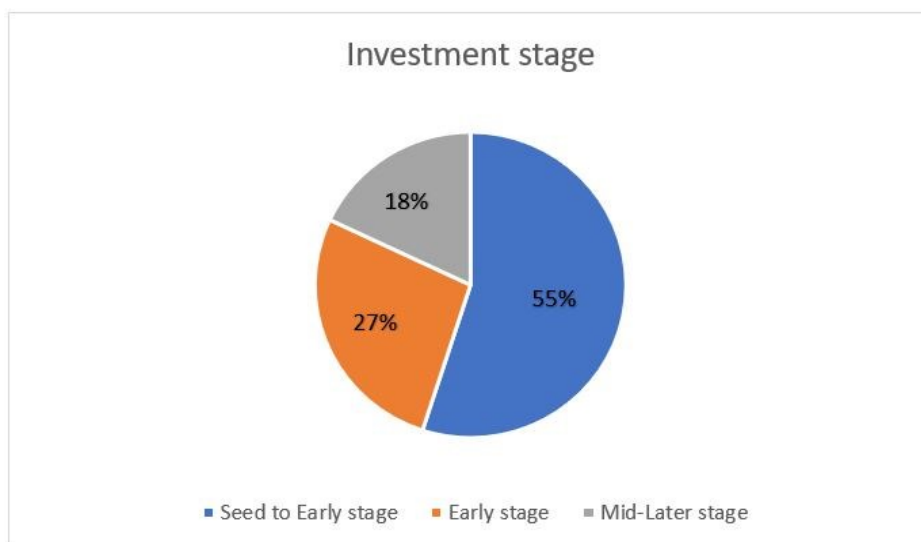
#### Stage of investments

We have already treated in the chapter two the differences between the financial investors and which is their stage of investments. In fact, the main financial investor treated was the venture capital due to the major presence of them in the alterative meat industry, that is similar to a private equity, but with some substantial differences that allow to differentiate the two type of investment funds.

Therefore, a difference highlighted was the precisely stage in which the company decide to invest its capital.

One question asked to the managers was about their investment position in the life cycle of the companies.

Graph 4.2 Investment stage in alternative meat ventures



Looking at the **graph 4.2** we can observe that a **55%** of the total has declared to invest in the *Seed to Early stage*, a **27%** in the *Early stage* and a **18%** in the *Mid-Later stage*.

To define a little more in the context of this space, seed is referred just after prototype but there is very few institutional capital that has already been put in the venture (or in some cases any capital apart from what come from the founders), while *Series stage*, that is between Seed and Early stage, is usually after a fair bit of revenue and there is a pathway to profitability.

If we consider the graph of (Cumming and Sofia, 2014) in the chapter two as reference, we can conclude that who stay in the range of Seed to Early stage and only Early stage could be classified as venture capital, so a **82%** of the total while the remaining **18%** are mainly private equity even if some of them could invest in the early stage.

## Rationale behind the investment in the alternative meat industry

The purposes behind the reason of companies that compete in the alternative meat market are already known. The traditional meat production creates very important problems for the whole society, and it is unsustainable continue in this way.

All the reason behind the investments in the alternative meat industry, addressing global meat consumption, sustainability, climate change, and food security, are confirmed by the managers of the funds involved in this analysis. Moreover, they add three further important reasons for investing capital of their partners in this novel companies, their point of view besides being ethical is also economical:

- 1) *It is a really large market.* The global meat market is a multi-trillion-dollar industry so capturing even a small portion of that with new products that work better for consumers, healthier, more environmentally friendly, is a great investment opportunity.
- 2) *Technology has improved significantly from 20-25 years ago.* The ability to replicate meat products, through plant-based or cell-cultivated products has improved massively over the past two decades which makes this kind of industry viable for the future. This has largely been due to advances in food science and biomanufacturing, respectively.
- 3) *Create a more equitable and accessible food system for people across all demographics and geographies respecting the environment.* Aim to net zero emissions sometime in the later part of this century is a difficult challenge and we have to find some way of reducing food emissions. The only other alternative is strong regulation/carbon pricing which seems unlikely in most countries. Alternative protein is a part of that larger attempt at a market-based solution and therefore exciting to invest in.

## Barriers to entry, direct competition and industry drivers

In order to better understand the industry from the demand point of view, some questions about the market have been addressed.

We can consider some difference and common *barriers to entry*. Therefore, for the differences we can consider the two type of products: *plant-based* and *lab-grown*.

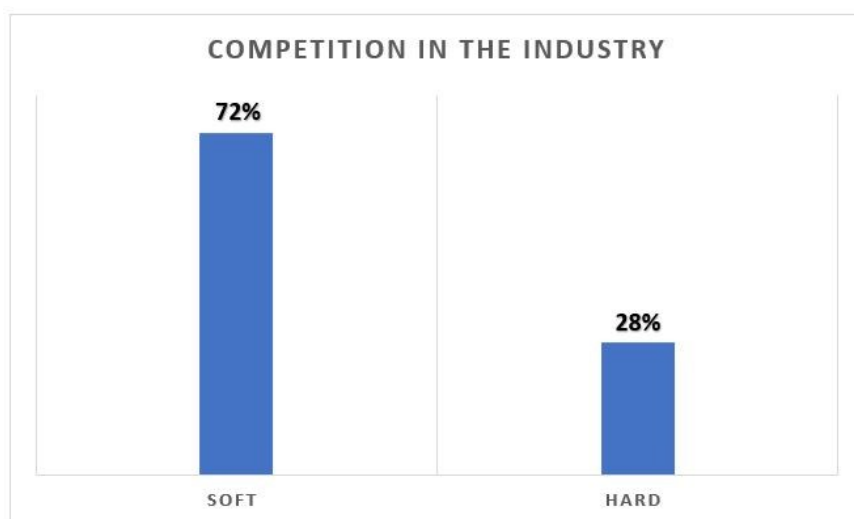
1) **Plant-based**: needing to scale to be successful in that business. Companies need to get to a substantial amount of scale and that is usually harder to do if they are starting a lot later than competitors. So, moving first is definitely an advantage if you can capture distribution and shelf space quickly and keep velocity numbers high.

Thought the food technology/food science is becoming more democratized, there are still some products that stand out because they do something a little different, Impossible foods as an easy example. That is another area which could be a barrier to entry for a new player.

2) **Lab-grown**: there are enough companies now that ventures need to have a unique bit of technology, preferably patented to really start out and this is an important barrier to entry. A second one, is referred to the fact that is a costly type of business to build and has more characteristics of biopharma investing than food for some aspects, such as long time to market or high risk, thus having enough capital would be a big barrier to entry for new players.

As regards the common barriers to entry, they are principally referred to the taste and knowledge. In the first case, flavor is a principally property that the alternative meat product has to own, because a low-quality product never succeed, especially in this market. In the second case, knowledge about these products is still low and people are still skeptical, thus new entrants could be reluctant to enter.

Graph 4.3 Competition in the industry



About the *competition* in the market and how their subsidiaries can manage the competition with others, **72%** of funds involved in the analysis have declared that competition is **still soft**

because the industry is in its inception, especially in the cell-based branch where ventures are not yet fully developed rather than plant-based branch where competition is already at higher level. Therefore, this result is in contrast with that identified in the previous parts of the paper in which the market was analyzed based on bibliographic information and online report. However, a **28%** of the total financial investors involved have declared that the competition is **very hard** in the alternative meat industry. This is due to the fact that more and more companies are deciding to enter in the market for its attractiveness at the moment, and the standards to remain competitive continue to rise.

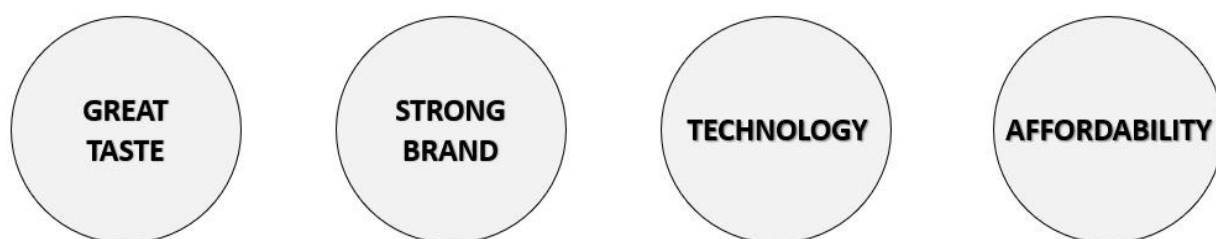
Another information obtained from the responses received, is that some funds have declared that do not invest in competitors in the same cohort of their investees, especially who has only one company in its portfolio. Instead, others have similar companies in their portfolio and ensure that they are targeting at different market and each company has their unique selling point. However, they agreed that the competition is focused on four principal elements: *Quality, Technology, Health* and *Price*. Moreover, they view still little competition because the market and the opportunity is big and most of the players are on the same mission: improve the meat production system.

The **key industry drivers** could be different for some type of products if they are located in a certain area of the whole market, but overall there are some industry drivers for both products:

- *Social, health, environmental awareness*: lifestyle motivators continue to influence how consumers eat and this is creating opportunities for firms that can offer products that have different environmental impact.
- *New competitive threats*: the rise of new ventures with new products is pressuring the traditional providers to invest in new technologies.
- *Increased awareness*: growing use of these products in groceries and restaurants is driving consumers to explore new tastes, and food technologies contributes as well.

## Key success factors and main risk factors

Figure 4.4 Key success factors of the alternative meat industry



Analyzing the responses received, we can summarize the *key success factors* of the alternative meat industry to take a competitive advantage, they are represented by four elements that are illustrated in the **figure 4.4** above. More precisely, we have:

- **Great taste:** having a great tasting product is important to attract more potential customers and reduce the difference between the real product and the “fake” one.
- **Strong brand:** having a brand that speaks to your consumers and packaging that aesthetically aligns with that. Building relationships with the right type of customers through positioning in stores where people are already looking (i.e. meat alternatives in the same section as the conventional meat products).
- **Technology:** unique technology and particularly something that could help make scaling easier. Having a deep scientific knowledge to create barriers is important and so a well-balanced team structure is essential to create the right technology.
- **Affordability:** reducing the costs of production is the key for growing in the "meat eater market" improving the presence of alternative products in groceries and restaurants. Moreover, not focusing only on vegetarians, but focusing on the new segments of "flexitarian" that is a lot spreading within the Millennials and more and more people are following this new way of living.

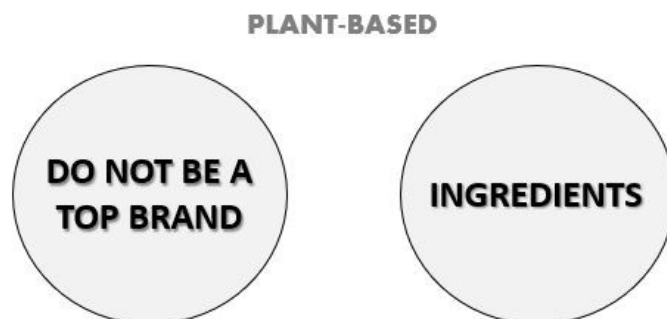
For the managers of the funds involved in the analysis, the main *risk factors* investing in this new industry are similar to other industry created in the past that have tried to revolutionize a specific market, and so deal with big food company creating a comparable product and launching directly in major supermarkets is a large risk factor.

They agree that investing in this industry really depends on the company/product in which they decide to invest capital.



Therefore, it is helpful to distinguish again between the two principal products of the market. The first two risk factors are referred to plant-based products while the second ones are referred to cell-based products.

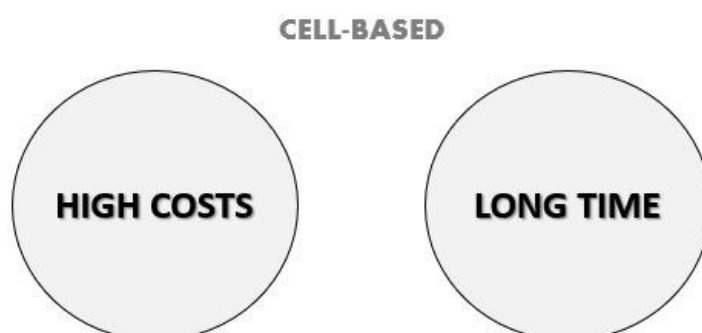
Figure 4.5 Risk factors investing in the plant-based products



**Do not be a top brand:** plant-based meat market is already a real market, with sales and market feedbacks, so the risks are fewer than cell-based that is at its inception. Being able to successfully replicate the taste/feel of meat to gain a great piece of market is very important, because market are full of these products nowadays. Therefore, if the company does not end up being one of the top few brands in their category, it will be hard in the average country to get them to profitability and possibly get any type of exit for the financial investors.

**Ingredients:** to produce in large scale the products, companies need a lot of ingredients, such as pea, soya bean and others. Obtaining raw materials could be difficult in some countries and you are very linked with suppliers and their production capacity. Thus, companies could have difficulties to access a certain amount for producing the right quantity for the market.

Figure 4.6 Risk factors investing in the cell-based products



**High costs:** at the moment the cell-based products are still in their very early stage. They are facing the R&D costs and the ventures have high costs to produce a possible final product for the market, but this means that is not ready to be put in the market for customers for his very high price. Therefore, a lot of improvement from the economic perspective is needed.

**Long time:** in order to be a marketable products, a lot of improvement in term of taste and price are necessary. Thus, time is an obstacle because is required a lot of it to reach the perfection and this means years of spending without having the certainty to enter in the market. Regulatory approvals also contribute to delay the moment to see the products on the shelves of supermarkets or in restaurants' plates.

### **Choose the alternative meat rather than others new industries**

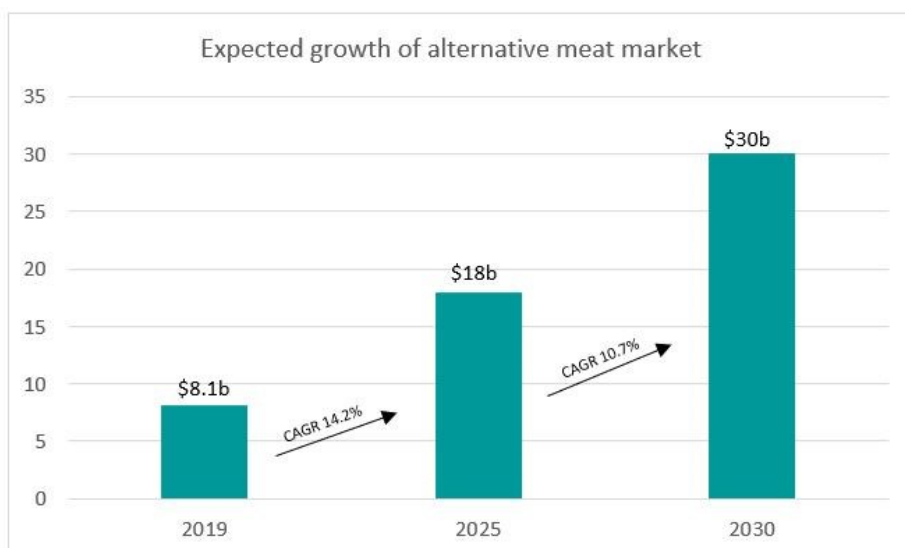
Certainly, the decisions made by principals and managers in the sustainable funds were driven by the impact that these new ventures can have on the meat production industry. Financial investors contribute to do something about meat environmentally and this seems like a more plausible solution in most countries than heavy carbon taxes on animal agriculture emissions, as well as provide environmental and health benefits.

However, the fund managers have more clue purposes to choose this new market rather than commit capital in other ones.

Other new industries are less attractive for many reasons that can range from the poor returns to a very little market that could be created in the future. So, the alternative meat industry for financial investors is the best combination between financial returns and the benefits for the whole society. This is a lot appealing for who want commit some capital through investment companies, such as venture capital and private equity.

The financial investors involved agree that food is the new Internet and innovations in this sector will lead to transformation of industries that opens a lot of opportunities with new and existing players. This affirmation is supported by the fact that the food industry is worth more than a trillion dollar and the alternative meat market is one of the markets that has not been disrupted yet and it can reach around **\$15-20 billion** in the next few years, with a possible peak of **\$30 billion** in 10 years, accordingly with the responses received by the fund managers.

**Graph 4.7 Expected growth of alternative meat market**



This assertion is in line with the research provided in the initial chapters where the alternative meat market was treated. In fact, financial investors' affirmation reflects the number of the estimated growth of the market, which is around *\$18 billion* by 2025 with a possible **CAGR** of **14.2%** during this projected period and the subsequent period the **CAGR** is around **10.7%** (see **graph 4.7** above).

Therefore, it is a profitable area that did not have a lot of capital a couple of years ago, thus funds at that time were able to get access to a lot of great companies in a growing space at reasonable valuations while it is an attractive area to set up a fund. Nowadays, there is the same range of profitability, especially in the cultivated meat that is more premature than the plant-based meat area.

### **Growth of their investees in the alternative meat industry**

About the future growth of their meat alternatives companies in their portfolio, all of the fund managers have confirmed their optimistic development for their investees.

The information provided to me are not precisely and exhaustive, because they prefer to keep private some quantitative data that concern their companies in the portfolio. However, the responses were much more qualitative and with a focus in how the fund could help to growth. The way to help the ventures to affirm themselves in the market could be several.

First of all, in addition to *commit the right capital* that is one of the most important resource that alternative meat companies require, the *support from the management* point of view is another important resource that they usually tend to activate for helping to growth fast and with robustness before other competitive firms.

They declared that the presence of the companies will increase exponentially over the couple of years, gaining more awareness globally. Human race grows, health is getting important and concern about environmental is more and more an important thing to consider. Thus, as this grows, the opportunity grows.

Furthermore, studies made by investors highlighted that US and European markets will probably keep growing at **15-20% YoY**, as described in the graph 4.7 above, with individual company growth rates varying based on what stage they are at exactly. Asia is a little more of a wild card, but they are optimistic particularly about China given the increased awareness on getting to zero gas emissions and food safety concerns that might be a tailwind for alternative proteins companies in their portfolio.

### **Which and why they prefer to invest in certain countries**

Generally, investing is not a simple task to accomplish because there is several elements to take in consideration. They can be external and internal factors, which affect the decisions to commit or not the necessary capital to a target venture that managers have decided to bet in.

Especially, the alternative meat industry is a new industry in which few regulations are already established and other will be presented, but required time and verification among political and governments.

This could be an important element that sustainable funds decide to take in consideration when they are looking in some countries, because government decisions can affect in a tough way the function of some products in a specific market.

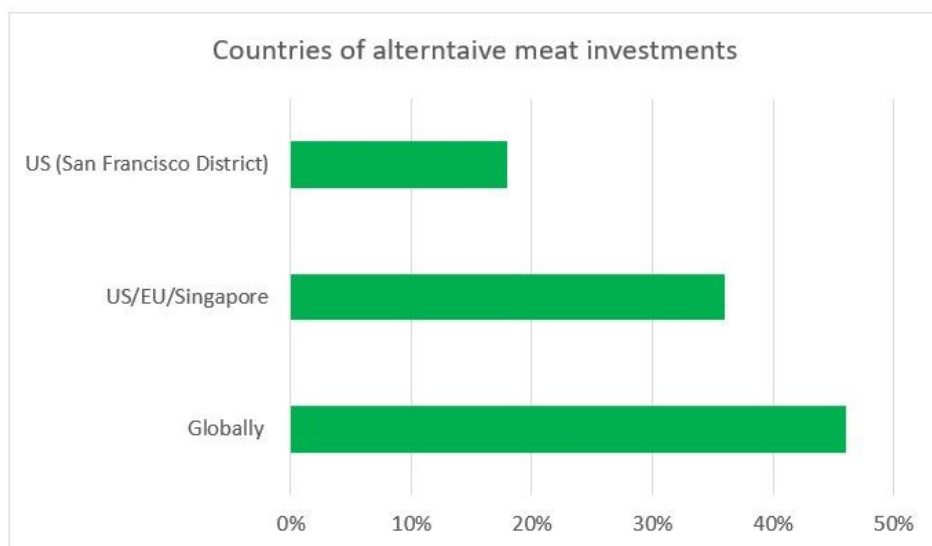
All financial investors involved in this analysis have some countries in which they prefer to invest (see **graph 4.8** below), even if many of them have declared that they operate **globally**. A good percentage, exactly **46%** of total interviewed, aim at investing everywhere because people need to eat food, improving the accessibility for some poor countries while solving meat production problems in other developed countries.

Therefore, they are actively looking in everything from Russia to India to China to Indonesia and South Africa even through these are not traditional countries you could think of when you consider the alternative meat industry.

Another part of them, **36%** of the total, have declared that its focus is only some specific countries: **US, Europe and Singapore**. This is due to the fact that these are countries where companies have the *right technologies* with important technologies hubs, *good teams* composed by people that are ready to embrace new technologies and where *governments support* is very important, so there is a more easier regulation approvals.

Finally, the remaining two sustainable funds, **18%** of the total, look at US only. More exactly, with the preference **San Francisco Bay Area**, in Southern California, where is the home of numerous start-ups and international companies specializing in technologies. The reasons of this choice is in line with the reasons described above.

**Graph 4.8 Selected countries to invest in alternative meat industry**



### **Outlook of industry due to COVID-19 and how their investees can benefit**

We have already treated the effects of the recent outbreak in the whole food market, especially in the alternative meat market. Due to the recent lockdown actuated in several countries around the world, the meat production suppliers started to have some problems. In fact, restaurants and fast foods have been closed for long time and as consequence the consumption of meat dropped dramatically in few months.

On the other hand, people at home started to be more curious and try new products in the shelves of supermarkets, such as plant-based products.

Moreover, all operational companies have increased their sales and investments into sustainability topic, this is on spot due to the health aspect.

Managers of funds involved agreed about labelling the recent outbreak as an event that has provided “fuel to the fire”, in terms of growth for the alternative meat industry.

*Covid-19 has increased awareness and health concerns.* Thus, it has emphasized on the importance of shifting towards a more sustainable approach to develop food and moving away from relying on animal sources, even if for the short-term period it has affected R&D that is essential for some ventures. However, the overall impact was positive.

Therefore, more and more people are trying and joining the plant-based meat trend, as consumers become increasingly conscious the alternative meat industry is experiencing exponential growth and this trend will for sure help the expansion of cultured meat.

Nevertheless, a consideration made by some financial investors has to take into account.

In some countries where there is a significant price premium it might be a small weight on sales, generally given the fact that alternative proteins is still mostly bought by consumers with high amounts of disposable income. Therefore, the effects viewed in this period probably can affect only **after 2-5 years** the trajectory of the industry in a significant way.

This period is driving the whole alternative meat industry towards the right way. Subsidiaries in the portfolio of companies of financial investors involved have the opportunity to take advantage of new situations created in the changing landscape. The best way to do it is to continue and improve their presence in the market in order to enter in the mind of potential customers that are really curious about this new world of meat consumption.

In this moment, it is important to take all the advantage towards the sustainability movement.

Therefore, consumers are changing their habits, and so people are more worried about climate changes and more concerned about their health.

Financial investors are sure that people are generally becoming more health conscious and the recent pandemic has only accelerated that further among the premium tier in the food market.

In their opinion, probably what will work is a continuation to play on the themes of health and environment to capture more mainstream consumers, given that young people are already aware about it and there is the need to reinforce its mind only.

In conclusion, financial investors with their alternative meat ventures have to leverage on three elements in the actual landscape:

- **Help with their expertise:** know-how and network built over years in this business by funds is very important .
- **Understand the consumer trends:** attract more consumers, especially attract mainstream people putting them aware of the social and environmental problems and understand their habits.
- **Figuring out how to get prices down:** this is a huge and incredibly complex challenge, so companies should definitely be focusing on that.

## Italian market as land for investments in the alternative meat industry

In order to understand this new industry and so investments in it, a question about our country was made to the financial investors interviewed: “*Are you interested in the Italian market? If so why and if not why?*”.

At the moment, in Italy the alternative meat market is very premature, and it is difficult find products related to the sector, even if in the recent times some products are exposed in the shelves of supermarkets and in some menu of restaurants. However, only big international brands, such as Beyond Meat, are in the Italian market now.

Moreover, the alternative meat companies established in Italy are very few. Principally, there are two ventures at the moment: Joy Food and Emilia Foods.

Both develop 100% meatless products, first Italian companies developing plant-based meat food. Being Italian, their presence is in the native country, but also they have started to sell in some countries around Europe. However, accordingly the research made in the databases, they are still total private, with any external injections of capital.

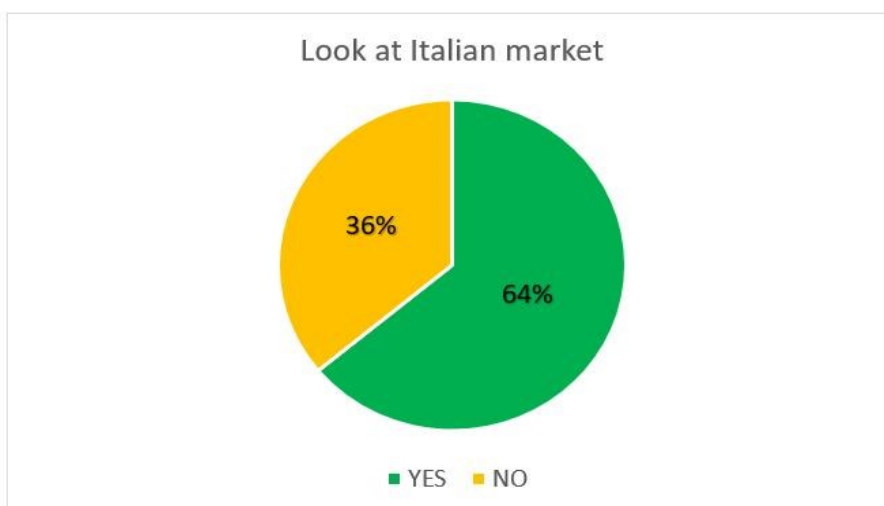
Through the explanation in the first chapters, we already known which are the principal brands in the alternative meat landscape at the moment. Anyway, many are arising and are competing with the affirmed companies in the market.

These ventures are principally established in US or north Europe for their strength technology knowledge, but in my opinion the Italian market could be a very prolific country as well.

It is a rich land for the passion of food which has the potential to unlock innovative solutions to sustainable food production.

However, financial investors involved have their opinion about the Italian market.

**Graph 4.9 Who is looking for Italian market**



Precisely, looking at the **graph. 4.9**, we can observe that **64%** of managers interviewed has declared to *consider the Italian market* as a potential land for the alternative meat industry in terms of investments.

They affirm that Italy is "behind" a lot of the other European markets, like UK or Germany, in terms of consumer adoption, familiarity with the category and some similar metrics, so it might be a bit early to look seriously at investing in Italy.

However, the infrastructure in terms of the right type of talent, capital, networks are definitely already there. Thus, Italy is promising for sure, especially it has a huge potential for the plant-based companies, if the right companies understand the Italian consumer acceptability.

On the other hand, a **36%** of them have declared that are *not interested in the Italian market*. This decision is supported by their view of the Italian food sector. Their opinion about Italy lies on a traditional country especially on food which people is really adverse to changes.

Another reason is driven by the fact that Italy is not really a technology district rather than US, which is the mother of tech industries and so more easily for the investment funds track new emerging ventures for an evaluation of a possible investments.

Finally, the choice to look at Italy market or not is still an important question for all funds and there is who see an opportunity or in contrast some of them see a risky environment.



#### **4.4 Discussion and conclusions**

The aim of this analysis was to better understand the alternative meat industry through the perspective of who bet and invest in this market, that are financial investors.

The open questions that compose the survey, administrated to managers and principals of different funds individuated through a deep screening analysis, were created in a way to be more clear and concise as possible to gain a better knowledge of this new industry.

The responses received were analyzed and managed to create the exact position of the funds in the sustainable meat market.

First of all, the results illustrated in the analysis are almost all in line with the information and data evidence found and treated in the first part of the paper, which are part of a research and interpretation of scientific studies performed by others.

However, some other results have highlighted the differences among the financial investors' perspective and information treated before the analysis, even if none tough difference questioned the results obtained from the responses, but mainly a clarification was put in place.

The responses of financial investors involved in the analysis have confirmed the nature of the alternative meat investments treated in the first chapters, which have comprised two main category of them, i.e. venture capital and private equity, and the reasons to establish a specific sustainable protein fund or a fund with the purpose of innovation.

We saw that reasons behind their investments are driven more by the environmental, social and health aspects rather than economic aspects, even if they cannot ignore this last element that is the core business and create an important responsibility towards their limited partners.

We have analyzed all the factors that influence the industry from the demand point of view. Part of Porter's five forces, such as barriers to entry or direct competition, were surveyed to understand how the ventures can position themselves in the market. The results have shown that barriers to entry are different in relation to the branch of the alternative meat industry to which reference is made.

Instead, competition is one of the factor that is in contrast with the information treated before the analysis. During the research, the competition has been described as tough due to the massive presence of companies that are gaining ground quickly and the high level inside.

On the other hand, the responses received tend to a softer competition, because even if it is true that there are important factors to own in order to succeed, as the industry is growing rapidly, there is a good profit margin for everyone if companies specialize themselves in the right way.

The main industry drivers, key success factors to gain a possible competitive advantage and on the other hand the key risk factors have been identified. Also in this case, responses have highlighted that factors vary in relation to plant-based or cell-based division of the industry.

In fact, in this first part of analysis, frequently the managers of funds have paid attention on the difference about the plant-based meat and cell-based meat products. Actually, it is true that they belong to the same new industry, but the products are treated in different way and especially their stage and position in the market are different.

The second part is more about the sustainable protein fund established by the financial investors and the position of their investees in portfolio. In relation to this, the capital committed, management expertise and attention to the potential customer are essential elements that have been identified based on the responses received from different funds, including the role that they play for their subsidiaries.

Moreover, the analysis highlighted which are the more productive countries for these type of investments. The majority of managers have pointed out that they take a look globally, because everywhere there is an opportunity to develop this business and precisely some countries could have an advantage to attract investments due to technology owned and government decisions. In addition, a focus on the Italian market and its future position for the alternative meat industry was analyzed. Our country, for many of the financial investors, is a prolific land for alternative meat investments. On the other hand, Italy has a strong food culture and revolutionize the mind of people is a very tough challenge that may not pay off.

Finally, it is inevitable that the recent situation around the world has only brought benefits to the alternative meat market and this growth of industry was also confirmed by respondents. Legislation to stimulate sustainable innovation and investments with a shift in the culture for sustainability are necessary to facilitate the development of such new businesses and this period have only rise the attention of all individuals involved in the market.

In conclusion, the analysis has contributed to have a broader view of market and the essential position that financial investors detain to lead the industry. Some information have been confirmed and others have been clarified, but generally the results and insights obtained after the empirical analysis indicate important achievements to understand better the new industry, which is trying to transform the entire food society.

## Conclusions

The purpose of this paper and its analysis is to bring the attention on the alternative meat industry, having a more precise knowledge of this new market through the involvement of some financial investors.

People involved are experts in this sector that decide to build ad hoc funds with the aim of sustainability, in which you can find start-ups and companies that try to revolutionize the traditional meat system with their innovative products.

Attempts have been made to pay attention to the current and future environmental, social and health problems created by the production of meat, whereby manage to damage the entire society with heavy repercussions.

The dissertation, in the first part, wanted to make an overall understanding of the alternative meat industry. It has pointed out the two main products, i.e. plant-based and cell-based, the aim of the new industry, how the market is fractioned in terms of numbers and potential growth in the next years, and some examples of success key players existing in the market.

This first part is really important to obtain essential information of the new market and how it works in the whole food industry now.

The second part have called back the literature of financial investors, with focus on the form of venture capital and some recall to the private equity, which it has very similar features with the first one in terms of structure, partnership and objectives. However, they have some differences that determinate the two structures. This choice to illustrate these type of funds was driven by the fact that they are the principal alternative investment funds and more important the venture capital with their strong presence in alternative meat investments.

A more clear definition of sustainability was established in the third part. More precisely, the distinction on sustainable investments, green investments and sustainable protein funds was clarified. Furthermore, the green financial investors with the aim of set-up a specific fund to invest in the alternative meat industry and the important role that they cover in the sector were explained, because it is really important for the purpose of the analysis.

The final part, related to the analysis, had the focus in the consultancy that selected financial investors gave me through their responses about the questions communicated with the survey.

As regards the results of the analysis, which we have already managed and analyzed, the managers of the funds involved have confirmed some aspects that were already treated in the first chapters of the paper and, on the other hand, have clarified some other aspects that are viewed in a different way by the financial investors in respect to the bibliographic and

research information treated in first parts. However, at the same time, they have added important information about their role and the market in the alternative meat industry.

The results, more precisely explained in the last part of analysis, have highlighted the nature of the financial investors and the role they play within industry. Generally, through the responses, we can affirm that taste, time and price are three important elements often featured as key factors to enter, compete and succeed for investees of funds. In fact, the primary focus of companies in the alternative meat industry is to improve these elements and others, trying to avoid a negative impact on own profits and on potential customer base.

In addition, some numbers and projections provided by fund managers about the market and its subsidiaries have declared, in addition to environmental and health benefits, that this industry can have excellent profit margins with a double-digit growth.

Moreover, the results have shown that each country could be a potential land for investments, even if some managers have shown a more narrow target mainly based on the massive presence of technology in the country and the policies implemented by government.

In conclusion, the analysis has brought to light all the benefits that this new industry can create in a way to revolutionize the whole market and the difficulties to achieve these results. However, we can affirm that this is the right pathway to adjust the existence industry without create other important concerns.

Hoping that this paper can be a solid base and a starting point for others similar projects, in order to enhance the alternative meat industry as a possible solution and make people aware about the existing problems nowadays.

# Appendixes

## Appendix 1: List of financial investors

Target	Headquarters - Country/Region	Current/Prior Investments
Ambrosiana Investments	Luxembourg	Beyond Meat
Atomico	UK	Memphis Meats
BackBone Ventures AG	Switzerland	SuperMeat
Backed LLP	United Kingdom	Impossible Foods
Baleine & Bjorn Capital	United States	Aalpha Foods, Memphis Meats
Beyond Impact Investing	Switzerland	Mosameat, SuperMeat, The Meatless Farm Co
Big idea ventures	Singapore	Beyond Meat
Blue Horizon Corporation	Switzerland	Beyond Meat, Impossible Foods, Mosameat, SuperMeat, JUST
Blue Yard Capital	Germany	Mosameat
Blueberry Ventures	United States	Mosameat
Caveau ventures	United States	Beyond Meat
Clear Current Capital	United States	Alpha Foods, Barbecue
Cleveland Avenue	United States	Beyond Meat
Closed Loop Capital	United States	Beyond Meat
Collaborative fund	United States	Beyond Meat, Impossible Foods
Commodore Partners, Ltd.	United States	Memphis Meats
CPT Capital	UK	Beyond Meat, Impossible Foods, Redefine Meat, Alpha Foods, Memphis Meats, Mosameat, Aleph Farms
Dao Ventures	China	Mission Barns
DFJ Growth Management, LLC	United States	Beyond Meat
DNS-BYMT, LLC	United States	Beyond Meat
Emerald Technology Ventures AG	Switzerland	Future Meat
Everhope Capital	United States	Memphis Meats, Emery Foods
Fifty years fund	United States	Memphis Meats
Finistere Ventures	Ireland	Memphis Meats
Five Seasons Ventures	France	Beyond Meat, Impossible Foods, JUST, Memphis Meats, THIS
For Good Ventures	United States	Memphis Meats
Founders Fund	United States	Beyond Meat
Future positive capital	France	Impossible Foods
Future Ventures	United States	Memphis Meats
Good Seed Ventures GmbH	Germany	SuperMeat, Meatable
Google Ventures	United States	Impossible Foods
Inevitable Ventures	United States	Memphis Meats
KBW Ventures, Inc.	United States	Beyond Meat, Memphis Meats
Khosla Ventures	United States	Impossible Foods, JUST
Kleiner Perkins	United States	Beyond Meat
Lever VC	United States	Mission Barns, The Better Meat Co
Manta Ray Ventures	United States	Future Meat, THIS
Moirca capital partners	Spain	Cubiq Foods
M-ventures	Netherlands	Mosa Meat
New Crop Capital	United States	Alpha Foods, Beyond Meat, Nova Meat, Aleph Farms, Memphis Meats, SuperMeat, Mosameat
New Luna Ventures	United States	Mission Barns
Norwest Venture Partners	United States	Memphis Meats
Obvious Ventures	United States	Beyond Meat
Power plant ventures	United States	Beyond Meat, JUST
Prelude Ventures	United States	Meati Foods
Purple Orange Venture	Germany	Mission Barns
Radicale Impact	United States	JUST
Root Ventures	United States	Impossible Foods
S2G Entities	United States	Beyond Meat, Future Meat
SOSV	United States	Memphis Meats, New Age Meats
Spark Capital	United States	Beyond Meat
Starlight Ventures Management LLC	United States	SuperMeat
Stray Dog Capital LLC	United States	Beyond Meat, Aleph Farms, Alpha Foods, Memphis Meats, Mosameat, SuperMeat
Supernode Ventures	United States	New Age Meats
Threshold Ventures	United States	Memphis Meats
TSG Consumer Partners LLC	United States	Memphis Meats
Tyson Ventures, LLC	United States	Beyond Meat, Memphis Meats, Future Meat Technologies
Union grove Venture partners	United States	Beyond Meat
VegInvest ventures	United States	Alpha Foods, Barbecue, JUST, Mosameat, SuperMeat
VU Venture Partners	United States	Impossible Foods
Y Capital	Hong Kong	Beyond Meat

## Appendix 2: Open questions of survey



UNIVERSITÀ  
DEGLI STUDI  
DI PADOVA

DIPARTIMENTO DI SCIENZE  
ECONOMICHE E AZIENDALI  
"MARCO FANNO"

Name of your investment company (if you want to be anonymous write: N/A)

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- 1) What is the rationale behind your investments in the alternative meat market?
- 2) What is the stage in which you invest in alternative meat industry companies?
- 3) Which are the main barriers to entry in plant-based and lab-grown meat market?
- 4) How is competition managed by your subsidiaries in this market?
- 5) Which are the potential key success factors for companies in the alternative meat market?
- 6) Which are the main risk factors investing in this industry?
- 7) Why did you decide to bet on this sector rather than investing in other new industries?
- 8) How do you see the growth of your investee in the sector?
- 9) Are there any countries where you are looking for this new industry and why?
- 10) What is your outlook on this industry in light of COVID-19?
- 11) How can alternative meat ventures in your portfolio take advantage of new opportunities in the changing landscape?
- 12) Are you interested in the Italian market? If so why and if not why?

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