Politecnico di Torino

Master's degree in Engineering and Management (Innovation branch)

The assertion process about the sustainability of the business model of a car body shop

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I reach the end of the way, the time is over.

Five years have passed since my beginning in this university, and so many are the people encountered during this long and demanding path.

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In the end, I want to dedicate this final step of my academic career to my grandparents. They have always believed in me and, day by day, always reminded me to never back down, concept that is strongly consolidated in me, indeed, as my grandfather always says, the motto is:

" insist, persist, achieve and conquer".

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INTRODUCTION

It was a hot day on the 27th of July 2019, when I started this project with Professor Guelfi. That morning we have met in his office to talk about the thesis that I would have developed, to get my degree. It was a very busy period for me because I passed my last exams, I was ending my academic internship in a firm and there were different thesis proposals that have been previoulsy presented to me, but about which I was not so convinced; just like if there was something missing in those proposals, something that I didin't manage to appreciate so much. Thus, because of the quick passing of the time, and the deadlines to present my thesis proposition to the universty were getting closer and closer every day, I felt a bit agitated to not succeed in finding my way in time. But that morning, a simple meeting was transformed in a really good opportunity for me, because the Professor talked me about this new project, which started exactly in the afternoon of that same day; about which I was enthusiast and I immediately agreed to take part to it.

In an abstract I explain the project and the goal to reach.

ABSTRACT

The industry sector of interest is the automotive one and in particular the segment about the independent aftermarket of spare parts and all the activities performed by the car body shops in Italy. More precisely the intent of this project is referred to the region of Piedmont, in north-west Italy, and then, if it becomes useful, possible to be extended to the whole country. Nowadays, in Italy, all the car body shops perform in their own way, without any kind of standard to keep as reference. This means that there not exist any kind of model, standard, recognized by a national entity, to point at, in order to determine its way of working, if it is creating value in the long term and so if it can consider itself sustainable over time.

Thus, the aim of this project is properly that of creating an official piece of paper, a real document, recognized by governamental entities, through which all the car body shops, in Piedmont, and then in Italy, can understand if their way of performing their business is the right one, and if their operating is sustainable over time, expecially in the long term. In a few words the aim is to give them answers about their concrete

value creation over time, respecting a lot of parameters and depending on the value of several KPIs (Key Performance Indicators), which are the final output of this project, and thus, the so waited answers to the requests of the interested workers.

Previously I talked about 'national entities' as the ones which have the power to recognize the legitimacy of this document, and its validity over the national territory.

Before starting with this project, the Professor and his assistant have had meetings with the Italian Economic Developement Ministry (IEDM, the national entity responsible of the recognition and validity of any kind of business industry; of the intellectual property, to protect the firms know-how in terms of marks and patents; the protection of the so called 'made in Italy' creations and so on); and with Accredia (it is the Unique national accreditation Body designated by the Italian Government, in application of the european regulation 765/2008, to guarantee competence, independence and impartiality of certification, inspection and testing organizations. Accredia is a recognized non-profit entity, under the surveillance of the Italian Economic Development Ministry). During these meetings, they presented their proposal which was well accepted and with a lot of expectations on this project to become alive and operative. These entities gave their approval and exhibited themselves to be available in any way possible to make this project succesful.

1. WHAT IS AN ASSERTION/CERTIFICATION PROCESS

First thing to do to describe the structure of this project and to make third parties understand its aim, is surely the explanation of any single key word related to it. In such a way all the concepts are more clarified and this operation may help readers to better point out the core of the work.

Then, it could be useful to describe the method through which this project is carried out and the way the information have been collected and organized, to give a mold to this work.

KEY WORDS

Process

Assertion/Certification

Car body shop

Business Model

Sustainability

1.1. What is a process.

As we can imagine, to define the meaning of a word, the starting point might be referring to a dictionary. By the way the definition used for this term is: ”a process is a sequence of events, or actions, that are normally interconnected with each others, which has the aim to generate an output, starting from an input”.

Thinking about the contest, the single word ‘process’ might assume several other meanings; think about the juridical sector, or the bureaucratic one, or still informatic, anatomical and so on. Obviously, for this matter, the right definition to use, cannot be other than the first given before.

Starting from the origin of this word, it comes from the latin ‘*processus’*, which literally means ‘*walk forward*’, just to refer to the progress of something. There are lots of different definition of this term, that is very often used in a wrong way. Taking into consideration the objective of this project, the most correct definition might be the following: “a process is any kind of activity, or group of activities, that has an input, adds value to this input and provides an output to an internal or external client.

In addition, the process makes use of the organizational's resources to generate the output wondered".

By this way, the totality of these actions are, as we already said, interconnected with each other and this interconnection depends on the fact that thinking about each activity individually, the sequence is built so that what is an output for one, represents the input for the following. More precisely, if we think in a linear way, what is the output generated by an upward activity, will be then the input for the downward one and so on till the end of the process, when the output generated is what is ready to be delivered to the end user (Fig. 1.1 below).

In the case under exam, the process will be identified by all the sequential activities that a car body shop must exercise, from the moment when the client comes for a damage to his car and asks to fix it; till the time when the same car, at that point repaired, is given back to the same client. In the following paragraphs will be described an example of all the different actions carried out by a car body shop, in the case of one specific type of user, to better understand which is the working way in this kind of sector. In order to avoid a list too much long, the cases of insurances and rental societies will be omitted, because the method is explained and the only thing that changes is the list of the activities.

Fig. 1.1 A schematic graphic rapresentation of a process. In the case under exam the sequentiality is required because the same car must be processed only step by step and is not possible to perform different tasks in parallel on the same processing item.

1.2. Meaning of assertion/certification

The two terms under analysis are synonymous, or even, they can be considered nearly the same word. Taking into consideration the several meanings conferred to these terms, the common aspect that link all of them is that the significance of assertion, or certification, is:" to declare having jurisdiction of the matter. Certification, in the manner prescribed by law, of the truthfulness of a fact, a document, a declaration, or the conformity of a translation with the original text".

The asseverated technical report is a particular form of report in which the supervisor states that everything reported is true: he assumes responsibility for the truthfulness of the information communicated and, consequently, is also legally, and sometimes penally, liable for any false ideological or material in it. Normally, an asseverated technical report, must contain few details that are necessary to confer legitimacy to this certification, which are:

- The details of the mentor who is preparing it, including his registration number on the relevant professional register;
- Date and signature;
- Declaration of assumption of responsibility by the supervisor, with consequent awareness of the legal liasbilities to which he exposes himself in the event that what is reported is not entirely true.

  In this case, the supervisor who has the authority to certify the validity of this project, is the previously mentioned entity of Accredia, together with the Italian Economic Development Ministry, both organizations recognized at national level.

  By the way, is important to precise that the assertion/certification process for the sustainability of the business model of a car body shop is just the final objective to be achieved. Before this, is fundamental to built the procedural guidelines of this model. This step will be deeper explained in the operating system section, described further.

1.3. What is a car body shop

An autobody repairman is the individual who has the knowledge, the ability and the equipment necessary to fix the damages that a car body may present, working in a repair garage for cars.

Normally, when a client comes to a car body shop with his vehicle damaged or crashed, firstly the repairman has to make a diagnosis of what happened and to identify which are the parts of the car (frame, windscreen, wheels etc.) that have been ruined. Then, he has to assess the extent of the damage and finally make an estimate on the time and labor costs needed to fix the vehicle and to be presented to the client. The aim is to restore the automobile to safe and efficient road holding conditions, as well as to restore its original aesthetic appearance. In some cases, the repairman also produces body parts. This is a high specialized job, for which the reasonable equipment is absolutely necessary to carry out all the different tasks, in a professional way.

The tasks normally performed in a car body shop are:

- Repair of scratches and dents to the body of the car (through hammering, crowning, plastering etc.);
- Substitution of damaged parts of the vehicle (windscreen, wheels, bumper, lights etc.);
- Straightening and levelling of the frame and the bodywork;
- Final painting, once all the repairing actions have been performed, to give the car its original appearance.

Nowadays car body shops are no longer just a fixer point, but are becoming also multi-service provider. In this sector the SMEs, today, may give their clients a temporary replacement car, just if the repair activities will lust more than one day; or they may offer services of assistance and maintenance (periodic inspections and reviews). Anyway the objective is always that to fix the cars of the clients in the best way possible and to reach the greatest level of satisfaction of them, so to hope them to come back again in the future if necessary; which means to create a good portfolio of customers.

1.4. Which activities a car body shop carries out (Business Model)

In the previous section a little introduction of what are the main tasks carried out by a car body shop, have been made. Now, it will be done a focussed description of what precisely happens in this job, in terms of activities and differentiation of potential clients.

First of all, is fundamental to say that, to realize this project, a Technical Working Group (GTW) has been created. It means that we decided to select a number of

participants to periodic meetings, of whom each is a member, or better an expert, of the sector under analysis, and so, he leads its own company. In such a way is possible for us to collect direct depositions about what happens in a car body shop, about the different methods and phases that carachterize this job. These meetings occurred at least once a week, starting from the end of august 2019, till now.

What emerged, from the first meeting with the GTW, in order to identify and measure the attitude of the car body shop and to operate in conditions of sustainability, in respect of the interest of all the stackeholders, interlocutors of the same, was to consider it appropriate the analysis of the activities carried out by the bodywork with reference to the user profile. In such a way this considers the differentiation of the latter, by:

- Private/Firms;
- Insurances;
- Rental companies.

Taking into consideration this division, then, the activities correlated, carried out by the company, are different, depending on the type of client.

In the following subsection, the main activities executed in case the client is a private/firm will be underlined, just making a list as an overview.

By this way i twill be possible to understand the method used to collect the information necessary to give life to this project. The one shown below is the scheme followed for all the three categories above mentioned of different customers, but it will be listed only the case of a private/firm client, for the reasons previously mentioned. Then, the scheme is the same for the others; clearly with different tasks.

1.4.1 **Private/Firms**

When the customer is a private or a firm, the two are processed in the same way, the activities carried out are the following:

A. **Incoming customer reception**, which is composed by:
    1. Listening to the client and having read of the vehicle to understand the typology of the damage;
    2. Synthetic collection of personal data of the customer (simple);
    3. Estimate of the damage;

4. Communication of the estimate to the external customer: when, in what form and with what degree of detail. Analytical list of the activities, of the spare parts used and of the workforce;
5. Acceptance/signature of the estimate by the customer (except for non-visible details or change in the cost of spare parts): after prior acceptance by the customer;
6. Back-office preparation of the file and signatures on various documents; possible advance payment on particular spare parts, by the client;
7. Photographic documentation and its matching with the practice;
8. Booking for the taking over of the car with or without a replacement car (free of charge or for a fee) with a form to be signed (driving licence, credit card);
9. Generation of the worksheet: it is automatically obtained from the estimate with evidence of the actions that each operator must take and of the spare parts connected to the various operations;
10. First order of spare parts (before the appointment), subsequent check of the ordered spare parts and storage and, in any case, spare parts management;
11. Any appointments with external collaborators and related communication to the customer on delivery times.

B. Now we are ready to the fixing; thus, **taking charge of the vehicle:**
    1. Job card socket with possible update for integrations;
    2. Check if the replacement car has been requested (which can be free of charge by the bodywork or for a fee), fill out the rental form and attached copy of the driver's license and delivery of the replacement car (if required);
    3. Covering of the steering wheel and seats with veil of nylon;
    4. Communication to the client about the timing for picking up their vehicle onced repaired;
    5. Repositioning of the car to the storage or to the adeguate working department;
C. Once the vehicle is ready and positioned in the right place, it is ready to be processed and repaired. Thus, we pass to the **processing phase**:

1. What is important to underline is that any operating phase must be supported by relating photographic documentation, so that it is possible for the workers to demonstrate the progress of the work performed, in terms of improvments generated on the restored car. This aspect is to safeguard the car body shop itself, towards third parties;
2. Awareness of the work to be done and assignment to the various operators of the related activities to be carried out;
3. Washing up of the car (if necessary);
4. Handling and positioning with possible lifting in the detachment and reattachment area (first phase of three) (sometimes in the same department and sometimes in another one);
5. Disassembly of the vehicle and possible indication of inconsistency with the work sheet that was updated in phase A;
6. Notification to the customer of any change. Then, if he authorizes to these additions, the estimate is updated;
7. Eventual second order of spare parts;
8. Matching of the spare parts previously ordered;
9. Moving and positioning in the typing area with eventual lifting (if necessary);
10. Typing intervention;
11. Possible calibration/measurement on a digital or traditional bench of validation;
12. Put in template;
13. Eventual substitution of welded or mobile specifics;
14. Pre-assembly of accessories to metal sheets and final check of clearance and profiles;
15. Dismantling of mobile parts;
16. Moving of the car to the preparation area;
17. Preparation of the car to the painting (masking of the body parts that are not going to be painted);
18. Introductione of the car in the painting cabin;
19. Washing and pickling with anti-silicone;
20. Painting of the vehicle;
21. Drying phase, as adviced on the worksheet of the paint producer;

22. Moving of the car in the assembly area;
23. Assembly of the various parts;
24. Polishing phase;
25. Trial on road (if necessary);
26. Cleaning of the internal parts of the car and washing of the external ones;
27. Last check.

D. **Delivery of the car to the client**:
   1. Communication to the client about time of delivery (taking into account possible delays);
   2. Withdrawal, check and signature of the return form of any replacement car;
   3. Check of works performed, payments of the invoices and delivery of the car.

E. **Satisfaction of the client**:
   1. Questionnaire to monitor the satisfaction level of the customer concerning to the works performed on his car (paper, digital forms → social, web etc.)

F. **Management post repair**:
   1. Archiving and selection of the photographic documentation (if not done before);

G. **Management process of the active cycle**:
   1. Credit monitoring;
   2. Payment check.

1.5. Meaning of sustainability

Sustainability is a term that includes a wide range of different sectors (environmental, economic, financial or social), but all with the same meanings. By definition, it is the changing process in which, through the exploitation of resources, the choice of reasonable investment plans and the unavoidable and sudden technological development, are capable of taking advantage of the current and future potential of the object under consideration. It is immediately clear that, for the matter of the project, the branch of sustainability of our interest is the economic-financial one. The

main aspect is based on the concept that 'sustainability' implies the creation of value and profit today, without altering or compromising the satisfaction of future needs. Being sustainable means, therefore, having the ability to develop financial strategies that allow generating profit over time, in the long term, in compliance with the rules in force; thus, taking care also of the legal aspect of the choices undertaken.

In the project under exam, the creation of sustainability of an ideal car body shop is carried out through several studies made on the determination of the different activities performed by the firms. More precisely, all the information collected from the members of the GTW are transformed in numbers, ratios and KPIs, which are better explained in the second section, because otherwise it might not be possible to confer an analytic interpretation to the results obtained. Information is collected just in a descriptive way and then converted in numbers, in accordance with the depositions of the experts of the profession, to give real and reliable interpretation of these data conversion.

The aim is to create a value scale, generally form 1 (low) to 10 (high), in which each value is linked to a range of the KPIs (generally reported in percentages) obtained as outputs of the value collected during the interviews in the GTW, and that corresponds to a status of the firm in relation with that kind of parameter (Fig. 1.1).

Thus, for a company the goal to achieve is trying to reach the highest positions in these scales, as far as possible, because in such a way the possibility to be sustainable over time is much more grounded and concrete.

In the end, once all the results have been elaborated and given as outputs, it will be possible to state if that business has the terms and details to be claimed as sustainable and declared compliant to the excellent body shop asseveration model.

Parameter 1/Parameter 2	10% 0%	11% 12%	13% 14%	15% 16%	17% 18%	19% 20%	21% 22%	23% 24%	25% 26%	26% 27%	Standard ≥ 28%
Score	0	1	2	3	4	5	6	7	8	9	10

(Fig. 1.1 , Example of table used to refer ranges of values obtained from the studies of the body work, to the scale of quality (1 to 10) for the final assertion of the body garage - the values reported are only a matter of example -)

The table above is an example of how the value useful for the classification are given. Everytime we decided to create a KPI, we tried to translate the percentages obtained

into a value (form 1 [low] to 10 [high]), in order to reach what is the end game of the work. All the tables built in this way follow the same structure: in the up left corner there is the description of the parameters under analysis (parameter 1 and parameter 2) by which the KPI is calculated. Then, in the last row there are the scores, that determine the scale of classification. Last, in the upper rows, the results obtained by the calculation of the KPI are linked to the relative score. The starting point of this association is the ideal one, or better the so called 'standard'. Everytime we asked to the GTW which was, as for them, the ideal value for the KPI for which a car body shop might reach the best score (10), and then, from that value, was decided the scanning interval for the association of the lower values of the KPI with the relative lower values of the scores' scale.

To better explain the matter, let's suppose that two different parameters are taken into consideration for the calculation of the KPI. The two might be taken as absolute values or evaluated through other mathematic operations and combination with other parameters. Anyway, the aim is to obtain a ratio between two parameters that will have as an output a value which is the KPI of that precise activity that is being analysing. Then, depending on the value of this KPI, a valu of the scores' scale is associated. For example if the ratio gives as a result 14%, the related score is 2, which is surely not a good value in a scale form 1 to 10; this means that for that precise task the car body shop is not operating good and its value creation may be affected by the low efficiency with which this task is performed. Thus, this might be a way to understand which are the strengths and weaknesses of the business, and so a way to identify which are the activities on which base the work, and which are the ones that absolutely must be corrected and improved, to arise the profitability of the body garage and its sustainability over time.

1.6. The method of collecting all the information.

The first meeting of the GTW, occurred on 30th of july 2019: from that day, as already said, at least once a week there have been a meeting to give shape to this new project. Just to make a metaphor, the starting point of this work was the grassland, with the aim to build a castle. Thus, huge effort and meticolous study of all the details that carachterize this project, have been done.

Another key point, as it is easily understandable, was the dimension of the project. In other terms, to be considered an acceptable, valid and considerable disciplinary, in order to be approved by Accredia and IEDM, its catchment area had to be significant. This means that the number of car body shops that will adopt this document as a model must be composed by, at least, a hundred of participants; otherwise there was no point to neither start the work. Just think that if the final goal is to spread all over the country, the resonance might be particularly extended.

This section will explain which has been the path followed in this project, giving indications regarding:

- the way with which all the information regarding the specific phases of a repair processing of a car that are executed within a car body shop have been collected;
- about who has the ability and is in charge to perform these activities;
- which is the *modus-operandi* of the car body shop.

The first, and main, aspect that is essential to underline is that the structure of the project and its management is the result of a careful way of data collection and analysis of them made by the Professor, together with Paolo and me. But the information collected, the technical terms, the specific sequence of the tasks and the associated operators, and also, in general, the flow of activities of this business, starting from the arrival of the client with his damaged car, till the moment when he leaves with the same restored, have been elaborated only thanks to the support and to the suggestions of the GTW, composed by a group of experts of the sector, who gave us the guidelines and references to elaborate an appropriate document to be submitted to Accredia and IEDM.

Taking into consideration what has been pointed out in the previous section, beyond the differentiation of all the activities; is fundamental to identify who is in charge to perform each task. By this way is possible to understand which role is connected with the corresponding activity(ies), in order to take trace of the progress status of the

practice and, also, to have knwoledge in any time about who is eventually liable in case something goes wrong. Considering the division by user profiles previously made; it is possible to meet different groups of individuals working on the practice, depending on the fact that the client is a private one or an insurance, or even a rental service company; because for different users, different group of worker are going to perform their tasks.

In particular, the several roles that is possible to find within a car body shop are:

- **The owner of the business**: he is in charge to do nearly anything and to act as a supervisor for any activity, taking care that everything is performed in the most correct way possible and that any client is going to be satisfied as best;
- **Bodywork manager or department supervisor**: is a technician, an expert of the job and is the person in charge to act as the supervisor in the area of competence. He is subordinated only to the owner of the business;
- **Receptionist**: is the person entitled to receive the incoming clients, asking them all the data needed to activate the practices;
- **Secretary**: normally is the person in charge to manage all the administrative side of this job, taking care of the cash inflows payments made by customers**;**
- **Other employees**: are all the people able to perfomr the activities necessary to fix the cars of the customers, under the supervision of the two first people;
- **Spare parts operator**: tendencially when a client needs his car to be repaired, the work necessary is composed by two voices of costs: the one related to the workers and the other related to the spare parts needed that are going to sustitute the old and damaged ones. By this way, this figure is in charge to manage the selection of the specific and right spare parts actually necessary for the intervention;
- **Apprentices or external parties**: might be any kind of people that is being learning the job, making experience within the body garage and helping the other workers;
- **Assembler**: is the person that, once the new spare parts have been ordered and the old damaged parts have been disassembled, has the capabilities to assemble the new parts;
- **Purchases manager**: is the person in charge for the acquisition of the car body shop of any kind of facilities and spare parts needed to perform the work;
- **Sheet metal worker**: is the technician expert in the leveling of the metal parts of the car that may present imperfections and dents;

- **Painter**: is the worker in charge of giving the paint to the restored car, such that all the new parts assembled will have the same paint after his performance.

In the early first meeting, on the end of July 2019, it was made just a '*brain storming*' of what are the main activities carried out in almost all the car body shops, without a precise order, but just to define a sort of delineation of the contents of the work. Then, as a second step, all the information collected have been organized creating a reasonable flow of actions which determines the work of a car repairman.
First consideration made, was about the fact that different way of work are related to different clients. Thus, it was fundamental to start the project, to identify the possible users' profiles with whom the firm can deal with; as already prior mentioned.

First scenario that has been analyzed was if the user's profile is a private client, thus, any common person who comes to the car body shop because his vehicle has suffered a damage, a crash and so on, and needs an intervention of fixing. Of course these are the traditional matters that make a client come to the car repairman, but not the only ones; indeed it could be possible also that the former comes just because he wants to change paint to its vehicle, nothing more. Other reasons why it is possbile for a client to come are due to the possible services that the car body shops may offer: for example the tyre dealing for changing wheels and tyres; the windows fixing in case of break of the windscreen or of the side windows; or also, if the car body shop is certified to be a car revision center, to make vehicle reviews.
Once all the activities have been defined, for all of them we tried to collect several information, to help us creating some parameters, giving them a value and finally determining the KPI of interest.
In particular, for any task we wanted to know:

- The **organizational position** → the person, intern of the car body shop, who is in charge of doing that kind of task;
- Which kind of **competences** the person in the previous point must have to perform the task. We distinguished two different types of knowledge:
    a. *Formal* → licences, titles, certificates etc;
    b. *Substancial* → experience, ability etc.
- The **output generated** → document, information, semifinished good, operating action etc. Normally this is generated from the first interaction of the worker with

the client and for any task there must be possible to recognize something done, created as a result of that kind of activity;

- Which were the **inputs** and the **used resources**, necessary to carry out the task; without which it might not be possible to generate the output and, also, this gives information on the phase of the entire process: if the input is the output of an upward phase, it means that we are in the middle of the process; if instead it is the result of the first direct interaction with the client, we are at the beginning of the process, and so on → time, tools, material, space, input from other activities etc;
- Last, but not least, it is important to set the **kind of client** of the practice in act: this means to recognize to whom is destined the output generated in the current task; sometimes the client is the same person who performed the activity because he is in charge of doing multiple steps of the same activity, other times it is different and so there is a sort of '*handing over of the witness*' from the organizational position to the client of the activity → if it is an internal or an external one, and specify who it is.

A template example of the way to collect the information just now listed above, is the following:

Private/Firm	Competences		Output Generated	Input/resourced used	Type of client	
Organizational position	Formal (licences, titles, certificates, etc.)	Substancial (experience, abilities, etc.)	Document, information, semifinished good, operating action, etc.	Time, tools, spaces, materials, input from other activities, etc.	Internal	External

Fig. 1.2 (table used to collect data information).

To better understand the meaning of this table and its use made in favor of the aim of this project, the following (Fig. 1.3) is a practical example of what we have done on the very first task; which is related to the section '*Welcome of the coming client*', so, the moment when the client enter the car body shop because he needs help in fixing his car, and in particular '*listening to the client and taking vision of the car to understand the type and the size of the damage*'.

Private/Firm	Competences		Output Generated	Input/resourced used	Type of client	
Organizational position	Formal (licences, titles, certificates, etc.)	Substancial (experience, abilities, etc.)	Document, information, semifinished good, operating action, etc.	Time, tools, spaces, materials, input from other activities, etc.	Internal	External
Owner or receptionist	No	a. Relational skills b. Experience in fixing and estimation (at least 5 years)	Understanding of the type of damage for possible future quote (in this pahse no data client are collected)	Time, Camera	The one who makes quotes	

Fig. 1.3 (example of management of the task 'listening to the client and take vision of the car to understand the type and entity of the damage')

The reading key of the table immediately makes us understand that we are talking about a private/firm user profile; that is a first calssification. Then, we know that the individual in charge of receiving the customer and listening to his needs is the owner himself or an employee, who works as a receptionist. About the competencies that this employee must have, we do not find formal ones (licences, certificates, titles etc.), but substancial ones are required: the receptionist must be endowed with good relational skills (the accomodation of the client could be a a very good starting point for him to be intended to choose that car body shop instead of others where the welcome has not been so pleasant), because he is everyday in touch with external customers: the receiving phase might represent an indicator of professionalism and accuracy of the business, towards incoming clients, and has a positive impact on him.

Over this, if this task is performed by the employee (because otherwise it is considered implicit for the owner to have these kind of skills), he must also have experience about fixing; in this way he is capable to understand the size of the work to be executed and give the client a reasonable estimation of the cost of the operation. After a debate with the GTW, they suggested that the minimum period of experience that this employee must have is at least five years, not less; because it has been considered that there was just enough time to have seen a great number of different dynamics in the sector and so, to have learnt how to move within it.

As always expected in a process, an activity, to be executed, must receive some inputs and generate outputs. In this case the inputs, also considering the resources used, are time and camera: the former is always present, but it is important to mention it because it is always a key factor in businesses' performances (the aim is always to try reducing the time of the activities in order to become more efficient). The latter is referred to

the fact that when a client comes, the first thing to do is to take trace about the actual situation, so to have clearer ideas about what is needed to be executed on the car to repair.

In the end, for any activity, there is the need to identify to whom the output generated is destined; in this case the client is the one who makes quotes (preventivatore) who has the ability to generate an initial and approximate estimate of what would be the future expense of the end client that wants his car fixed.

2. OPERATING PROCESS

As always done, when a project is put in act, the operating process is a fundamental phase of the implementation of the same because it is the moment when the project itself begins to acquire a concrete shape; this because all the previous ideas are now translated in facts and actions.

Looking at the huge dimension of the work, the first crucial thing to do has been the identification and the subdivision of the project in some subactivities that have been elaborated separately and then merged together. More precisely we decided to divide the project in three different macro areas for determining the assertion of a car body shop; in particular the analysis of the latter was made considering:

a) **Organisational Quality** → In this area we took into consideration all the activities performed in a car body shop, trying to understand how each one must be carried out in the highest professional way and taking care of the fact that for all the activities, the complete list of different tasks was carried out and the sequence of them was the correct one. This has been possible and reliable only thanks to the support of the GTW. Obviously this macroarea plays a fundamental role for the assertion of the company because the following economic aspects of the business are the result of a good way of working and performing the job. Thus, if the company is weel organized, well equiped and composed by the right number of human resources who cooperate in the correct way optimizing the process in its totality, then it will be possible to appreciate good economic results;

b) **Economic and Financial Quality** → This is the area dedicated to all the economic and financial evaluations of the car body shop that is going to be examinated through the assertion process, that are collected from the balance sheet, income statement and other financial documents. In this branch several KPIs are taken into consideration for the evaluation of the trend of the business of the company (ROS, ROE and others that will be better explained in the following sections). Is through this area that comes out the potential sustainability of the company and its capability to generate profits over time (tendencially on a quiet long time horizon, long term). As everybody knows, the first aim of any kind of business is generating profit, thus all the activities performed by the business must be carried out so to maximize this value, trying to reach the highest efficiency possible in the process;

c) **Quality of compliance with the standard in force** → For any kind of business, the respect of the legal system is absolutely mandatory: it means that the infringment of

it can lead the company to a score equal to zero in the certification process, which means, by definition, that the same doesn't have the minimum requirements for the assertion. If the legal entity is violeted, the business might be penally liable, and even if it has the maximum scores in the other two areas, this is not enough to catch the certification. Respecting the law is a necessary, but not sufficient, condition to affirmation without which the assertion is not reliable.

In this macroarea the aim was to check which are all the laws that must be respected to certify that the business operates in compliance with the legal system and so is authorized to perform and generate profit. More precisely, during the creation of this assertion model, we discovered that there are some rules that are, as already said, mandatory and others that are not, but that are anyway good practice to be respected: is on the base of these latters that in this area a company might get more points in its evaluation during the assertion process, in comparison with other companies that do not do the same.

At the moment when these three macro areas have been stated, the consequent consideration was if they have all the same impact on the project or not. It means that we decided to confer a weight to each of them; and this will be crucial at the moment of the assertion process of a company: by this way if the weights are different, the several scores impact in different ways on the final result, otherwise not. Anyway, for the fact that these three macro areas are each fundamental for the process, then, the respective weights are equal and so cover 1/3 of the total (≈ 33% each; Fig 2.1 below).

Fig. 2.1 Subdivision of the project in three macro areas, all with the same weights.

At this point one consideration has to be made: the focus of this thesis will be addressed on the second macroarea of the prior mentioned: the one related to the economic and financial quality analysis for the assertion process of the business model of a car body shop. In the introduction of this document it was said something related to the organisational quality area, for the creation of the process; but the rest of the work will be based on the study of the economic and financial KPIs of this sector.

2.1. THE TEMPORAL EVOLUTION OF THE ECONOMIC AND FINANCIAL BALANCES OF THE FIRST THOUSAND CAR BODY SHOPS IN ITALY.

The project under analysis takes into consideration the automotive sector of spare parts, the indipendent aftermarket of spare parts and the job of the car body shop. As previoulsy said, form now on, it will be analyzed the economic and financial side of this market, focussing the attention exclusively to the business of the world of the car body shops in Italy and their economic trend over time, on the base of data collected referred to the passed years. In order to give constistency to the study, the span of time considered will be the one starting from the beginning (January) of 2014 till the end (December) of 2018, so, five years time horizon: bu this way it was possible to collect all the information needed from the companies: all the balance sheets, income statements and other fiancial information concerning to previous years are consolidated and available, thus, possible to be accessed and studied.

In Italy, it is possible to count more or less 12.500 car body shops operating on the territory .

About the totality of this group, we have decided to consider only a part of it. This decision was due to the fact that for the majority of companies there was no public economic-financial documents available to collect and study financial data: this happens because, lots of companies (≈70-80% of the Market) are registered to the Chamber of Commerce as companies of phisical person and not as legal ones. This gives to the former a right of privacy, thus the possibility to keep their economic and financial information private and so, hidden to the public, while for the lattersb (which constitute, by the way, nearly the 20% of the Market) is mandatory, by the law, to make available to the world all the information concerning their balance

sheets, income statements and other documents related to the property of the business under analysis (for example through the Company Registration document edited by the Chamber of Commerce is possible to know the composition of the partnership of the business, so who are all the members; then the headquarter of the business, the VAT number, the company name and so on).

Furthermore, because of the direct availability of financial documents, we decided to study the portion of the Market related to the capital companies; thus, referred to the 20% of the whole Merket in Italy. The number of registered capital car body garages in the country amounts to 3076 companies; about them we decided to make our studies on the first thousand of car body shops, after have created a list on the decreasing value of the Value of Production (VP) parameter.

Numerically, this decision, has been due to the facts above explained and also because we hold to be true that this thousand would be a consistent sample to determine a structured group of capital companies, as a group.

To make an economic and financial analysis of this first thousand of car body shops, as already said, there was the need to collect all the information about them, thus, we had to search all the balance sheets and income statements related to each, to study them and to create some indicators of performance (KPIs) to help us better understand the situation of each company and, most important, of the global market of this kind of industry. To carry out this objective, we decided to create and study eleven key performance indicators that would have helped us in the evaluation of the sector. In the following sections there will be a list of all the indicators the we decided to consider for the goal above mentioned.

2.2. KPI 1: VALUE OF PRODUCTION - VP.

By this section we are beginning to collect, define, elaborate and evaluate some indicators of performance in order to reach a final global picture of the trend of several values in this branch of the market. To make this evaluation, it was necessary to obtain all the balance sheets and other documents possible, of the ones publicly available, which might help us in better understand any economic and financial scenario of each company.

Basically, we made a list of the total 3,076 companies, creating an .xls file composed by the VAT number of each, the relating name of the company registered to the

Chamber of Commerce and then all the information present in the balance sheet and income statement from the 2014 to the 2018 (annual basis, not monthly discretization).

Then, on another worksheet, once all these data had been listed, for all the car body shops, the indicators have been evaluated numerically through some formulas. At the end of the analysis, final considerations will be done, depending on the scores obtained as KPIs.

As the title of this section suggests, the first and representative indicator of this list is the Value of Production (VP). This is an Income Statement item and first of all it is necessary to make a distinction between this parameter and the other of Revenues because they have not actually the same meaning: the former is the value of the goods that are 'destined' to the sale, the value that has been produced within the year, so, production sold, production ready but not yet sold and production destined to the internal use of the business; whereas the latter is the value of the goods that 'have been actually sold and for which relative invoices have been issued'.

The value of production is equal to the revenue increased by the inventories of the production for the concurrent year and decreased by the value of the inventories of past productions. Only in the case in which all the goods produced were sold, the VP would be identical to the revenues.

In reality, very often it happens that is sold only a part of the production of the concurrent period, and that the excess is added to the inventories; but, on the opposite, it could happen that in the concurrent period is sold not only the whole production, but also part of the inventories of the previous year(s) of production. This latter hypotesis seems to be the most favorable condition for the right management of the company. For this reason, very often it happens that the income statement item of VP is considered as the one of revenues, and so the inflows coming from the sale of goods produced by the company.

Thus, to calculate this item of the Income Statement, is necessary to keep the revenues and add or subctract them the inventory variation of semi-finished products, or the ones that are in progress, and the already finished ones. The formula might be the following:

$$VP = Revenues + \Delta I + \Delta Imm$$

Where:

ΔI = Inventory variation of semifinished and/or finished goods

ΔImm = Increases in fixed assets for internal work

A first observation to be made is that the ΔI might be also negative, it depends on how the inventory varies its volumes. Thus, from a practical point of view it is necessary to add or subctract to the value of the sales made, the difference between the initial level of the inventory and the final one. Anyway, the point is that the higher the VP, the better is for the company.

Previously we said the optimal condition for a company, was to wonder to sell exactly what it produces, but it might not be always possible. Anyway, it is possible to say that if a company tend to present a VP higher than its revenues, for more than one years, and among these years the growth is a trend, it might be a signal that there are problems in the production phase: it would be an indicator of the fact that the company is in a moment of structural crysis of overproduction, which might be translated in a high accumulation of inventory that will be harder and harder to work off. Thus, it might be better trying to get these two parameters as closer as possible.

From now on, we will consider VP and Revenues exactly equal and so, for all the KPIs that will be taken into consideration in which this item is present, we will consider them exactly the same parameter for each company that will be analysed.

2.3. KPI 2: ANNUAL PERCENTAGE VARIATION OF THE VP.

Another indicator that might be useful to be taken into consideration is the Annual % Variation of the VP. In general the % variation is a math technique to understand and evaluate what have been the change of a value or parameter between two different situations: a beginning and a final one. In the case under exam, this percent variation is calculated comparing the values of the VP, for the same company, among two consecutives years of the same indicator (VP in this case). This value is suitable to make considerations on the trend of the indicator on which it is applied, because it is its representation over time and it gives a feedback about if that parameter (VP) has improved or has become worse from one year to the following. This latter consideration depends totally on the kind of indicator under exam, because sometimes a decrease of the indicator might be an improvement, other times a

worsening; the same for an increase of the % variation. The formula might be, for a current year *t*:

$$Annual\ \Delta\% = \frac{VP_t}{VP_{t-1}} - 1$$

If the will is to evaluate this parameter for the aggregate, considering a generic company *i*, at a current year *t*, the formula will change as:

$$Annual\ \Delta\%_{aggr} = \frac{\sum_i VP_{i,t}}{\sum_i VP_{i,t-1}} - 1$$

2.4. KPI 3: EBITDA vs VP.

This indicator is composed by VP and EBITDA, as reported in the title; VP has been defined in the prior sections, thus, now we will focus on the meaning of the latter and, then, understand the KPI under analysis.

First of all EBITDA stands for "Earnings Before Interests Taxes Depreciation and Amortization". It is a way to evaluate the performance of a company, excluding from the calculation financial and fiscal conditions. EBITDA is useful for comparing the financial strength of a company with one another, based on a single return estimate. It is also applicable in several sectors and it allows analysts to focus on the outcome of operational decisions in a given company.

EBITDA allows analysts to verify whether the company makes positive profits from ordinary operations and it is used as a measure of operating income in the calculation of cash flows from operating activities.

When using the EBITDA assessment method, it is worth checking other factors and performance indicators to ensure that the company does not want to spread misleading information. For the calculation of this indicator, the path to follow is the following:

$$EBITDA = VP - Operating\ Monetary\ Costs$$

Or, alternatively:

$$EBITDA = EBIT + Depreciations + Amortizations$$

Very often, analysts prefer the second choice, thus, starting from EBIT e going back on the Income Statement, adding depreciations and amortizations; anyway there is not a specific rule on which of the two alternatives is more correct than the other.
To better understand at which point of the Income Statement is possible to find this item, the following figure may help:

VP (Revenues)	€ 2,000,000
Operating Costs	
- Salaries	(€ 500,000)
- Rents	(€ 250,000)
EBITDA	€ 1,250,000
Depreciation	(€ 37,500)
Amortization	(€ 12,500)
EBIT	€ 1,200,000
Interests	(€ 25,000)
EBT	€ 1,175,000
Taxes	(€ 475,000)
Net Income	€ 700,000

Fig. 2.3 Semplificative and generic example of the representation of EBITDA in an Income Statement.

A very important consideration to be made is that EBITDA is commonly used in performance ratios, such as in evaluations of a company with a high added expense value, which can in turn be subtracted from profits. For this reason in our report it is considered the ratio between EBITDA and VP: the aim is to compare and observe which is the impact of the outcomes of operating decisions (excluding non-operating ones such as interests, taxes, depreciations and amortizations), on the totality of the revenues made by the company, hopefully equal to the VP. The ratio under exam is called EBITDA Margin:

$$EBITDA\ Margin = \frac{EBITDA}{VP}$$

The utility of this KPI is that through it is possible to understand what is the percentage of the VP that the company under analysis is capable to turn into cash profit during the year considered in the evaluation.

This indicator is very often used by entrepreneurs who rely on return on sales: the ratio of operating profit to total sales. However, in this calculation, various items are taken into account that have no relevance for the actual performance of the operating activities and actually alter in some way the result. The EBITDA margin, instead, gives a more realistic picture of the profitability of the company's business processes: through this KPI the company is capable to monitor the costs due to the management of the company, which minimization leads to a higher profitability in daily operational processes.

2.5. KPI 4: TRADE MARGIN vs VP.

The trade margin is one of the most used indicators by company to monitor their economic situation, especially for those that act as distributors in the market, because it aids them to measure the profitability of a product, or even of an entire category of products. In particular this margin is the profit (difference between price and cost) related to the price; in such a way is possible to understand which is the percentage of actual earning that the company gains on a specific price.

By this first definition, is clear how the trade margin is closely linked to the sale price of the product; but, notwithstanding this, is also important not to confuse this margin with the "total trade margin" and also with the "mark-up".

The **total trade margin** is calculated in the case an enterprise sells, or distributes, more than one product: in such a case the total trade margin may be derived from the difference between the total revenue and the total cost of acquisition, which in turn is all related to the total revenue and then multiplied by 100:

$$Total\ trade\ margin = \frac{(R - C)}{R} * 100$$

Where R is the total revenue and C the total cost of acquisition; unlike the trade margin, which is expressed as a percentage, this one is not derived in this way.
If all the variable costs are subtracted from the trade margin, the contribution margin is obtained: this last indicator is particularly useful for the calculation of the so called "Break Even Point" (BEP) which is the value at which costs are exactly covered by revenues, without no profit. Thus, this expresses the sales price level, above which the product becomes profitable for the company that produces or distributes it.
Coming back to the initial differentiation, was said to pay attention to not confuse the trade margin with the mark-up; this because the difference is really subtle. The former is the revenue (difference between price and cost) related to the price:

$$Trade\ Margin = \left[\frac{(P - C)}{P}\right] * 100$$

Where:

P = Sales price
C = Acquisition costs

By doing so is possible to know what is the percentage of income gained on a specific sales price.
While the latter (mark-up) expresses the selling price of the product through an increase applied to the purchase cost. It therefore represents the gain (difference between price and cost) compared to the cost:

$$Mark\ up\ = \left[\frac{(P - C)}{C}\right] * 100$$

By doing so is possible to know, instead, how much the company can increase the costs it incurs by paying a certain price. To better explain, this method is useful to determine the selling price of a product actually bu increasing of a certain percentage, the mark-up, the cost of the product. For this reason the mark-up applied to the retail of products is uniform.
Once all these differences have been emphasized, the KPI that is taken into consideration for the analysis in question, is the ratio between the trade margin and the VP:

$$Commercial\ Margin = \frac{Trade\ Margin}{VP}$$

Through this ratio, the intent is trying to understand which fraction of trade margin is referred to the whole VP; thus, expressing it in a percentage value. In other words, it is the margin created, depending on the difference between sales price and production cost of each product, on the basis of the global VP of the total market segment (≈ 1000 car body shops considered).

2.6. KPI 5: NET INCOME.

This item of the income Statement and of the balance sheet, is the result of any business and its value is fundamental to understand if the company is acting good or not in the market. The aim is always the one to maximize this parameter because it is strictly linked to the satisfaction of the owners of the business, indeed it represents their earnings.

Net income is, by definition, the overall profit that a company has been capable to realize, reported in its balance sheet, at the net of any kind of cost. It is useful for the calculation of the EPS (earning per share) and it is a strategic data to evaluate the profitability of a company in a certain period. To calculate it, it is necessary to subtract all the costs and the expenditures incurred from the total revenues; in the last step it will be necessary also to subtract interests owed to third parties and taxes: what remains is the net earning of the period under analysis.

Last, net income may be used to pay dividends to the shareholders, or it might be agreed upon the reinvestment of this amount in a fund, for future needs of the company. As illustrated in Fig. 2.3, this item absolutely must not be confused with the one of the revenues: it is easy to understand, after the prior definitions made, that a high value of revenues (or VP, as we said) may seem to be satisfactory; but what really matters is net income. This clarification may sound obvious to the reader of this work, but actually the misunderstanding of the meanings of these two values, is the cause of crisis of many entrepreneurs nowadays: very often it happens to them to observe an increasing value of the revenues over time (year by year), but with a decreasing value of the net income, on the same span of time. Thinking about this

might be absurd for a business, yet there is no consequentiality between the two: it is not certain that to the increase of the former, corresponds an increase of the latter. Very often it happens that the proportionality between these two values is inverse, instead of being direct. Of course, obtaining a higher value of revenues over time is positive, but it must be supported by a progressive increase of net income, otherwise it means that the business is operating wrong somewhere in the process.

Then, these two values are not the only ones that can be considered as 'drivers' for a business; there are others, such as the liquidity, that are essential indicators of the economic and financial situation of a company; anyway it is important to have in mind the difference already explained between these two parameters that always catch the attention of the entrepreneurs first.

2.7. KPI 6: RETURN ON CAPITAL EMPLOYED – ROCE.

Return on capital employed (ROCE) is a financial ratio that measures the company's profitability and the efficiency with which its capital is used. In other words, the ratio measures how well a company is capable to generate profits from its capital: thus, it is a good indicator for evaluating how the investments made are profitable to the company and so, if the same investments have been a good choice. The ROCE ratio is considered an important profitability ratio and is very often used by investors when screening for suitable investment candidates. This ratio is obtained taking into consideration the capital employed, which is obtained by a balanced equation, as it is for the assets and Liabilities section in a balance sheet, which is:

$$Capital\ Employed = NFA + NWC - SP = Equity + NFL$$

Where *NFA* stands for '*Net Fixed Assets*', *NWC* for '*Net Working Capital*' and *SP* for '*Severance Pay*'. The latter is the outpayment that a company owe to one of its employees in the moment this will no longer work for the business; instead the other two can be deducted by the following formulas:

$$NFA = Tang.\ fixed\ assets + Intang.\ fixed\ assets$$

And

$$NWC = Inv. + COR - COP$$

Where:

Inv. = Inventory;

COR = Current operating Receivables (credits towards clients, tax credits and others);

COP = Current Operating Payables (debts towards suppliers, tax debts and others).

On the right side of the equation, instead, it is possible to find the Equity, that as already known is obtained just by the difference between Assets and Liabilities (by the classical balance in the balance sheet); while the *NFL* stands for '*Net Financial Liabilitites*' is calculated through the formula below:

$$NFL = FD - FFA - LA$$

Where

FD = Financial Debts;

FFA = Financial Fixed Assets (bonds, shares etc.);

LA = Liquid Assets.

An important thing to clarify is that instead of using capital employed at an arbitrary point in time, analysts and investors often calculate ROCE based on the average capital employed, which takes the average of opening and closing capital employed for the time period under analysis.

Coming back to the definition of ROCE as a financial indicator, it could be useful to say that it is a metric for comparing profitability across companies based on the amount of capital they use. There are two metrics required to calculate return on capital employed: earnings before interest and tax and capital employed:

$$ROCE = \frac{EBIT}{Capital\ Employed}$$

Where EBIT has been defined in section 2.4. and capital employed just above.

There are several reasons why this indicator is preferred to other such as ROI or ROE: this is because unlike other fundamentals such as return on equity (ROE), which only analyses profitability related to a company's common equity, ROCE considers debt and other liabilities as well. This provides a better indication of financial performance for companies with significant debt; indeed, in this industry, the one of car body shops, companies present high levels of debts in their balance sheets.

Then, for a company, the ROCE trend over the years is also an important indicator of performance. In general, investors tend to favour companies with stable and rising ROCE numbers over companies where ROCE is volatile and bounces around from one year to the next.

This indicator is basically synonymous with capital available from net profits. The higher the value derived using the above formula, the more effectively the company uses its capital. It is essential that the ROCE exceeds at least the capital costs (financing costs), or the company is in very poor financial condition. ROCE can be very useful for comparing the use of capital by different companies engaged in the same activity, particularly with regard to capital-intensive industries such as energy companies, car companies (the sector under exam) and telecommunications companies.

2.8. KPI 7: BREAK EVEN POINT (BEP).

The Break Even Point (BEP) is the level of revenues that guarantees the coverage at least of all the costs, without any kind of margin; it assures so, the result of parity between costs and revenues. It is a value that indicates the quantity, expressed in volumes of production or revenues, of product sold necessary to cover the costs previously incurred, in order to close the reference period without any profit or loss.

It can be calculated through two different methods:

a) **Graphic method:** it allows reader to understand the dependence of BEP on the structure of business costs and, therefore, on the business choices from which they derive. In a Cartesian plan with revenues as an independent variable (the x-axis), fixed costs can be represented with a straight line

parallel to the x-axis (they do not vary with the variation of turnover). Variable costs, on the other hand, are a positively inclined straight line (they increase as turnover increases, because they depend on the volume produced, by definition). It follows that the total costs can be represented by a positively inclined line that crosses the axis of the orders in correspondence with the total fixed costs (they are incurred even in the absence of turnover). The intersection of this line with the 45° inclined line passing through the origin determines the BEP. If the inclination of the line of the total costs is equal to or exceeds 45°, the lines never cross: it means that it will be never got a balanced budget because the variable costs are too high (Fig. 2.4). The increase in fixed costs and/or variable costs “moves BEP to the right": a break-even is achieved with a higher turnover. Only if revenues exceed BEP does the company actually “earn", because there is a margin created between the level of turnover and the one of total costs, so that at the same volume, the difference between price and cost of a product generates margin. The following figure well explains this concept graphically, identifying the areas of potential profit and loss and the BEP, point of equilibrium: the higher the value of BEP, the higher will be the probability to get a loss (because bigger will be the area on the left of BEP); thus, getting a low BEP gives space to higher probabilities for profits, limiting the extension of losses as well.

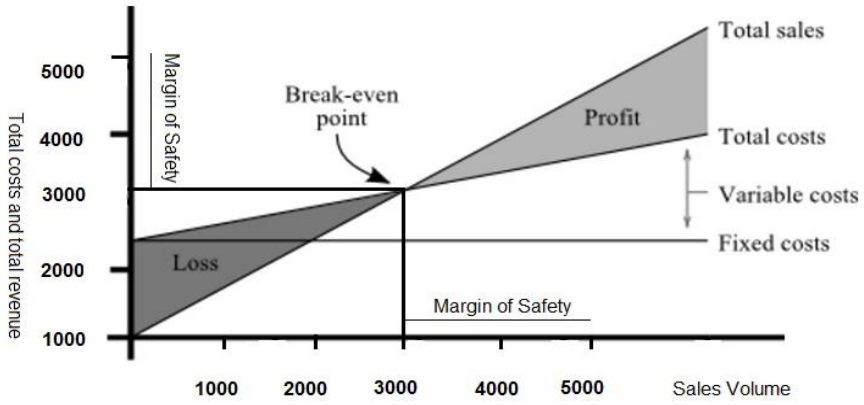


Fig. 2.4 graphic illustration of the BEP.

b) **Analytical Method**: through the following formula is possible to determine the BEP:

$$BEP = \frac{CF}{1 - \frac{CV}{R}}$$

Where

BEP = Break Even Point
CF = Fixed Costs
CV = Variable Costs
R = Revenues

This formula allows to calculate the BEP for a company supposing it trades just one product, but, as everyone can imagine, nowadays companies sell batches of different products and so the calculation changes a bit: there are some mathematical ways by which is possible to evaluate the BEP of a product A, as a function of the quantity produced of another product B, that is known:

$$Qa = \left(\frac{CF}{Pa - Ca}\right) - \left(\frac{Qb * (Pb - Cb)}{Pa - Ca}\right)$$

Where

Qa, Qb = quantity to be produced to reach the BEP for a, b;
Pa, Pb = selling price of product a, b respectively;
Ca, Cb = variable cost of production of product a,b
CF = fixed costs

For the aim of the project, we decided to evaluate the so called 'Normalized BEP' which is the ratio between the weighted BEP and the VP: at the same time the weighted BEP ($BEPw_i$) has been obtained through the multiplication between the BEP (BEP_i) with the respective VP of each car body shop (VP_i). Thus, to obtain the weighted BEP, of a generic company *i*, the calculation has been the following:

$$BEPw_{\mathrm{i}} = BEP_{\mathrm{i}} * VP_{\mathrm{i}}$$

Once all the $BEPw_i$ have been calculated, the last indicator to be calculated is the Normilized BEP (percentage value):

$$BEP\% = \frac{\sum_i BEPw_{\mathrm{i}}}{VPtot}$$

Where

BEP% = Break Even Point normilized;
Numerator = Sum of the BEP of the whole list of companies considered (~ 1000 car body shops);
VPtot = Global value of VP of the whole list of companies considered (~ 1000 car body shops).

This last formula is useful to understand which percentage of BEP is (in terms of quantity to balance the costs of production) referred to the amount of VP_{tot} of that year of the whole list of car body shops.

2.9. KPI 8: DAYS SALES OUTSTANDING – DSO.

Days Sales Outstanding (DSO) is the financial indicator that shows the average number of days a company takes to collect the receivable after the sale. The lower the DSO, the lower the working capital and consequently the risk of default by its customers. On the contrary, the higher the DSO, the greater will be the level of financial resources used by the company to compensate for late payments or, in the worst cases, for missed payments. Moreover, this latter situation limits a company's evolutionary strategy: in this specific case, beyond the amount of money to be collected, also the variable of time plays a fundamental role. It seems obvious that at a financial level everything revolves around how much a company spend and how much it cashes, but knowing in detail “the moment when it is necessary to spend" and

“the moment when it is necessary to cash" is a wealth of knowledge that no company can do without taking the utmost account.

There are two time-values related to sales: the first depends exclusively on the negotiation, namely the agreement with the customer on the payment terms, while the second is the time needed to collect after the receivable has become due and effective. This last condition is essential because once payments have become due, it means that the time for the customer to pay has expired and so the company can demand the payments; but in the evaluation of the DSO it could happen to take into consideration the possibility that some payments are due by the clients, but cannot be required yet, easily because the expiration date has not yet been reached. This difference must be kept in mind when evaluating this indicator: tendentially the DSO is calculated after having invoiced all the month under exam (normally it is evaluated monthly, but other times also annually), and so at the end of this time period. To calculate it is necessary to:

a. Consider the total revenue of the last twelve months, VAT included (paying attention not to consider the calendar year, but just the last twelve months);
b. Consider the total revenue that the company cannot yet require, because the time for paying by the customers has not expired yet; before each cash-in of the day;
c. Consider the total revenue already expired and not yet collected, before each cash-in of the day;
d. It is now possible to calculate the average daily revenue on the base of data at point a), dividing by 365 days (supposing to consider the overall days in a calendar year);
e. Now dividing the amount obtained at point b) with the one at point d), is possible to obtain the so-called $DSO_{(v)}$, which is the number of days of sales outstanding due to payment terms agreed with customers.

$$DSO_{(v)} = \frac{Revenues\ not\ yet\ expired\ so\ not\ yet\ receivable}{Daily\ average\ revenue}$$

Then, by dividing the amount obtained at point c) with the one obtained at point d), is possible to get the so-called $DSO_{(s)}$, due instead to expired but yet not collected amount of money from customers.

$$DSO_{(s)} = \frac{Revenues\ expired\ but\ not\ yet\ collected}{Daily\ average\ revenue}$$

f. In the end, by summing the two values achieved at point e), is possible to evaluate the global DSO for the company, in terms of number of days.

$$DSO = DSO_{(v)} + DSO_{(s)}$$

A company must be as quick as possible in transforming receivables from its customers into money to be spent in order to program the cash-flow plan necessary to the routine regime. If the turnover of the last 12 months has decreased since the comparison with the previous month, there will be an increase in the DSO, which means that the percentage of own credits has increased. Similarly, the DSO will decrease with the increase in turnover in the last 12 months compared to those of the previous month.

To reduce the DSO, at company level it could be useful certainly to work on payment terms in the contractual phase, but on late payments the analysis should be done on those customers who always pay in delay the work received as if it is a their constant. Particular attention must be paid to the contact with a new customer: checking their economic solidity is a good thing, even if it is not always an index of “good payer". It is at this stage of contacting with the customer that the true sales professional emerges, who, using and skillfully dosing empathy and psychological knowledge, can understand whether it is worth serving the customer or leaving it up.

For the goal of this project, in order to evaluate the trend of the market segment of car body shops business, this indicator is evaluated on the basis of the global VP:

taking into consideration a general company *i,* the evaluation of the DSO_{aggr}, aggregate of the global market (≈ 1000 car body shops taken into account), is the result of the following relationship:

$$DSO_{aggr} = \frac{(\sum_i DSO_i) * VP_i}{VP_{tot}}$$

Where

DSO_i = Days Sales Outstanding of the company *i;*
VP_i = Value of Production of the company *i;*
VP_{tot} = Value of Production of the global market.

2.10. KPI 9: DAYS PAYABLE OUTSTANDING - DPO.

One of the items reported on the balance sheet, and not so much appreciated by all the entrepreneurs, but necessary, is the list of all the trade payables towards suppliers, including VAT. Days payable outstanding (DPO) is a financial ratio that indicates the average time (in days) that a company takes to pay its bills and invoices to its trade creditors, which include suppliers, vendors or other companies. More precisely this indicator measures the average span of time between the moment when the company acquire the debt and the one when it pays it out. When considering these kinds of indicators, the context is always based on the short term: the ratio is calculated on a quarterly or on an annual basis, and it indicates how well the company's cash outflows are being managed for the financial equilibrium of the company.

To manufacture a saleable product, a company needs raw material, utilities, and other resources. In terms of accounting practices, the accounts payable represents how much money the company owes to its supplier(s) for purchases made on credit.

Additionally, there is a cost associated with the manufacturing of the saleable product, and it includes payment for utilities like electricity and for employee wages. This is represented by the well-known 'cost of goods sold' (COGS), which is defined as the cost of acquiring or manufacturing the products that a company sells during a period:

$$COGS = BI + P - EI$$

Where

COGS = Cost Of Goods Sold
BI = Beginning Inventory;
P = Purchases;
EI = Ending Inventory.

Both the figures above described, represent cash outflows and are used in calculating DPO over a period: the number of days in the corresponding period is usually taken as 365 for a year and 90 for a quarter.

The formula for DPO, takes account of the average per day cost, being borne by the company for manufacturing a saleable product. The numerator figure represents payments outstanding and the net factor gives the average number of days taken by the company to pay off its obligations after receiving the bills:

$$DPO = \frac{Accounts\ payable}{COGS} * 365$$

As already said if the wish is to evaluate the DPO quarterly, it is sufficient not to multiply by 365, but by 90.

Generally, a company acquires inventory, utilities, and other necessary services on credit. It results in accounts payable, a key accounting entry that represents a company's obligation to pay off the short-term liabilities to its creditors or suppliers. Beyond the actual dollar amount to be paid, the timing of the payments: from the date of receiving the bill till the cash actually gone out of the company's account, also becomes an important aspect of business.

Companies having high DPO can use the available cash for short-term investments and to increase their working capital and free cash flow. However, higher values of DPO may not always be a positive for the business. If the company takes too long to pay its creditors, it risks jeopardizing its relations with the suppliers and creditors who may refuse to offer the trade credit in the future or may offer it on terms that

may be less favourable to the company. The company may also be losing out on any discounts on timely payments, if available, and it may be paying more than necessary. A high value of DPO can be beneficial if the company is running short of cash. A high DPO also helps if the company is better off in delaying the payments than making them on time and then loaning the money by paying interest to continue its business operations. Companies must strike a delicate balance with DPO.

For the goal of this project, in order to evaluate the trend of the market segment of car body shops business, this indicator is evaluated on the basis of the global VP: taking into consideration a general company *i,* the evaluation of the DPO_{aggr}, aggregate of the global market (≈ 1000 car body shops taken into account), is the result of the following relationship:

$$DPO_{aggr} = \frac{(\sum_i DPO_i) * VP_i}{VP_{tot}}$$

Where

DPO_i = Days Payable Outstanding of the company *i;*
VP_i = Value of Production of the company *i;*
VP_{tot} = Value of Production of the global market.

2.11. KPI 10: NET FINANCIAL POSITION vs EQUITY.

With 'Net Financial Position' (NFP), is possible to establish which are the conditions of an undertaking company, with reference to its degree of liquidity.

In order to obtain this data, it is necessary to calculate the difference between all the financial credits of the company under analysis and all the financial debts. If this difference is positive, it is sure that short-term financial receivables, cash and cash equivalents are in fact greater than short-term, medium-term and long-term financial liabilities: this means that the company under analysis has an economic availability equal to the balance obtained. If the difference is negative, this is a sign of the fact that the company's financial debts will be highlighted.

This indicates a net exposure to third-party lenders, equal to the value obtained; the lenders in question may be represented by various entities: finance companies, banks,

bondholders, leasing companies or factoring ones. However, it is advisable to indicate how financial payables are considered for each maturity date, not including those of other nature: payables to the tax authorities, to suppliers of goods and services or general tax and trade liabilities.

Thus, it could sound obvious that enjoying a positive NFP is preferable: in such a case the company will have an amount of liquidity available greater than the expiring debts in short-medium-high term. In the alternative case, it will be forced to face an amount of debts higher than the one of credits.

At this point, to evaluate the NFP of a business, is very important being able to calculate the global level of financial liabilities.

The first step is to reclassify the balance sheet, distinguishing between items of a financial nature within liabilities and assets, such as payables to banks, shareholders or other entities, and receivables of a financial nature, for example from associated companies. Then, the algebraic sign at the end of the NFP, is the indicator assessment of total debt:

- a positive sign shows that the company's liquidity and financial resources exceeded its indebtedness: practically this case is when the so-called balance is ‘on debit’ (to be received);
- a negative sign indicates insufficient cash and cash equivalents, in order to cover the company's level of debits, which results in the company's net exposure to the lenders. Practically this case is when the so-called balance is ‘on credit’ (to be given).

$$NFP = -Financial\ Assets + Financial\ Liabilities$$

There are two ways to evaluate the parameter of NFP: the one already explained, and another one that takes into account only the Financial debts and activities of the company. To better explain this concept, the formula is:

$$NFP = FD_{st} + FD_{mlt} - FAct$$

Where

FD_{st} = Financial Debts on the short-term;

FD_{mlt} = Financial Debts on the medium-long term;

FA_{ct} = Financial Activity.

It is common use to think the word ‘on credit’ is associated with a positive sign, and so, that ‘on debit’ with a negative one: indeed, this is what usually happens in practice. Anyway, the considerations made above are the ones that might be applied by textbook.

Each company, furthermore, must consider its capability of rebalancing a debt, which is the result of the ability of the business in generating positive cash inflows, that must be enough to make the lenders reimbursed. About the kind of cash inflows generated, the sources of them might be several: surely, they must be deduced by sales: from ordinary operations with reference to the revenues and EBITDA:

- NFP – Revenues → capability of the company to cover the debt through financial flows obtained from sales;
- NFP – EBITDA → capability of the company to cover the debt through financial flows obtained from the ordinary operations.

As usual, because the final goal is always to make use of the indicators described, for the project under analysis, is important, in the end, to specify which is the path followed for this aim. For this reason, a general introduction is always made, and then considerations about how these indicators are applied to our work.

The other member of the KPI of this subsection, is the ‘Equity’. It is the accounting difference between assets and liabilities in a company's balance sheet.

$$Equity = Assets - Liabilities$$

By this calculous, is possible to identify all the company’s own resources. Its composition is made by:

- *Equity* → amount of money paid by the founding partners for the creation of the company;
- *Financial reserve* → fraction of the net income not yet distributed to dividends;
- *Net income*;
- *Losses* → which must be covered by the financial reserves, before giving dividends their part.

In the very beginning phase of a business activity, the net assets are exactly equal to the capital injected by the economic entity of the business (the shareholders). Subsequently, the amount of shareholders' equity varies according to the allocation of legal and/or statutory reserves and the carry-forward of losses/earnings for the year. Conceptually, shareholders' equity represents the amount that remains with them, once all liabilities to third parties (including suppliers, banks, various creditors, employees and the tax authorities) have been deducted from assets.

It should be noted that the measurement of the shareholders' equity in the balance sheet (also known as the Equity of equity) generally does not provide any indication of the intrinsic value of the share (otherwise there would be no need to estimate the fundamental value of the shares).

Our usage of these two financial indicators, is composed by a ratio between the two: this KPI is called 'Financial Independence Index' (FII) and is obtained by:

$$FII = \frac{NFP}{Equity}$$

This figure may be read in two different ways depending on which of the two alternatives for evaluating NFP parameter, is chosen:

- If the first one presented is used, it indicates which portion of 1 € funding comes from the company's own resources (those of the partners or entrepreneur) and so, do not need to be given back as settlement of a debt. This is a useful method for identifying the solidity of the company itself in terms of capital and, also, to understand the extent to which the total of the company's assets has been financed through shareholders' equity.

  Therefore, the higher it is, the more the company relies on self-financing to find the funds to invest in the uses listed under assets, thus, the more it can be considered economically independent. Conversely, the lower its value, the more the company uses external sources to finance its investments.

  To be able to read and understand in the correct way the meaning of this KPI and its order of magnitude, firstly it is necessary to know that its value can vary in a

range from 0 to 1: if the index assumes values close to 1, it is a sign of the fact that the company will show an excellent solidity from the point of view of capital, as well as a high capacity of the same to finance itself with its own funds. If, on the other hand, the index assumes values close to 0, the company's debts to third parties will weigh heavily on its balance sheet. To better point out this kind of explanation, it is possible to subdivide this range into four segments, such as:

- Group 1 from 0 to 30% (Very Low): the financial structure is seriously unbalanced;
- Group 2 from 31 to 55% (Low): the financial structure of the company is unbalanced;
- Group 3 from 56 to 66% (Medium): the financial structure of the company is balanced;
- Group 4 from 67% to 100% (High): the financial structure of the company is very well balanced and, also, the most suitable for the profitable development of the company.

Just to show graphically the representation of the discretization already explained, the following figure (Fig. 2.5) will be a very schematic view of these four groups of division: the different colours are the reference to the quality of the value of this indicator:

Red → Very Low;
Yellow → Low;
Dark Green → Medium;
Light Green → High.

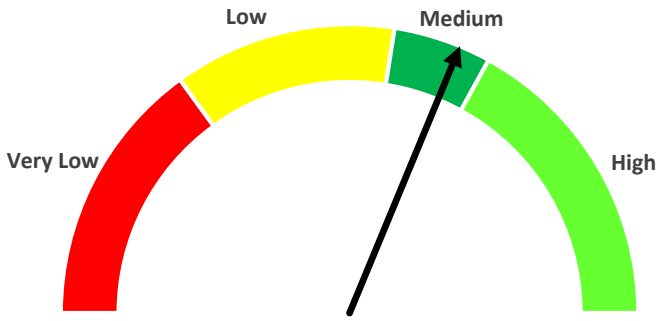


Fig. 2.5 graphic representation of the outcomes for FII, in the generic case the KPI assumes a value of 62,5%.

The graph is automatically set with an .xls file, thus, a change of the F.I.I. value (in this case is 62,5% → 0,625) corresponds to the moving of the black arrows on the appropriate range of values within that given values falls: indeed, 62,5% falls in the range of the group 3, which goes from 56% to 66%, and has a 'Medium quality' → Dark Green area.

- If the latter is chosen, the evaluation scale changes completely, because the value is no longer normalized from 0 to 1, but it varies and may assumes values higher than 1. During the study of the sample of car body shops selected to carry out the analysis, this is the alternative chosen, but the previous one is always used when normalization of this parameter is adopted. In the next section, number 3, it will be presented the table of scores to better understand how to deal with the outcomes of this indicator.

Once, in the final section of this work, there will be the analysis referred to the aggregate of the first 1000 car body garages under study, the formula previously introduced, will be evaluate for this totality: so, considering a generic car body shop *i,* the aggregate value of the FII key performance indicator is evaluated as the ratio between the aggregate of NFP and the same of Equity. In other words, the formula changes as the following:

$$FII_{aggr} = \frac{\sum_i NFP_i}{\sum_i Equity_i}$$

2.12. KPI 11: NFP vs EBITDA.

The two parameters of this ratio have been already explained in the prior sections; thus, it is necessary just to understand the meaning of their relationship in this KPI.

The NFP/EBITDA ratio, named 'Time of writing off the Financial Debts' (TWOFD), should express in how many years the company would be able to repay its financial debts if it used all its "potential" operating flows (expressed by EBITDA) for this purpose. The index is widely used by the financial community, professionals and banks as an indicator that can reveal the attractiveness of a company. A careful reading of the parameters that compose it and the analysis of the real cases invites instead to greater caution.

The reason why it is necessary to be careful in using this ratio as an indicator is because analysts must pay a great attention on the definition of the two parameters of this ratio and about how they have been evaluated.

Just as a quick summary:

- EBITDA → Earnings Before Interests, Taxes, Depreciation and Amortization means the Operating Margin deriving from the characteristic management of a company: Revenues net of consumption, fixed and variable costs, general and administrative costs;
- NFP → Net Financial Position: the algebraic sum of Financial Payables net of cash liquidity.

$$TWOFD = \frac{NFP}{EBITDA}$$

The careful reading of these definitions imposes some questions that are difficult to find a unique answer, suitable for all business realities; some examples are:

- What are the financial debts? Do they include amounts owed to partners? And the debts to other financiers? Are debts for bonds issued to shareholders included in NFP?
- Which items should be included in Revenues? Should item A5 of the statutory balance sheet be included?

The last point of these sequence of questions is of a great importance because there are real cases in which the consideration or the exclusion of the item A5, which is the so-called 'Other Revenues and profits', from the calculation of the NFP indicator, represents a deep change in the final evaluation of the KPI under analysis, and so, of the time that company might be able to pay off its financial debts to the lenders.
For these reasons, even if this KPI is really appreciated among analysts, because of its kind of response information, it is always a good practice to go deeper and try to discover how the sub indicators have been previously calculated.
About the values that this KPI might assume, it is possible to recognize three different ranges of evaluation to determine the trend of the business that is being analysed. These ranges are:

- TWOFD > 5 → Very Danger situation (Red area): the financial institutions or generic lenders of the analysed business must be scared about the possible repayment of the money they lent. The span of time for the return of money lent is large and the probability to not see the money back is higher and higher, as well as this KPI increases its value;
- 3 < TWOFD ≤ 5 → Risky situation but anyway with possibility of improvements (Yellow area): the span of time is significant, but not so large to be alarming;
- TWOFD ≤ 3 → Optimal situation (Green area): financial debts repaid within three years are a sign of a good solidity of the business, which, in turn, acquires good attendance for the lenders, who would be willing to lend money also in the future; if it would be necessary.

As for the previous KPI 10) representation in Fig. 2.5, also in the following figure (Fig. 2.6), the above definitions of ranges are represented graphically:

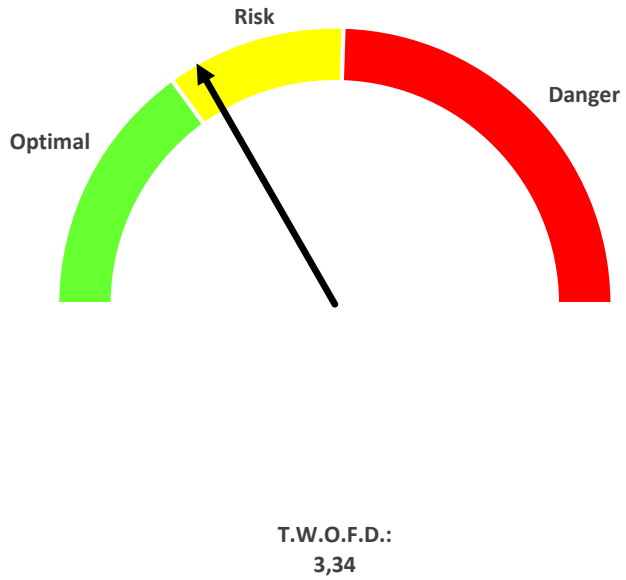


Fig. 2.6 graphic representation of the outcomes for TWOFD, in the generic case the KPI assumes a value of 3,34 years.

As anybody can understand, the lower the value of this indicator, the better it is for third parties that need back the money they have lent, and for the company itself as a sign of solidity of the business. Of course, this is a fundamental indicator for lenders to state out which might be the right candidates to whom lend money, without risk too much to lose the money lent.

3. OUTPUTS: RESULTS OBTAINED.

The first two sections are essential to identify the kind of project that is under study and its definition from different point of views. In particular, the first one has been dedicated to the quality organization of this project: the way of collection about all the information needed, the instrument used to take trace of these information, acquired during the meetings with the GTW and their organization through different tables and scales of values, useful to give an operational and practical shape to the classification process. The second one, instead, has been dedicated to the definition of all the economic and financial KPI_s, through which it has been possible to understand how to evaluate the performances of this kind of market and, studying the same KPI_s referred to the aggregate of the car body shops in all the country, understand which is their trend over the last five years.

3.1. GROUP DIVISION OF THE FIRST 1000 CAR BODY SHOPS IN THE MARKET.

The aim of this third section is to study what has been introduced in the previous one, with all the considerations made extended to the whole market segment. For this goal, it was considered enough to take into account the first 1000 car body shops of the country: as previously explained, the 70-80% of the car body shops in Italy are society of persons, thus, there is no public financial documents available. The capital companies amount to nearly 3076 enterprises (≈20% of the Market), about which the decision to consider the first thousand has been due to the fact that this kind of sample might be evaluated enough to give consistency to this study. To reach this subdivision, the financial item that has been used as a driver was the Revenues, as we said actually considered equally to the VP: that's why maybe it would be better to say that the driver is the VP of each car body shop, which is the item that actually figures out in the Income Statement of each company.

The studies and evaluations carried out in this last section are referred to an .xls file on which all the economic and financial data, of each car body shop, have been uploaded in a list, so to make possible the calculation of the aggregate first thousand of companies, in an easier and quicker way.

Starting from these initial considerations, the first move that have been done was to define the sub groups of this list of 1000 car body shops, in terms of VP of each one. Other aspect on which is fundamental to focus is the time horizon: we collected data of each company, taking information from their public balance sheets (only for those

that are societies of capital and so cannot claim for privacy of their financial documents that must be published every year ended) available on their websites. The period considered for the analysis is from the beginning of 2014, till the year end of 2018.

For the group division announced, after a careful reading of how each company evolves its VP over the years, it has been decided to drive the division through the last VP generated: the one referred to the most recent accounting year, 2018. This because over time has been observed that a company didn't change so much its VP, so to make a considerable differentiation in the group creations, considering the whole time horizon 2014-2018.

In order to make a discretization of the global group of 3076 car body shops considered, there is the need to use an objective way of evaluation. The easiest way to carry out this scope might be through the total VP of the first 1000 companies.

By observing the aggregate, is possible to find out that the total amount of VP in 2018 is 862.803.079 €: thus, the average mean, of the first thousand car body garages, is towards 860 K€. On these facts, there have been created three different groups' categories, taking as reference the mean of 860 K€ and moving upward and downward by 50% to create the ranges for the subdivision of these groups, like the following:

- Group 1 → VP < 430 K€ → Small enterprises;
- Group 2 → 430 K€ ≤ VP < 1.290 K€ → Medium enterprises;
- Group 3 → VP ≥ 1.290 K€ → Big enterprises;

Making this categorization, the different scenarios, in terms of number of car body shops per group, always basing on the list of the first 1000 companies taken into account, is the following:

Group	**Nº of companies**
1	378
2	454
3	169

From now on, the study will be made by calculating all the prior explained KPI_s for each group, trying to deduce the arithmetic mean and the weighted average in each group, for some of that indicators. In the end, all these considerations will be carried out for the 1000 car body shops for the aggregate, as if they were a single large group.

3.2. ECONOMIC-FINANCIAL ANALYSIS COMPARING ALL THE GROUPS.

In this section, the totality of the 11 KPI_s that have been explained in the 'Operating Process', will be evaluated on the basis of the data of the related group of analysis and so, following the previously explained discretization. As already said, arithmetic and weighted averages, for some of the KPI_s, will be evaluated. Taking the data values from the .xls file, the 11 KPI_s calculated for all the three groups, give the output values in the figures below (Fig. 3.1, 3.2, 3.3).

About the composition of this table, firstly is possible to identify the list of all the KPI_s on the rows: they are eleven as already said, but some of them have been evaluated with both mean and weighted averages. This choice was made because both the two types of average are useful for understanding the trend of the market; even if they tell two different aspects of the same fact. The mean average is better off with the global trend of the market segment: when a study of a group is carried out, through this mean the whole segment is treated as a single entity, to which all the components give their own contribute and without distinguishing among the size of the companies of the same segment: it is as if they are all equal to each other. On the other side, the weighted average, is better off with the study of the market segment, going to underline who are the main players who influence this trend in a deeper way. In this case all the companies are different from each other and, depending on its size, the relative 'weight' gives a specific contribute to the market: in this situation the bigger the size of a company, the higher will be its influence on the global market.

On the columns, instead, have been put the span of time considered for the study (2014-2018), the CAGR (Compound Annual Growth Rate) which is the formula to be used in the case the comparison of the same indicators have to be done among more than two years; the DELTA, which is the difference between the last year and the first one of the span of time taken under study: thus, the years in the middle are actually not considered. Finally, the last column is for the Evaluation of the value of

the CAGR or the DELTA (if the former has been calculated, the latter has not) giving a positive connotation (green area) or a negative one (red area).

EVOLUTION OVER TIME (2014-2018) OF THE 11 KPIs OF THE SMALL ENTERPRISES MARKET SEGMENT.

Small enterprises segment (378 companies)	2018	2017	2016	2015	2014	Cagr 2018/2014	Delta 2018/2014	Evaluation	Cagr 2018/2017	Delta 2018/2017	Evaluation
KPI 1) VOPtot [€]	89.986.209	84.933.271	73.158.266	64.134.598	54.647.929	13,3%			5,9%		
KPI 2) Annual Δ% of the VOP	5,9%	16,1%	14,1%	17,4%							
KPI 3) EBITDA/VOP	9,20%	9,70%	10,31%	9,63%	8,17%		1,03%			-0,50%	
KPI 4) Trade Margin/VOP	67,00%	67,31%	67,71%	67,51%	68,12%		-1,12%			-0,31%	
KPI 5) Net Income [€]	2.016.154	2.201.856	1.959.070	1.233.741	40.856	165,0%			-8,4%		
KPI 6) Return on capital employed	14,36%	15,82%	17,24%	14,37%	7,07%		7,29%			-1,47%	
KPI 7) BEP weighted avg.	78,0%	93,7%	91,8%	93,9%	97,6%		-19,62%			-15,76%	
KPI 7bis) BEP mean avg.	53,4%	333,1%	-247,2%	79,6%	93,5%		-40,09%			-279,77%	
KPI 8) Days Sales Outstanding (mean avg.) [Numb. of days]	34	48	74	78	84		-51			-14	
KPI 8bis) Days Sales Outstanding (weighted avg.) [Numb. of days]	35	52	74	78	80		-45			-17	
KPI 9) Days Payable Outstanding (mean avg.) [Numb. of days]	50	39	93	141	93		-43			10	
KPI 9bis) Days Payable Outstanding (weighted avg.) [Numb. of days]	38	41	91	85	88		-50			-3	
KPI 10) Financial Indipendence Index	0,71	0,66	0,64	0,73	1,10		-0,40			0,04	
KPI 11) NFP/EBITDA	1,59	1,43	1,33	1,53	2,73		-1,14			0,15	

Fig. 3.1 Table reporting the outcome values for Small Enterprises for all the KPIs.

EVOLUTION OVER TIME (2014-2018) OF THE 11 KPIs OF THE MEDIUM ENTERPRISES MARKET SEGMENT.

Medium enterprises segment (454 companies)	2018	2017	2016	2015	2014	Cagr 2018/2014	Delta 2018/2014	Evaluation	Cagr 2018/2017	Delta 2018/2017	Evaluation
KPI 1) VOPtot [€]	354.973.039	340.124.334	308.824.555	282.448.437	255.364.609	8,6%			4,4%		
KPI 2) Annual Δ% of the VOP	4,4%	10,1%	9,3%	10,6%							
KPI 3) EBITDA/VOP	9,91%	10,07%	9,91%	9,62%	9,13%		0,78%			-0,16%	
KPI 4) Trade Margin/VOP	63,92%	63,35%	63,76%	63,82%	64,12%		-0,21%			0,56%	
KPI 5) Net Income [€]	10.439.591	10.321.934	8.281.608	6.813.418	4.114.369	26,2%			1,1%		
KPI 6) Return on capital employed	15,94%	16,97%	16,25%	14,08%	12,14%		3,81%			-1,03%	
KPI 7) BEP mean avg	93,62%	92,47%	138,33%	40,70%	79,19%		14,43%			1,15%	
KPI 7bis) BEP weighted avg	93,7%	92,1%	93,3%	93,6%	94,9%		-1,27%			1,54%	
KPI 8) Days Sales Outstanding (mean avg) [Numb. of days]	54	80	108	71	77		-23			-26	
KPI 8bis) Days Sales Outstanding (weighted avg) [Numb. of days]	54	60	67	69	73		-19			-6	
KPI 9) Days Payable Outstanding (mean avg) [Numb. of days]	45	55	79	85	83		-38			-10	
KPI 9bis) Days Payable Outstanding (weighted avg.) [Numb. of days]	45	53	79	74	79		-35			-9	
KPI 10) Financial Indipendence Index	0,62	0,61	0,58	0,67	0,67		-0,05			0,01	
KPI 11) NFP/EBITDA	1,46	1,37	1,34	1,62	1,69		-0,23			0,09	

Fig. 3.2 Table reporting the outcome values for Medium Enterprises for all the KPIs.

EVOLUTION OVER TIME (2014-2018) OF THE 11 KPIs OF THE BIG ENTERPRISES MARKET SEGMENT.

Big enterprises segment (169 companies)	2018	2017	2016	2015	2014	Cagr 2018/2014	Delta 2018/2014	Evaluation	Cagr 2018/2017	Delta 2018/2017	Evaluation
KPI 1) VOPtot [€]	417.843.831	375.800.245	339.274.953	290.039.170	258.957.874	12,7%			11,2%		
KPI 2) Annual Δ% of the VOP	11,2%	10,8%	17,0%	12,0%							
KPI 3) EBITDA/VOP	10,76%	11,09%	14,90%	11,74%	11,42%		-0,67%			-0,33%	
KPI 4) Trade Margin/VOP	63,87%	62,64%	63,87%	63,62%	65,54%		-1,67%			1,23%	
KPI 5) Net Income [€]	17.946.126	15.668.991	25.785.204	11.246.176	7.760.297	23,3%			14,5%		
KPI 6) Return on capital employed	16,22%	17,48%	27,38%	17,87%	15,31%		0,92%			-1,25%	
KPI 7) BEP (mean avg)	91,09%	90,77%	84,35%	30,97%	80,24%		10,85%			0,32%	
KPI 7bis) BEP (weighted avg)	90,5%	90,3%	86,1%	91,8%	92,6%		-2,10%			0,28%	
KPI 8) Days Sales Outstanding (mean avg) [Numb. of days]	52	57	80	102	77		-26			-6	
KPI 8bis) Days Sales Outstanding (weighted avg) [Numb. of days]	57	63	72	78	81		-24			-6	
KPI 9) Days Payable Outstanding (mean avg) [Numb. of days]	52	61	96	180	85		-33			-8	
KPI 9bis) Days Payable Outstanding (weighted avg) [Numb. of days]	58	65	85	78	74		-16			-7	
KPI 10) Financial Indipendence Index	0,57	0,52	0,50	0,63	0,72		-0,16			0,05	
KPI 11) NFP/EBITDA	1,43	1,27	0,92	1,33	1,56		-0,13			0,16	

Fig. 3.3 Table reporting the outcome values for Big Enterprises for all the KPIs.

Whenever an indicator is evaluated, there are three main conditions to be analysed that are essential; these are:

- The outcome of its value → thus, if it has positive or negative connotation;
- The evolution → if it has had an improvement or not with respect to the previous year;
- The trend → if, over time, its evolution has been 'constant/stable' or 'nervous'.

The ideal situation occurs when the indicator has positive connotation, have improved with respect to the previous year and when this increase is stable over time. Of course, this 'perfect' situation does not always occur, and now it will be analysed how each KPI has evolved over the time horizon under study (2014-2018).

KPI 1) VALUE OF PRODUCTION

Fig. 3.5 KPI 1): evolution over time of the total Value of Production compared among all the Market segments.

By this graph, for the first KPI, is easily observable a growth of the global VP for all the Market segments. Knowing the meaning of this KPI, an increase of its value surely

confers it a positive connotation; furthermore, in this specific case, the revenues have rose up year by year constantly. Thus, this growth has a positive connotation, it is an improvement and it has been stable over the years: it is the ideal condition to point at for an indicator. The reader can easily understand that by these scenarios, all the Market segments are increasing their Revenues over time, which is a sign of expansion: car body shops are not producers of goods, but they provide services; thus, an increase of the VP cannot be translated in an increase of volume of production, but probably in terms of investments in fixed assets and in labour volumes. Referring to each segment, the only difference is that this evolution is carried out for different levels of M€: by the prior Fig. 3.1-3.2-3.3 is observable that for Small enterprises, VP amounts to ≈90 M€, while Big ones show a VP equal to ≈418 M€. The good perspective of this indicator might be misleading, if it is analysed alone: as previously said, there is the need to observe also the trend of Net Income, otherwise this growth can be of no great meaning.

KPI 2) ANNUAL Δ% OF THE VALUE OF PRODUCTION

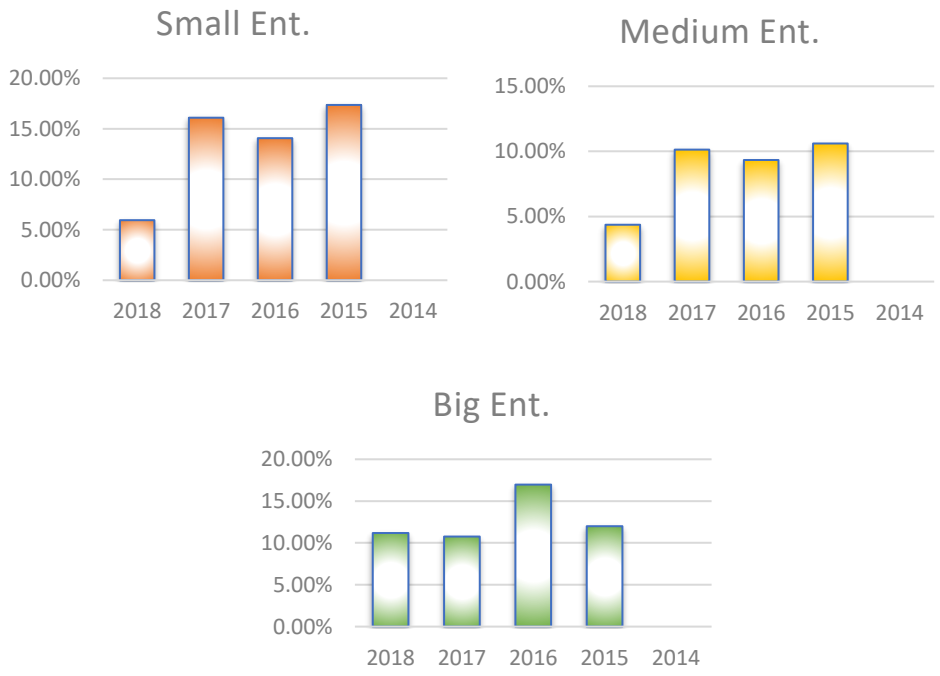


Fig. 3.6 KPI 2): Δ% among two consecutive years of the VP of all the Market segments.

This KPI is strictly related to the previous one: indeed, it evaluates how important has been the increase of the VP from one year to the following one. For instance, by the graph of the Small Enterprises, is possible to observe that the evolution doesn't show

an improvement year after year and the trend is a little bit nervous: the VP level has actually increased year by year, because otherwise the graph would have shown bars below the x-axis, but this growth is really volatile: the fact that the bars are not of the same height, means that in the last year, for instance, there have been an improvement in the VP, but not so consistent as in the previous year where the % variation with respect to the 2016 has been much more considerable. This tells the reader that passing from 2017 to 2018, the increase in VP has been much lower than the increase in the same indicator from 2016 to 2017.

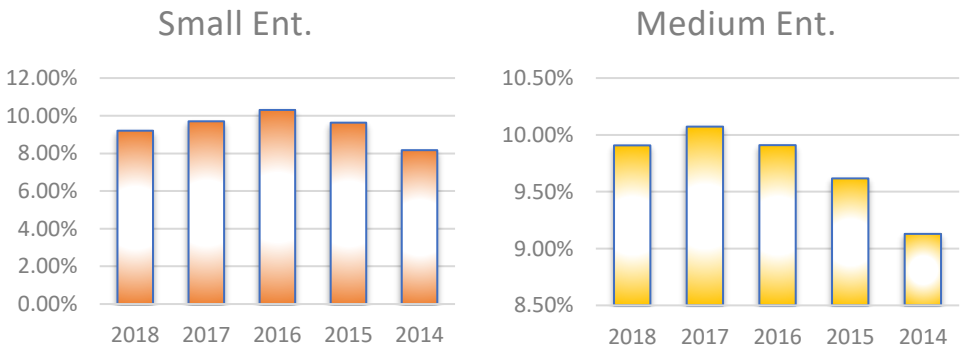
About the other two Market segments, the one related to the Medium enterprises gives the most stable outcome of all the three segments; in fact, the bars of the years 2015-2016-2017 are nearly equal: it means that year by year the growth of VP has grown of a 'constant' factor. While in the last passed year, 2018, the increase in VP has been not so great as prior years.

For the Big companies, the outcome states that the best historical growth occurred in the passage from 2015 to 2016. In the last two years, the VP seems to observe a light recovery with respect to the previous year 2017.

A note to be underlined is that in this case, no DELTA, neither CAGR, have been calculated: this because this KPI is a % variation of an indicator, and so, there is no sense in evaluating a variation of a percentage variation. Then, it has not been calculated for the year 2014: this because being this indicator a percentage variation among two consecutive years, the value for the year 2014 would depend on the VP of 2013 which is actually out of the time horizon examination.

The aim for each company might be trying to maximize this annual % variation year after year, conferring a progressive positive upward sloping trend to this parameter.

KPI 3) EBITDA/VP



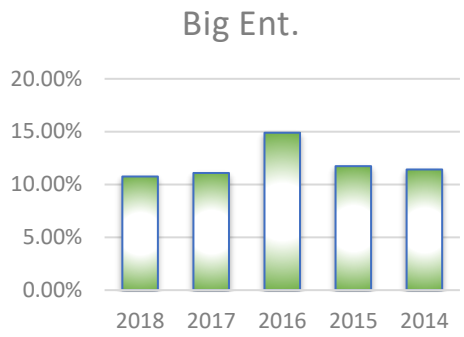


Fig. 3.7 KPI 3): evolution over time of the EBITDA/VP ratio compared among all the Market segments.

In a context of progressive expansion, is possible that, apart from an increase in revenues, there is also an increase in operating costs. This kind of costs is the one that must be subtracted to the total revenues of a company, in an Income Statement, to get the EBITDA; thus, by the graph, is possible to evince that the growth of the VP over time, shown in Fig. 3.6, is not the same growth that affected the level of operating costs in the respective years, because otherwise the trend would have been the same as in Fig. 3.6. In other words, if we observe the graph related to Small enterprises, especially in the last two years (2017-2018) is possible to observe a little decrease of this ratio, which might be due to the fact that in these years the ΔOC (Operating Costs Variation) has been higher than the variation of the VP in each corresponding year. Anyway, the outcome of this KPI is positive: the DELTA between 2018 and 2014 is higher than zero (+1,03%); furthermore, the improvement seems to be occurred as nearly stable over time. But, if the DELTA between 2017-2018 is taken into account, the outcome reveals a different scenario: this ratio has decreased by 0,5%, which is very light change, but anyway considerable. Referring to Fig. 3.6, this might be due to the fact that in these last two years, as we saw, the Δ% of VP has been not so consistent as in previous years and, so, on the basis that all operating costs being equal, a lower level of VP confers a lower EBITDA/VP ratio, by definition.

By observing Fig. 3.7 is possible to notice that for Small, Medium and Big companies this ratio varies from ≈8% to ≈15%. What is easily observable is that for Small and Medium enterprises, this ratio stays in a range of nearly 8-9,5%; while for Big companies it is set always over ≈11%. This happens because probably bigger companies are better in taking operating decisions, more than others do, but it is also due to the consistently higher level of VP of the Market segment (remind ≈418 M€ of VP for Big companies' segment against ≈90 M€ for the Small one). Having an

EBITDA margin equal to 25%, means that for each € earned, this Market segment generate 0,25 € of operating cash and so tend to maximize their profitability more than the others. Anyway, these kinds of percentages report very good results for all the Market segments, as the following scale of values shows:

Performance	< -1,5%	-1,5%	0,0%	1,5%	3,0%	4,5%	6,0%	7,0%	8,0%	9,0%	≥ 10,0%
Score	0	1	2	3	4	5	6	7	8	9	10

Thus, considering this scale of values, the relating scores for the Market segments under exam would vary from 8 to 10, which is actually an absolutely positive outcome. Another important aspect to focus on, is the fact that if we observe the DELTA 2018-2014 and the one for 2018-2017 of the three groups, is possible to observe a progressive decrease as the size of companies increases:

EBITDA/VP	DELTA 2018-2014	DELTA 2018-2017
Small ent.	1,03%	-0,50%
Medium ent.	0,78%	-0,16%
Big ent.	-0,67%	-0,33%

This outcome gives us information concerning to the fact that the evolution of this margin, in the time range considered, has been of higher importance for Small companies, for which is observable the most consistent changes over time. In general, especially in the last part of this time window (so, 2018-2017), no segment managed to improve this ratio: all the outcomes are negative, because in these last years the growth in VP has not been so consistent with respect to the parallel increase in operating costs. Anyway, always referring to the scale of values, this ratio has positive connotation for all the Market segments, even if without showing a progressive improvement. In the end, the trend is nearly stable over time.

KPI 4) TRADE MARGIN/VP

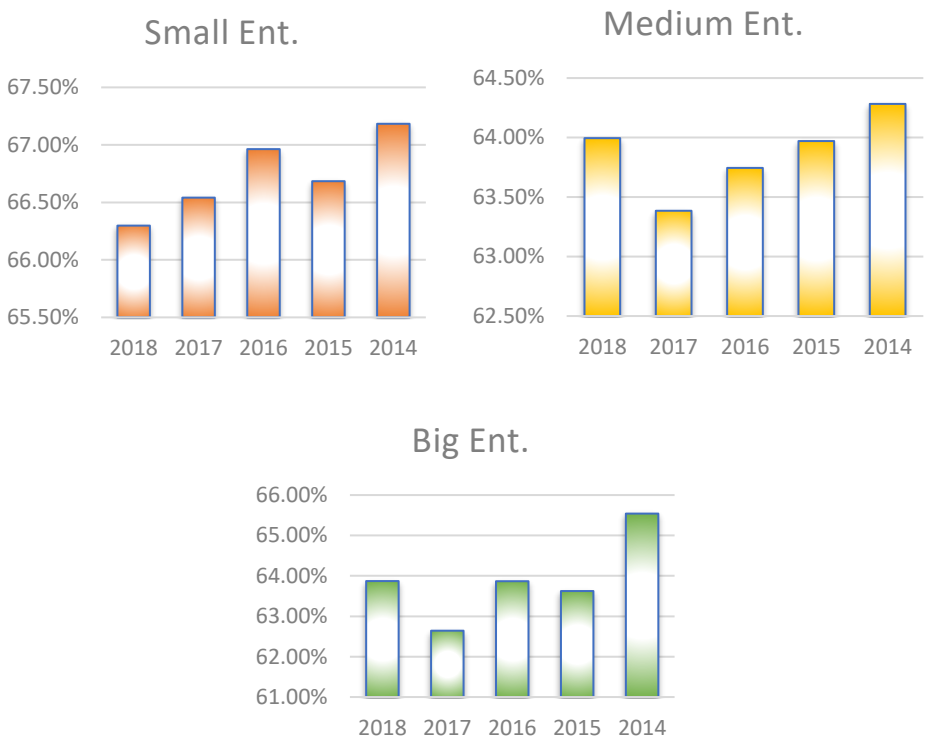


Fig. 3.8 KPI 4): evolution over time of the trade margin/VP ratio compared among all the Market segments.

By looking at these graphs, and especially paying attention to the y-axis, is possible to observe that the highest performance, in terms of trade margin, belong to the group of Small enterprises. In this case, percentages over 67% are reached, while for the other two segments the threshold reaches the 64,5-65,5%. Having a high trade margin means that the company can create a great difference between the sale price and the relating cost of the product: in this specific market it might be the margin over spare parts and labour.

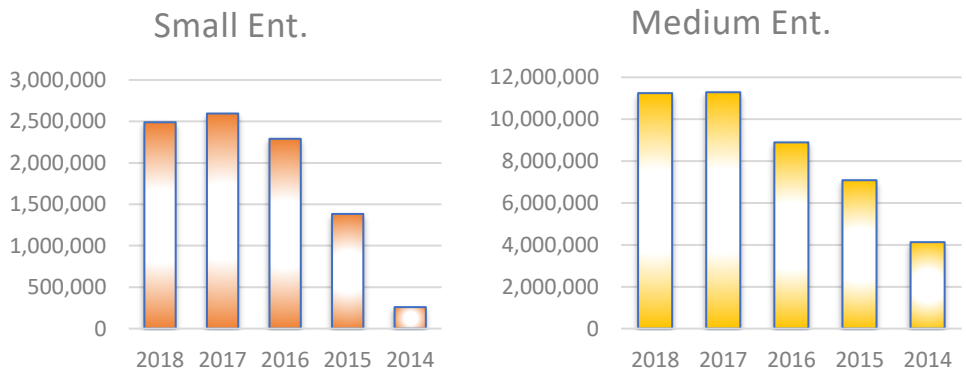
Through this KPI is understandable that this Market segment is suffering a decrease in the very last years and it seems that, for Small companies this looks like a trend, because of the downward sloping of the bars of the chart. For the others, it seems that the situation is regaining improvements in 2018, with respect to previous years. Through these charts is difficult to talk about economies of scale, because it is not stated that being a big company, leads to higher efficiency in terms of production and operating costs: indeed, small companies give the highest outcomes, as we saw. Then, the order of magnitude is nearly the same for all the Market segments (65%-67,5%):

the Medium segment suffered a decrease in the latter part of the time period considered (greatest valley in 2017), while Big one suffered also in the early stages of this period (2015), with the lowest valley also in 2017. Anyway, it seems that Medium companies are reacting quicker and with stronger intensity, while Big ones are recovering more gradually year after year. By looking at the graphs in Fig. 3.8, it is possible to say that in this case we cannot talk about economies of scale because the highest values for this KPI has been reached by the small companies' group.

In the end, to sum up, the response seems to be not so good, also due to the fact that DELTA is negative and more considerable for higher size companies, for the time window 2018-2014; then, the evolution is affected by great volatility: indeed, the trend looks like a little bit nervous. In the end, the global response should be positive, because of high percentages of margin over the total VP, for each segment, and looking at the most recent situation of 2018-2017, medium and big companies gained an improvement for this KPI, as stated out by the following image. Small companies are suffering a decreasing trend for this indicator, that anyway seems to recover year by year: with respect to 2014, the DELTA is -1,12%; while about 2017 it is -0,31%, which means a progress of nearly 30%.

T.Margin/VP	DELTA 2018-2014		DELTA 2018-2017	
Small ent.	-1,12%		-0,31%	
Medium ent.	-0,21%		0,56%	
Big ent.	-1,67%		1,23%	

KPI 5) NET INCOME



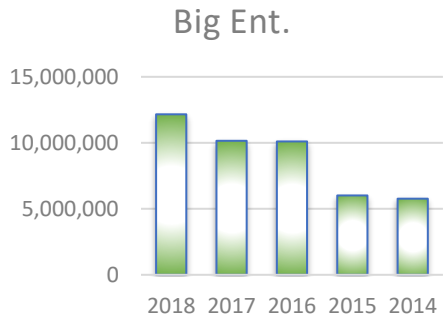
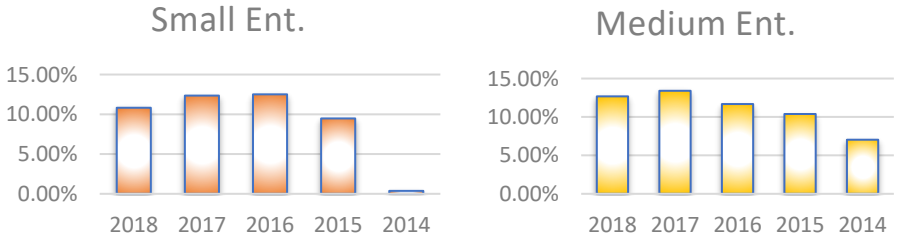


Fig. 3.9 KPI 5): evolution over time of the Net Income, compared among all the Market segments.

In any kind of business, as in any kind of industry, the principal aim is to maximize profits. Anyway, this is not the only objective to reach: together with a high profit, the efficient company is capable to generate a considerable net income; otherwise the effort in maximizing revenues might be meaningless. Looking at the graphs, is possible to observe a quiet constant increase of the Net Income over years, for Small, Medium and Big companies, with yearly improvements and stable trends. This kind of growth may be strengthened by the fact that also VP has increased with the same trend over time, which is an important consideration since we had said before that is not a foregone conclusion to observe a high net income level only because of an increasing VP level.

The following three graphs will show the trend for the ROE (Return on Equity) which is the portion of Net Income related to the Equity of the company for each year of study, for each segment of the Market.



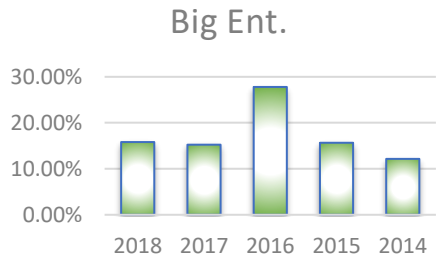


Fig. 3.10 KPI 5bis): evolution over time of the ROE, compared among all the Market segments.

By these graphs is evident that starting from the Small enterprises, and going on to the Big ones, the percentages of net income over equity are progressively higher. The starting point is towards 9-10% for small companies, nearly 13-14% for Medium ones and towards 18-19% for Big enterprises. For this latter group is observable an important pick in the graph, for the year 2016, that is not present in the graph above: it means that, for that year, this group of companies succeeded in gaining a higher percentage of profit by the amount dollars the shareholders put as equity.
In general, to evaluate this percentage outcomes, it is useful to have a look to the following table of scores:

Performance	< 2%	2%	3%	5%	8%	11%	14%	17%	20%	23%	≥ 26%
Score	0	1	2	3	4	5	6	7	8	9	10

A clear meaning can be given to the outcomes obtained in relation with this scale of values: being a big company gives higher percentages of net income over equity; this because bigger enterprises surely have available higher level for equity, thus, higher probabilities to get more net income over it. But this is not a rule, in the sense that it is a percentage value, so, it depends on which is the relationship between these two quantities: anyway, by this scenario, bigger companies better managed their operating costs and took advantageous strategic decisions, to let them gain higher ROE percentages. Tendentially, to evaluate the profitability of a company, the ROE value must be related with the Government bonds:

- If ROE > Gov. bonds → the company is good in generating profits, thus, it is convenient to invest in it;
- If ROE < Gov. bonds → the company is not enough profitable;

- If ROE < 0 → ALARM: the company is getting losses; it means that it is consuming its equity.

In the end, looking the CAGR columns for each Market segment, is possible to understand which the evolution of net income has been, over the whole time period of examination. The reader might observe that the greatest change occurred for Small enterprises (+165%), overall because the VP increment has been just of +13,3%: but this kind of data is no so reliable because the aggregate for the year 2014, for this segment, is missing by a lot of items for a lot of companies. Surely more trustworthy might be the comparison between 2018 and 2017, which report a CAGR of -8,4%, which is in line with the graph in Fig. 3.9.
For the other segments, CAGR was +26,2% for Medium companies related to a +8,6% increment in VP for 2018-2014, while for 2018-2017 it is a 1,1% increment in net income referred to a 4,4% in VP: thus, most recent years are suffering a less sudden upward trend. For Big enterprises +23,3% increase in net income for a +12,7% increase in VP, and +14,5% related to a VP level increases of +11,2%, for time window 2018-2017. Thus, the outcomes can be defined as good result for big companies, because this group increased Net Income more than they increased VP; for the Medium group the closest years show an improvement which is not so pronounced as for the previous group. The small companies group instead sees a worsening in the last years because net income level has decreased while VP level has increased, as observable by the following figure.

Net Income	CAGR 2018-2014		CAGR 2018-2017	
Small ent.	165,04%		-8,43%	
Medium ent.	26,21%		1,14%	
Big ent.	23,32%		14,53%	

KPI 6) Return on Capital Employed

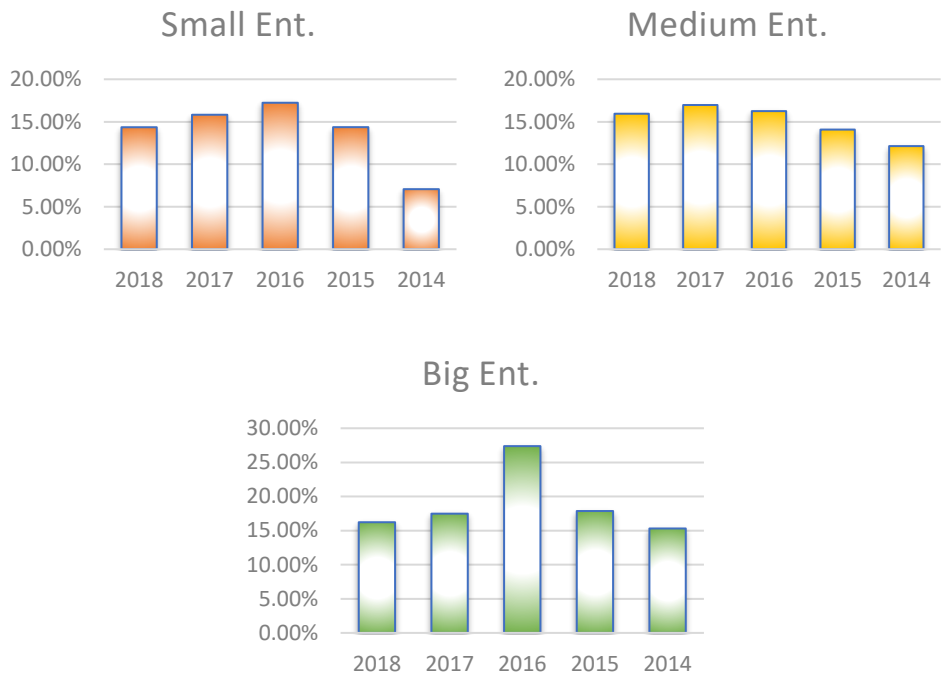


Fig. 3.11 KPI 6): ROCE compared among all the Market segments, 2018-2014.

For the reason why this KPI is a 'return', the higher its percentage, the better is. All the groups present nearly a stable improvement, with a sort of positive trend, with the only exception of the big entreprises' group that shown a particularly high value of ROCE for the year 2016 (≈28%), thus, during that year really good investments have been done. Anyway, for all the three groups is observable a value of ROCE towards 15-20%. Concerning to the DELTA, the evolution over the two time windows has been the following:

ROCE	DELTA 2018-2014		DELTA 2018-2017	
Small ent.	7,29%		-1,47%	
Medium ent.	3,81%		-1,03%	
Big ent.	0,92%		-1,25%	

During the most recent years, this KPI shows a downward sloping trend curve for all the three Market segments and the situation seems to be worsening with the passing of the time with respect to the beginning phases of the time horizon referred to the year 2014.

Performance	< 7%	7%	9%	11%	13%	15%	17%	19%	21%	23%	≥ 24%
Score	0	1	2	3	4	5	6	7	8	9	10

Again, bigger companies reported higher otucomes fort this KPI: the higher availability to invest bigger amount of dollars as capital employed, let them to get higher returns on it. Being this KPI the ratio between EBITDA and capital employed, being a big company, as stated out by Fig. 3.7, means reaching higher percentages of EBITDA margin, which might be due to good management of operating costs, so, higher EBITDA.

KPI 7) Break Even Point (mean average)

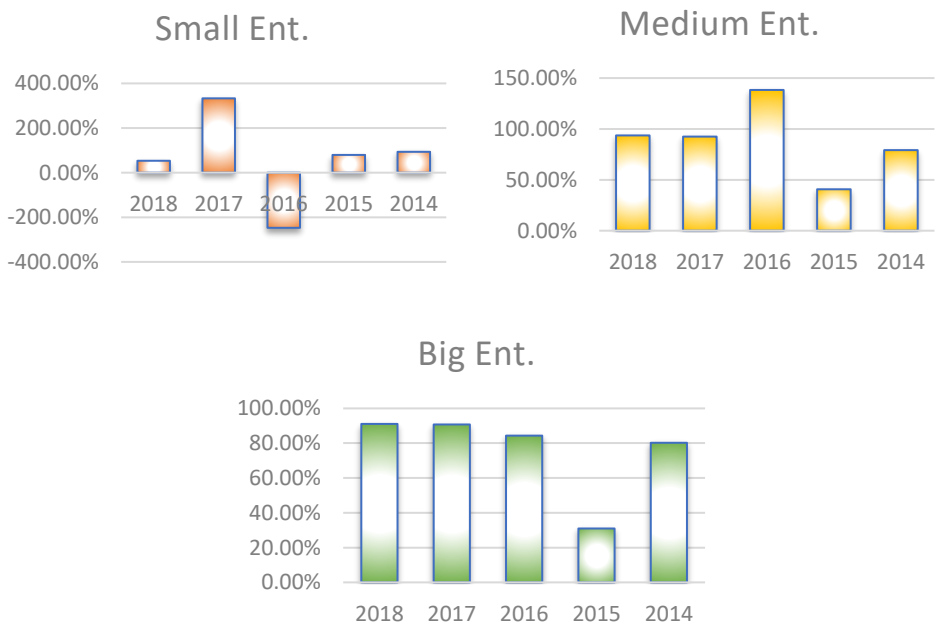


Fig. 3.12 KPI 7): Comparison among the time period 2018-2014 of the BEP (mean average) for all the Market segments.

For this way of evaluating the KPI, through the mean average, the reliability of data is compromised: the value for small companies in 2016 is out of range, this might be due to the possible wrong transcription of data in the early years of 2014-2015.

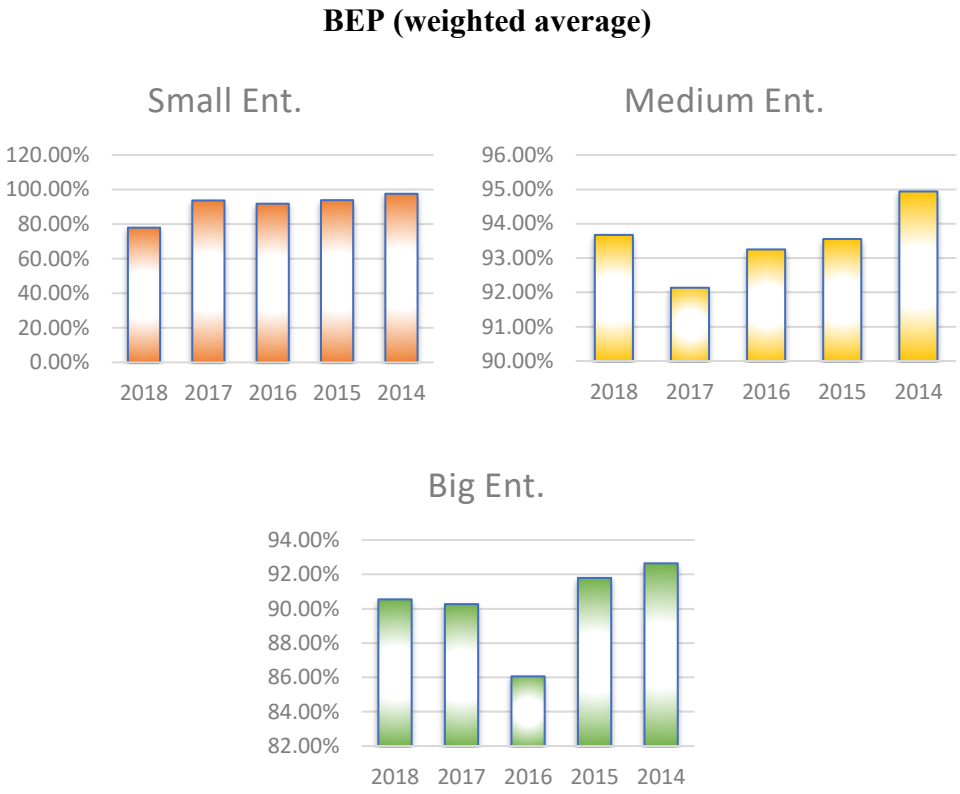


Fig. 3.13 KPI 7bis): Comparison among the time period 2018-2014 of the BEP (weighted average) for all the Market segments.

By observing the weighted average BEP evaluated for the three groups, the scenario presents a quiet stable situation for all: BEP varies in a range 90-98%, with the only two exceptions of the last year for the small companies' group, whose value of this indicator fell to nearly 78% and for the big one, during year 2016, the BEP fell to ≈86%.

Knowing the meaning of this indicator, the aim is always the one to lower it as much as possible, reducing, as a consequence, the probability to get losses and, on the other hand, increasing the one of getting profits.

KPI 8) Days Sales Outstanding (mean average)

Fig. 3.14 KPI 8): Comparison among the time period 2018-2014 of the DSO (mean average) for all the Market segments.

This KPI, together with the following one related to the DPO (Days Payable Outstanding), are referred to the number of days necessary to collect receivables after sales, and the number of days in which the company cut off its payables to third parties (suppliers etc.). The ideal situation should be reached if the two are exactly equal, but this is quite an impossible outcome; normally DSO are lower than DPO, because the first care is to receive money, and, then, the attention is for payments. In the specific case of the Fig. 3.13, through the mean average is possible to study each segment as if all the car body shops of that segment are equal: by this way is possible to observe that all the three groups are improving year after year this KPI, because the DSO is decreasing progressively: this means positive connotation and, by the graph, the trend looks positive and stable. The DELTA is in favour of all the four groups: it is always negative, and this is related to a higher assurance for the companies about the reliability of their receivables toward their clients: in other words, these companies succeed in reducing the time their credits are collected by clients and creditors, which is a very positive outcome.

DSO (weighted average)

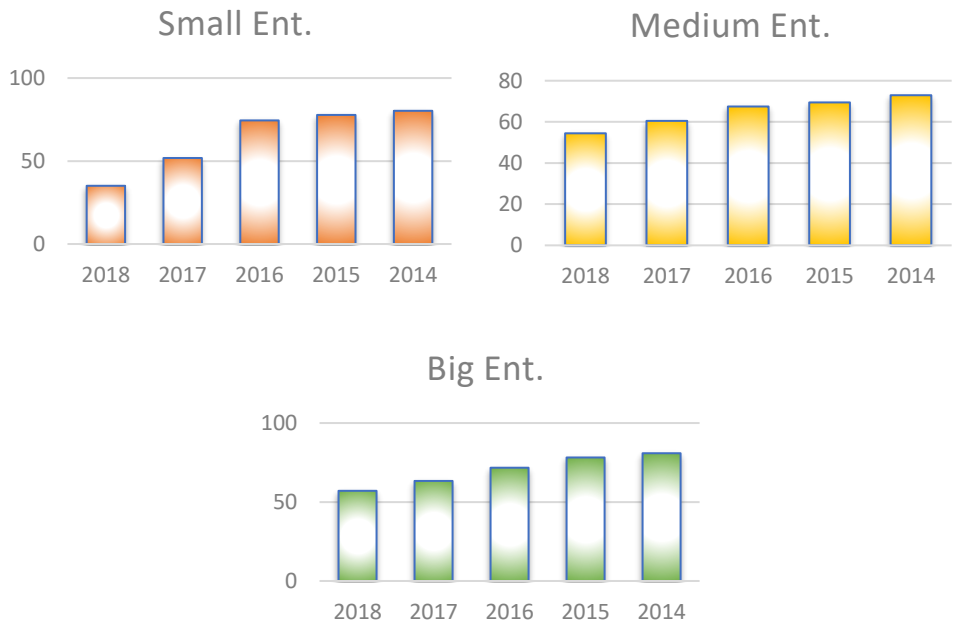


Fig. 3.15 KPI 8bis): Comparison among the time period 2018-2014 of the DSO (weighted average) for all the Market segments.

In this case, where the weighted average has been considered, it immediately comes to the eyes of the reader that the trend is more stable than in the previous case; this because now, the companies that weight much more than the others and succeed in obtaining a lower number of days for the collection of receivables, actually compensate the ones that have longer period for the collection of their credits. For the weighted average case, the downward sloping curve for the evolution of the DSO over the time period is more linear than in the previous case. About the DELTA, like the previous case, the outcomes are all positive, because all the groups have actually decreased the number of days necessary to collect their receivables. The following image just sums up the considerations on the DELTA made for both cases of mean and weighted averages:

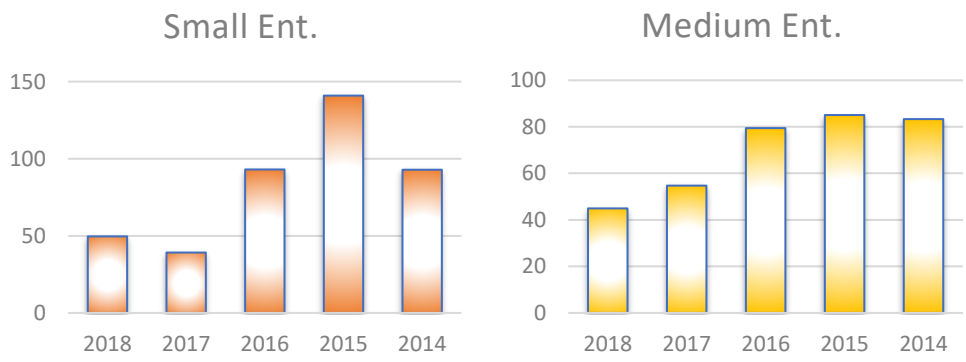
DSO mean	**DELTA 2018-2014**	**DELTA 2018-2017**
Small ent.	-51	-14
Medium ent.	-23	-26
Big ent.	-26	-6
DSO weighted	**DELTA 2018-2014**	**DELTA 2018-2017**
Small ent.	-45	-17
Medium ent.	-19	-6
Big ent.	-24	-6

In the end, to better understand if the outcomes of each market segment are positive, thus, if the number of days of the DSO has a positive connotation, the following table of scores can be taken as a reference:

Performance	> 105,0	105,0	100,0	95,0	90,0	85,0	80,0	75,0	70,0	65,0	≤ 60,0
Score	0	1	2	3	4	5	6	7	8	9	10

Both in the mean and weighted average cases, in the last two years, the Small, Medium and Big companies' groups receive an excellent score, precisely 10, because of their level toward nearly 50 days. Going back to the first years of the time period of analysis, instead, the segments of medium and big companies would have received a score, without no doubt, lower: in the mean average case, they reached a threshold of nearly 90-100 days for the DSO, which is definitely a very low performance (scores equal to 2-3). While in the weighted average case, this aspect is quiet more dampened for these three groups (DSO reached more or less 75 days, which corresponds to scores equal to 7-8). The small companies instead, always maintained a level of DSO towards 75-80 days in the first stages of the time window 2018-2014, thus, for this group this performance was good till in the beginning.

KPI 9) Days Payable Outstanding (mean average)



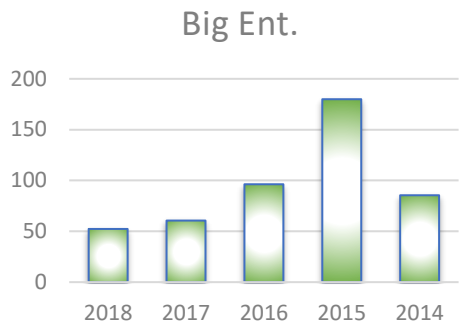


Fig. 3.16 KPI 9): Comparison among the time period 2018-2014 of the DPO (mean average) for all the Market segments.

By observing Fig. 3.15, is possible to understand that the last years of the time period of analysis have been of great improvement for this KPI. This because, for Small, Medium and Big enterprises, the number of day, on average, to cut off payables to third parties, such as suppliers, have been reduced consistently: in the early stages of this period the number of days amounted to 141 days in 2015 for small companies' group, then reduced to, on average, 50. Thus, reducing by nearly 65%, in five years, this KPI, has an absolutely positive connotation; anyway, this improvement didn't occur so constantly year after year and the trend looks like a little bit nervous. Big enterprises' group reached a threshold of 180 days in 2015, reduced to 52 on 2018 (mean avg): thus, reduction of ≈71%. In this case, a part for the abnormal year 2015, the decrease looks constant and stable over time. Totally different is the discussion for the segment of the medium companies: for them, the trend is much more linear and stable than in previous cases, following a downward sloping curve. Then, the maximum level for DPO reached by this group has been 85 days, always on 2015. Looking at the DELTA 2018-2014 and the one referred to 2018-2017 for all the three groups, it is possible to notice that as far as the size of the companies rises, the reduction in DPO has been lower and lower analysing the whole time window 2018-2014, but in most recent years, small companies have increased this value, increasing it by 10 days, as the following image figure out:

DPO mean	DELTA 2018-2014		DELTA 2018-2017	
Small ent.	-43		10	
Medium ent.	-38		-10	
Big ent.	-33		-8	

9bis) DPO (weighted avg)

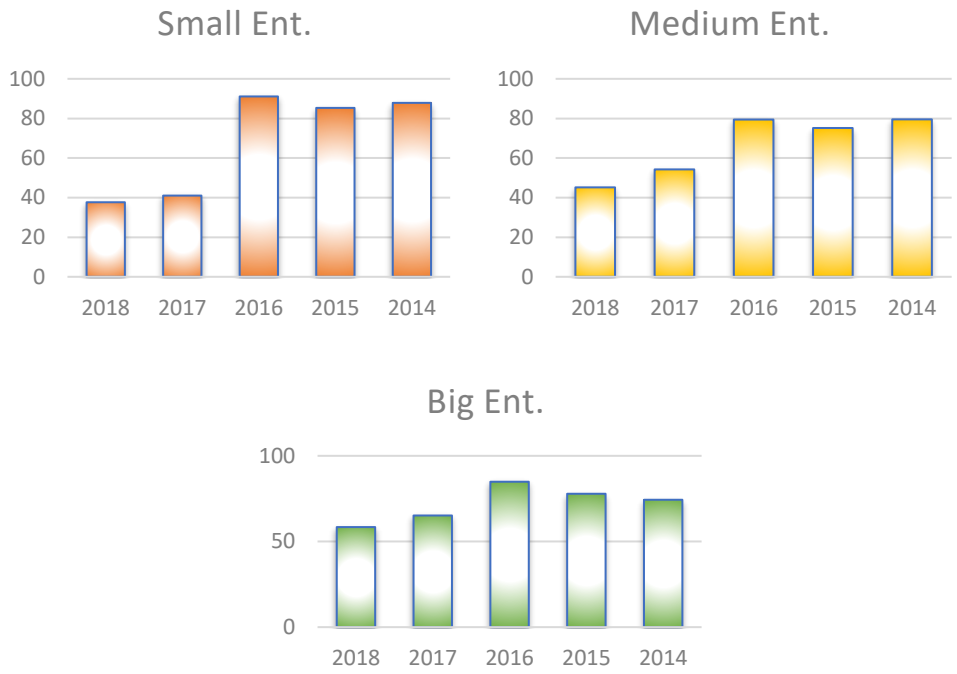


Fig. 3.17 KPI 9bis): Comparison among the time period 2018-2014 of the DPO (weighted average) for all the Market segments.

By studying the behaviour of this KPI over time, using a weighted average evaluation, is possible to observe nearly the same outcomes previously discussed but, with a level of DPO in the first years of the time period under analysis a little bit lower than before: in this case for Small, Medium and Big enterprises, DPO started from an amount of ≈80-90 days and then decreased to nearly 45, which has been a very great reduction. The following table of scores better helps the reader to evaluate the performances of these market segments, on a scale from 1 to 10:

Performance	> 115,0	115,0	110,0	105,0	100,0	95,0	90,0	85,0	80,0	75,0	< 70,0
Score	0	1	2	3	4	5	6	7	8	9	10

Through this table is possible to understand that the outcome of the Market segments is, in general, excellent for both mean and weighted averages (scores achieved: 10) for Small, Medium and Big enterprises. It is possible to say that the global outcome is positive, and this indicator evolved in a quite stable way over time, with quiet sudden reductions of this KPI especially for small and medium groups.

Favourable responses are come out looking at the DELTA of this indicator: its connotation remains positive for all the three groups: during last years, the yearly reduction is slowing down, but actually, this happens because falling below 45 days for DPO might be counterproductive for the business; it is important to give breath to the companies and let them some time to pay back their debts.

DPO weighted	DELTA 2018-2014		DELTA 2018-2017	
Small ent.	-50		-3	
Medium ent.	-34		-9	
Big ent.	-16		-7	

KPI 10) Financial Independence Index (FII)

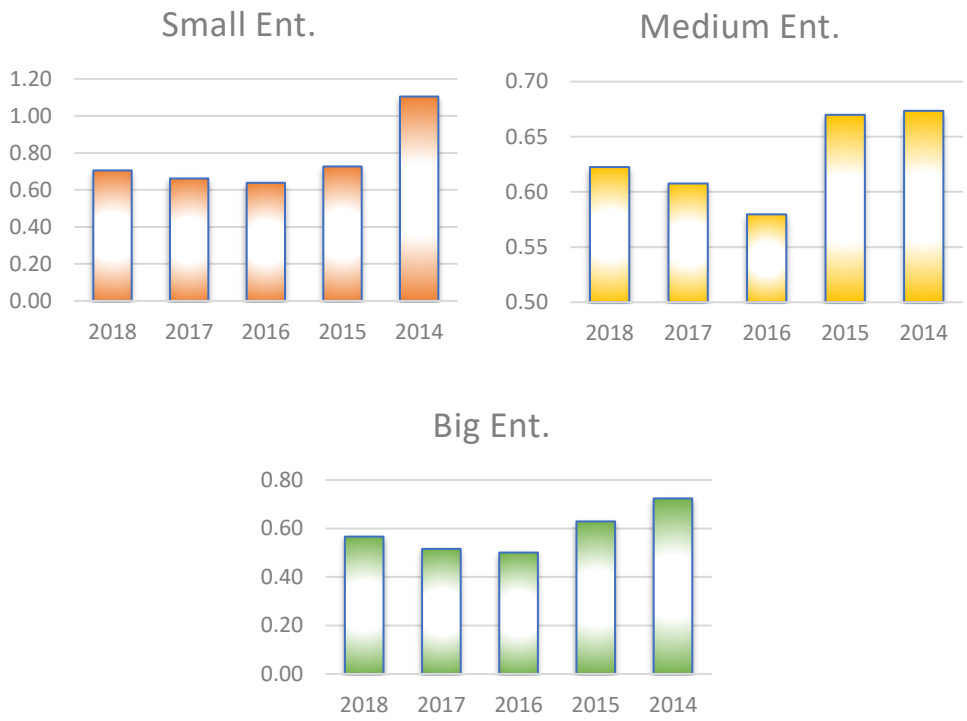


Fig. 3.18 KPI 10): Comparison among the time period 2018-2014 of the FII for all the Market segments.

In section 2.11 the definition of this indicator has been given as 'the portion of 1€ funding that comes from company's own resources and so, is not a settlement of debt', in case of normalization, but it was stated that the second alternative way of evaluation might be chosen: the one for which NFP is evaluated as the sum of short-medium-long

term Financial Debts, and the Financial Activity of the company. In order to immediately come out with the performance of each group of this kind of Market, the following table of scores might be useful:

Performance	> 3,0	3,0	2,8	2,6	2,4	2,2	2,0	1,8	1,6	1,4	≤ 1,2
Score	0	1	2	3	4	5	6	7	8	9	10

By the graph in Fig. 3.17, the reader can immediately observe that the performances carried out by each Market segment are definitely excellent: the value of FII is always below the best threshold of 1,20 for all the time period under examination. Thus, this market shows a high patrimonial robustness and a high tendency to gather own resources for financing businesses, rather than asking money to trade creditors, so rising debts. This is one of the most important indicators among all those that have been analysed and all the groups show a great strength and good opportunities to obtain support from third parties in the future because of their high capital reliability. Evaluating the evolution of this parameter through the DELTA, is possible to notice that since 2014, the financial independence index in each Market segment reports an improving performance: values for this KPI are getting lower through the years. Although the excellent outcomes for this indicator, since 2015 it seems that this index is rising again a bit. Anyway, because of the excellence of the values observed, even though this indicator has increased its value, the global outcomes remains top rated, and so, it still achieves optimal results, as stated out by the scale of scores reported above.

FII	DELTA 2018-2014		DELTA 2018-2017	
Small ent.	-0,40		0,04	
Medium ent.	-0,05		0,01	
Big ent.	-0,16		0,05	

KPI 11) Time of Writing off the Financial Debts (TWOFD)

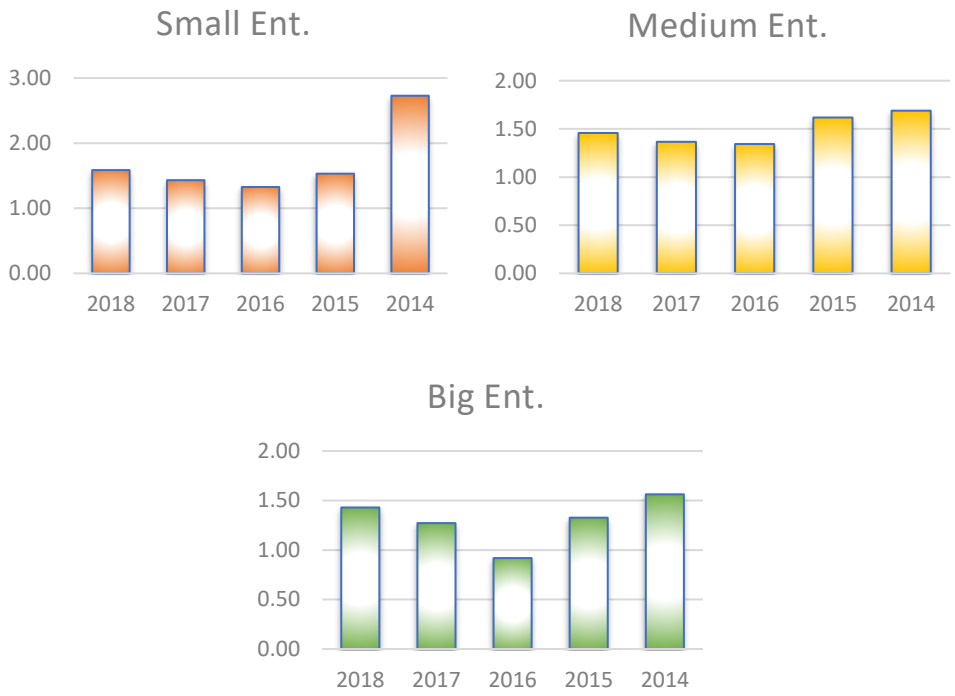


Fig. 3.19 KPI 11): Comparison among the time period 2018-2014 of the TWOFD for all the Market segments.

TWOFD is a KPI that tells a lot about the solvency of a company. Being it the time to write off financial debts, the potential trade creditors may have some indications about the attendance of a company in repaying back this money, and so, not to risk too much to freely lose money. Thus, the lower the value of this indicator, the better is. The table of scores for this case is the following:

Performance	> 5,0	4,8	4,6	4,4	4,2	4,0	3,8	3,6	3,4	3,2	≤ 3
Score	0	1	2	3	4	5	6	7	8	9	10

The ‘performance’ item in the first row is related to the number of years by which the company, on average, writes off its financial debts. Giving a look to the graphs in Fig. 3.18, it comes immediately to the eyes of the reader that the global situation is close to the excellence: all the Market segments, on the total duration of the period under examination (2018-2014), show a value of this KPI which is below the optimal treshold of 3 years: thus, in this Market, companies do not want to take too much longer their debts and so, they perfere to cut off the mas soon as possible.

Paying attention to the DELTA, the evolution over time has a positive connotation for Small, Medium and Big enterprises groups, buti t is possible to observe that the trend of the last three years of the time window under analysis, from 2014 to 2018, shows a curve that describes a hump and that seems to rise up little by little with the passing of the years: the lowest level of this KPI has been reached in 2016; then, from there on, the value has increased a bit.

Anyway, the DELTA for these groups, comparing 2018 with 2014, is negative, which means that the number of years to write off debts has been reduced over time. The same cannot be said if the comparison is made between the two most recent years 2018 and 2017, for which has been registered an increase of this KPI, even if very soft. In the end, this Market looks very strong and with a high solidity which is translated in very high reliability and very good attendance for the firms: trade creditors, during their decisional phase about of lending them money or not, may opt to give them money because of the optimal patrimonial scenario that identifies this kind of Market.

TWOFD	DELTA 2018-2014		DELTA 2018-2017	
Small ent.	-1,14		0,15	
Medium ent.	-0,23		0,09	
Big ent.	-0,13		0,16	

3.3. ECONOMIC-FINANCIAL ANALYSIS OF THE WHOLE MARKET.

As the last analysis, it has been studied the performances of the whole Market. The table below shows the same outcomes as Fig 3.1, 3.2 and 3.3, but in this case the values are referred to the total aggregate of those three groups, as if they were a unique entity. The kind of evaluation followed the same path: time window is five years (2018-2014), the KPIs are eleven, and for some of them both mean and weighted averages have been calculated. The evaluation of the CAGR and DELTA is again related to the five years and to the last two years (2018-2017), just to observe how critical, or not, have been the last period of the time span under examination, with respect to the very beginning phases.

1000 car body shops	2018	2017	2016	2015	2014	Cagr 2018/2014	Delta 2018/2014	Valutazione	Cagr 2018/2017	Delta 2018/2017	Valutazione
VPtot	862.803.079	800.857.850	721.257.774	636.622.205	568.970.412	11,0%			7,7%		
Annual Δ% of VP	7,7%	11,0%	13,3%	11,9%							
Trade margin/VP	64,22%	63,44%	64,21%	64,10%	65,15%		-0,94%			0,78%	
EBITDA/VP	10,24%	10,51%	12,30%	10,58%	10,08%		0,16%			-0,27%	
Net Income	30.401.871	28.192.781	36.025.882	19.293.335	11.915.522	26,4%			7,8%		
ROCE	15,94%	17,12%	22,00%	15,92%	13,15%		2,79%			-1,18%	
BEP (mean avg)	77,99%	183,06%	-10,12%	52,18%	83,96%		-5,97%			-105,07%	
BEP (weighted avg)	90,5%	91,4%	89,7%	92,8%	94,1%		-3,63%			-0,91%	
DSO (mean avg)	46	64	91	79	79		-33			-18	
DSO (weighted avg)	54	61	70	74	77		-24			-7	
DPO (mean avg)	48	50	87	121	87		-39			-2	
DPO (weighted avg)	51	58	83	77	78		-27			-7	
FII	0,60	0,56	0,54	0,66	0,73		-0,13			0,04	
NFP/EBITDA	1,46	1,33	1,10	1,46	1,70		-0,25			0,13	

Fig. 3.20 Table reporting the outcome values of all the KPIs, relating to the whole Market.

The aim of this section is that of understanding and evaluating how evolved over time the global Market of the car body shops. That's why, in this section, the focus will be pointed to the differences between CAGR and DELTA related to the total time period 2018-2014, and the ones related to the more recent years of 2018-2017, for the indicators previously studied.

To start this comparison, one first indicator that could be of nice meaning, to give a beginning picture of this aggregate, might be the one referred to the Net Income, in relation with the Equity: for this indicator the evolution over years has been the following:

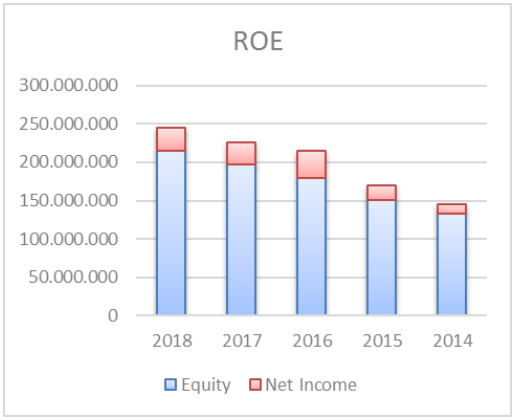


Fig. 3.3.1. Evolution over the time window 2018-2014 of the ROE per year.

For the analysis of the aggregate, because of all the previous considerations made about what are the differences and what are the links between Equity and the Net Income, the study is carried out by comparing in the meanwhile both these indicators, trying to understand how one evolves with respect to the other. First observation possible to be done is that the trend of this indicator seems to evolve following an upward sloping linear curve, year after year, so, this outcome has a positive connotation and it seems to maintain a sort of stability for its progressive growth, over time. It is composed just by the sum of the Equity amount of each car body shop, taken from the list composed by the first thousand companies. The graphs proposed in Fig. 3.3.1 is composed by two elements: the evolution of Equity and the one of the Net Income, for each corresponding year. By looking at the red blocks, is possible to observe a light progressive increase of the Net Income aggregate level, on the basis of Equity growth: this means that, in general, inside companies' boards of directors, shareholders have been willing to invest more and more money, year after year, because of the positive outcomes of the companies in terms of yearly revenues growth, net income increments, trade and EBITDA margins increases. Investing more in businesses that are profitable and financially solid, leads to higher percentages of net income over Equity, as stated out by the figure above. If this relationship is analysed

in percentages, the evolution of aggregate Net Income with respect to the aggregate Equity is:

	2018	2017	2016	2015	2014
ROE	14,18%	14,27%	20,09%	12,83%	8,94%

Fig. 3.3.2 trend of the relationship between Net Income and Equity (ROE) in the time window 2018-2014.

	CAGR 2018-2014		CAGR 2018-2017	
Net Income	26,39%		7,84%	
Equity	12,61%		8,51%	
	DELTA 2018-2014		**DELTA 2018-2017**	
ROE	5,24%		-0,09%	

By evaluating its variation from the first year, 2014, till the end of the time window, 2018, the increment in Equity has been of +12,61% that, distributed among the five years, gives as output an annual growth of +2,52%, on average. The actual increment of the last two years, thus, passing from 2017 to 2018, gave an increment of + 8,51%, which is more than three times the annual growth expected: thus, in this Market, companies, because of their good capability in getting profits, invest more and more money each year. On the other side, the CAGR referred to the Net Income has been of +26,4% for 2018-2014, so, nearly +5,3% increment expected per year, while the actual last increment has been of 7,8%. By these indicators is possible to say that companies are performing better than expected, making higher incomes, as much they invest money: the profitability of this market get shareholders and investors better off with rising Equity over time.

COMMERCIAL margin **EBITDA Margin**

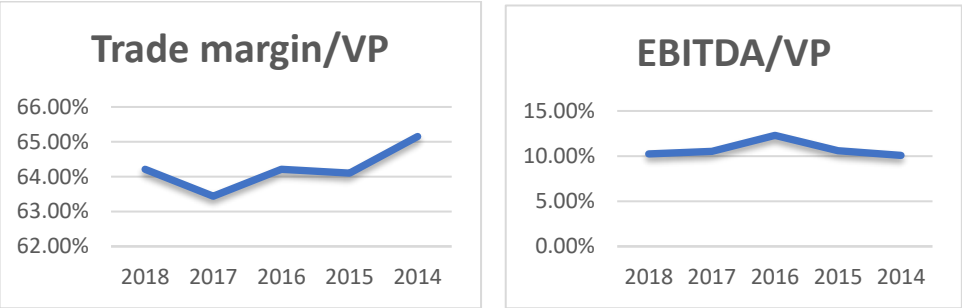


Fig. 3.3.3 trend of Trade margin and EBITDA over VP, in the time window 2018-2014

By looking at the graphs above in Fig. 3.3.3, it is possible to say that the aggregate of the first 1000 companies of this Market, succeed in managing quiet well operating costs at the beginning, in fact EBITDA level over VP nearly increases in the first stages of the time period, while decreased over the last years. The trade margin, instead, always referred to the VP level, suffered a reduction over the beginning phases, which has been compensated by a good increment over the last years 2017-2018. By looking at the percentage values (btw 63,5-65%), on the basis of the studies carried out for this sample, it is possible to observe that companies are able to generate quiet good margins between sales price and costs. On the other hand, the EBITDA margin, in terms of numeric considerations, doesn't give as positive outcome as trade margin did, because percentages now are towards 10-12%, while to state that the entrepreneurial formula adopted is successful and the technologies, marketing strategies or other elements of production have given excellent results, this value might be towards 20%.

Going on in the analysis of the aggregate, it is possible to say that the trend of the ROCE parameter is downwards in the last two years, reporting a decrease of -1,15% of the year 2018 with respect to the 2017; but referring to the beginning phase of the time window 2018-2014, there has been a growth of +0,92%. Anyway the trend seems to follow a downwards sloping curve because after the pick in 2016, when ROCE reached 27,38%, then, it suffered a progressive reduction: -11,16% since 2016, confers a not so positive connotation to this parameter. This means that in the last years, returns on capital employed are not giving satisfactions to the companies, as it was in the prior years.

Another important indicator is BEP, for which a different approach of analysis, gives highly different outcomes. Indeed, if it is evaluated through a mean average, the DELTA over the five years showed a critical situation: +10,85%. During the last two years it has been of +0,32%, which means that the first stages of this time window have been the more critical ones. Bu this way, through the meaning of this indicator, this Market has rised up the probabilities to get losses, because of an increase in the break even point. By evaluating this KPI through a weighted average, the scenario is absolutely different: -2,10% over the five years, menas that companies have actually decrease the point of parity, with a light +0,28% of increase in this parameter passing from 2017 to 2018. Surely the fact of giving the proper weight to each company, makes possible for bigger companies to fill gaps of smaller ones.

Talking about the DSO and DPO, the outcomes for the aggregate can be defined as excellent. In the tables of scores previously presented in section 3.2, it was reported a score of 10 points if the DSO has a value lower or equal to 60 days and if the DPO assumes a value lower or equal than 70 days. As it is possible to observe, for the aggregate the values assumed by these two KPI_s are largely below these values. Then, a part for this, it is common use to evaluate these two parameters together, so to compare one with the other. By this way, the 'perfection' might be reached as far as these two KPI_s are closed to the each other: by observing both the mean and weighted averages evaluations made for the aggregate, is possible to say that this combination is nearly obtained; which confers to these parameters an absolutely positive connotation for a quiet excellent performance. Through this sample, we can say that companies tend to collect receivables from their creditors in a short time, as well as they manage to payback to their lenders the money borrowed; maintaining the two nearly at the same level. As a visual conclusion of these considerations, the following figure may help the reader to better understand quantitatively this concept:

	2018	2017	2016	2015	2014	Cagr 2018/2014	Delta 2018/2014	Evaluation	Cagr 2018/2017	Delta 2018/2017	Evaluation
DSO (mean avg)	46	64	91	79	79		-33			-18	
DSO (weighted avg)	54	61	70	74	77		-24			-7	
DPO (mean avg)	48	50	87	121	87		-39			-2	
DPO (weighted avg)	51	58	83	77	78		-27			-7	

Fig. 3.3.4 DSO and DPO evaluated with mean and weighted averages, for the time window 2018-2014

Last considerations are pointed at the Financial independence of the aggregate, together with the time necessary to these companies, to cut off their debts (TWOFD). Starting from the former, the scenario is the following:

	2018	2017	2016	2015	2014	Delta 2018/2014	Evaluation	Delta 2018/2017	Evaluation
FII	0,60	0,56	0,54	0,66	0,73	-0,13		0,04	

Fig. 3.3.5 Evolution of the FII over the time window 2018-2014.

Taking the prior table of scores as reference, it wa stated that to get 10 points, and so to be optimal, this value might be equal or lower than 1,2. As it is observable by the figure above, within all the time window, this KPI never assumes a value higher than that treshold; this confers a highly positive connotation to the performance of this indicator fot this aggregate. By this way it is possible to say that these companies have a really high patrimonial and financial solidity, because great part of their funding is composed by their own resources. The DELTA for the aggregate is improving time after time by decreasing the value of this indicator: it means that companies in general tend to lower their tendence to get financial debts with third parites and instead comply on their patrimonial resources. By the last two years there has been a soft increase of 4%, but referring to the excellence of this performance for this kind of Market, it can be considered negligible at all.

About the time necessary to cut off financial debts, the aggregate presents the following outcomes:

	2018	2017	2016	2015	2014	Delta 2018/2014	Evaluation	Delta 2018/2017	Evaluation
TWOFD	1,46	1,33	1,10	1,46	1,70	-0,25		0,13	

Fig. 3.3.6 Evolution of the TWOFD over the time window 2018-2014.

By referring to the table of scores related to this KPI showed in the previous section, it is possible to say that the outcome has an excellent connotation, because to get 10 points, on a scale from 1 to 10, this indicator might assume a value not higher than 3: it is easily observable tht over all the time window this parameter never exceeds this treshold. The meaning of these data is that companies in this Market tend to cut off their financial debts after a period of 1,41 years, which is absolutely an optimal result: this confers them a high reliability for lenders and great solidity of the business.

Looking at the DELTA, since 2014 the situation has improved by -0,25 year: it means that with respect to the beginning of this time window, the time necessary to cut off financial debts, has been reduced by 3 monthes, which can be evaluated as a very positive outcome; even if in the last two years this indicator suffered an increment of +0,13, which corresponds to nearly a month and a half. Although this, because of the excellent level at which this aggregate is set, it is largely blow the excellence treshold, this cannot assume a negative connotation.

CONCLUSIONS

After the analysis carried out, this kind of Market results being very healthy, stable and solid. After all the evaluations made, the outcomes have been of good results and with positive connotation. The future for these kind of companies is destined to be blooming because of their particular patrimonial and financial strength: it must be said also that the analysis focused on the first 1000 car body shops of the capital companies, which by definition means that the starting level was quiet high. Through this project, the aim will be to create a model for the evaluation of the trend, for these enterpises, by a quality organizational point of view; going to create and evaluate several KPI_s to give them a score necessary for the following assertion phase. This kind of disciplinary is a work in progress: my personal hope is that this project goes on and that i twill be spreaded and shared all over the country. What is surely stimulating is that strong interest that few entities, companies and associations have shown; that's why it seems to be concrete basis to work on.

REFERENCES

- Libby, Libby, Short - Financial Accounting, 7th edition, Mc Graw Hill Irwin
- Ross, Westerfield, Jaffe - Corporate Finance, 10th edition, Mc Graw Hill
- Grant – Contemporary Strategy Analysis, 7th Edition, John Wiley and Sons Ltd
- https://www.accredia.it
- https://www.mise.gov.it/index.php/it/ministero
- https://www.giornaledellepmi.it/che-cose-un-processo/
- https://www.asseverazionitalia.it/quesito-asseveramento-o-asseverazione/
- https://www.jobbydoo.it/descrizione-lavoro/carrozziere
- http://www.treccani.it/enciclopedia/sostenibilita/
- https://www.laleggepertutti.it/153550_societa-possono-conoscere-dati-e-bilanci-o-ce-privacy
- http://www.agenzia50.it/index.php/30-carlo-pandolfini-articoli/il-gestore-aziende/l-analisi-del-merito-di-credito/211-fatturato-e-valore-della-produzione /
- https://tuaimpresa.net/valore-della-produzione-definizione-significato-e-calcolo/
- https://www.ig.com/it/glossario-trading/definizione-di-ebitda/
- https://www.borsaitaliana.it/borsa/glossario/earnings-before-interest-taxes-depreciation-and-amortisation.html/
- https://www.ionos.it/startupguide/gestione/ebitda-margin/
- https://dizionarioeconomico.com/margine-commerciale/
- https://www.imprenditoreglobale.com/differenza-margine-ricarico-vendita/
- https://www.ig.com/it/glossario-trading/definizione-di-utile-netto/
- https://www.smartbusinesslab.com/fatturato-e-utile-netto/
- https://www.massimotonci.it/break-even-point/
- https://argomenti.ilsole24ore.com/parolechiave/dso.html
- https://www.detergo.eu/marketing-d-s-o-questo-sconosciuto-da-scoprire-nei-dettagli/
- https://www.investopedia.com/terms/d/dpo.asp/
- https://quifinanza.it/fisco-tasse/posizione-finanziaria-netta-cose-come-si-calcola/303475/
- https://www.borsaitaliana.it/borsa/glossario/patrimonio-netto.html
- https://www.cloudfinance.it/grado-di-autonomia-finanziaria.html
- https://lavoroefinanza.soldionline.it/come-calcolare-l-indice-di-autonomia-finanziaria-in-un-azienda-259248.html

- https://shop.seac.it/blog/p-elementi-di-valutazione-della-solidita-patrimoniale-elemento-1-lindice-di-indipendenza-finanziaria/
- http://leanus.it/manuale/1/it/topic/occhio-al-rapporto-pfn-ebitda/
- https://www.cloudfinance.it/pfn-mol.html