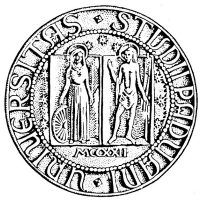

UNIVERSITA' DEGLI STUDI DI PADOVA

DIPARTIMENTO DI SCIENZE ECONOMICHE ED AZIENDALI "M.FANNO"

CORSO DI LAUREA MAGISTRALE IN ECONOMICS AND FINANCE

TESI DI LAUREA

"Evaluation of a railway investment project and determination of its concession price through the real options analysis: the case of the Napoli-Bari line"

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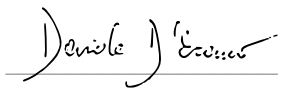

Acknowledgements

I thank the Professor Michele Moretto for the professionalism and the helpfulness with which he followed me during the writing period of the present work.
I thank my parents and my sister Serena who supported me during these two years.

Preface

After the proclamation of the Kingdom of Italy, which took place in Torino in 1861, a new and fundamental impulse was given to the realization of an organic program of rail transport. The strongest industrial groups of that time invest substantial capital, making also use of foreign fundings (especially French fundings), on this new activity and they founded about twenty concessionaires.

Soon it emerged the need to reduce the number of concessionaires and the law n.2248 of 20/03/1865 assigned the management of the whole railway network to four companies: "Società per le Ferrovie dell'Alta Italia", "Società per le Strade Ferrate Romane", "Società Italiana per le Strade Ferrate Meridionali" and "Società Vittorio Emanuele".

In the 1885, the Italian State enacted a law which reorganized the general organization of the railways and renewed the concessions to the major companies; furthermore, the railway lines were disposed in longitudinal sense along the peninsula: the first line, on the Adriatic side, was given to the "Società Italiana per le Strade Ferrate Meridionali" and the second line, on the Tyrennian side, was given to the "Società Italiana per le Strade Ferrate del Mediterraneo". These companies operated under concession as provided by the law n. 2248 of 1865.

After the constitution, between the 1905 and the 1907, of "Ferrovie dello Stato", a lot of concessions remained to the private companies according to the pre-existing legal institute of concession which provided that the concession from the State has to last at least for a period deemed appropriate to remunerate the invested capital.

In the second postwar period, the concessions to the private companies were regulated by the "Regio Decreto n. 1447 of 09/05/1912" and they represented a fifth of the whole national railway network of which the State was bare owner till the expiration of the concessions.

During the years, the institute of the railway concession was renewed and today it is regulated by the articles 200 and 201 od the "Decreto Legislativo n. 50 of 18/04/2016".

In my thesis, I evaluated if currently the State finds optimal to give the concession of the new railway line Napoli-Bari to a Private Company.

First, I highlighted the importance of the realization of this line which is considered a fundamental impulse to the economic development of the South of Italy by allowing the improvement of the links of the South with the North of Italy and the Europe as well as the improvement of the links between the Tyrrhenian and the Adriatic Sea.

Indeed, I proceeded to describe the characteristics socio-economic, infrastructural and geographical of the areas interested by the project; furthermore, I examined the actual railway

link with its deficiencies and I also examined the future railway link with the improvements made.

Successively, elaborating the data provided by RFI[1], I performed the financial and economic analysis and the socio-economic analysis of the railway project: the first has the purpose to evaluate the economic convenience to realize the project while the second has the purpose to evaluate the socio-economic impact of the project on the areas subject to the intervention.

In the last part of my thesis, first I described a theoretical model that allows to evaluate if the interest of the State to give the concession to the Private Company matches with the interest of the Private Company to invest; after, I applied this model, using the data of the socio-economic analysis, to the present case.

[1] Rete Ferroviaria Italiana.

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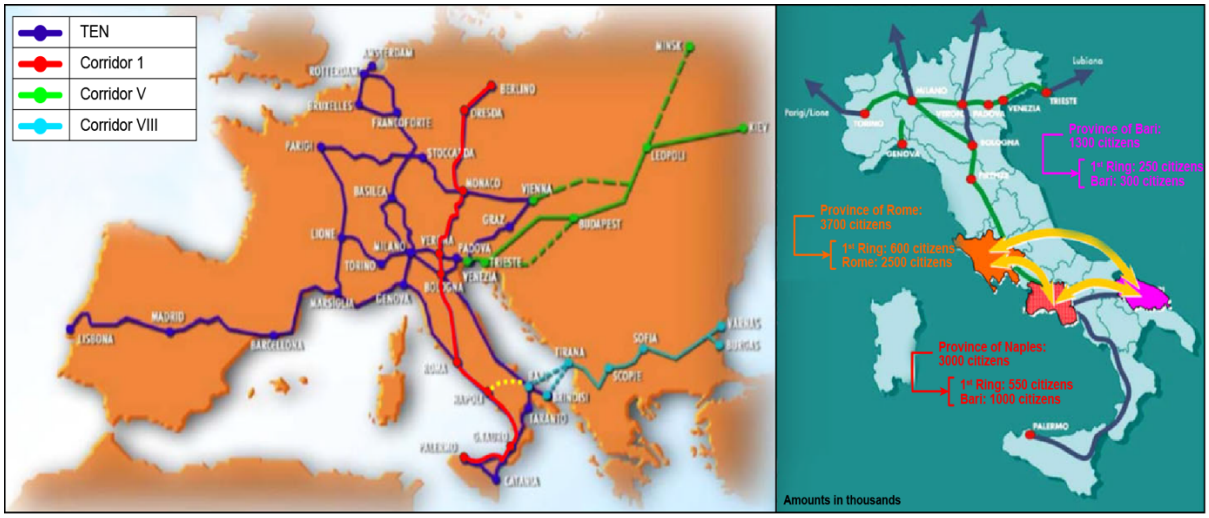
1.GENERAL FRAMEWORK

Picture 1



Within the initiative for the development of South Italy, the transport networks renewal between the Regione Campania and the Regione Puglia, finalized to an adequate response to the growing needs of travellers and freight mobility, constitutes a fundamental element for the socio-economic integration in Italy and in Europe. The project will allow the strengthening and speeding of the Napoli-Bari line and its integration with the main corridors of North Italy and Europe. The connections improvement of the Regione Puglia and provinces more interior of the Regione Campania to the national transportation system and in particular the Apennine line (of which the AV / AC Milan-Rome-Naples is an integral part) is the first step of a wide integration process.

The connection strengthening between the Tyrrhenian and Adriatic Sea will create a triangle (Rome, Naples and Bari) which will be one of the largest metropolitan systems in Europe.

The project was made and will be realized by RFI[2]. RFI is a company 100% owned by "Ferrovie dello Stato Italiane" which is the holding of the group; the last is totally owned by the Italian Economic and Finance Ministery.

This company has about 83.000 railwaymen, more than 9.000 trains and it manages a network of about 16.600 Km on which about 600.000.000 travellers and 50.000.000 tons of goods are transported annually.

The subsidiaries companies, considering the holding company shares, are reported in the picture 2.

[2] Rete Ferroviaria Italiana.

Picture 2

The Napoli-Bari line will achieve the following benefits:

• the railway integration improvement with intermodal transport and logistics facilities;

• the improvement of rail transport competitiveness through the increase of performance levels, comparable with road transport, and a significant reduction in travel time;

• the South-East railway network integration improvement with the high capacity railway system;

• the railway integration improvement with freight pole of Marcianise;

• the elimination of the constraints which characterize the existing infrastructure;

• the increase of the quality standards improving reliability and regularity of the system.

These benefits will take place in form of:

• the connections speeding to and from the Adriatic line with positive effects on long-distance services;

• the railway offer increase;

• the rail freight transport recovery;

• the creation of direct connections with Naples,

• the regional services improvement between Puglia and Campania;

• the improvement with the high-capacity line towards the north and south, through the Naples-Afragola Station;

• environmental and social benefits which will allow the rebalancing of the modal distribution through the quality improvement of the public transport service contributing to the reduction of congestion, pollution and accident rates.

This intervention is part of the following national and regional programs and plans that regulate the transport systems development of the territory covered by this study:

- Piano Generale del Trasporto e della Logistica
- Programma Operativo Nazionale (PON) – Trasporti 2000–2006
- Piano Regionale dei Trasporti Regione Campania
- Programma Operativo Regionale (POR) Campania
- Piano Regionale dei Trasporti della Regione Puglia.

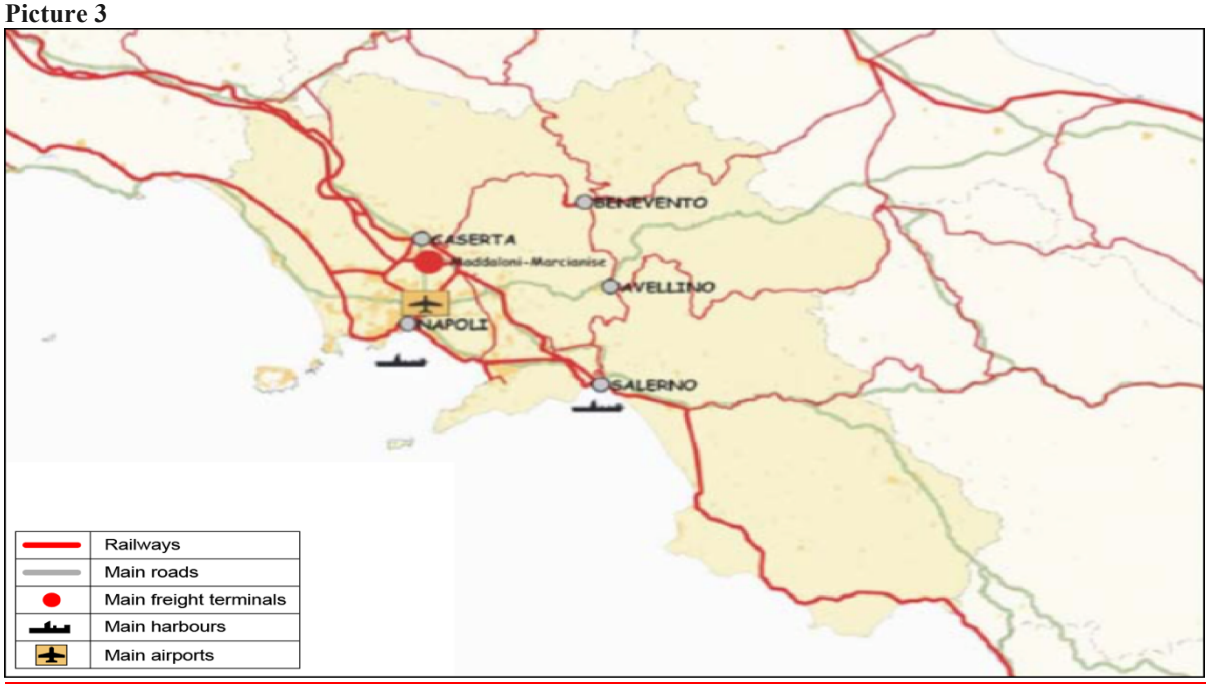
The Rome-Napoli-Bari line renewal fits, functionally and structurally, the key projects for the development of the South and its economic and social integration within the European Community, through the integration improvement of the railway towards South-East, extending in that direction the High Speed/High Capacity connections. The intervention will permit a substantial enhancement of the SNIT[3] rail network through the increase of the passengers and goods traffic according to economic development and modal shift objectives. Moreover, the interventions enable the enhancement and modernization of the cross connection lines through the speeding and a better integration with the national and international railway system.

[3] National Scheme for Infrastructures and Transports.

2 DESCRIPTION OF THE GEOGRAPHICAL AREA OF INTERVENTION

2.1 Regione Campania

Picture 3



The Regione Campania is the second most populated region of Italy and the first in population density. Naples, the third Italian city, has over a million inhabitants. The other provinces are Salerno, Caserta, Benevento and Avellino. The region is crossed by transport networks of the following types:

• rail lines with a total length of 1606 km (considering the number of tracks);

• highways with a total length of 442 km;

• Regional and Provincial roads for a total length of about 9,680 km

In addition there are the following transport terminals:

• Naples Capodichino airport (which in 2004 developed a sum of about 51.410 commercial aircraft movements);

• the freight pole Maddaloni-Marcianise which developed in 2006 a volume of freight traffic of about 1402 thousand tons.

• ports of Naples and Salerno, which in 2015 developed the following data:

Table 1

Harbours	Tons	TEU[4]	Travelers
Napoli	20.996.552	438.280	7.593.733
Salerno	12.943.969	359.328	687.268
	Total	Total	Total
	33.940.521	797.608	8.281.001

The main information (2015) of the provinces are reported in the table 2:

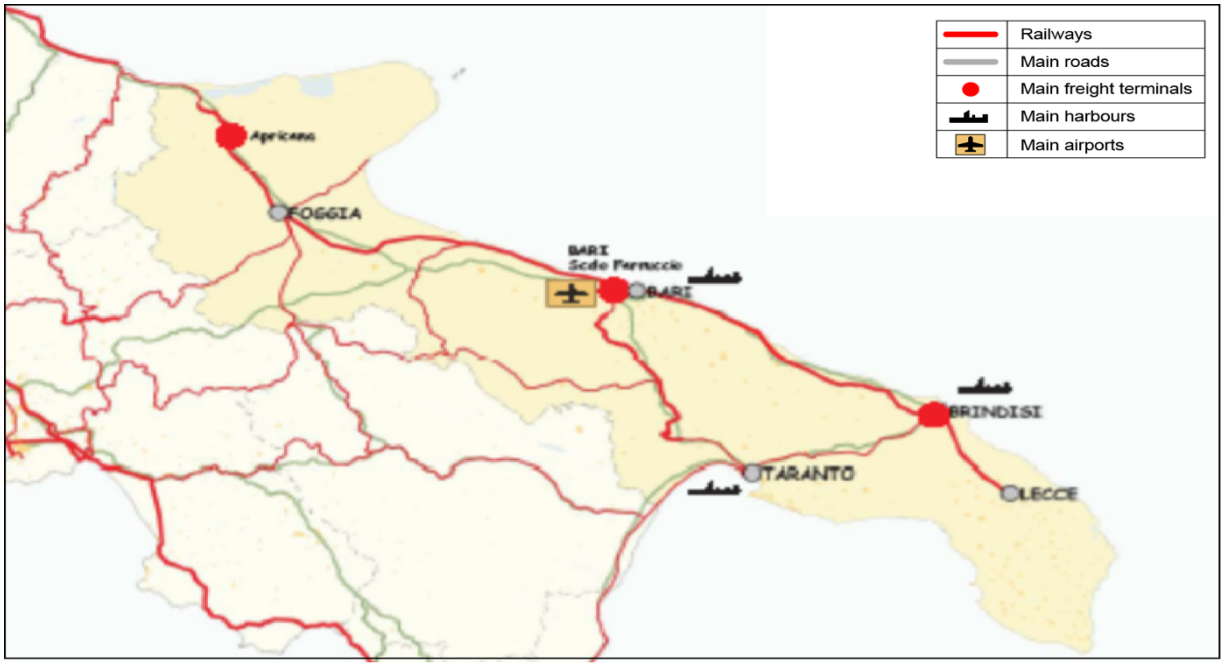
Table 2

	Inhabitants	**Surface**	**Population density**
Provinces		Sq Km	Inhabitants/ Sq km
Caserta	924.414	2.651,35	348,6578535
Benevento	280.707	2.080,44	134,9267463
Napoli	3.113.898	1.178,93	2641,29168
Avellino	425.325	2.806,07	151,5731967
Salerno	1.106.506	4.954,16	223,3488624
	Total	**Total**	**Average population density**
	5.850.850	13.670,95	699,9596677

[4] The unit is the standard measurement unit of volumes in the containers transport and amounts to about 40 cubic meters.

2.2 Regione Puglia

Picture 4



Puglia is crossed by land transport networks of the following types:

• rail lines with a total lenght of 1218 km (considering the number of tracks);

• highways with a total length of 313 km;

• Regional and Provincial roads for a total length of about 11,210 km

In addition, in the region there is the localisation of the following major transport terminals:

• Bari Palese Airport (which in 2004 developed about 21.440 commercial aircraft movements)

• freight poles of Bari Scalo Ferruccio, Brindisi and Apricena which developed in 2006 a volume of freight traffic, respectively, of 1.592.000, 680.000 and 735.000 tons.

• the ports of Brindisi, Bari and Taranto which in 2015 developed the following data:

Table 3

Harbours	**Tons**	**TEU**	**Travelers**
Bari	5.070.224	60.009	1.491.786
Bridisi	11.774.738	329	625.714
Taranto	22.565.243	148.519kj	358
	Total	**Total**	**Total**
	39.410.205	208.857	2.117.858

The main information of the provinces are reported in the table 4:

Table 4

	Inhabitans	**Surface**	**Population density**
Provinces		Sq Km	Inhabitants/ Sq km
Foggia	630.851	7.007,54	90,02460207
Bari	1.263.820	3.862,88	327,1704014
Taranto	586.061	2.467,35	237,526496
Brindisi	398.661	1.861,12	214,2048874
Lecce	804.239	2.799,07	287,3236468
Barletta-Andria-Trani	393.534	1.542,95	255,0529829
	Total	**Total**	**Average population density**
	4.077.166	19.540,91	235,2171694

3. CURRENT RAIL LINK DESCRIPTION

3.1 Technical description

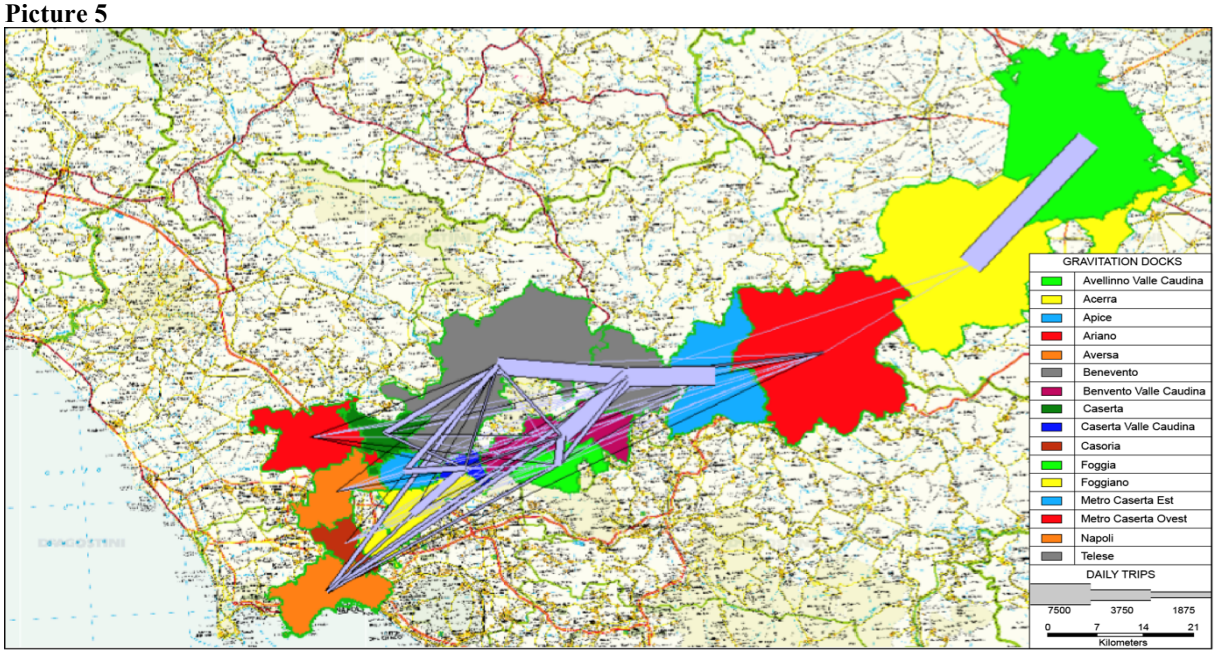
Currently, the rail link between Napoli and Bari is not continuous in fact it presents a discontinuity (so-called "break of cargo") in Caserta station and a reverse gear gear (reversal of the train running direction) in the Foggia station.

Proceeding from West to East, the first railway route that runs that direction is that from Naples to Caserta, via Cancello: this line is double-track. From Caserta, after rail change, it continues Eastward covering the current Caserta-Foggia route which is single-track for almost its entire length of about 163 km. The sections between Vitulano and Apice, for an extension of about 21 km, and between Foggia Centrale and the Cervaro station, for an extension of about 7 km, have already been doubled in recent times (1980s).

In the Foggia station occurs, always using the same rail, a reverse to allow the entry of the train on the Pescara-Bari line which is double track.

3.2 Travel time

Picture 5



The Naples-Bari line plays an important role in long and short distance passenger transport service and in the freight transport service. Currently, the railway infrastructure between Caserta and Foggia is mainly used by passengers with a flow of about 1,3 million passengers a year. It can be compared, for these values, to similar Transapennine routes (Orte-Falconara, Roma-Pescara, Pontremolese).

The average travel times of the existing services are the following:

Table 5

Line	**Travel time**
Napoli-Bari	3h 35 min
Roma-bari	4h 37 min

The freight transport service along the Caserta-Foggia route is quite low: around 0.6 million tons/year.

The regional services are mainly developed between Naples/Caserta and Benevento while the services supply is marginal towards Foggia and the Puglia side.

The traffic volume is highly significant on the Caserta-Cancello route because along the last route there is the addition of the Rome/Naples and Foggia lines towards the Tyrrhenian South line.

The traffic volume is also significative in the Cancello-Napoli route which is exclusively dedicated to local transport thanks to the construction of the railway Villa Literno-Naples-Caserta and the High Speed/High Capacity Rome-Naples.

3.3 Mobility

This section describes the project mobility area which is divided into 16 traffic docks reported in the table 6. The analysis was carried out starting with the elaboration of the matrix origin/destination of work and study movements on a municipal basis[5].

[5] Source ISTAT 2001.

Table 6

Docks	Acerra	Apice	Ariano	Avellino Valle Caudina	Aversa	Benevento	Benevento Valle Caudina	Caserta	Caserta Valle Caudina	Casoria	Foggia	Foggiano	MetroCaserta Est	MetroCaserta Ovest	Napoli	Telese
Acerra		X	X	X		X	X		X		X	X				X
Apice	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ariano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Avellino Valle Caudina	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Aversa		X	X	X		X	X		X		X	X				X
Benevento	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Benevento Valle Caudina	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Caserta		X	X	X		X	X		X		X	X				X
Caserta Valle Caudina	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Casoria		X	X	X		X	X		X		X	X				X
Foggia	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Foggiano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MetroCaserta Est		X	X	X		X	X		X		X	X				X
MetroCaserta Ovest		X	X	X		X	X		X		X	X				X
Napoli		X	X	X		X	X		X		X	X				X
Telese	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The total daily demand is about of 93.000 shifts: 30.500 trips for study, 42.500 for work and 20.000 for other reasons.

The transport modes are different: those for study take place for the 38% by private transport (car or motorcycle) and 62% by public transport (bus or rail) while those for work take place for the 90% by private transport and 10% by public transport.

Regarding the public transport mode: the shifts for study reasons are performed for the 15% by rail and for the remaining 85% by road while for business reasons the 35% prefer the use of the rail and the remaining 65% prefer the road.

In summary the public rail transport attracts about 5.000 shifts: 2.600 for study purposes (about 9% of the total), 1.350 for work purposes (about 3% of the total) and the remaining 1050 for other purposes.

This data highlights an inadequate competitiveness of public transport by rail compared to other transport modes available for both trips made for study and business purposes.

Students tend to reward the widespread coverage of the territory offered by road public transport than by rail.

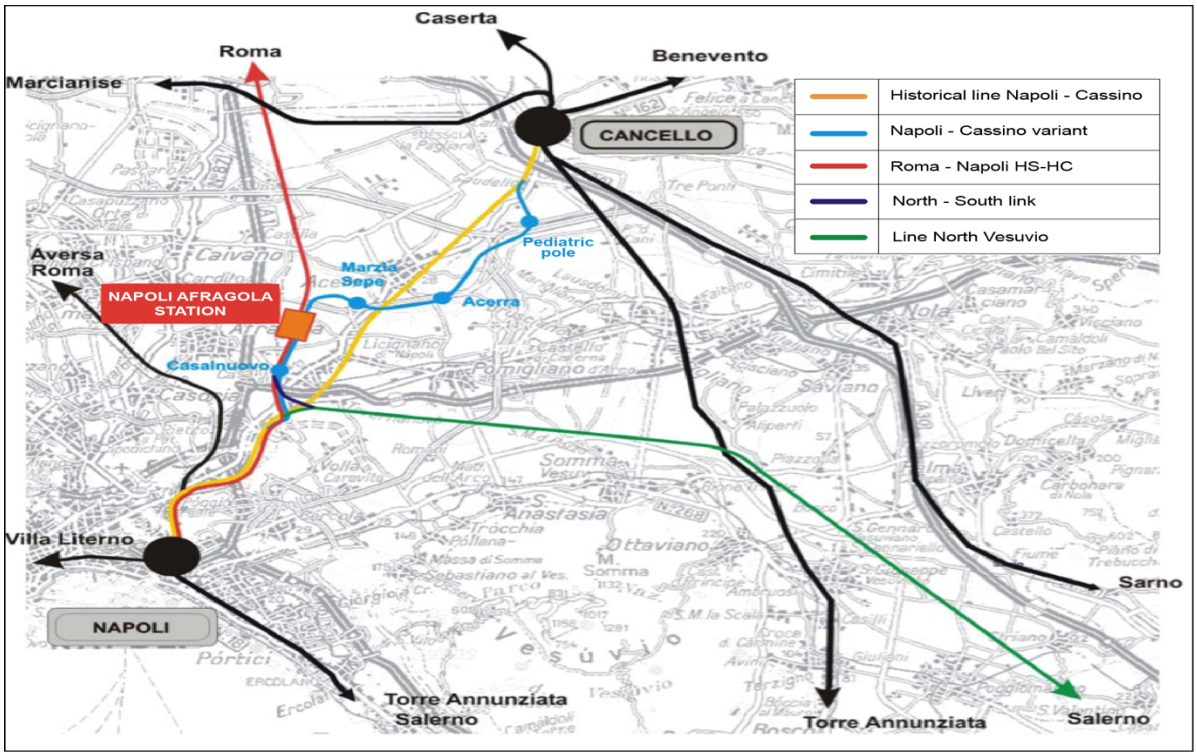
The work passengers reward the private transport rather than the public rail and road for various reasons: first because private transport guarantees lower travel times, especially if we consider travel times currently offered by the rail service on the Telese-Benevento-Caserta-Napoli; second, the lack of adequate parking areas limits the ability to use the car to access the rail system and therefore penalizes transport demand linked to the park and ride, moreover, the current rail service is characterized by a low rides frequency especially during the afternoon time slots; this penalizes the re-entry shifts; finally, the current lack of integration between iron and rubber penalizes the choice of the railway.

4 FUTURE RAIL LINK DESCRIPTION

This section describes the intermediate future routes proceeding from Naples to Bari.

4.1 Napoli-Cancello route

Picture 6



The planning solution develops at South of the town of Acerra and involves the building of a service station for the connection of the Acerra industrial area and interchange with the Circumvesuviana line and it allows the addition of a stop in proximity of the pediatric pole.

This line is the first route of Napoli-Bari and it allows, through the new Napoli Afragola Station, the integration of the historical line with the High Speed/High Capacity railway.

The project layout, from the Afragola station towards Napoli Centrale, presents a total length of 5,3 km and runs for about 1,8 km on a single infrastructure corridor together with the existing High Speed/High Capacity railway, made by TAV[6] S.p.A, continuing parallel to the the last railway until the junction with the historical line at Casoria at Km 241+740. At Km 2+600 the realization of the stop Casalnuovo is expected, thereby allowing the interchange with the Circumvesuviana line. The variant line at North of the High Speed/High Capacity station, with an overall length of approximately 10,2 km, runs for 2 km in Afragola territory, crossing the shopping center "Le Porte di Napoli", where the realization of the stop of Marziasepe is

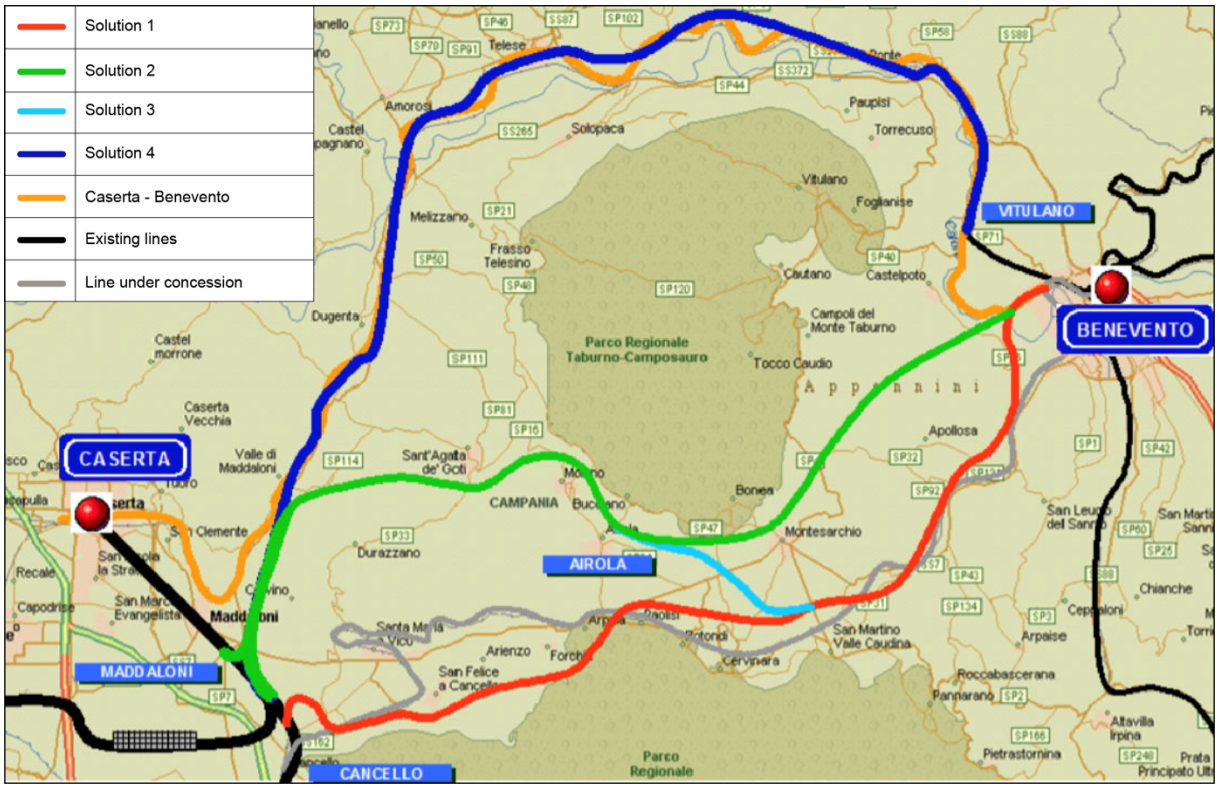
[6] Treno Alta Velocità.

expected. It runs then in the municipality of Acerra, at the South of the city center, for about 8,2 Km integrating with the historical line at Km 229+568. The realization of the new Acerra station is expected to be realized at this location, where the rail link Pomigliano engages and allows its interchange with the Circumvesuviana line and the shutdown at the pediatric pole.

The variant total length is equal to 15,5 km, the project speed is 130 km/h (except for some points where the urbanization of the territory has led to a reduction to 100 Km/h) with diverting 60 km/h.

4.2 Cancello-Benevento route

Picture 7



The are four solutions examined for this route:

- the first provides a new railway infrastructure in the Valle Caudina corridor;
- the second provides a new infrastructure that runs in a corridor at North of Valle Caudina;
- the third provides a new infrastructure whose path is a combination of the paths of the two previous solutions,
- the fourth solution involves the modernization of the historical line between Caserta and Benevento through Telese-Cerreto.

- ***Solution 1*** *- Valle Caudina corridor*

The track in solution 1 develops in Valle Caudina, an area which is characterized by a significant urbanization.

The intervention involves the construction of a new single electrified rail line with an overall length equal to about 38 km with a project speed of 200 km/h and a maximum longitudinal slope of 20%. The solution of the first line has a capacity of approximately 43 pairs of trains/day. The connection to the Caserta-Cancello existing line is a double rail both towards Rome both towards Naples. From Km 0+000 to Km 4+500 there is a double-track line that allows the removal of the first section of the Benevento-Cancello route, in order to eliminate the insertion of this line in that of Cancello. The regional traffic is routed on the two rail variant. From Km 4+500 to Benevento, the single rail line continues on an independent site from the existing line and includes a dock station at Km 19+130 named Cervinara-Montesarchio.

The high longitudinal gradients and the difficulties to realize a direct connection with Maddaloni-Marcianise freight pole make the new line inadequate to freight traffic which therefore remains routed on the existing line Benevento-Caserta.

With the aim to improve the link with Maddaloni-Marcianise, a freight road will be created between the freight pole and Caserta-Aversa route. This makes it possible to insert freight trains coming from Benevento towards Maddaloni-Marcianise with no U-turn in Caserta.

- ***Solution 2 -*** *Corridor at the north of Valle Caudina*

This route runs entirely at North of the Benevento-Cancello existing line, it provides a double-track electrified line which has a length of 40 km, project speed of 200 km/h and maximum longitudinal gradient of 12%. It has a capacity of approximately 130 pairs of trains/day.

The insertion towards Caserta-Cancello line is a double rail both towards Rome both towards Naples.

This line is destined for long distance passenger and freight traffic; it provides a stop at Km 24+800 named Airola-Montesarchio.

The connection to the Maddaloni-Marcianise pole is made with a pair of rails that connect directly to the pole rails allowing the improvement of the functionality of Caserta plant and the traffic reduction in the historical line that stretches between Cancello and Caserta.

- ***Solution 3 -*** *Combination of the previous two solutions*

The third solution, until Km 20+000, retraces the route of solution 2 and then going through the territorial area between the towns of Aiola and Montesarchio, then returning to the route of the Solution 1 until Benevento. This route, even if it increases the line length of about 5-6 km compared to previous solutions, allows a considerable reduction in the number of tunnels.
This solution provides the realization of a single electrified rail line with 200 km/h project speed and a maximum 16% of the longitudinal slope with a daily capacity of about 34 pairs of trains/day.
Specifically, it involves the construction of a double rail until Km 6+200; from here the rail branches off creating two single rails, one for the new project connection and the other will link to the historical line Caserta-Benevento before Frasso-Telesina station. It thus provides the dismission of the historical line section between Valle di Maddaloni and Caserta and the routing of regional traffic on the new stretch of double rail. This allows to the regional traffic on the Napoli-Benevento to use the new line with a significant reduction in travel time.
Even in this solution it is expected the station of Aiola-Montesarchio at Km 22+900.
Freight traffic continues to circulate on the existing line but, taking advantage of the above-described variation, it can be routed directly to Maddaloni-Marcianise without affecting the system of Caserta and the historical line section between Caserta and Maddaloni.

- ***Solution 4 -*** *Speeding up and doubling of Benevento-Caserta historical line*

This solution provides the doubling and the speeding up of the existing line to a project speed of 160 km/h and an increase in daily capacity up to about 110 pairs of trains/day. The insertion to Caserta-Cancello line is similar to that described in the solution 3 with the removal of a historical line section between Valle di Maddaloni and Caserta. Moreover, even in this hypothesis the direct connection for freight traffic with Maddaloni-Marcianise, through the creation of a double rail, is mantained. The stations of Valle di Maddaloni, Frasso Dugenta, Amorosi, Telese, Solopaca and S. Lorenzo Maggiore are maintained, with the necessary modifications, while the plants of Maddaloni Superiore and Ponte Casalduni are decommissioned. This solution provides an overall length of the track of about Km 47+300.

The characteristics of the four solutions are summarised in the table 7:

Table 7

	Total km	Total tunnel km	Tunnels (%)	Project speed	Maximum slope (%)	Stations
Solution 1	38+260	14+850	39	200km/h	20	Cervinara-Montesarchio
Solution 2	40+968	23+000	56	200km/h	12	Airola-Montesarchio
Solution 3	45+643	17+240	38	200km/h	16	Airola-Montesarchio
Solution 4	45+724	13+157	29	180km/h	12	Existent stations

The four solutions for the Cancello-Benevento line described above, submitted to the studies made by RFI, have been restricted to solution 3 and 4 so excluding solutions 1 and 2.
The reasons for this choice are:

- constructive and functional criticalities:
  - for solution 1 the biggest problems are related to the excavation of the tunnel named 1A (between Km 6+500 to Km 14+500 because the last involves highly fractured carbonate formations with poor mechanical properties and there are also high hydraulic loads, reaching the limits of technical feasibility, concentrated just in correspondence with the fault zones.
  - for solution 2 the criticality issues are mainly in the final stretch towards Benevento, linked essentially to the realization of the long tunnel characterized by highly heterogeneous formations (an alternation of rock types) which could lead to instability of the face and the cavity especially in concomitance of probable water seepages.
- travel time because both solution 1 that 2 do not ensure a time reduction while solution 3 and 4 allow a time reduction (Δ) according to the table 8:

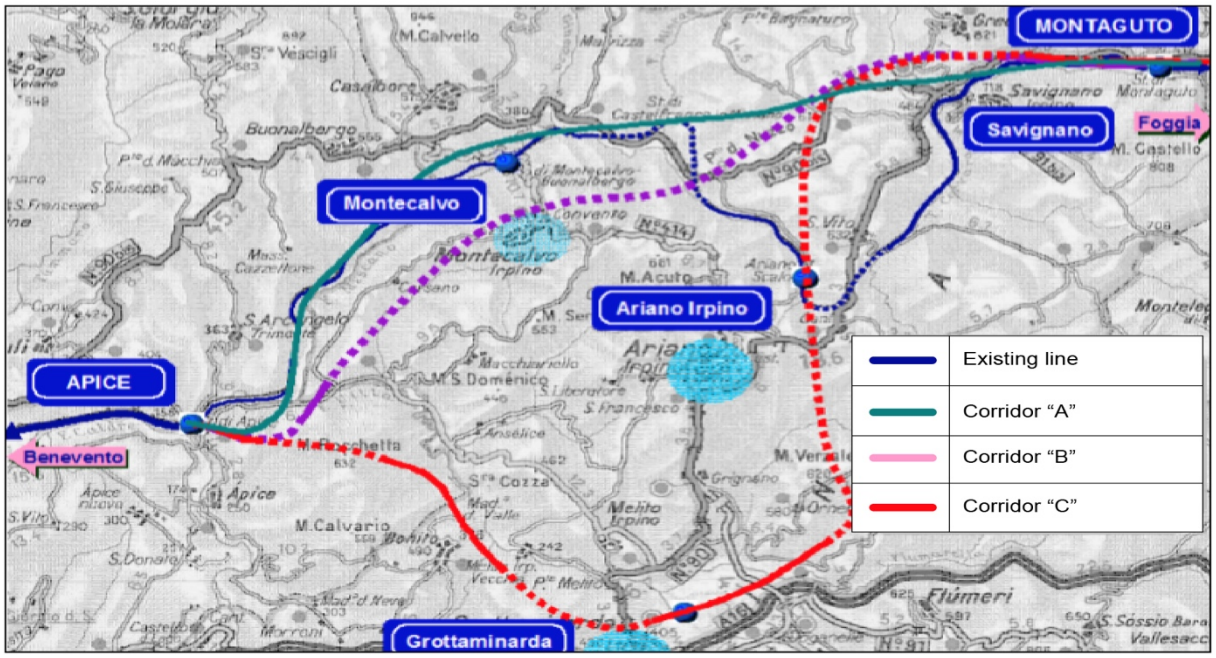
Table 8

Line	Current	Solution 1-2	Solution 3	Solution 4
Napoli-Benevento	1h 50 min	1h 50 min	1h 20 min	1h 10 min
		Δ	Δ	Δ
		0	-30 min	-40 min

So further in the analysis we analyse only solutions 3 and 4.

4.3 Benevento/Apice-Orsara di Puglia route

Picture 8



The Benevento/Apice-Orsara di Puglia route represents the "Apennine pass" of the line and the most challenging line for the doubling.

Three possible infrastructure corridors have been identified:

- corridor A, which develops at the North of Montecalvo Irpino;
- corridor B, which develops at the North of Ariano Irpino and laps, underground, the town of Montecalvo Irpino;
- corridor C, which develops at the South of Ariano Irpino and provides the passage in the Grottaminarda territory.

The three solutions (corridors), submitted to the studies made by RFI, have been restricted to solution B and C.

The reason for the exclusion of solution A is due to building problems mainly caused by the nature of the crossed geological formations and disseminated superficial landslides which would require important stabilization interventions to the tunnels entrances; moreover, the clays multicolour can be probable gas pockets.

Corridor A is also critical from an environmental point of view since it crosses archaeological areas (proximity to ancient Via Traiana).

From these studies the two achievable solutions are the so-called "Direct solution" which falls in the corridor B and the "South Solution" which falls in the corridor C.

4.4 Orsara di Puglia-Cervaro di Foggia

This line is already completed and provides a double rail.

The main features of the route are reported in the table 9:

Table 9

Project speed	200 km/h
Total km	33
Number of bridges	3
Total km of bridges	1
Number of tunnels	6
Total km of tunnels	5,372
Number of stations	2

4.5 Foggia rail link

Picture 9

The reverse abolition is provided in Foggia station obtaining a time recovery and the decongestion of the same station.

The route inserts at Km 5+660 of the Caserta-Foggia historical line and it develops at the South-East of the town of Foggia connecting it to the Adriatic line at Incoronata station.

The main features of the line are reported in the table 10:

Table 10

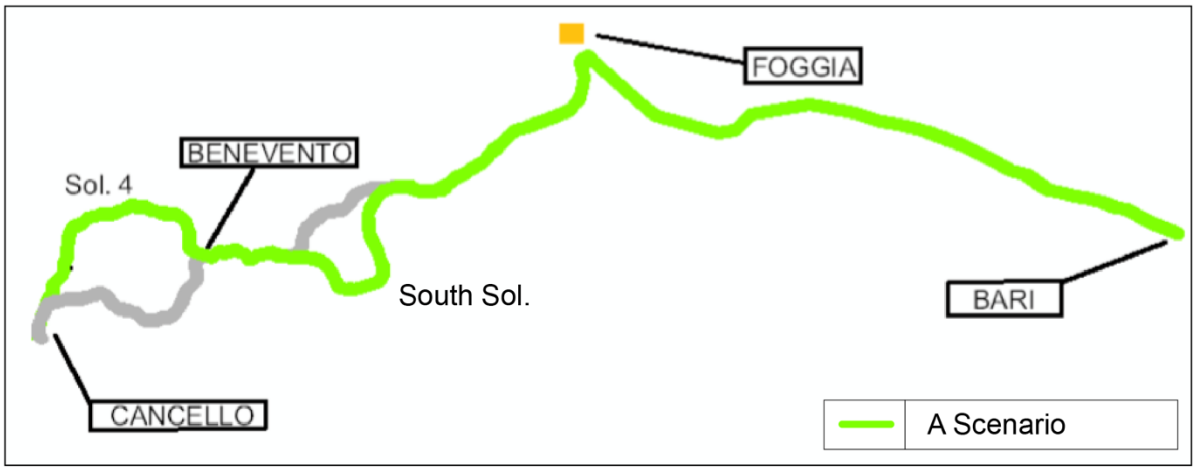
Project speed	100 km/h
Total km	4,285
Number of bridges	2
Total km of bridges	0.783
Number of stations	110

4.6 Possible combinations of lines

From the analysis made in chapter 4.2 and 4.3, it emerges that in the Cancello-Benevento line there are two solutions (3 and 4) while in the Benevento/Apice-Orsara di Puglia there are also two ones (Direct and South solutions); from the combinations of these rise four solutions:

- **Solution A** = solution 4 + South solution

Picture 10



This solution presents the following characteristics:

Table 11

Napoli-Bari (A scenario)

Total lenght	293 km
Travel time	2h 18 min
Time recovered w.r.t. the current scenario	1h 17 min

- **Solution B** = solution 4 + Direct solution

Picture 11

This solution presents the following characteristics:

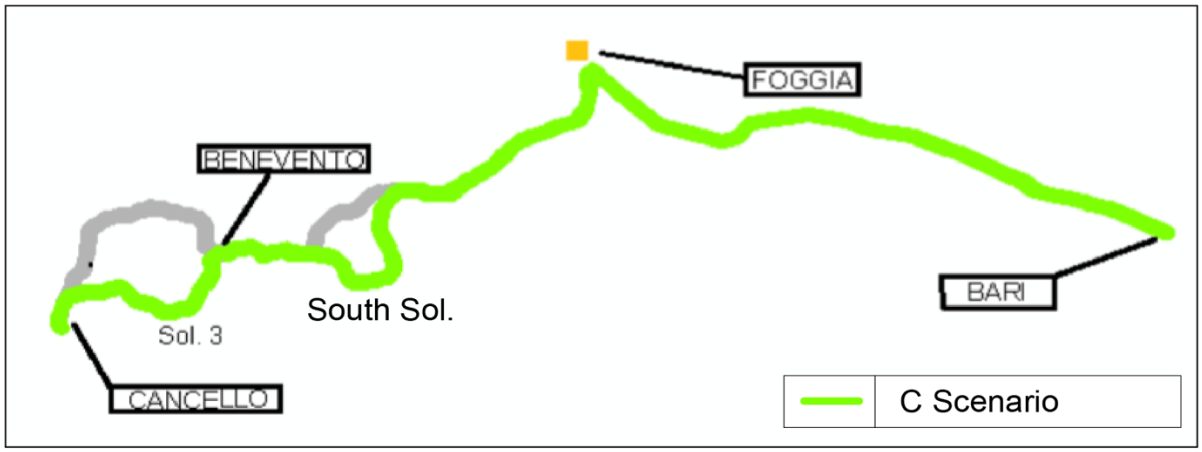
Table 12

Napoli-Bari (B scenario)

Total lenght	278 km
Travel time	2h 12 min
Time recovered w.r.t. the current scenario	1h 23 min

- **Solution C** = solution 3 + Direct solution

Picture 12



This solution presents the following characteristics:

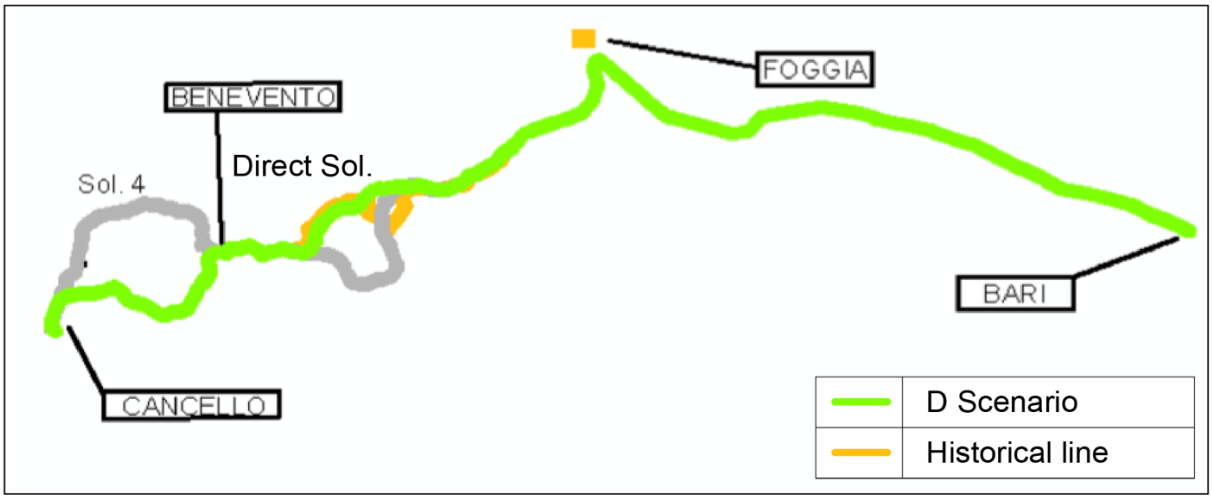
Table 13

Napoli-Bari (C scenario)

Total lenght	270km
Travel time	2h 10 min
Time recovered w.r.t. the current scenario	1h 25 min

- **Solution D** = solution 3 + South solution

Picture 13



This solution presents the following characteristics:

Table 14

Napoli-Bari (D scenario)

Total lenght	285 km
Travel time	2h 15 min
Time recovered w.r.t. the current scenario	1h 20 min

5. FINANCIAL AND ECONOMIC ANALYSIS

The financial and economic analysis is a very important step in a project feasibility study; in fact it allows to estimate the convenience, from the investor point of view, to realize or not the project depending on the revenues and the costs flows and on the salvage value of the investment; these three items, discounted at a rate, compose the financial and economic net present value.

In the analysis development I have proceeded, using the data of RFI, to the recalculation of the previous items taking into account the past values of annual inflation[7] from 2006, the year of the analysis made by RFI, to 2016 and the forecast of annual inflation, from 2016 to 2060, which is considered stable around 2%[8]; while for the discount rate I have used the rate of similar railway project which is 4% according to the EU Cohesion Policy 2014-2020 [9].

Further analysis information are included in the following list:

- the time horizon goes from 2016 to 2060 (last year of the RFI concession); thus the present values (PVs) are computed at 2016;
- the four plan solutions, previously described, have been considered;
- the numbers are expressed in millions of Euros unless otherwise noted;
- the data have been extrapolated from different RFI reports which are listed in the bibliography.

[7] The inflation rates (source www.inflation.eu) are reported in the appendix (5)

[8] Source OECD (Organisation for Economic Cooperation and Development)

[9] The European Cohesion policy is the main investment policy of the European Union; it supports: job creation and growth, investment in people, business support, research and innovation strengthening, environmental improvement and transport modernization.

5.1 Costs

The project costs include: realization costs, maintenance costs and operating costs.
I have corrected these values, estimated by RFI in 2006, for the inflation rates occurred between 2006 and 2016 and for the estimated inflation rate between 2016 and 2060.

5.1.1 Realization costs

The realization costs (RC) include the costs for the building of the lines Napoli-Cancello, Cancello-Benevento, Benevento/Apice-Orsara di Puglia and the Foggia rail link.
These costs are reported in table 15.

Table 15

Realization costs			
A	B	C	D
4.512,00 €	4.106,00 €	3.869,00 €	4.275,00 €

According to the RFI time-program, the line should be realized from 2016 to 2023 (8 years); thus I have assumed the costs are distributed over 8 years.[10]
The PV for the realization costs is computed through the formula:

$$PV = \sum_{t=0}^{7} \frac{Annual\ realization\ cost_t}{(1+0{,}04)^t}$$

obtaining:

Table 16

PV RC			
A	B	C	D
4.473,58 €	4.071,03 €	3.836,05 €	4.238,60 €

[10] The values are reported in the appendix (5.1.1 A).

5.1.2 Maintenance costs

The maintenance costs (MC) are divided in ordinary and extraordinary costs.

According to the RFI time-program, the ordinary maintenance costs (OMC)[11] become effective from 2020 until 2060.
The PV of the maintenance costs is computed through the formula:

$$PV = \sum_{t=0}^{40} \frac{Annual\ ordinary\ maintenance\ cost_t}{(1 + 0{,}04)^{t+4}}$$

obtaining:

Table 17

PV OMC			
A	B	C	D
31,41 €	39,26 €	36,64 €	28,79 €

Considering the RFI time-program, the extraordinary maintenance costs (EMC) become effective from 2020 until 2060.
These costs are foreseen with deadline at 10, 20, 25, 30 and 40 years according to table 18.

[11] The values are reported in the appendix (5.1.2 A)

Table 18

Extraordinary maintenance costs

	A	B	C	D
10 years	0,80 €	1,10 €	1,04 €	0,74 €
20 years	2,18 €	4,19 €	4,43 €	2,42 €
25 years	0,71 €	0,68 €	0,65 €	0,68 €
30 years	1,36 €	1,87 €	1,78 €	1,26 €
40 years	2,56 €	4,91 €	5,19 €	2,84 €

Whose PV is computed through the formula:

$$PV_t = \frac{Extraordinary\ maintenance\ cost_t}{(1 + 0{,}04)^t} \quad with\ t = 10, 20, 25, 30, 40$$

obtaining:

Table 19

	PV EMC			
	A	B	C	D
10 years	0,54 €	0,74 €	0,70 €	0,50 €
20 years	1,00 €	1,91 €	2,02 €	1,11 €
25 years	0,26 €	0,25 €	0,24 €	0,25 €
30 years	0,42 €	0,58 €	0,55 €	0,39 €
40 years	0,53 €	0,70 €	0,74 €	0,40 €
	Total	Total	Total	Total
	2,35 €	3,58 €	3,64 €	2,27 €

The PV of maintenance costs is derived by the formula:

$$PV\ MC = PV\ OMC + PV\ EMC$$

obtaining:

Table 20

PV MC			
A	B	C	D
33,76 €	42,84 €	40,28 €	31,06 €

5.1.3 Operating costs

The operating costs (OC) are divided into: freight transport service and passenger transport service costs.

The freight transport service operating costs (FTSOC) [12] are taken into account from 2024, activation year of the freight transport services, to 2060.
The PV is computed through the formula:

$$PV = \sum_{t=0}^{37} \frac{Annual\ freight\ operating\ cost_t}{(1 + 0{,}04)^{t+8}}$$

obtaining:

Table 21

PV FTSOC			
A	B	C	D
852,56 €	852,56 €	852,56 €	852,56 €

The passenger transport service operating costs (PTSOC)[13] are taken into account from 2020, activation year of the short distance passenger service, to 2060.
The PV is computed through the formula:

$$PV = \sum_{t=0}^{40} \frac{Annual\ passenger\ operating\ cost_t}{(1 + 0{,}04)^{t+4}}$$

[12] The values are reported in the appendix (5.1.3 A).

[13] The values are reported in the appendix (5.1.3 A).

obtaining:

Table 22

PV PTSOC			
A	B	C	D
2.530,95 €	2.530,95 €	2.530,95 €	2.530,95 €

The PV of the operating costs is given by:

$$PV\ OC = PV\ FTSOC + PV\ PTSOC$$

obtaining:

Table 23

PV OC			
A	B	C	D
3383,51€	3383,51€	3383,51€	3383,51€

5.1.4 PV Total costs

The PV of the total costs is computed through the formula:

$$\text{PV TOTAL COSTS} = \text{PV RC} + \text{PV MC} + \text{PV OC}$$

obtaining:

Table 24

PV TOTAL COSTS			
A	B	C	D
7.890,85 €	7.497,38 €	7.259,84 €	7.653,16 €

5.2 Revenues projections

As RFI made available only the data regarding traffic flows, I have proceeded to the revenues estimation.

In this estimation, I have used the ticket prices available on www.trenitalia.it by considering a price update linked to the foreseen annual inflation rate of 2% as well as by considering a traffic volume (passenger or freight transport) update of an annual value of 1,5% for the first 20 years.

The revenues can be divided in:

- short distance passenger transport service revenues;
- long distance passenger transport service revenues;
- freight transport service revenues.

5.2.1 Short distance passenger transport service revenues

The short distance passenger transport service regards the Napoli-Caserta-Cancello-Benevento-Bovino-Foggia route.

I have conjectured only the weekly traffic, so 5 days/week (252 days/year), because such traffic is relevant for the presence of workers and students.

The activation year of the short distance passenger transport service will be 2020.

The PV of the short distance passenger transport service revenues (SDPTSR)[14] is computed through the formula:

$$PV = \sum_{t=0}^{40} \frac{Annual\ short\ distance\ passenger\ revenues_t}{(1 + 0{,}04)^{t+4}}$$

obtaining:

Table 25

PV SDPTSR			
A	B	C	D
767,62 €	424,74 €	751,38 €	408,50 €

[14] The short distance passenger transport service revenues, for each solution (considering the different routes), are reported in the appendix (5.2.1 A).

5.2.2 Long distance passenger transport service revenues

The long distance passenger transport service regards the routes: AV (Roma-Bari; Milano-Bari), ES (Napoli-Bari) and IC (Roma-Bari; Napoli-Bari).
I have conjectured traffic 7 days/week (365 days/year).
The activation year of the long distance passenger transport service will be 2024.
The PV of the long distance passenger transport service revenues (LDPTSR)[15], which is equal for the four solutions, is computed through the formula:

$$PV = \sum_{t=0}^{36} \frac{Annual\ long\ distance\ passenger\ revenues_t}{(1 + 0{,}04)^{t+8}}$$

obtaining:

Table 26

PV LDPTSR			
A	B	C	D
10.588,26 €	10.588,26 €	10.588,26 €	10.588,26 €

5.2.3 Freight transport service revenues

The freight traffic regards the route Napoli-Bari.
I have conjectured relevant only the weekly traffic, so 5 days/week (252 days/year), because such traffic is linked to the working days.
The activation year of the freight transport service will be 2024.
The PV of the freight transport service revenues (FTSR)[16], which is equal for the four solutions, is computed through the formula:

[15] The long distance passenger transport service revenues, for different routes, are reported in the appendix (5.2.2 A).

[16] The freight transport service revenues are reported in the appendix (5.2.3 A).

$$PV = \sum_{t=0}^{36} \frac{Annual\ freight\ revenues_t}{(1 + 0{,}04)^{t+8}}$$

obtaining:

Table 27

PV FTSR			
A	B	C	D
2.302,40 €	2.302,40 €	2.302,40 €	2.302,40 €

5.2.4 PV Total revenues

The PV of the total revenues is computed through the formula:

$$PV\ TOTAL\ REVENUES = PV\ SDPTSR + PV\ LDPTSR + PV\ FTSR$$

obtaining:

Table 28

PV TOTAL REVENUES			
A	B	C	D
13.658,28 €	13.315,41 €	13.642,04 €	13.299,16 €

5.3 Investment Salvage Value

The salvage value is the value which the infrastructure will have at the end of the concession period; it is computed in terms of the perpetuity of flows from 2024 to 2060.
The value for each solution is reported in table 29.

Table 29

Salvage value in 2060			
A	B	C	D
8001,18 €	7.601,93 €	7.361,19 €	7.760,29 €

The PV is computed through the formula:

$$PV = \sum_{t=0}^{36} \frac{Salvage\ value}{(1 + 0{,}04)^{t+8}}$$

obtaining:

Table 30

PV SALVAGE VALUE			
A	B	C	D
1.424,58 €	1.353,50 €	1.310,63 €	1.381,69 €

5.4 Financial and economic NPV

The financial and economic (FE) NPV is an indicator which allows to verify the financial and economic convenience for the investor to realize the infrastructure.
It is computed through the formula:

$$FE\ NPV = PV\ TOTAL\ REVENUES - PV\ TOTAL\ COSTS + PV\ SALVAGE\ VALUE$$

obtaining:

Table 31

FE NPV			
A	B	C	D
7.192,02 €	7.171,57 €	7.692,86 €	7.027,67 €

The financial and economic NPV results positive and extremely high for each plan solution, thus it is convenient, from the investor point of view, to start the realization of the infrastructure at the current date i.e. 2016.

6. SOCIO-ECONOMIC ANALYSIS

The socio-economic analysis takes into account the values of the financial and economic analysis as well as the values coming from the evaluation of the socio-environmental impact on the areas where the infrastructure will be realized.
This analysis indicates if a project, sustainable from the financial and economic point of view, can be also sustainable from the socio-economic one.
In the socio-economic analysis there is the distinction among internal benefits and costs and external ones. Substantially there is a comparison between benefits and costs, directly or indirectly associated with the investment, with benefits and costs, external to the financial statements, which are relevant for the entire collectivity.
The internal costs are analysed in paragraph 6.1; the internal benefits are analysed in paragraph 6.2; the external benefits are analysed in paragraph 6.4 while, according to RFI reports, the external costs are not present.

While in the financial and economic analysis the monetary values are subjected to the inflation and to a nominal discount rate, in the social and economic analysis the values refer generally to benefits and costs constant over time and to a real discount rate; the last one is 5% according to the EU Cohesion Policy 2014-2020.
This analysis is divided in two parts: in the first one I have converted, through the use of conversion factors[17], the financial and economic values into socio-economic ones while in the second part I have added, to the previous values, the monetary quantifications of the socio-environmental impact.

Further analysis information are included in the following list:

- the time horizon goes from 2016 to 2060 (last year of the RFI concession); thus the present values (PVs) are computed at 2016;
- the four plan solutions, previously described, have been considered;
- the numbers are expressed in millions of Euros unless otherwise noted;
- the data have been extrapolated from different RFI reports which are listed in the bibliography.

[17] The conversion factors are reported in the appendix (6A). They allow to purify the financial items from transfers to the State because the transfers, from the collectivity perspective, do not imply resources consumption.

6.1 Internal costs

In this paragraph, I employed the same analysis made in paragraph 5.1 but I have considered the absence of inflation, a real discount rate of 5% and the conversion factors for the different items of costs.

6.1.1 Realization costs

The realization costs (RC) of paragraph 5.1.1, are converted through the conversion factor 0,8706, thereby obtaining the following results:

Table 32

Total realization costs			
A	B	C	D
3.928,15 €	3.574,68 €	3.368,35 €	3.721,82 €

Considering the RFI time-program, the line should be realized from 2016 to 2023, so 8 years; thus I have assumed that the costs are equally distributed over 8 years.[18]
The PV is computed through the formula:

$$PV = \sum_{t=0}^{7} \frac{Annual\ realization\ cost_t}{(1+0{,}05)^t}$$

obtaining:

Table 33

NPV RC			
A	B	C	D
3.332,23 €	3.032,39 €	2.857,36 €	3.157,20 €

[18] The values are reported in the appendix (6.1.1 A).

6.1.2 Maintenance costs

The maintenance costs (MC) are divided in ordinary and extraordinary costs.

The items of paragraph 5.1.2 are converted through the conversion factor 1,0182.
According to the RFI time-program, the ordinary maintenance costs (OMC)[19] become effective from 2020 until 2060.
The PV is computed through the formula:

$$PV = \sum_{n=0}^{40} \frac{Annual\ ordinary\ maintenance\ cost}{(1 + 0{,}05)^{n+4}}$$

obtaining:

Table 34

PV OMC			
A 18,25€	B 22,82€	C 21,3€	D 16,73€

Considering the RFI time-program, the extraordinary maintenance costs (EMC) become effective from 2020 until 2060.
These costs are foreseen with deadlines at 10, 20, 25, 30 and 40 years according to the table 35.

[19] The values are reported in the appendix (6.1.2 A).

Table 35

	Extraordinary maintenance costs			
	A	B	C	D
10 y	0,80 €	1,10 €	1,04 €	0,74 €
20 y	2,18 €	4,19 €	4,43 €	2,42€
25 y	0,71 €	0,68 €	0,65 €	0,68€
30y	1,36 €	1,87 €	1,78 €	1,26 €
40y	2,56 €	4,91 €	5,19 €	2,84€

Whose PV is computed through the formula:

$$PV_t = \frac{Extraordinary\ maintenance\ cost_t}{(1+0{,}05)^t} \quad with\ t = 10, 20, 25, 30, 40$$

obtaining:

Table 36

	PV EMC			
	A	B	C	D
10 years	0,63 €	0,86 €	0,82 €	0,58 €
20 years	0,67 €	1,28 €	1,35 €	0,74 €
25 years	0,16 €	0,16 €	0,15 €	0,16 €
30 years	0,24 €	0,33 €	0,31 €	0,22 €
40 years	0,25 €	0,48 €	0,51 €	0,28 €
	Total	Total	Total	Total
	1,60 €	2,56 €	2,59 €	1,63 €

The PV of maintenance costs is given by the formula:

$$PV\ MC = PV\ OMC + PV\ EMC$$

obtaining

Table 37

PV MC			
A	B	C	D
19,85 €	25,37 €	23,88 €	18,36 €

6.1.3 Operating costs

The operating costs (OC) are divided in freight transport service and passenger transport service costs.

The items of paragraph 5.1.3 are converted, in the socio-economic analysis, through the discount factor 0,7144.

The freight transport service operating costs (FTSOC)[20] are taken into account from 2024, activation year of the freight transport services, to 2060.

The PV is computed through the formula:

$$PV = \sum_{t=0}^{37} \frac{Annual\ freight\ operating\ cost_t}{(1 + 0{,}05)^{t+8}}$$

obtaining:

Table 38

PV FTSOC			
A	B	C	D
401,76 €	401,76 €	401,76 €	401,76 €

The passenger transport service operating costs (PTSOC)[21] are taken into account from 2020, activation year of the short distance passenger service, until 2060.

The PV is computed through the formula:

[20] The values are reported in the appendix (6.1.3 A).

[21] The values are reported in the appendix (6.1.3 A).

$$PV = \sum_{t=0}^{40} \frac{Annual\ passenger\ operating\ cost_t}{(1+0{,}05)^{t+4}}$$

obtaining:

Table 39

PV PTSOC			
A	B	C	D
1.439,81€	1.439,81€	1.439,81€	1.439,81€

The PV of the operating costs is given by:

$$PV\ OC = PV\ FOC + PV\ POC$$

obtaining:

Table 40

PV OC			
A	B	C	D
1.841,57 €	1.841,57 €	1.841,57 €	1.841,57 €

6.1.4 PV Internal costs

The PV of the internal costs is computed through the formula:

$$\text{PV INTERNAL COSTS} = \text{PV RC} + \text{PV MC} + \text{PV OC}$$

obtaining:

Table 41

PV INTERNAL COSTS			
A	B	C	D
5193,66 €	4899,34 €	4722,81 €	5.017,13€

6.2 Internal benefits

As RFI made available only the data regarding traffic flows, I have proceeded to the internal benefits estimation. The internal benefits are the project revenues.
In this estimation, like in chapter 5.2, I have used the ticket prices available on www.trenitalia.it by considering the absence of inflation as well as by considering a traffic volume (passenger or freight transport) update of an annual value of 1,5% for the first 20 years.
The revenues are converted through the conversion factor 1.
The revenues can be divided in:

- short distance passenger transport service revenues;
- long distance passenger transport service revenues;
- freight transport service revenues.

6.2.1 Short distance passenger transport service revenues

The short distance passenger transport service regards the Napoli-Caserta-Cancello-Benevento-Bovino-Foggia route.
I have conjectured only the weekly traffic, so 5 days/week (252 days/year), because such traffic is relevant for the presence of workers and students.
The activation year of the short distance passenger transport service will be 2020.
The PV of the short distance passenger transport service revenues (SDPTSR)[22] is computed through the formula:

$$PV = \sum_{t=0}^{40} \frac{Annual\ short\ distance\ passenger\ revenues}{(1+0{,}05)^{t+4}}$$

obtaining

Table 42

PV SDPTSR			
A	B	C	D
455,15 €	251,84 €	445,52 €	252,06 €

[22] The short distance passenger transport service revenues, for each solution (considering the different routes), are reported in the appendix (6.2.1 A).

6.2.2 Long distance passenger transport service revenues

The long distance passenger transport service regards the routes: AV (Roma-Bari, Milano-Bari), ES (Napoli-Bari), IC (Roma-Bari, Napoli-Bari).
I have conjectured traffic 7 days/week (365 days/year).
The activation year of the long distance passenger transport service will be 2024.
The PV of the long distance passenger transport service revenues (LDPTSR)[23], which is equal for the four solution, is computed through the formula:

$$PV = \sum_{t=0}^{36} \frac{Annual\ long\ distance\ passenger\ revenues_t}{(1 + 0{,}05)^{t+8}}$$

obtaining

Table 43

PV LDPTSR			
A	B	C	D
6.267,74 €	6.267,74 €	6.267,74 €	6.267,74 €

6.2.3 Freight transport service revenues

The freight traffic relates to the route Napoli-Bari.
I have conjectured relevant only the weekly traffic, so 5 days/week (252 days/year), because such traffic is linked to the working days.
The activation year of the freight transport service will be 2024.

The PV of the freight transport service revenues (FTSR)[24], which is equal for the four solution, is computed through the formula:

[23] The long distance passenger transport service revenues, for each route, are reported in the appendix (6.2.2 A).

[24] The freight transport service revenues are reported in the appendix (6.2.3 A).

$$PV = \sum_{t=0}^{36} \frac{Annual\ freight\ revenues_t}{(1 + 0{,}05)^{t+8}}$$

obtaining:

Table 44

PV FTSR			
A	B	C	D
1.362,91 €	1.362,91 €	1.362,91 €	1.362,91 €

6.2.4 PV Internal benefits

The PV of internal benefits is computed through the formula:

$$PV\ INTERNAL\ BENEFITS = PV\ SDPTSR + PV\ LDPTSR + PV\ FTSR$$

obtaining:

Table 45

PV INTERNAL BENEFITS			
A	B	C	D
7.382,31 €	7.181,24 €	7.372,79 €	7.171,72 €

6.3 Investment salvage value

The investment salvage value, mentioned in paragraph 5.3, is converted through the conversion factor 0,8706; thereby obtaining:

Table 46

Salvage value in 2060			
A	B	C	D
6.965,83 €	6.545,69 €	6.293,70 €	6.713,84 €

The PV is computed through the formula:

$$PV = \sum_{t=0}^{36} \frac{Salvage\ value_t}{(1 + 0{,}05)^{t+8}}$$

obtaining:

Table 47

PV SALVAGE VALUE			
A	B	C	D
814,04 €	764,94 €	735,49 €	784,59 €

6.4 External benefits

The external benefits are the benefits due to the socio-environmental positive impact.
The main project impact is the switch from the road mobility to the rail mobility with different external benefits that are analysed in the following chapters.

6.4.1 Environmental impacts

From the lower car use and the higher train use, it derives reduction of pollutant emissions and greenhouse gases according to the following RFI estimates (the numbers are tons/year).

Table 48

	Pollution emissions + greenhouse gases reduction			
	A	B	C	D
NO_x	-332	-285	-269	-314
PM	-37	-32	-30	-35
COVNM	-33	-29	-28	-32
SO_2	69	65	62	66
CO_2	-96.401	-80.350	-75.536	-90.417

The only increment is SO_2 due the the major demand of electric energy caused by major railway traffic.
The estimates have been taken into account from 2024 to 2060.
The monetary quantification, made by RFI, is the following:

Table 49

Pollution reduction/year			
A	B	C	D
7,90 €	6,60 €	6,30 €	7,40 €

The PV of the pollution reduction (PR) is computed through the formula:

$$PV = \sum_{t=0}^{36} \frac{Pollution\ reduction_t}{(1 + 0{,}05)^{t+4}}$$

obtaining:

Table 50

PV PR			
A	B	C	D
93,82 €	78,38 €	74,82 €	87,89 €

6.4.2 Social impacts

As a function of pollutant emissions, RFI has determined the annual impact of these substances on the exposed population in terms of the overall reduction in life expectancy expressed in YOLL (years of life lost).
According to train and road accidents, RFI has determined the annual impact on the number of lives and injuries generated by the implementation of new infrastructure.

Table 51

Life expectation							
A		B		C		D	
61 YOLL/year		52 YOLL/year		49 YOLL/year		57 YOLL/year	
Accidents reduction							
A		B		C		D	
Injured -96	dead -3	Injured -82	dead -2	Injured -78	dead -2	Injured -91	dead -3

The estimates have been taken into account from 2024 to 2060.
The monetary quantification, made by RFI, is the following:

Table 52

Accidents reduction + life expectation			
A	B	C	D
22,20 €	19,00 €	17,90 €	20,90 €

The PV of the accidents reduction (AR) and life expectation (LE) is computed through the formula:

$$PV = \sum_{t=0}^{36} \frac{\text{Accidents reduction } + \text{ life expectation}_t}{(1 + 0{,}05)^{t+4}}$$

obtaining

Table 53

PV SR+LE			
A 263,66 €	B 225,65 €	C 212,59 €	D 248,22 €

6.4.3 Ceasing costs due to the switch from road mobility to rail mobility

The annual ceasing costs, estimated by RFI, include ceasing costs freight traffic (CCFT) and ceasing costs passenger traffic (CCPT)[25].

The first relates to the vehicular traveller portion which will abandon the use of the vehicle on the road in favour of the new rail transport system; for the evaluation of these costs RFI has taken as a reference the data published by ACI[26] and in the Conto Nazionale dei trasporti and it has computed the average production cost on kilometric base.

The second relates to the vehicular freight transport portion who will abandon the use of the vehicle on the road in favour of the new rail transport system; for the evaluation of these costs RFI has taken as a reference the data published by ACI and in the "Conto Nazionale dei trasporti" and the data "CSST/Albo trasportatori"; on the basis of these data RFI has computed the average production cost on kilometric base.

The estimates have been taken into account respectively from 2024 to 2060 and from 2020 to 2060.

The PV is computed through the formulas:

$$PV = \sum_{t=0}^{36} \frac{Annual\ ceasing\ costs\ freight\ traffic_t}{(1 + 0{,}05)^{t+4}}$$

and

[25] These values are reported in the appendix (6.4.3 A).

[26] Automobile Club d'Italia.

$$PV = \sum_{t=0}^{40} \frac{Annual\ ceasing\ costs\ passenger\ traffic_t}{(1+0{,}05)^{t+4}}$$

obtaining:

Table 54

PV CCFT			
A 1.059,14 €	B 1.059,14 €	C 1.059,14 €	D 1.059,14 €

and

Table 55

PV CCPT			
A 2.808,11 €	B 2.808,11 €	C 2.808,11 €	D 2.808,11 €

6.4.4 Time savings

Among the benefits resulting from the railway investment program there are also the time savings which derive from the reduction of travel times.

The corresponding monetary benefits refer to the concept of willingness of the consumer to pay, or to the value recognized by the individual for the use of a specific service/product. In the absence of a market price, the time saved value was estimated by RFI[27] through the use of indirect measurement techniques related to the so-called "cost saving approach". This approach requires that the value of one hour of work of each individual is attributed to the gross hourly average earnings.

RFI has taken as reference the statistics of the Bank of Italy considering:

• the amount of compensations of employees paid equal to 630,44 billions of Euros;

• the total dependent employment recorded equal to 17,945 millions of standard units;

• the average number of annual hours worked per employee equal to 1,659.

By dividing the total employment wages for the corresponding total number of hours worked the result is an average working time value of about 21,18 €.

[27] The time savings, quantified in euros, are reported in the appendix (6.4.3 A).

The time savings estimates have been taken into account from 2020 to 2060.
The PV for time savings (TS) is computed through the formula:

$$PV = \sum_{t=0}^{40} \frac{Annual\ time\ savings_t}{(1 + 0{,}05)^{t+4}}$$

obtaining:

Table 56

PV TS			
A 550,02 €	B 550,02 €	C 550,02 €	D 550,02 €

6.4.5 PV External benefits

The PV of external benefits is computed through the formula:

$$PV\ EXTERNAL\ BENEFITS = PV\ PR + PV\ (AR + LE)) + PV\ CCFT + PV\ CCPT + PV\ TS$$

obtaining:

Table 57

PV EXTERNAL BENEFITS			
A 4.774,75 €	B 4.721,31 €	C 4.704,68 €	D 4.753,37 €

6.5 Socio-economic NPV

The socio-economic (SE) NPV is given by the formula:

$$SOCIO - ECONOMIC\ NPV = PV\ INTERNAL\ BENEFITS - PV\ INTERNAL\ COSTS + PV\ SALVAGE\ VALUE + PV\ EXTERNAL\ BENEFITS$$

obtaining:

Table 58

SE NPV			
A	B	C	D
8.794,85€	8.783,32 €	9.107,44€	8.717,46€

As we can see from the numbers the NPV is positive and extremely high for each solution.
The project presents positive FE and SE NPV i.e. respectively it is convenient to realize it both from the economic point of view both from the social point of view; this is valid for each solution.
Recent studies have excluded the solution C and D for different reasons: water crossing, landslide risk, landscape and archaeological, material disposal.
Between solutions A and B, the first has a slightly higher NPV and serve more population: so I share the RFI choice to realize the solution A.
From this point in the analysis I will consider only solution A.

7 CONCESSION PRICE MODEL

This chapter describes the model used to establish the concession price in the hypothesis that the railway line Napoli-Bari is assigned in concession to a Private Company.
This model refers to the paper published by the economists Scandizzo and Ventura[28] with some adaptions for the case at hand.
The broad diffusion of concession contracts in recent years is due to the tight budget constraints and the economic situations faced by governments. These factors have pushed and continue to push governments to outsource services through concessions.

7.1 Model description

The model can be used to:

- introduce a theoretical scheme which allows the concession design ex-ante evaluation;
- identify the key variables which have to be monitored before, during and after the concession tender procedure;
- identify the bargaining relations between the Principal, i.e. the State, and the Concessionaire, i.e. the Private.

In the model the following assumptions are made:

- the uncertainty, surrounding the decisions, is dynamic and can only be solved with the passage of time;
- the investment is irreversible;
- the investment can only be realized by the private investor but not by the principal who faces the decision to give the resource to the private under a concession contract or to renounce to its development.

The concession contract is structured in the following way:

- the concessionaire pays an amount of money (the concession price) to the principal
- the concessionaire takes charge of all maintenance and operating costs and a portion of investments costs and it benefits from the revenues generated by the investment;

[28] Sharing risk through concession contracts, European Journal of Operational Reasearch (16/11/2010, pp 363-370)

- the concessionaire obligates itself to give back the resource at the concession period expiration.

It is assumed that the resource development yields to a cash flow, y, described by a geometric Brownian motion process according to the following stochastic equation:

Equation 1

$$dy_t = \alpha y_t dt + \sigma y_t dz$$

with α and σ respectively the drift and the standard deviation parameters.

The cash flow y is given by the difference between the revenues and the operating and maintenance costs.

The contract value for the State can be determined according the following equation:

Equation 2

$$V(y) = \sup E_y \left[e^{-\rho\tau}\left(\int_{\tau+T}^{\infty} e^{-\rho(s-\tau)} y_s ds + \int_{\tau}^{\tau+T} e^{-\rho(s-\tau)} P_M ds + \int_{\tau}^{\infty} e^{-\rho(s-\tau)} \chi ds - I_M\right)\right]$$

with ρ the discount rate, T is the concession expiration date, τ is the stochastic time of entry (which is the initial year of the concession), P_M is the minimum acceptable concession price, χ is the flow of external benefits and costs generated by the investment[29] and I_M is the portion of the investment costs sustained by the State.

The value for the State is equal to the cash flow that it will enjoy after the end of the concession period to infinity (like a perpetual bond) plus the concession price, paid by the Private during the concession period, plus the flow of external benefits and costs generated from the initial year of the concession to infinity minus the portion of investment costs sustained by the State.

The contract value can also be seen as an option held by State, so by applying contingent claim analysis[30] to equation 2 the results are the following state dependent solutions depending on whether the value of the stochastic variable y is above or below the threshold y_p:

[29] In the line Napoli-Bari only external benefits were estimated by RFI.

[30] Dixit and Pindyck, Investement under uncertainty (1994, pp.122-123).

Equation 2A

$$V(y) = \frac{y}{\delta}e^{-\delta T} + \frac{P_M}{\rho}\left(1 - e^{-\delta T}\right) - \frac{\chi}{\rho} - I_M \quad if\ y \geq y_p$$

and

Equation 2B

$$V(y) = \left(\frac{y}{y_p}\right)^{\beta_1}\left[\frac{y_p}{\delta}e^{-\delta T} + \frac{P_M}{\rho}\left(1 - e^{-\delta T}\right) - \frac{\chi}{\rho} - I_M\right] \quad if\ y < y_p$$

With $\left(\frac{y}{y_p}\right)^{\beta_1} = E[e^{-\rho\tau}]$ and the opportunity cost of delaying the construction project given by $\delta = \rho - \alpha > 0$.

y_p, the optimal exercise boundary at which the option should be exercised, is given by:

Equation 2C

$$y_p = \delta e^{\delta T}\frac{\beta_1}{\beta_1 - 1}\left(\frac{\chi - \left(1 - e^{-\delta T}\right)P_M}{\rho} + I_M\right)$$

The exercise boundary depends on the risk adjustment $\frac{\beta_1}{\beta_1 - 1}$, the flow of external benefits and costs χ, the concession price P_M and the portion of the investment costs sustained by the State I_M and the various discount factors.
The option held by the State, reported in equation 2, will be exercised only if $y \geq y_p$;
so, according to equation 2C, when $y \geq \delta e^{\delta T}\frac{\beta_1}{\beta_1 - 1}\left(\frac{\chi - \left(1 - e^{-\delta T}\right)P_M}{\rho} + I_M\right)$ obtaining:

Equation 2D

$$\frac{P_M}{\rho} \geq \frac{\chi}{\rho(1 - e^{-\delta T})} - \frac{y}{\delta}\frac{e^{-\delta T}}{(1 - e^{-\delta T})}\frac{\beta_1 - 1}{\beta_1} + \frac{I_M}{(1 - e^{-\delta T})}$$

The equation 2D shows that the minimum concession price, acceptable by the State, should be at least equal to the flow of the external benefits and costs minus the cash flow, adjusted for the risk, that the State will recover after the concession expiration plus the portion of investment costs sustained by the State.

On the other contract side, the same analysis is made for the concessionaire, i.e. the Private.

The contract value for the Private can be determined according the following equation:

Equation 3

$$V_\pi(y) = sup\, E_y\,[e^{-\rho\tau}\left(\int_\tau^T e^{-\rho(s-\tau)}\, y_s ds - \int_\tau^T e^{-\rho(s-\tau)} P_m ds - I_\pi\right)]$$

Where I_π is the portion of the investment costs sustained by the Private and P_m is the maximum concession price affordable by the Private.
The contract value can be seen as an option held by the Private; so, by applying contingent claim analysis to equation 3, the results are given by the following state dependent solutions:

Equation 3A

$$V_\pi(y) = (\frac{y}{\delta} - \frac{P_M}{\rho})\left(1 - e^{-\delta T}\right) - I_\pi \quad if\ y \geq y_\pi$$

and

Equation 3B

$$V_\pi(y) = \left(\frac{y}{y_\pi}\right)^{\beta_1}\left[(\frac{y_\pi}{\delta} - \frac{P_M}{\rho})\left(1 - e^{-\delta T}\right) - I_\pi\right] \quad if\ y < y_\pi$$

With y_π , the minimum acceptable cash flow by the Private, given by:

Equation 3C

$$\frac{y_\pi}{\delta}\left(1 - e^{-\delta T}\right) = \frac{\beta_1}{\beta_1 - 1}\left[I_\pi + \frac{P_M}{\rho}\left(1 - e^{-\delta T}\right)\right]$$

The option held by the Private, reported in equation 3, will be exercised only if $y \geq y_\pi$;so, according to equation 3C, when $y \geq \frac{\rho}{\left(1-e^{-\delta T}\right)}\frac{\beta_1}{1-\beta_1}\left[I_\pi + \frac{P_M}{\rho}\left(1 - e^{-\delta T}\right)\right]$ obtaining:

Equation 3D

$$\frac{P_m}{\rho} \leq \frac{y}{\delta}\frac{\beta_1 - 1}{\beta_1} - \frac{I_\pi}{(1 - e^{-\delta T})}$$

For a given time span a deal can be reached only if $P_m \geq P_M$, so if the maximum affordable price by the Private is greater than the minimum acceptable price by the Principal; i.e. by using equation 2D and 3D if:

$$\frac{y}{\delta}\frac{\beta_1 - 1}{\beta_1} - \frac{I_\pi}{(1 - e^{-\delta T})} \geq \frac{\chi}{\rho(1 - e^{-\delta T})} - \frac{y}{\delta}\frac{e^{-\delta T}}{(1 - e^{-\delta T})}\frac{\beta_1 - 1}{\beta_1} + \frac{I_M}{(1 - e^{-\delta T})}$$

which becomes:

Equation 4

$$\frac{\bar{y}}{\delta} \geq \frac{\beta_1}{\beta_1 - 1}\left[\frac{\chi}{\rho} + I_\pi + I_M\right]$$

Where $\bar{y}$ is the minimum cash flow above which both parties find optimal to sign the contract. So the cash flow should at least cover the sum, adjusted for risk, of the flow of external benefits and costs and of the investment costs given by the sum of the Private's and the State portions $(I_\pi + I_M)$.

The State objective function can be specified as the extended NPV (π_p) from the concession according to the following equation:

$$\pi_p = \left[\frac{y}{\delta}e^{-\delta T} + \frac{P_M}{\rho}\left(1 - e^{-\delta T}\right) - \frac{\chi}{\rho} - I_M\right] - \left[\left(\frac{y}{y_p}\right)^{\beta_1}\left[\frac{y_p}{\delta}e^{-\delta T} + \frac{P_M}{\rho}\left(1 - e^{-\delta T}\right) - \frac{\chi}{\rho} - I_M\right]\right]$$

Where the first addend (equation 2A) is the expected NPV of the State and the second addend (equation 2B) is the value of the option to wait; specifically, the first addend is the gain of the State if the contract is stipulated while the second addend is the gain of the State under the no-agreement condition.

The previous equation can be written in the following way:

Equation 5

$$\pi_p = \left[\frac{y}{\delta}e^{-\delta T} + P^* - \frac{\chi}{\rho} - I_M\right] - [\left(\frac{y}{y_p}\right)^{\beta_1}\left[\frac{y_p}{\delta}e^{-\delta T} + P^* - \frac{\chi}{\rho} - I_M\right]]$$

With $P^* = \frac{P_M}{\rho}\left(1 - e^{-\delta T}\right)$.

The State extended NPV is minimized when the concession price, which must be positive, equals the minimum acceptable price (given by equation 2D) according to the following equation:

$$\operatorname{argmin}\pi_p = \frac{P_M}{\rho} = \frac{\chi}{\rho(1 - e^{-\delta T})} - \frac{y}{\delta}\frac{e^{-\delta T}}{(1 - e^{-\delta T})}\frac{\beta_1 - 1}{\beta_1} + \frac{I_M}{(1 - e^{-\delta T})}$$

Similarly, for the Private, the objective function can be specified as the extended NPV (π_π) concession according to the following equation:

$$\pi_\pi = [\left(\frac{y}{\delta} - \frac{P_M}{\rho}\right)\left(1 - e^{-\delta T}\right) - I_\pi] - [\left(\frac{y}{y_\pi}\right)^{\beta_1}\left[\left(\frac{y}{\delta} - \frac{P_M}{\rho}\right)\left(1 - e^{-\delta T}\right) - I_\pi\right]]$$

Where the first addend (equation 3A) is the expected NPV and the second addend (equation 3B) is the value of the option to wait; specifically, the first addend is the Private's gain if the contract is stipulated while the second addend is the Private's gain under the no-agreement condition.

The previous equation can be written in the following way:

Equation 6

$$\pi_\pi = [\frac{y}{\delta}\left(1 - e^{-\delta T}\right) - I_\pi - P^*] - [\left(\frac{y}{y_\pi}\right)^{\beta_1}\left[\frac{y_\pi}{\delta}\left(1 - e^{-\delta T}\right) - I_\pi - P^*\right]]$$

With $P^* = \frac{P_M}{\rho}\left(1 - e^{-\delta T}\right)$.

The Private's extended NPV is minimized when the concession price, which must be positive, equals the maximum affordable price (given by equation 3D) according to the following equation:

$$\text{argmin}\,\pi_\pi = \frac{P_M}{\rho} = \frac{y}{\delta}\frac{\beta_1 - 1}{\beta_1} - \frac{I_\pi}{(1 - e^{-\delta T})}$$

Now it is possible to analyse the equilibrium solutions.

If the two parties, the State and the Private, want to reach a cooperative solution in order to optimize the concession price paid, they can join their ENPVs (given by equation 5 and 6) and maximize wrt to P^* according to equation 7:

Equation 7

$$P_c^* = arg_{P^*} max(\pi_p + \pi_\pi)$$

where P_c^* represents the equilibrium price if the cooperative solution is reached.
By taking the derivative of equation 7 wrt P^* using equations 5, 6, 2C, 3C the following equation is obtained:

Equation 8

$$P_c^* = \chi - \frac{\rho e^{-\delta T}}{(1 - e^{-\delta T})}(I_\pi + I_M)$$

The equilibrium price which maximizes the parties' ENPVs is independent on cash flow and uncertainty; the equilibrium price is equal to the difference between the flow of external benefits and costs and the total investment costs given by the sum of the State and the Private's investment costs portions.

If instead the State and the Private reject the cooperative solution, their payoffs are defined by equations 2D and 3D according to:

$$\pi_p(P) = P^* - P^*{}_M = P^* - [\frac{\chi}{\delta} - \frac{y}{\delta} e^{-\delta T}\frac{\beta_1 - 1}{\beta_1} - I_M]$$

and

$$\pi_{\pi}(P) = {P^*}_m - P^* = [\frac{y}{\delta}\left(1 - e^{-\delta T}\right)\frac{\beta_1 - 1}{\beta_1} - I_{\pi}] - P^*$$

In the first equation any value above ${P^*}_M$ yields a surplus to the State equal to $\pi_p(P) = P^* - {P^*}_M$, while in the second equation any value below ${P^*}_m$ yields a surplus to the Private equal to $\pi_{\pi}(P) = {P^*}_m - P^*$.

By using the previous payoffs, it is possible to compute the Nash equilibrium[31] by maximizing the product of the players' net payoff according to:

$$P_R^* = arg_P \max\{[\pi_p(P)]^w * [\pi_{\pi}(P)]^{1-w}\}$$

which developed yields to:

Equation 9

$$P_R^* = arg_P \max\left\{[P^* - [\frac{\chi}{\delta} - \frac{y}{\delta}e^{-\delta T}\frac{\beta_1 - 1}{\beta_1} - I_M]]^w * [[\frac{y}{\delta}\left(1 - e^{-\delta T}\right)\frac{\beta_1 - 1}{\beta_1} - I_{\pi}] - P^*]^{1-w}\right\}$$

i.e.

Equation 10

$$P_R^* = w{P^*}_M + (1 - w){P^*}_m$$

with $0 \leq w \leq 1$.

The Nash equilibrium is the weighted average of the limiting acceptable price for the two parties; the weights represent the parties' bargaining power.

The Nash equilibrium represents the best price that either part could choose, given their knowledge of the alternative possible choices (but not of the actual choice) of the other part.

[31] (Nash,1951; Harsanyi; 1967 and 1968).

7.2 Model application to the Napoli-Bari railway line

In this paragraph, the Scandizzo and Ventura's model[32] was applied to the Napoli-Bari railway investment project.

In the application, I have considered different hypotheses of investment costs distribution between the State and the Private Company, in order to study how the optimal moment to sign the contract and indeed the decision to invest change according to these hypotheses.

First, I have applied the model by using, as inputs, the data of the socio-economic analysis and I have called it "the basic model".
After I have made the comparative static analysis and precisely:

- I have selected some inputs i.e. the discount rate, the cash flows volatility and the investment costs;
- I have taken each input one by one and I modified its value ceteris paribus in order to analyse how the outputs of the model change according to different values of each single input.

For the basic model the results are reported through tables and plots.
For the comparative static analysis only the plots are reported while the tables are reported in the appendix.

In the tables and in the plots, the values are written in black colour if it is optimal to invest immediately, i.e. at the current date[33], otherwise the contract values are written in red colour if it is optimal to wait.

In the analysis, all the numbers are expressed in millions of Euros unless otherwise specified.

[32] Sharing risk through concession contracts, European journal of operational reasearch(2010).
[33] The starting date is 2016 (see chapter 5).

7.2.1 Basic model

The inputs, used for the application of the model, are reported in the table 59:

Table 59

α	σ	ρ	δ	T	$y\ avg$	χ	I	β_1	β_2
0,95%	1,00%	5.00%	4,05%	40	523,50 €	-397,96 €	3928,15 €	5,15	-194,16

Where:

- α and σ are the drift and the standard deviation of equation (1) thus representing the growth rate and the standard deviation of the cash flows;
- ρ is the discount rate;
- δ is "the opportunity cost of delaying the construction of the project"[34] and it is computed as $\delta = \rho - \alpha$;
- T is the duration of the concession;
- $y\ avg$ is the average cash flow computed using the forecast of the time series of the concession period;
- χ is the flow of external costs generated by the investment (it is expressed as a negative number because the case study under analysis presents only external benefits);
- I is the investment cost;
- β_1 and β_2 are two parameters that express the risk aversion[35].

[34] Expression used by Scandizzo and Ventura in the paper Sharing risk through concession contracts, European journal of operational reasearch(2010).

[35] Expression used by Scandizzo and Ventura in the paper Sharing risk through concession contracts, European journal of operational reasearch(2010).

Three cases are considered for each hypothesis of investment costs distribution:

- the first case, called by me “the general case”, is that in which the concession price is not fixed through an agreement between parties but it is fixed, in an arbitrary way, within the range of the admissible prices, determined by the theoretical model; the lower bound of this range is the minimum acceptable price by the State to give the concession while the upper bound is the maximum price at which the Private Company is ready to invest;
- the second case regards the cooperative equilibrium in which the concession price is determined between the parties in order to maximize the sum of their payoffs;
- the third case regards the Nash equilibrium in which the concession prices are computed as a weighted average of the limiting acceptable prices by the two parties and the weights represent the parties’ bargaining power.

The results of the application of the model are reported in the following pages.

- **Hypothesis 1: investment costs sustained entirely by the Private Company**

First case ("general case")

The results for the general case are reported in the table 60:

Table 60

P	0,00 €	50,00 €	100,00 €	150,00 €	200,00 €	250,00 €	276,03 €
y_p	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
$V(y)$	10.517,78 €	11.319,87 €	12.121,97 €	12.924,06 €	13.726,16 €	14.528,25 €	14.945,82 €
y_π	246,13 €	296,39 €	346,64 €	396,90 €	447,16 €	497,42 €	523,58 €
$V_\pi(y)$	6.441,44 €	5.639,35 €	4.837,25 €	4.035,16 €	3.233,06 €	2.430,97 €	2.013,39 €
V project	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €

Where:

- the first row shows the range of possible concession prices (**P**); the first price (0,00 €) is the minimum price at which the State is ready to give the concession (this value is computed through equation 2D) while the last one (276,03 €) is the maximum price at which the Private Company is ready to invest (this value is computed through equation 3D); these two values constitute, respectively, the lower and the upper bound of the concession prices range while intermediate values are examples of possible concession prices that the parties can choose;
- the second row shows the range of possible minimum cash flows y_p at which the State is ready to the give the concession (these values are computed through the equation 2C).
- the third row shows the range of possible contract values for the State $V(y)$ (these values are computed equation 2);
- the fourth row shows the range of possible minimum cash flows values y_π at which the Private Company is ready to invest (these values come from the application of 3C);
- the fifth row shows the range of possible contract values for the Private Company $V_\pi(y)$ (these values come from the application of equation 3);
- the last row shows the range of possible values of the project **V project** which result from the sum of $V(y)$ and $V_\pi(y)$.

It is important to analyse the cash flows percentage variations with the aim to identify if the Private Company will find profitable to invest at the current date[36].

To have an idea if it is worth for the Private Company to start the project at the current date, we compute the percentage change in the cash flow required to make optimal investment. This is done by the following equation:

$$\text{percentage variation} = \frac{Y_\pi - Y_{avg}}{Y_{avg}} * 100\ \%$$

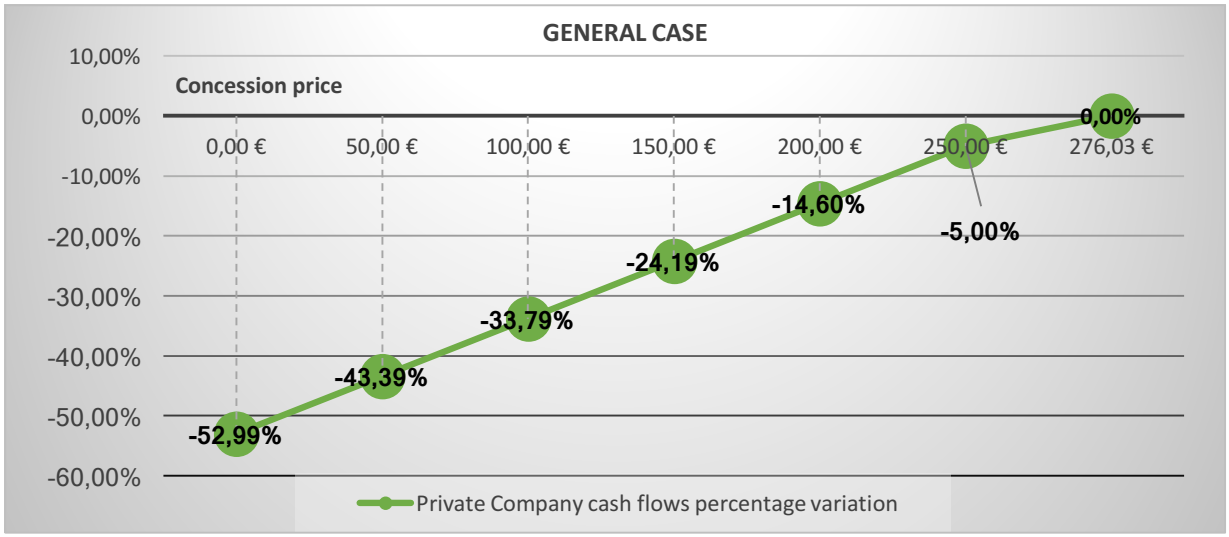
Where Y_π is the Private Company cash flow and Y_{avg} is the average cash flow of the project.

When the percentage variation is negative, the Private Company invest at the current date because the average cash flow of the project is higher than the minimum cash flow for which the Private Company would invest.

Viceversa when the percentage variation is positive, the Private Company does not invest at the current date because the average cash flow of the project is lower than the minimum cash flow for which the Private Company would invest.

The cash flows percentage variations for the general case are reported in the plot 1:

Plot 1



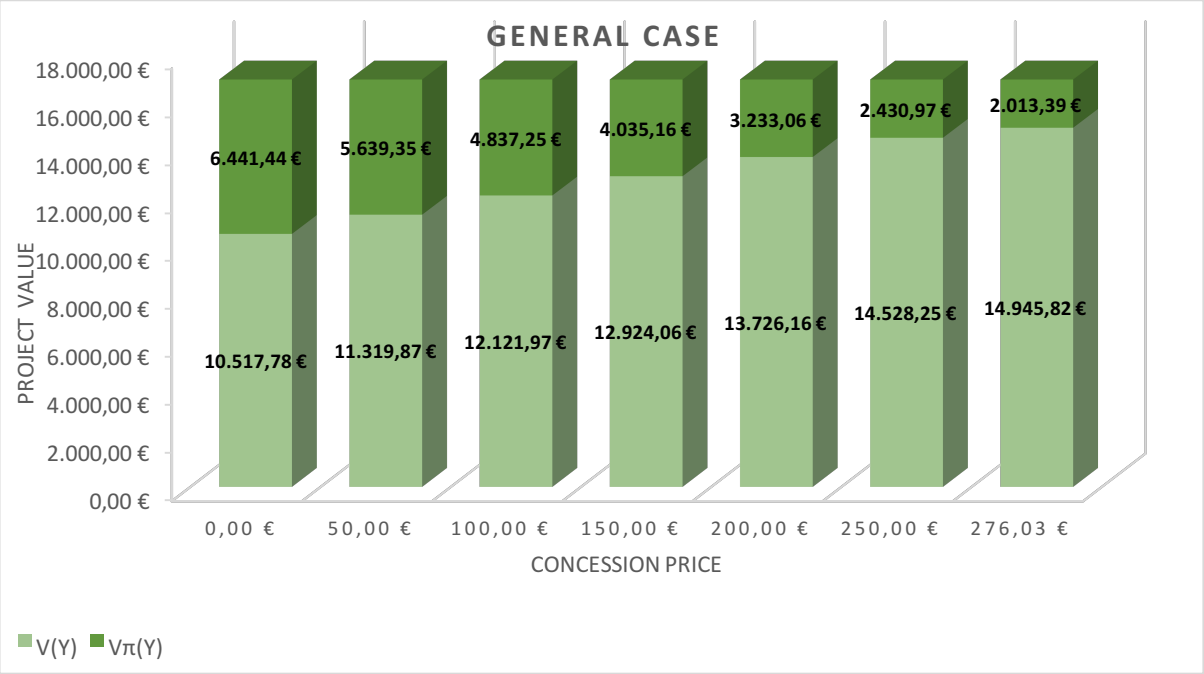
[36] i.e. 2016.

The cash flows percentage variations are negative because the minimum cash flows for which the Private Company accepts to invest are lower than the average cash flow of the project; this implies that the Private Company is ready to invest at the current date.
For example when the concession price is 0€, the Private Company minimum cash flow is 52,99 times lower than the average cash flow of the project and so on…

It is also important to analyse, from an alternative point of view, the parties' contract values with the aim to identify if the State and the Private Company sign the concession contract at the current date.

The parties' contract values and their variations according to the different concession prices are reported in the plot 2:

Plot 2



For each level of concession price in the range [0€;276,03€] the State and the Private Company are ready to sign the contract and thus to invest. When the concession price increases, we have that:

- the State finds even more convenient to give the concession because its contract value $V(y)$ increases;
- the Private Company finds less convenient to enter into the contract and to invest because his contract value $V_\pi(y)$ decreases.

Second case (the cooperative equilibrium)

The cooperative price (obtained through equation 8) is $P_C = 0$ thus the results are the same of the first column of table 60 and of the plot 1-2 when $P = 0$ and precisely we have that: the State and the Private Company are ready to sign the contract and thus to invest.

Third case (Nash equilibrium)

For the Nash equilibrium the results are reported in the table 61:

Table 61

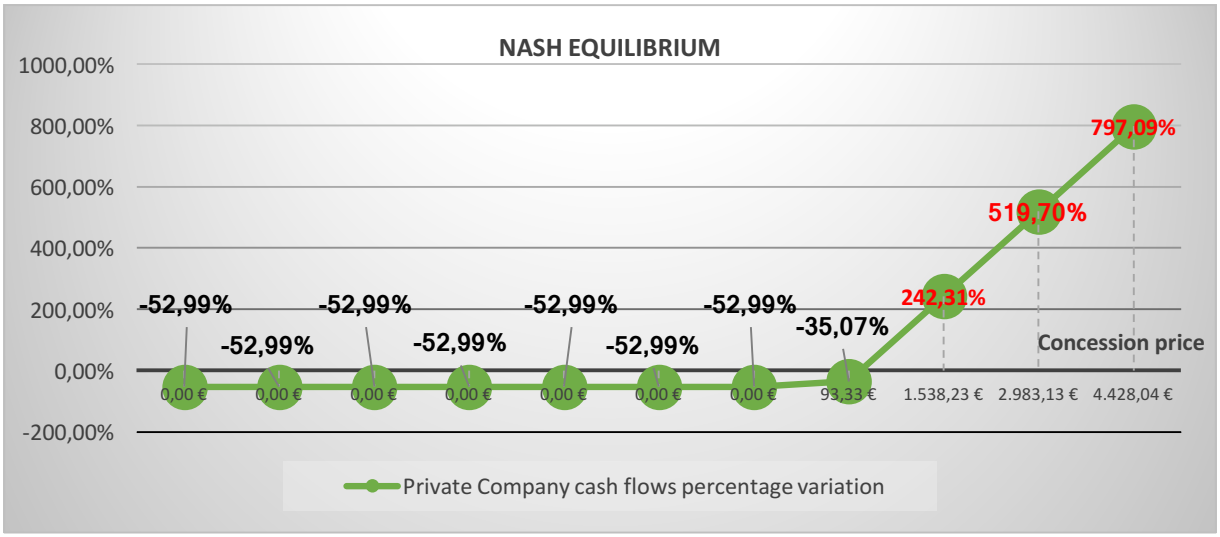
w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0,00 €	0,00 €	10.517,78 €	246,13 €	6.441,44 €	16.959,22 €
0,9	0,1	0,00 €	0,00 €	10.517,78 €	246,13 €	6.441,44 €	16.959,22 €
0,8	0,2	0,00 €	0,00 €	10.517,78 €	246,13 €	6.441,44 €	16.959,22 €
0,7	0,3	0,00 €	0,00 €	10.517,78 €	246,13 €	6.441,44 €	16.959,22 €
0,6	0,4	0,00 €	0,00 €	10.517,78 €	246,13 €	6.441,44 €	16.959,22 €
0,5	0,5	0,00 €	0,00 €	10.517,78 €	246,13 €	6.441,44 €	16.959,22 €
0,4	0,6	0,00 €	0,00 €	10.517,78 €	246,13 €	6.441,44 €	16.959,22 €
0,3	0,7	93,33 €	0,00 €	12.014,90 €	339,94 €	4.944,32 €	16.959,22 €
0,2	0,8	1.538,23 €	0,00 €	35.193,91 €	1.792,28 €	12,19 €	35.206,10 €
0,1	0,9	2.983,13 €	0,00 €	58.372,92 €	3.244,63 €	12.477,08 €	70.850,00 €
0	1	4.428,04 €	0,00 €	81.551,93 €	4.696,97 €	18.062,02 €	99.613,95 €

Where:

- the first and the second column show the State (**w S**) and the Private Company's (**w P**) bargaining power;
- the third column shows the Nash equilibrium prices $\boldsymbol{P^*_R}$ (computed according equation 10);
- the fourth column shows the minimum cash flows $\boldsymbol{y_p}$ (computed according equation 2C) at which the State is ready to give the concession;
- the fifth column shows the contract values for the State $\boldsymbol{V(y)}$ (computed according equation 2);
- the sixth column shows the minimum cash flows $\boldsymbol{y_\pi}$ (computed according equation 3C) at which the Private Company is ready to invest;
- the seventh column shows the contract values for the Private Company $\boldsymbol{V_\pi(y)}$ (computed according equation 3);
- the last column shows the project values **V project** (which are the sum of $V(y)$ and $V_\pi(y)$).

The cash flows percentage variations for the Nash equilibrium are reported in the plot 3:

Plot 3

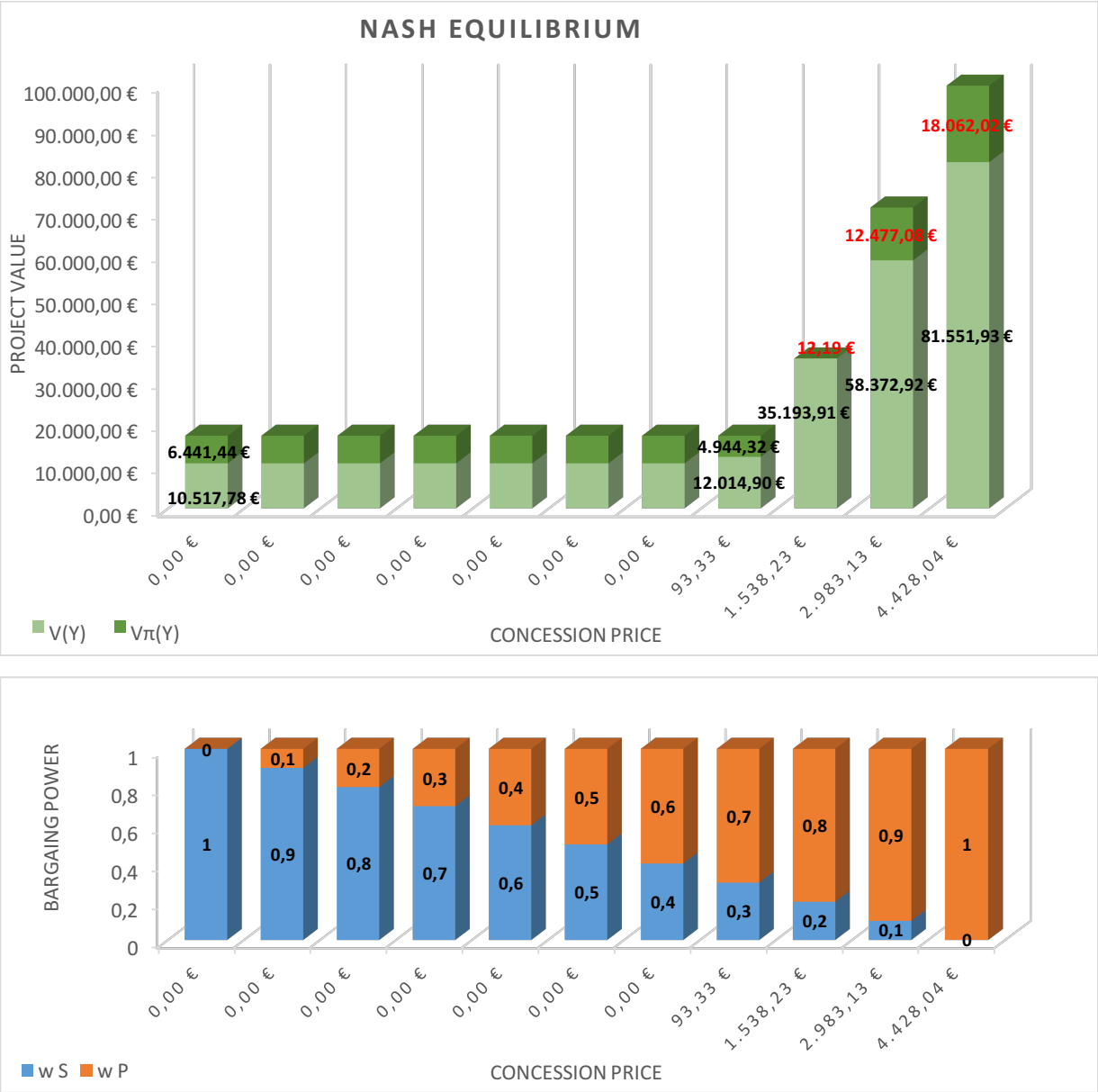


When the concession price is lower than 1538,23€, the Private Company is ready to invest at the current date because the minimum cash flows for which the Private Company accepts to invest are lower than the average cash flow of the project (for this reason the cash flows percentage variations are negative). For example when the concession price is 0€, the cash flow of the project is 52,99 times higher than the minimum cash flow for which the Private Company accepts to invest.

When the concession price is higher or equal to 1538,23€, the Private Company does not invest at the current date because the minimum cash flows for which the Private Company accepts to invest are higher than the average cash flow of the project (for this reason the cash flows percentage variations are positive). For example when the concession price is 1538,23€, the minimum cash flow for which the Private Company accepts to invest is 242,32 times higher than the average cash flow of the project thus the Private Company does not invest.

The parties' contract values and their variation according to the different concession prices and bargaining power are reported in the plot 4:

Plot 4



When $P^*_R = 0{,}00€$ the Nash equilibrium does not exist and the model collapses to the case of the cooperative equilibrium.

From $P^*_R = 0{,}00$ € to $P^*_R = 93{,}33€$ both the State both the Private Company find optimal to enter in the contract and thus to invest at the current date; instead from $P^*_R = 1.538{,}23$ € to $P^*_R = 4.428{,}04$ € only the State finds optimal to enter in the contract while the Private Company finds optimal to wait since its expected NPV is negative but his option to wait is positive (the option to wait is in written red colour in the plots and in the tables).

- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

First case ("general case")

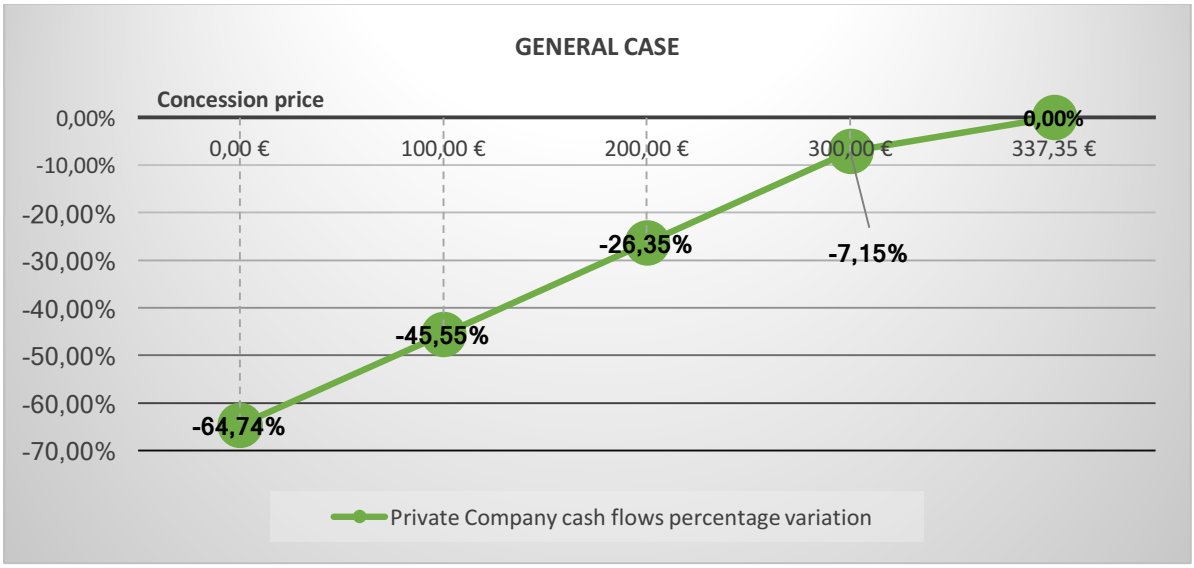
For the general case the results are reported in the table 62:

Table 62

P	0,00 €	100,00 €	200,00 €	300,00 €	337,35 €
y_p	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
$V(y)$	9.535,74 €	11.139,93 €	12.744,12 €	14.348,31 €	14.947,48 €
y_π	184,60 €	285,11 €	385,63 €	486,14 €	523,68 €
$V_\pi(y)$	7.423,48 €	5.819,29 €	4.215,10 €	2.610,91 €	2.011,74 €
V project	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €

The cash flows percentage variations for the general case are reported in the plot 5:

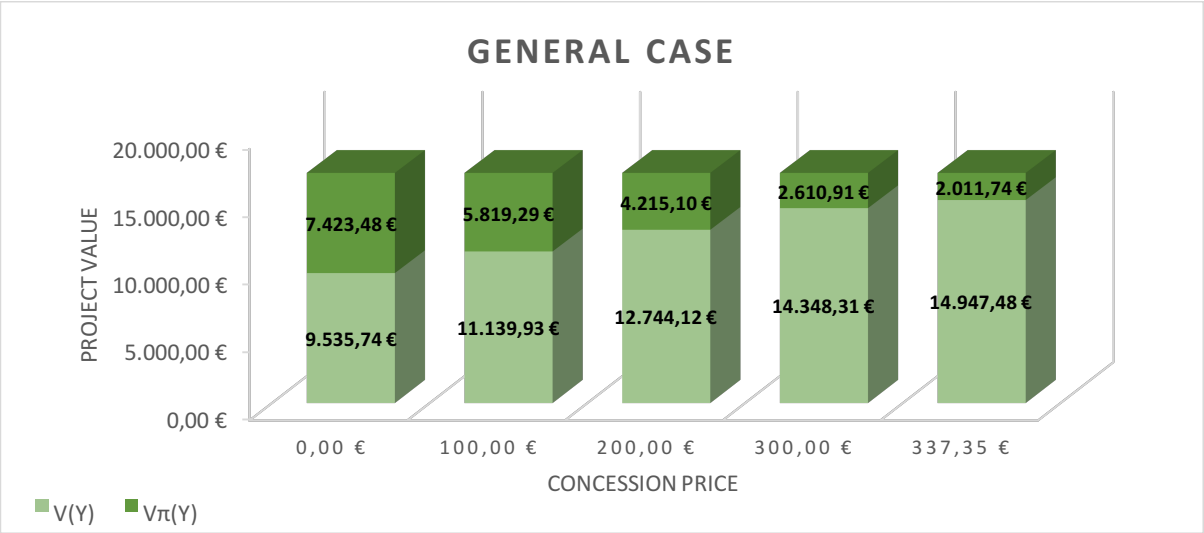
Plot 5



The cash flows percentage variations are negative because the minimum cash flows for which the Private Company accepts to invest are lower than the average cash flow of the project; this implies that the Private Company is ready to invest at the current date.

The parties' contract values and their variation according to the different concession prices are reported in the plot 6:

Plot 6



The maximum price (337,35 €) at which the Private Company accepts to invest has increased wrt the hypothesis 1 (276,03 €) and it will continue to increase as the distribution of investment costs reach the hypothesis of the investment costs entirely sustained by the State because this is due to the fact that the Private Company sustains less investment costs and so it is available to spend more money for the concession price.

For each level of concession price in the range [0€;337,35€] the State and the Private Company are ready to sign the contract and thus to invest. When the concession price increases, we have that:

- the State finds even more convenient to give the concession because its contract value $V(y)$ increases;
- the Private Company finds less convenient to enter into the contract and to invest because his contract value $V_\pi(y)$ decreases.

<u>Second case (the cooperative equilibrium)</u>

The cooperative price (obtained through equation 8) is $P_C = 0$ thus the results are the same of the first column of table 62 and of the plot 5-6 when $P = 0$ and precisely we have that: the State and the Private Company are ready to sign the contract and thus to invest.

Third case (Nash equilibrium)

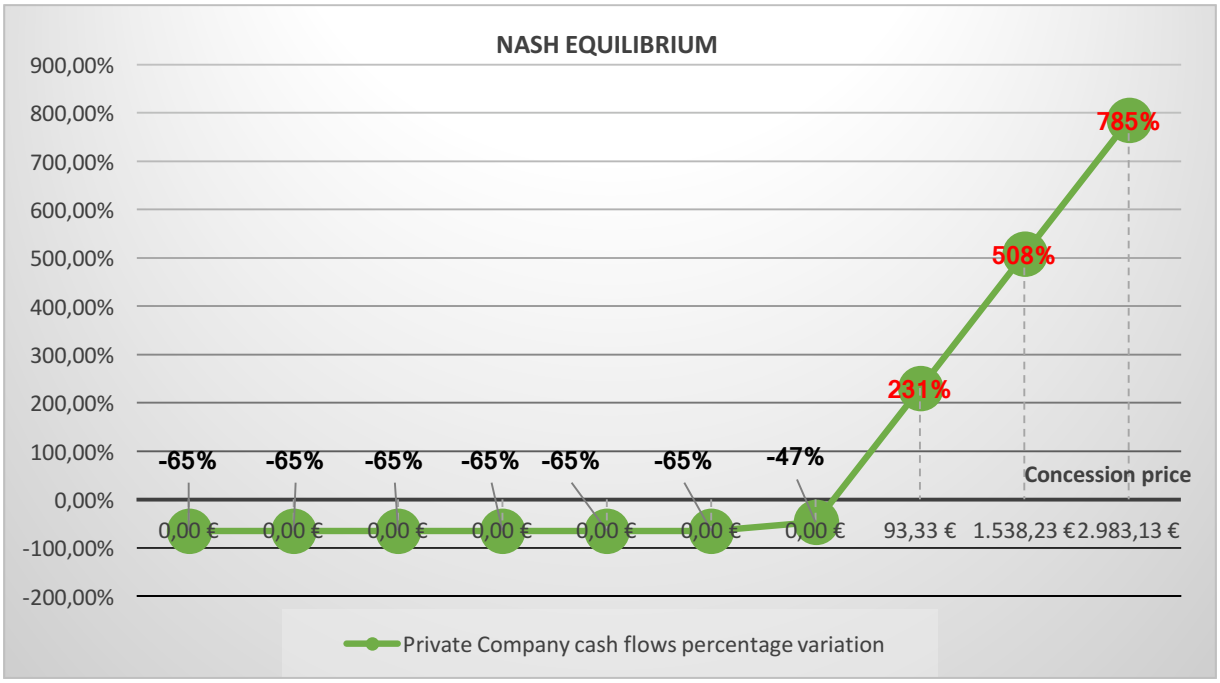
For the Nash equilibrium the results are reported in the table 63:

Table 63

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0,00 €	0,00 €	9.535,74 €	184,60 €	7.423,48 €	16.959,22 €
0,9	0,1	0,00 €	0,00 €	9.535,74 €	184,60 €	7.423,48 €	16.959,22 €
0,8	0,2	0,00 €	0,00 €	9.535,74 €	184,60 €	7.423,48 €	16.959,22 €
0,7	0,3	0,00 €	0,00 €	9.535,74 €	184,60 €	7.423,48 €	16.959,22 €
0,6	0,4	0,00 €	0,00 €	9.535,74 €	184,60 €	7.423,48 €	16.959,22 €
0,5	0,5	0,00 €	0,00 €	9.535,74 €	184,60 €	7.423,48 €	16.959,22 €
0,4	0,6	0,00 €	0,00 €	9.535,74 €	184,60 €	7.423,48 €	16.959,22 €
0,3	0,7	93,33 €	0,00 €	11.032,86 €	278,40 €	5926,36 €	16.959,22 €
0,2	0,8	1.538,23 €	0,00 €	34.211,87 €	1.730,75 €	14,09 €	34.225,96 €
0,1	0,9	2.983,13 €	0,00 €	57.390,88 €	3.183,09 €	12.240,46 €	69.631,34 €
0	1	4.428,04 €	0,00 €	80.569,89 €	4.635,44 €	17.825,40 €	98.395,29 €

The cash flows percentage variations for the Nash equilibrium are reported in the plot 7:

Plot 7



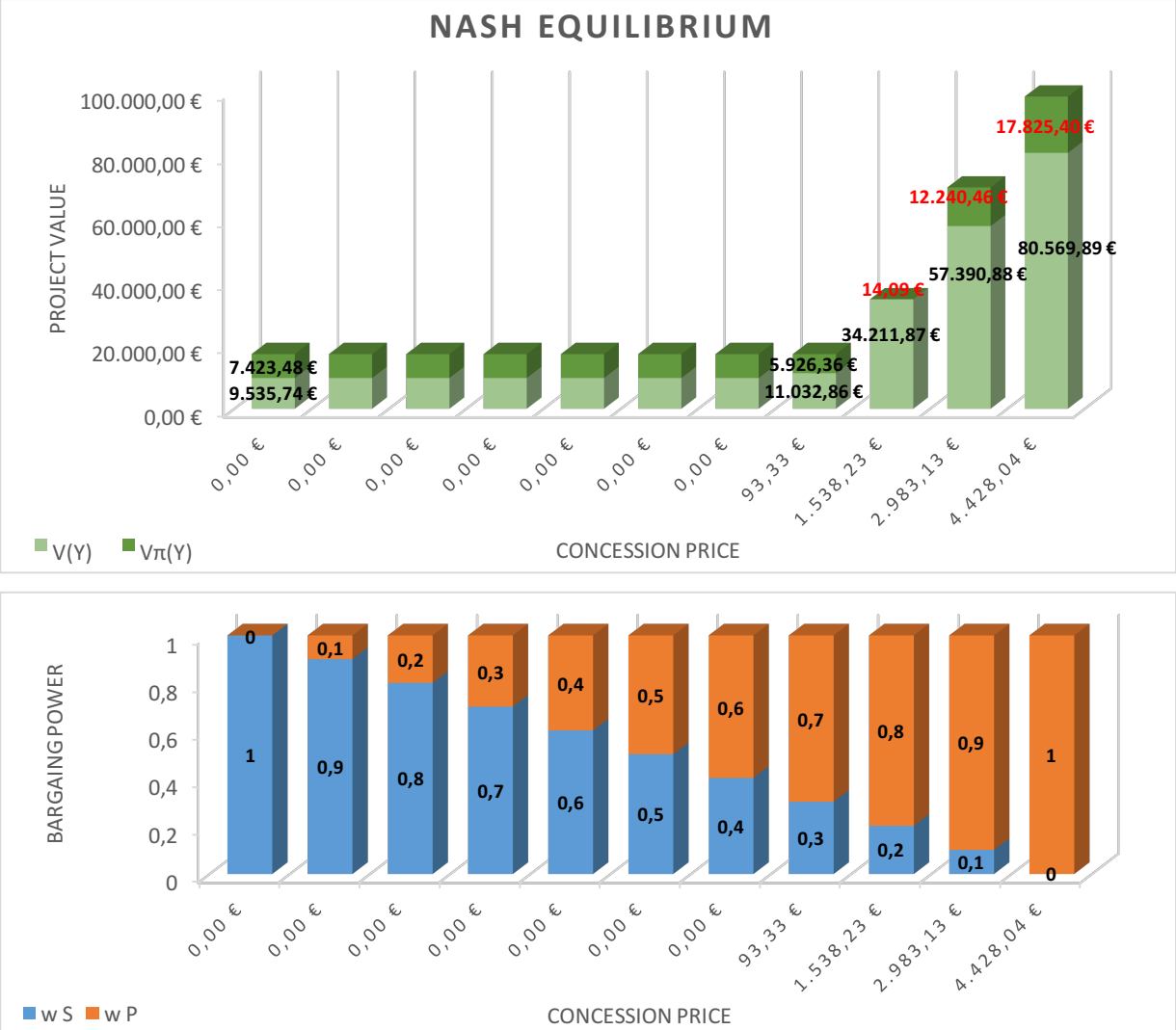
When the concession price is lower than 1538,23€, the Private Company is ready to invest at the current date because the minimum cash flows for which the Private Company accepts to

invest are lower than the average cash flow of the project (for this reason the cash flows percentage variations are negative).

When the concession price is higher or equal to 1538,23€, the Private Company does not invest at the current date because the minimum cash flows for which the Private Company accepts to invest are higher than the average cash flow of the project (for this reason the cash flows percentage variations are positive).

The parties' contract values and their variation according to the different concession prices and bargaining power are reported in the plot 8:

Plot 8



When $P^*_R = 0{,}00€$ the Nash equilibrium does not exist and the model collapses to the case of the cooperative equilibrium.

From $P^*_R = 0{,}00$ € to $P^*_R = 93{,}33€$ both the State both the Private Company find optimal to enter in the contract and thus to invest at the current date; instead from $P^*_R = 1.538{,}23$ € to

$P^*_R = 4.428{,}04\ €$ only the State finds optimal to enter in the contract while the Private Company finds optimal to wait since its expected NPV is negative but his option to wait is positive (the option to wait is in written red colour in the plots and in the tables).

- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

First case ("general case")

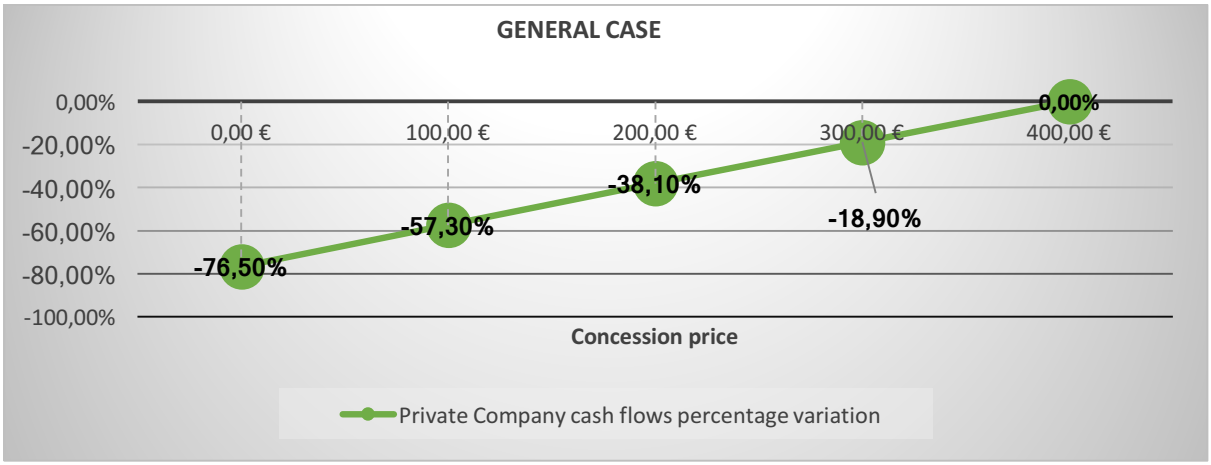
For the general case the results are reported in the table 64:

Table 64

P	0,00 €	100,00 €	200,00 €	300,00 €	398,46 €
y_p	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
$V(y)$	8.553,70 €	10.157,89 €	11.762,08 €	13.366,27 €	14.945,76 €
y_π	123,06 €	223,58 €	324,09 €	424,61 €	523,58 €
$V_\pi(y)$	8.405,52 €	6.801,33 €	5.197,14 €	3.592,95 €	2.013,46 €
V project	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €

The cash flows percentage variations for the general case are reported in the plot 9:

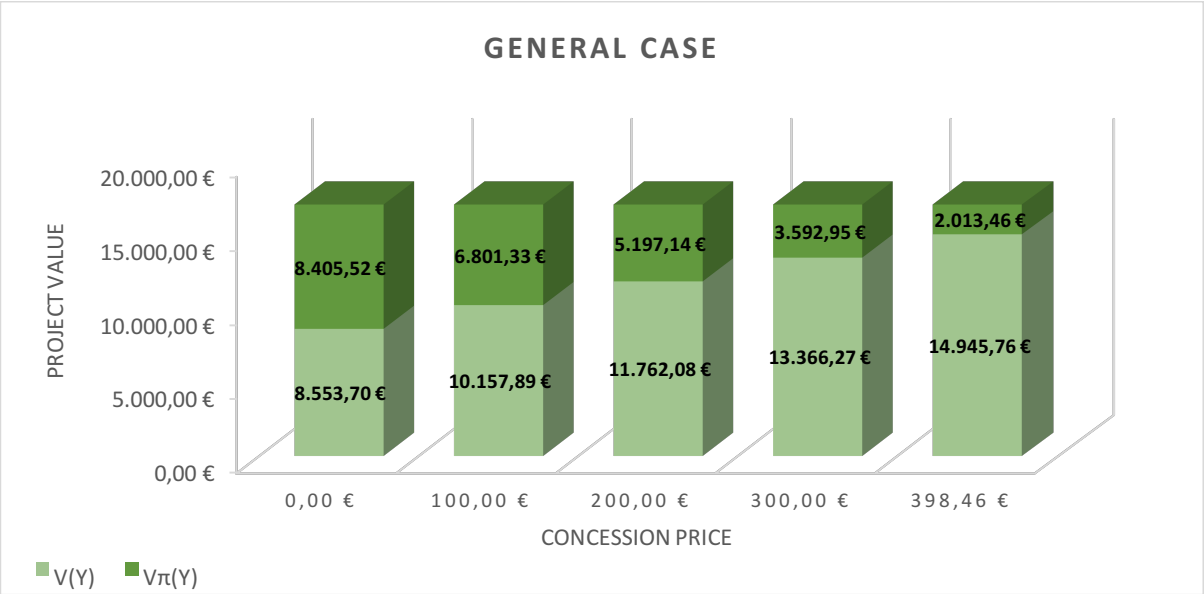
Plot 9



The cash flows percentage variations are negative because the minimum cash flows for which the Private Company accepts to invest are lower than the average cash flow of the project; this implies that the Private Company is ready to invest at the current date.

The parties' contract values and their variation according to the different concession prices are reported in the plot 10:

Plot 10



For each level of concession price in the range [0€;398,46€] the State and the Private Company are ready to sign the contract and thus to invest. When the concession price increases, we have that:

- the State finds even more convenient to give the concession because its contract value $V(y)$ increases;
- the Private Company finds less convenient to enter into the contract and to invest because his contract value $V_\pi(y)$ decreases.

Second case (the cooperative equilibrium)

The cooperative price (obtained through equation 8) is $P_C = 0$ thus the results are the same of the first column of table 64 and of the plot 9-10 when $P = 0$ and precisely we have that: the State and the Private Company are ready to sign the contract and thus to invest.

Third case (Nash equilibrium)

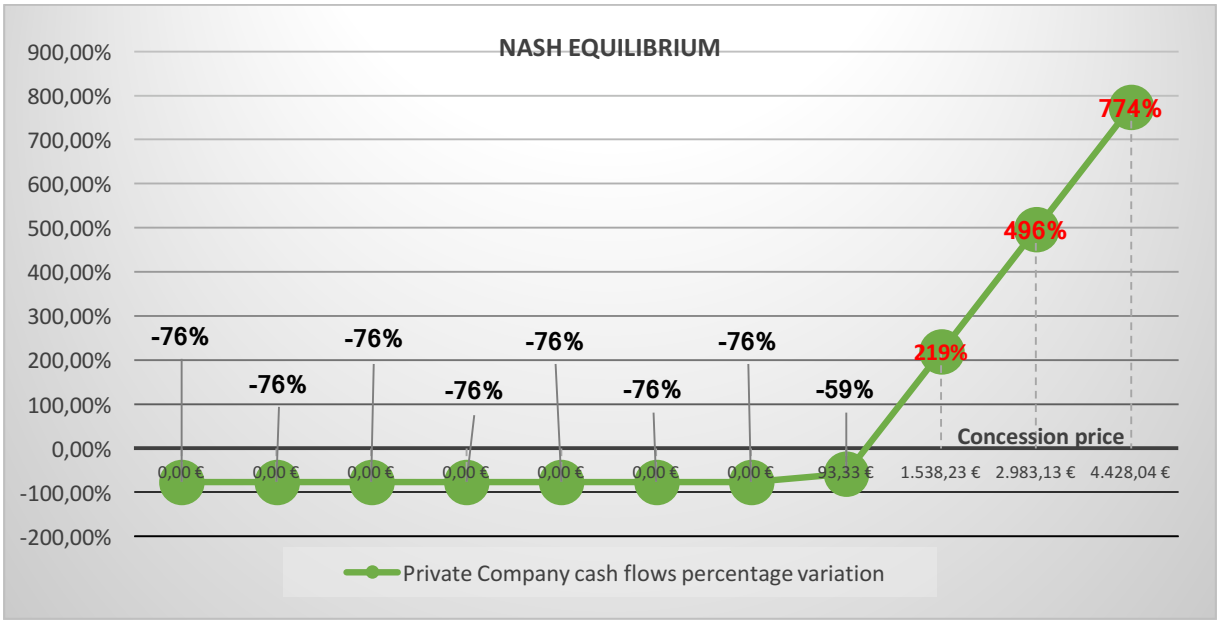
For the Nash equilibrium the results are reported in the table 65:

Table 65

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0,00 €	0,00 €	8.553,70 €	123,06 €	8.405,52 €	16.959,22 €
0,9	0,1	0,00 €	0,00 €	8.553,70 €	123,06 €	8.405,52 €	16.959,22 €
0,8	0,2	0,00 €	0,00 €	8.553,70 €	123,06 €	8.405,52 €	16.959,22 €
0,7	0,3	0,00 €	0,00 €	8.553,70 €	123,06 €	8.405,52 €	16.959,22 €
0,6	0,4	0,00 €	0,00 €	8.553,70 €	123,06 €	8.405,52 €	16.959,22 €
0,5	0,5	0,00 €	0,00 €	8.553,70 €	123,06 €	8.405,52 €	16.959,22 €
0,4	0,6	0,00 €	0,00 €	8.553,70 €	123,06 €	8.405,52 €	16.959,22 €
0,3	0,7	93,33 €	0,00 €	10.050,82 €	216,87 €	6.908,39 €	16.959,22 €
0,2	0,8	1.538,23 €	0,00 €	33.229,83 €	1.669,22 €	16,37 €	33.246,21 €
0,1	0,9	2.983,13 €	0,00 €	56.408,84 €	3.121,56 €	12.003,84 €	68.412,69 €
0	1	4.428,04 €	0,00 €	79.587,85 €	4.573,91 €	17.588,78 €	97.176,63 €

The cash flows percentage variations for the Nash equilibrium are reported in the plot 11:

Plot 11



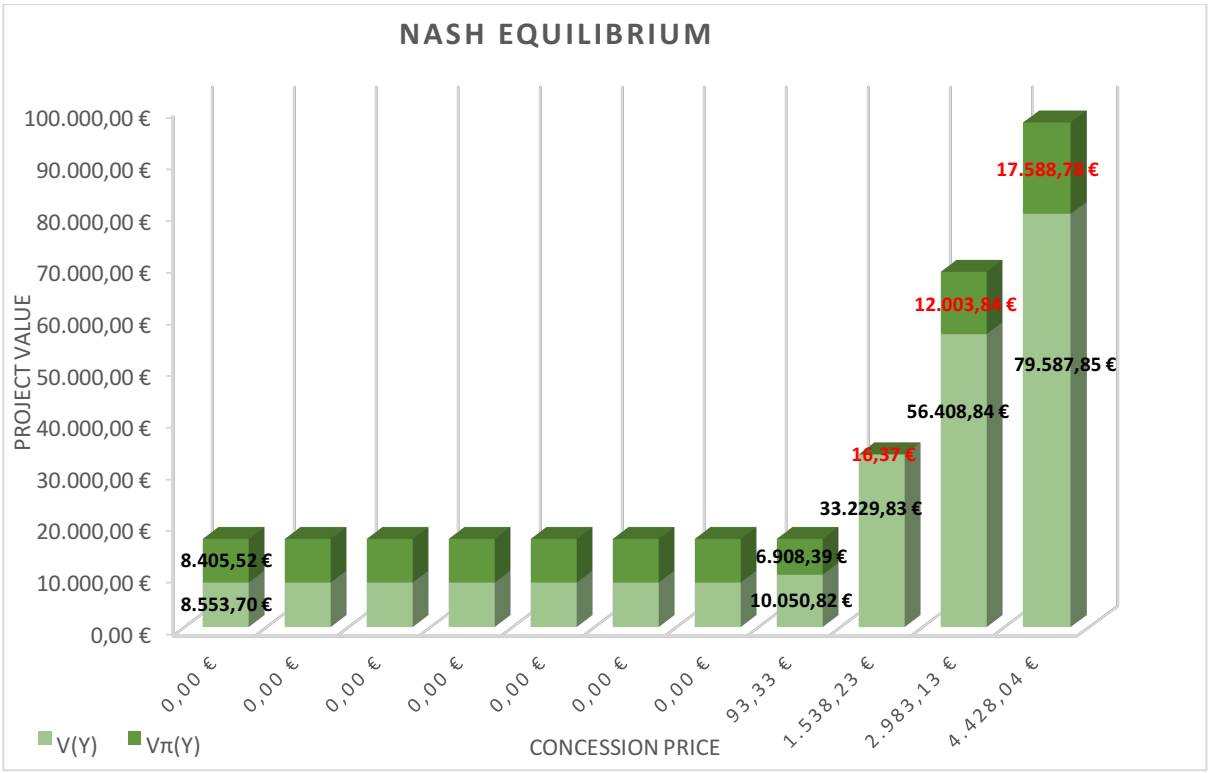
When the concession price is lower than 1538,23€, the Private Company is ready to invest at the current date because the minimum cash flows for which the Private Company accepts to

invest are lower than the average cash flow of the project (for this reason the cash flows percentage variations are negative).

When the concession price is higher or equal to 1538,23€, the Private Company does not invest at the current date because the minimum cash flows for which the Private Company accepts to invest are higher than the average cash flow of the project (for this reason the cash flows percentage variations are positive).

The parties' contract values and their variation according to the different concession prices and bargaining power are reported in the plot 12:

Plot 12



When $P^*_R = 0{,}00€$ the Nash equilibrium does not exist and the model collapses to the case of the cooperative equilibrium.

From $P^*_R = 0{,}00$ € to $P^*_R = 93{,}33€$ both the State both the Private Company find optimal to enter in the contract and thus to invest at the current date; instead from $P^*_R = 1.538{,}23$ € to $P^*_R = 4.428{,}04$ € only the State finds optimal to enter in the contract while the Private Company finds optimal to wait since its expected NPV is negative but his option to wait is positive (the option to wait is in written red colour in the plots and in the tables).

- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

First case ("general case")

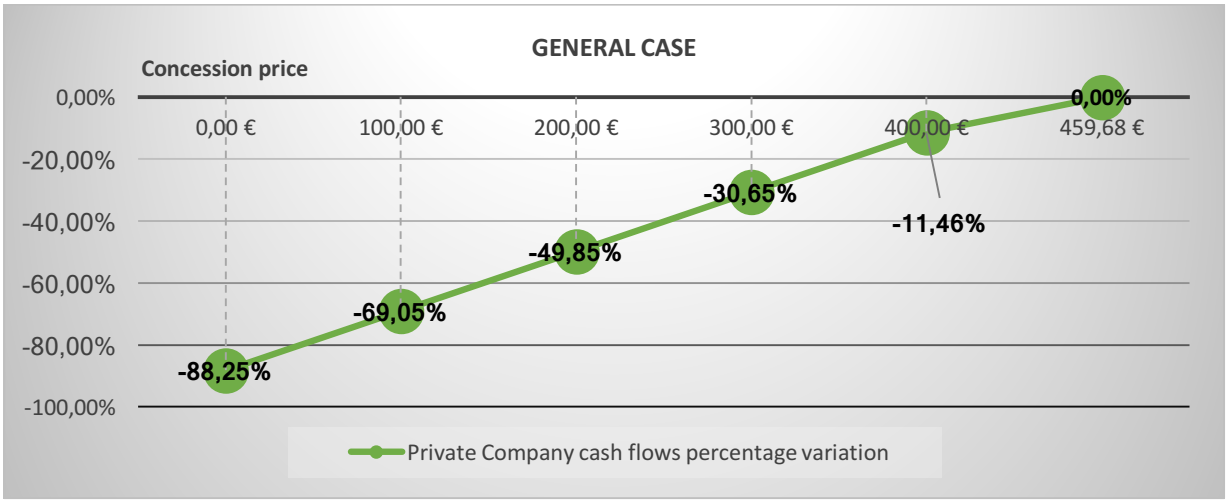
For the general case the results are reported in the table 66:

Table 66

P	0,00 €	100,00 €	200,00 €	300,00 €	400,00 €	459,68 €
y_p	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
$V(y)$	7.571,66 €	9.175,85 €	10.780,04 €	12.384,24 €	13.988,43 €	14.945,81 €
y_π	61,53 €	162,05 €	262,56 €	363,08 €	463,59 €	523,58 €
$V_\pi(y)$	9.387,56 €	7.783,36 €	6.179,17 €	4.574,98 €	2.970,79 €	2.013,41 €
V project	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22€

The cash flows percentage variations for the general case are reported in the plot 13:

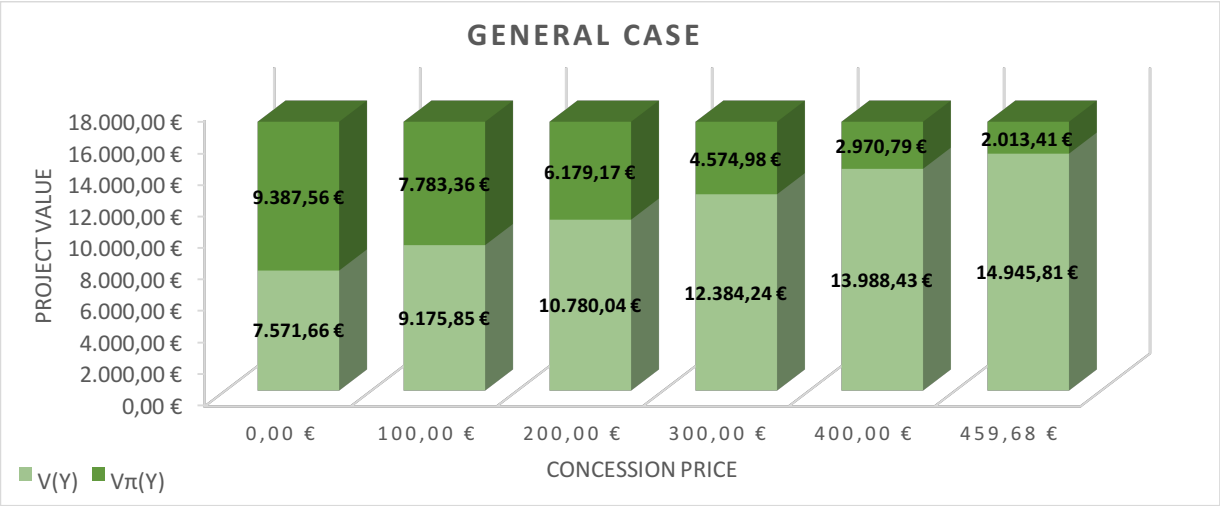
Plot 13



The cash flows percentage variations are negative because the minimum cash flows for which the Private Company accepts to invest are lower than the average cash flow of the project; this implies that the Private Company is ready to invest at the current date.

The parties' contract values and their variation according to the different concession prices are reported in the plot 14:

Plot 14



For each level of concession price in the range [0€;459,68€] the State and the Private Company are ready to sign the contract and thus to invest. When the concession price increases, we have that:

- the State finds even more convenient to give the concession because its contract value $V(y)$ increases;
- the Private Company finds less convenient to enter into the contract and to invest because his contract value $V_\pi(y)$ decreases.

Second case (the cooperative equilibrium)

The cooperative price (obtained through equation 8) is $P_C = 0$ thus the results are the same of the first column of table 66 and of the plot 13-14 when $P = 0$ and precisely we have that: the State and the Private Company are ready to sign the contract and thus to invest.

Third case (Nash equilibrium)

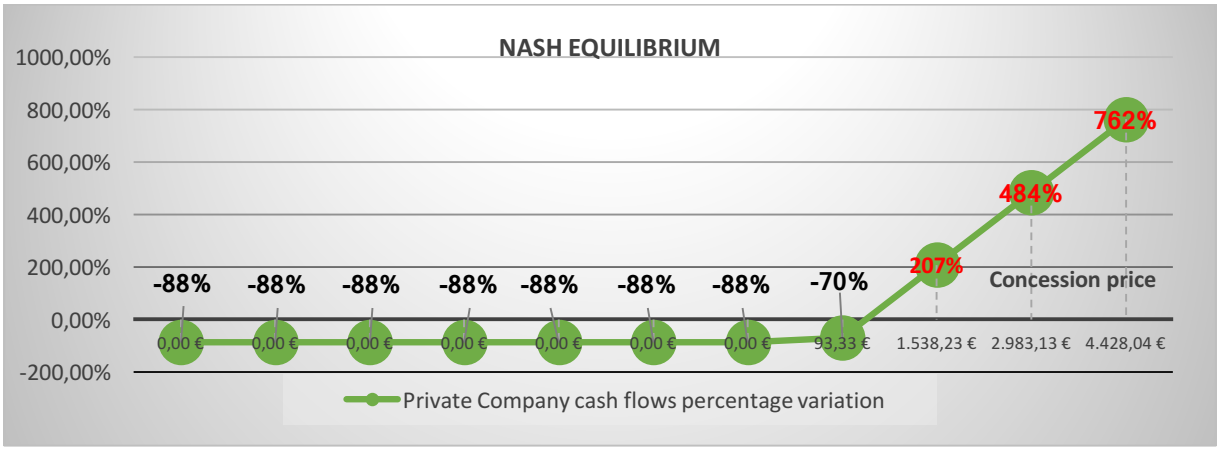
For the Nash equilibrium the results are reported in the table 67:

Table 67

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0,00 €	0,00 €	7.571,66 €	61,53 €	9.387,56 €	16.959,22 €
0,9	0,1	0,00 €	0,00 €	7.571,66 €	61,53 €	9.387,56 €	16.959,22 €
0,8	0,2	0,00 €	0,00 €	7.571,66 €	61,53 €	9.387,56 €	16.959,22 €
0,7	0,3	0,00 €	0,00 €	7.571,66 €	61,53 €	9.387,56 €	16.959,22 €
0,6	0,4	0,00 €	0,00 €	7.571,66 €	61,53 €	9.387,56 €	16.959,22 €
0,5	0,5	0,00 €	0,00 €	7.571,66 €	61,53 €	9.387,56 €	16.959,22 €
0,4	0,6	0,00 €	0,00 €	7.571,66 €	61,53 €	9.387,56 €	16.959,22 €
0,3	0,7	93,33 €	0,00 €	9.068,79 €	155,34 €	7.890,43 €	16.959,22 €
0,2	0,8	1.538,23 €	0,00 €	32.247,80 €	1.607,68 €	19,14 €	32.266,93 €
0,1	0,9	2.983,13 €	0,00 €	55.426,81 €	3.060,03 €	11.767,22 €	67.194,03 €
0	1	4.428,04 €	0,00 €	78.605,82 €	4.512,37 €	17.352,16 €	95.957,98 €

The cash flows percentage variations for the Nash equilibrium are reported in the plot 15:

Plot 15

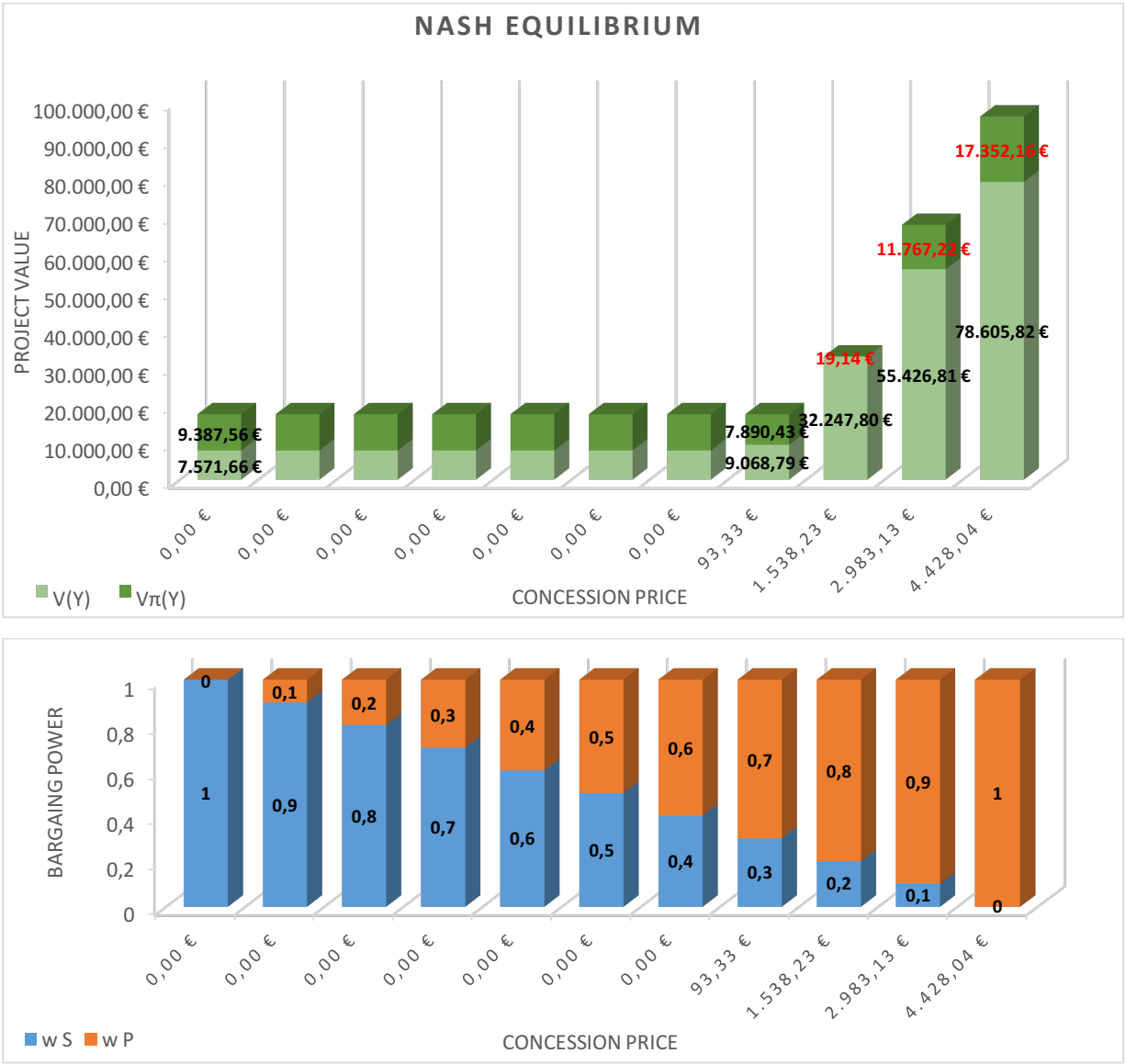


When the concession price is lower than 1538,23€, the Private Company is ready to invest at the current date because the minimum cash flows for which the Private Company accepts to invest are lower than the average cash flow of the project (for this reason the cash flows percentage variations are negative).

When the concession price is higher or equal to 1538,23€, the Private Company does not invest at the current date because the minimum cash flows for which the Private Company accepts to invest are higher than the average cash flow of the project (for this reason the cash flows percentage variations are positive).

The parties' contract values and their variation according to the different concession prices and bargaining power are reported in the plot 16:

Plot 16



When $P^*_R = 0{,}00€$ the Nash equilibrium does not exist and the model collapses to the case of the cooperative equilibrium.

From $P^*_R = 0{,}00$ € to $P^*_R = 93{,}33€$ both the State both the Private Company find optimal to enter in the contract and thus to invest at the current date; instead from $P^*_R = 1.538{,}23$ € to $P^*_R = 4.428{,}04$ € only the State finds optimal to enter in the contract while the Private Company finds optimal to wait since its expected NPV is negative but his option to wait is positive (the option to wait is in written red colour in the plots and in the tables).

- **Hypothesis 5: investment costs sustained entirely by the State**

First case ("general case")

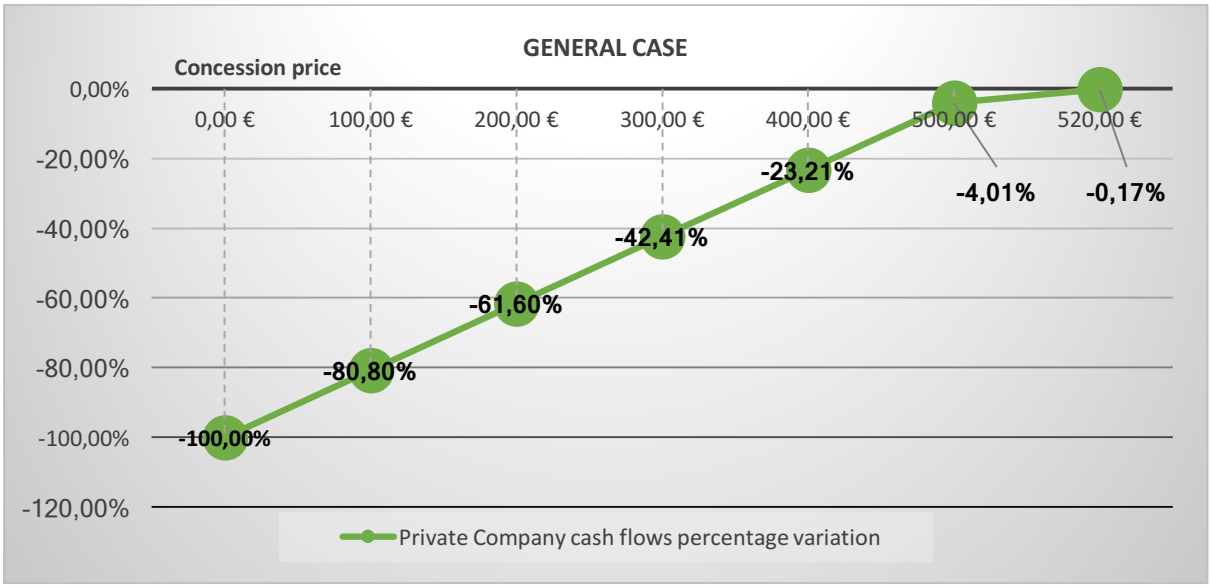
For the general case the results are reported in the table 68:

Table 68

P	0,00 €	100,00 €	200,00 €	300,00 €	400,00 €	500,00 €	520,00 €
y_p	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
$V(y)$	6.589,63 €	8.193,82 €	9.798,01 €	11.402,20 €	13.006,39 €	14.610,58 €	14.931,42 €
y_π	0,00 €	100,52 €	201,03 €	301,55 €	402,06 €	502,58 €	522,68 €
$V_\pi(y)$	10.369,59 €	8.765,40 €	7.161,21 €	5.557,02 €	3.952,83 €	2.348,64 €	2.027,80 €
V project	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €	16.959,22 €

The cash flows percentage variations for the general case are reported in the plot 17:

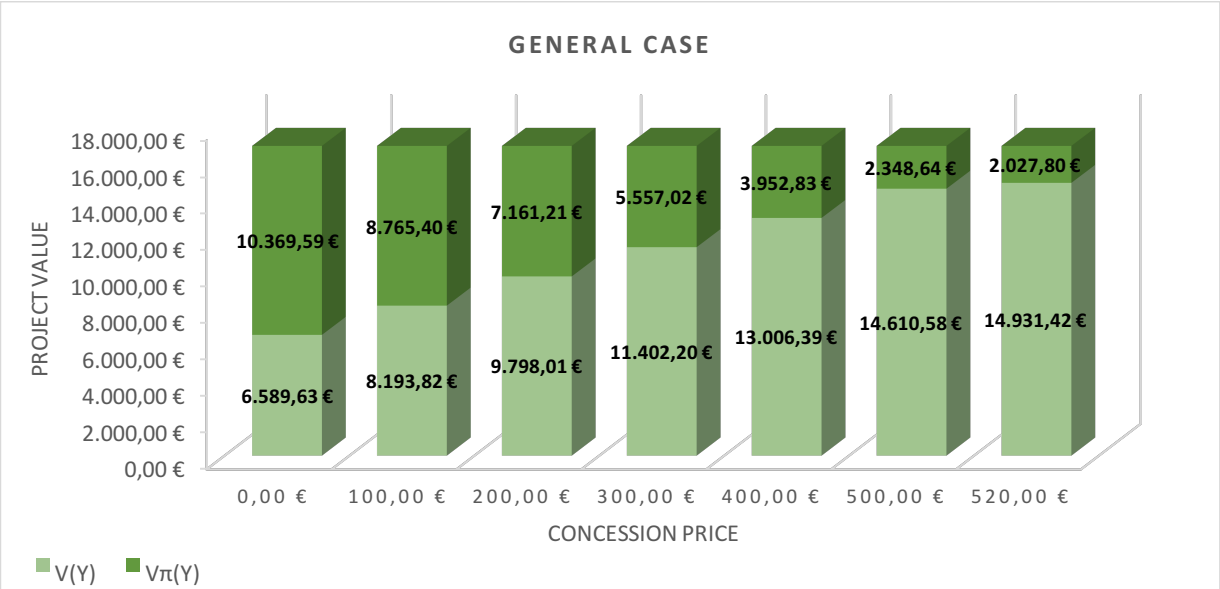
Plot 17



The cash flows percentage variations are negative because the minimum cash flows for which the Private Company accepts to invest are lower than the average cash flow of the project; this implies that the Private Company is ready to invest at the current date.

The parties' contract values and their variation according to the different concession prices are reported in the plot 18:

Plot 18



For each level of concession price in the range [0€;520,00€] the State and the Private Company are ready to sign the contract and thus to invest. When the concession price increases, we have that:

- the State finds even more convenient to give the concession because its contract value $V(y)$ increases;
- the Private Company finds less convenient to enter into the contract and to invest because his contract value $V_\pi(y)$ decreases.

Second case (the cooperative equilibrium)

The cooperative price (obtained through equation 8) is $P_C = 0$ thus the results are the same of the first column of table 68 and of the plot 17-18 when $P = 0$ and precisely we have that: the State and the Private Company are ready to sign the contract and thus to invest.

Third case (Nash equilibrium)

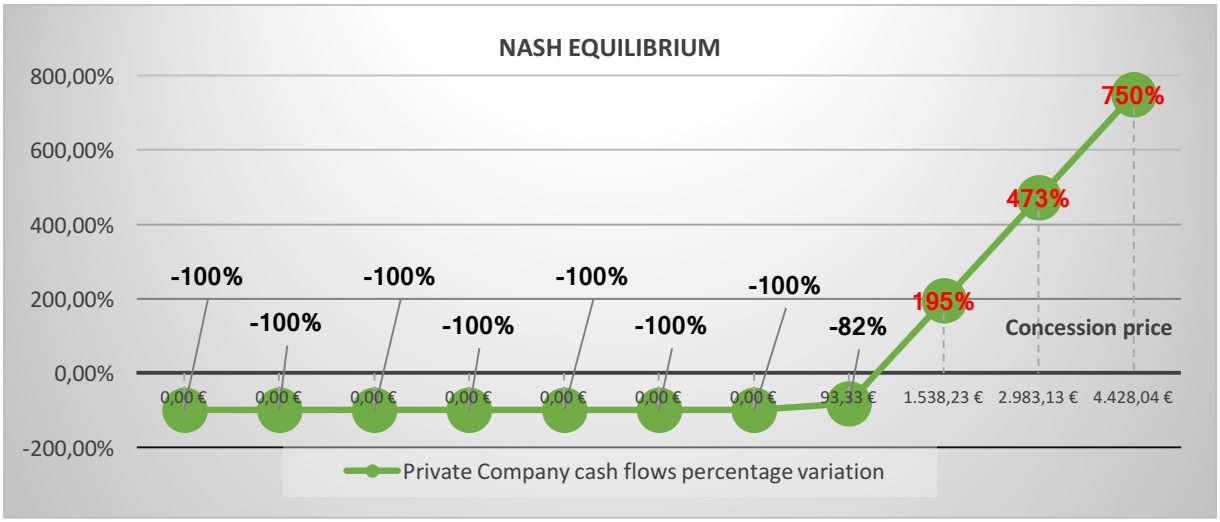
For the case of the Nash equilibrium the results are reported in the table 69:

Table 69

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0,00 €	0,00 €	6.589,63 €	0,00 €	10.369,59 €	16.959,22 €
0,9	0,1	0,00 €	0,00 €	6.589,63 €	0,00 €	10.369,59 €	16.959,22 €
0,8	0,2	0,00 €	0,00 €	6.589,63 €	0,00 €	10.369,59 €	16.959,22 €
0,7	0,3	0,00 €	0,00 €	6.589,63 €	0,00 €	10.369,59 €	16.959,22 €
0,6	0,4	0,00 €	0,00 €	6.589,63 €	0,00 €	10.369,59 €	16.959,22 €
0,5	0,5	0,00 €	0,00 €	6.589,63 €	0,00 €	10.369,59 €	16.959,22 €
0,4	0,6	0,00 €	0,00 €	6.589,63 €	0,00 €	10.369,59 €	16.959,22 €
0,3	0,7	93,33 €	0,00 €	8.086,75 €	93,81 €	8.872,47 €	16.959,22 €
0,2	0,8	1.538,23 €	0,00 €	31.265,76 €	1.546,15 €	110,22 €	31.375,98 €
0,1	0,9	2.983,13 €	0,00 €	54.444,77 €	2.998,50 €	34.709,61 €	89.154,38 €
0	1	4.428,04 €	0,00 €	77.623,78 €	4.450,84 €	40.294,55 €	117.918,33 €

The cash flows percentage variations for the Nash equilibrium are reported in the plot 19:

Plot 19

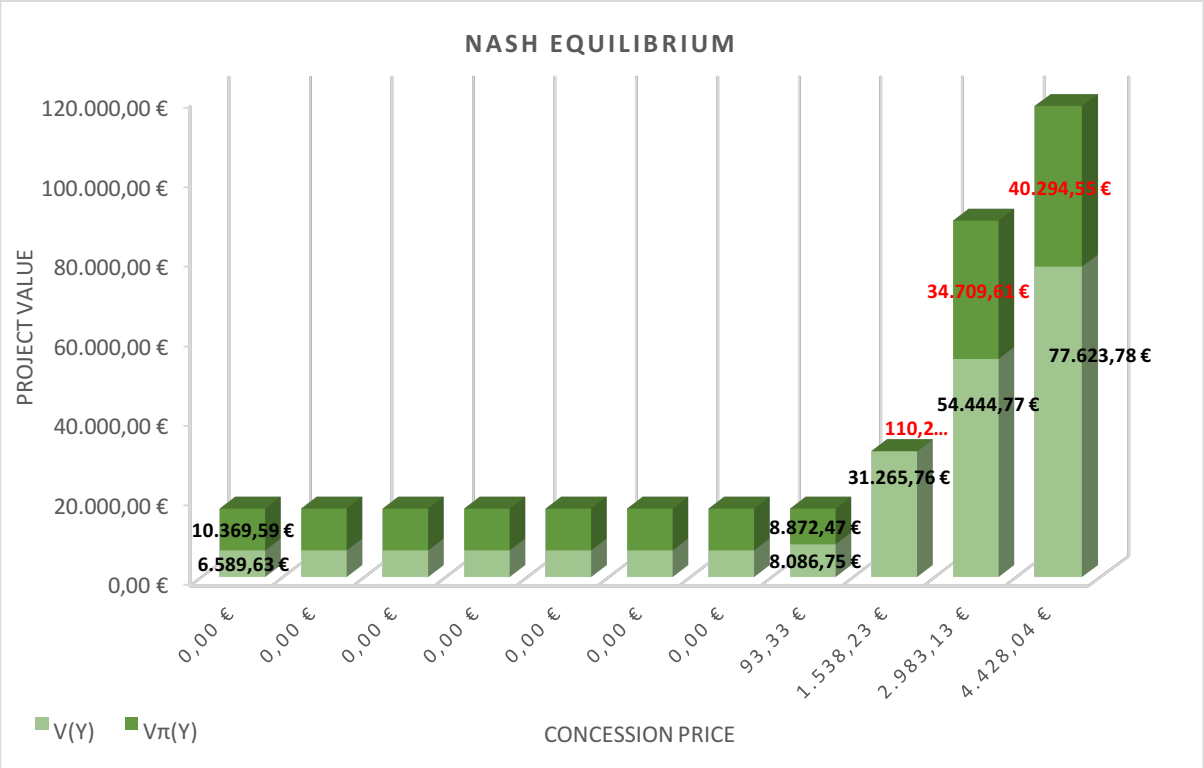


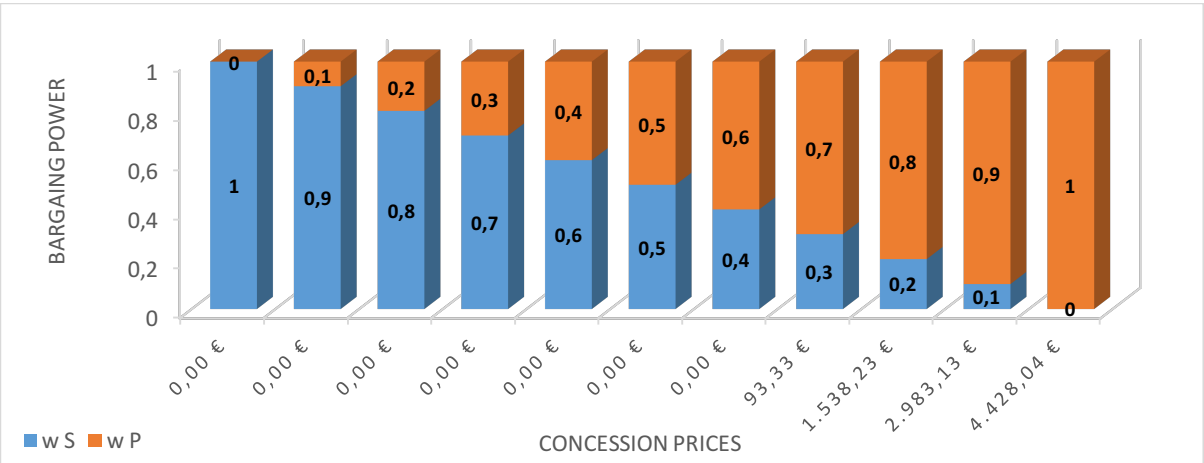
When the concession price is lower than 1538,23€, the Private Company is ready to invest at the current date because the minimum cash flows for which the Private Company accepts to invest are lower than the average cash flow of the project (for this reason the cash flows percentage variations are negative).

When the concession price is higher or equal to 1538,23€, the Private Company does not invest at the current date because the minimum cash flows for which the Private Company accepts to invest are higher than the average cash flow of the project (for this reason the cash flows percentage variations are positive).

The parties' contract values and their variation according to the different concession prices and bargaining power are reported in the plot 20:

Plot 20





When $P^*_R = 0{,}00€$ the Nash equilibrium does not exist and the model collapses to the case of the cooperative equilibrium.

From $P^*_R = 0{,}00$ € to $P^*_R = 93{,}33$€ both the State both the Private Company find optimal to enter in the contract and thus to invest at the current date; instead from $P^*_R = 1.538{,}23$ € to $P^*_R = 4.428{,}04$ € only the State finds optimal to enter in the contract while the Private Company finds optimal to wait since its expected NPV is negative but his option to wait is positive (the option to wait is in written red colour in the plots and in the tables).

7.2.2 Comparative Static Analysis

In this paragraph, I have done the comparative static analysis and precisely:

- I have selected some inputs i.e. the discount rate, the cash flows volatility and the investment costs;
- I have taken each input one by one and I modified its value ceteris paribus in order to analyse how the outputs of the model change according to the variation of the single input.

I have assumed two scenarios for each input:

- for the discount rate, which in the basic model is $\rho = 5\%$, I have assumed a variation of 25% by obtaining $\rho = 4\%$ and $\rho = 6\%$;
- for the standard deviation of the cash flows, which in the basic model is $\sigma = 1\%$, I have assumed $\sigma = 10\%$ and $\sigma = 20\%$ [37] ;
- for the investment costs, which in the basic model are $I = 3928{,}15$ €, I have assumed an increase of 100% and 200% by obtaining $I = 7856{,}3$ € and $I = 11784{,}45$ € [38].

[37] The reason for this choice is explained in the paragraph 7.2.2.2

[38] The reason for this choice is explained in the paragraph 7.2.2.3

7.2.2.1 Discount rate variation

The first input on which the comparative statics analysis is made is the discount rate: while the discount rate in the basic model is equal to 5%, I have conjectured a lower discount rate equal to 4% (example 1) and a higher discount rate equal to 6% (example 2).

The inputs for the example 1 become:

Table 70

α	σ	ρ	δ	T	$y\ avg$	χ	I	β_1	β_2
0,95%	1,00%	4,00%	3,05%	40	523,5 €	-397,96 €	3928,15 €	4,14	-193,16

while for the example 2 the inputs become:

Table 71

α	σ	ρ	δ	T	$y\ avg$	χ	I	β_1	β_2
0,95%	1,00%	6,00%	5,05%	40	523,5 €	-397,96 €	3928,15 €	6,15	-195,16

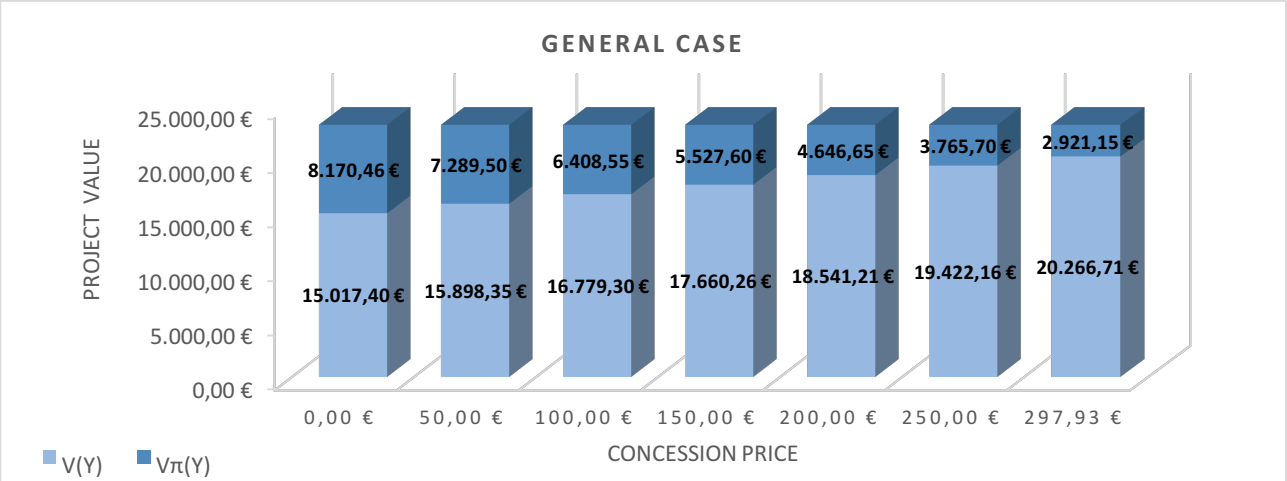
Indeed, I have proceeded as follows:

- as in the basic model, I have reported the plots under the different hypotheses of investment costs distribution;
- after the plots of each example, I have done a general comment to understand how the discount rate variation affects the outputs of the model.

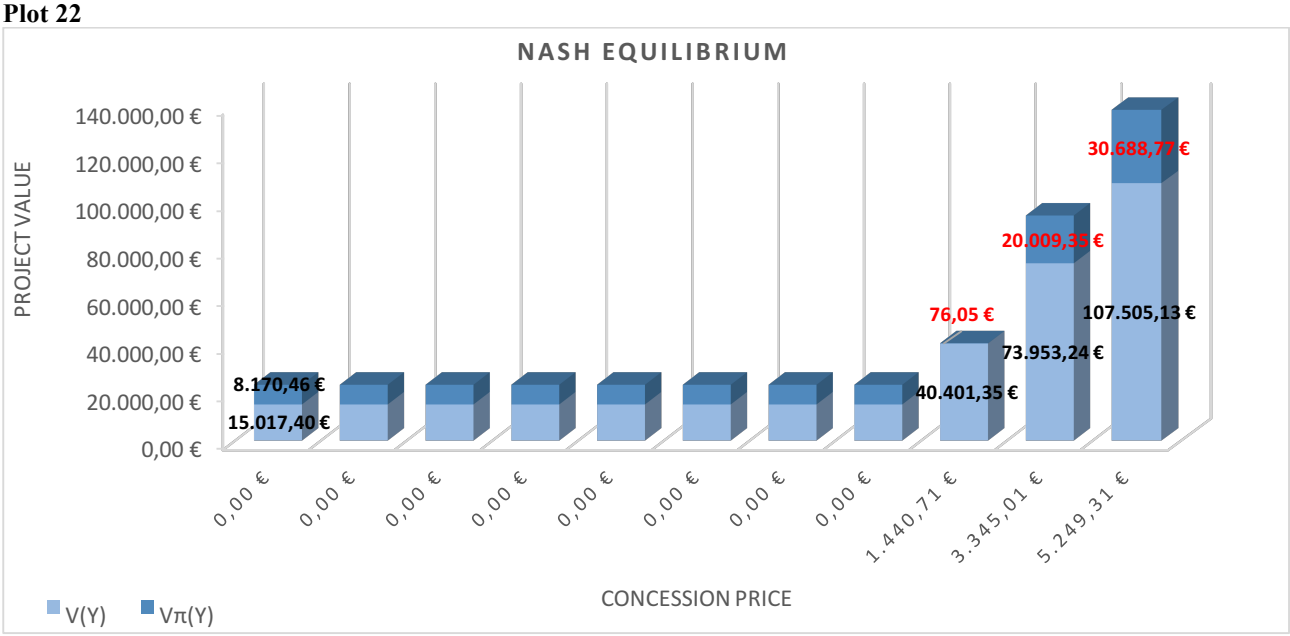
- **Example 1 ($\rho = 4\%$)**

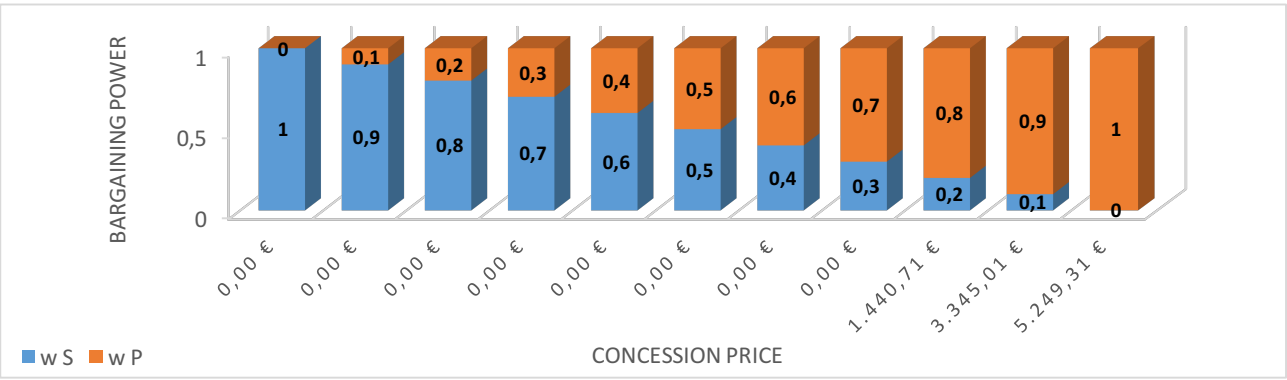
- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Plot 21



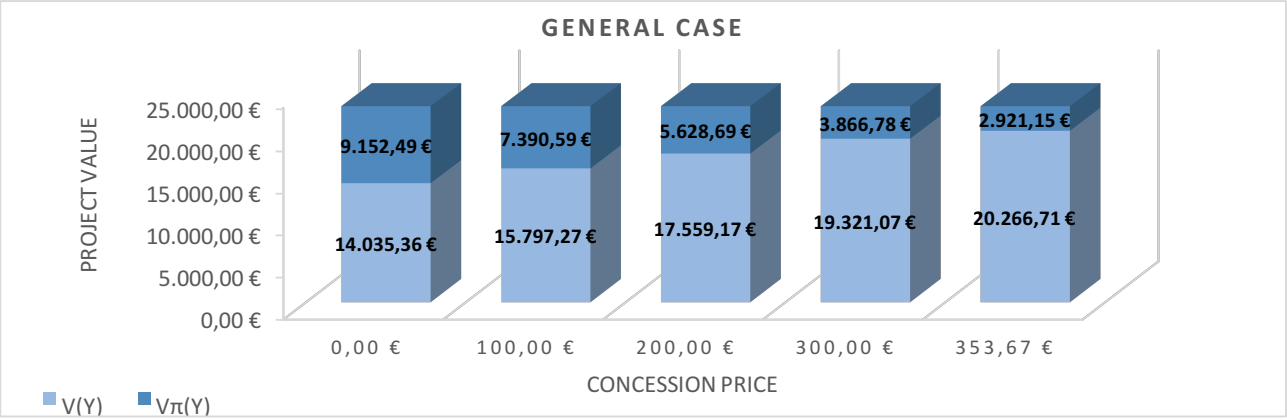
Plot 22



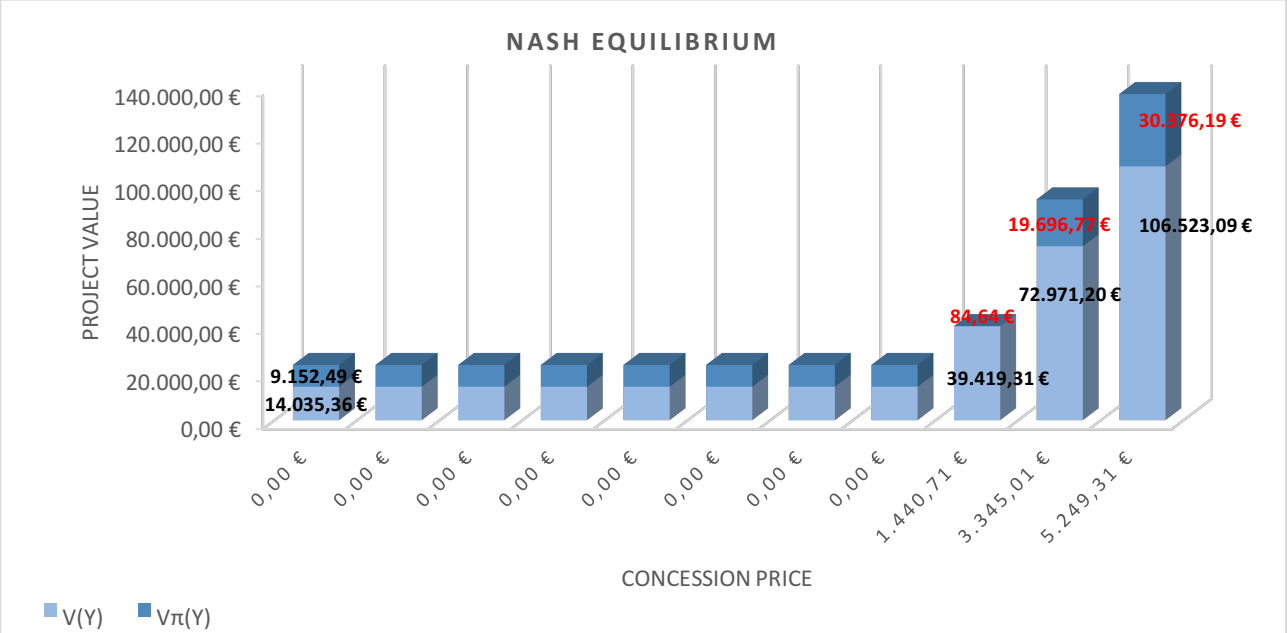


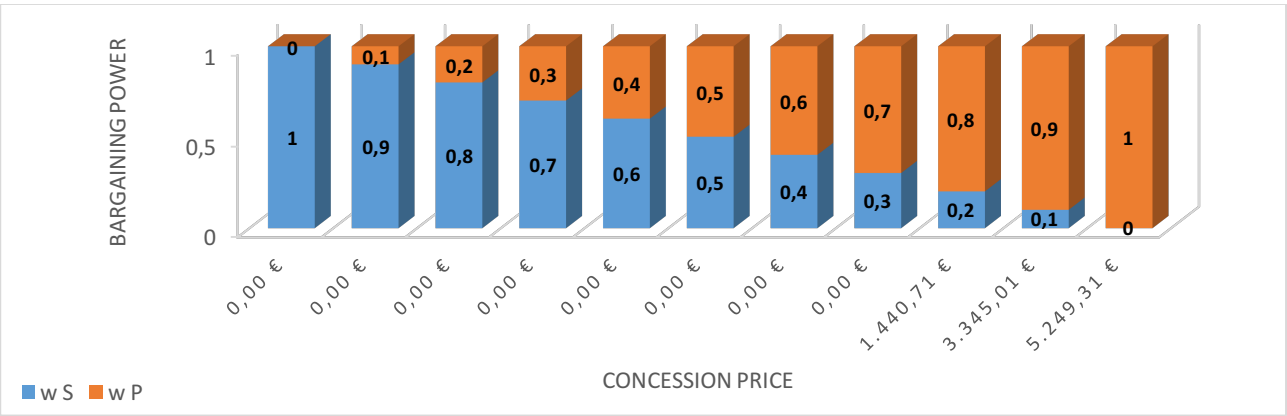
- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Plot 23



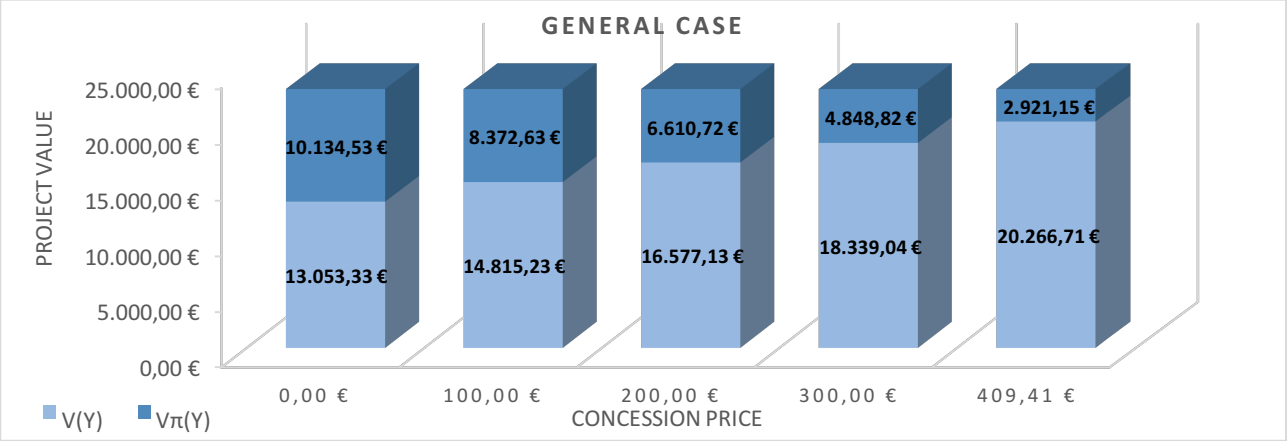
Plot 24



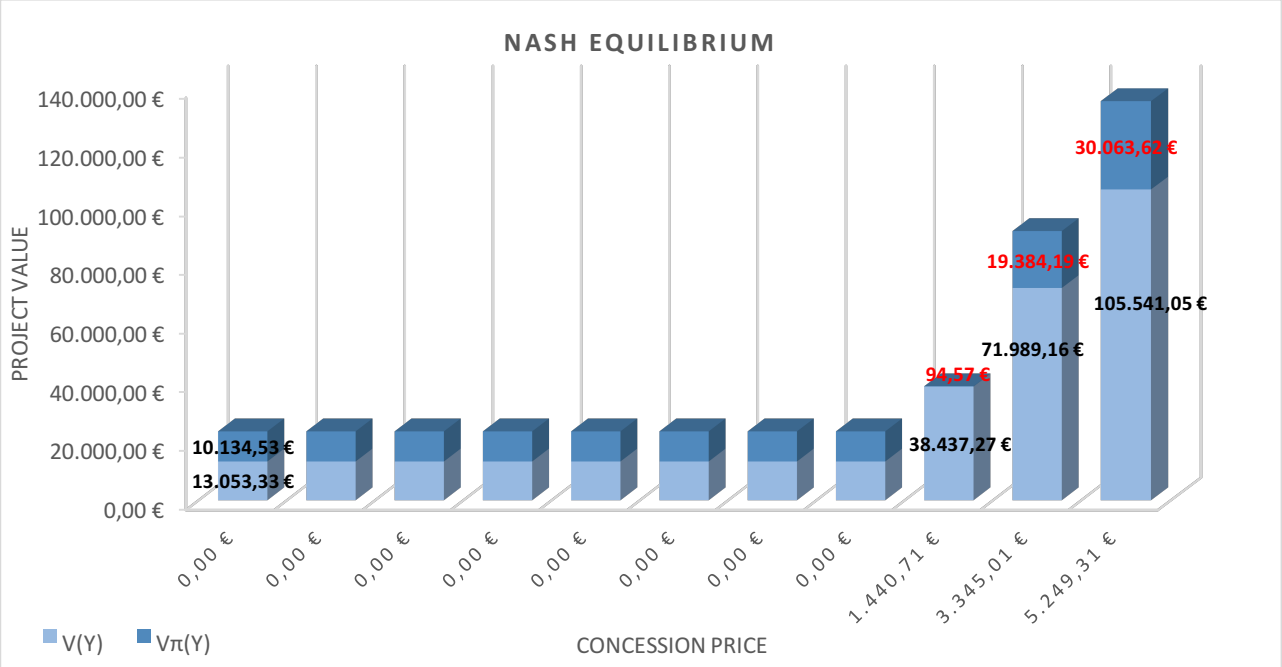


- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Plot 25

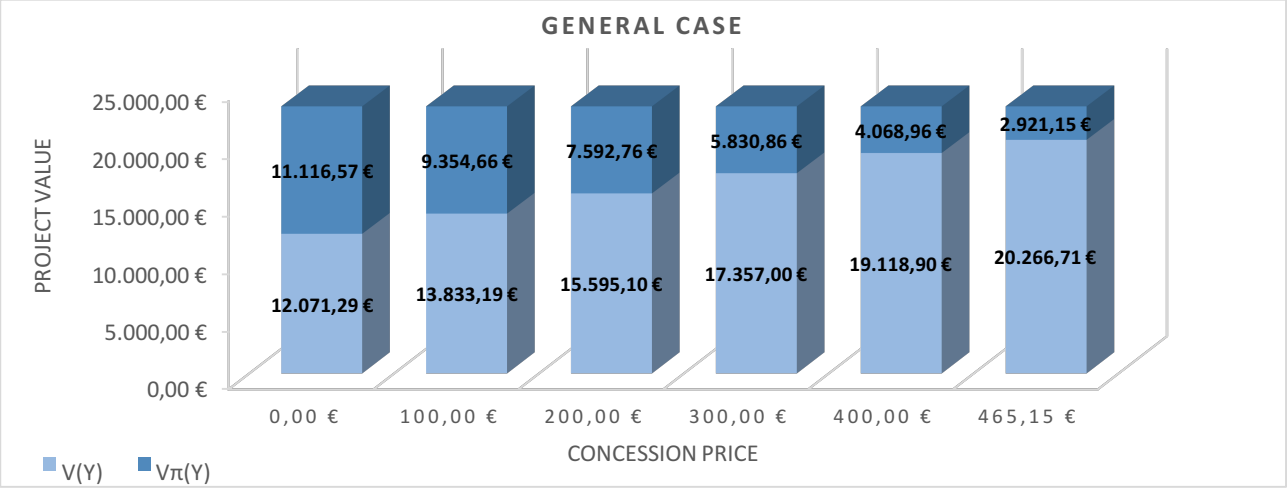


Plot 26

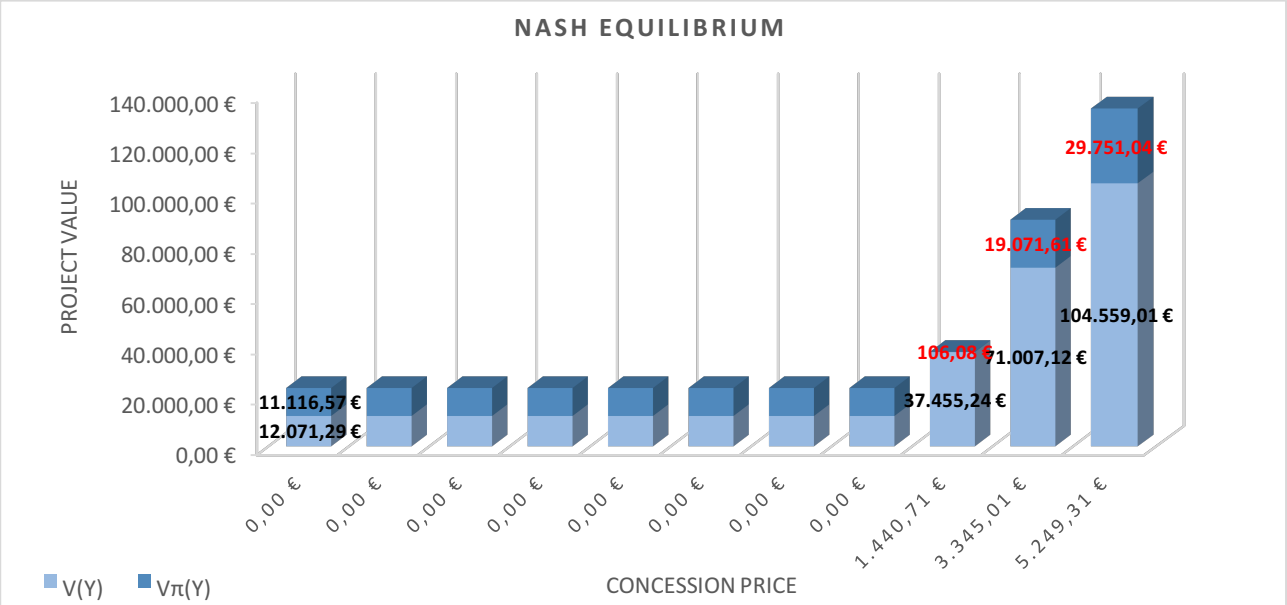


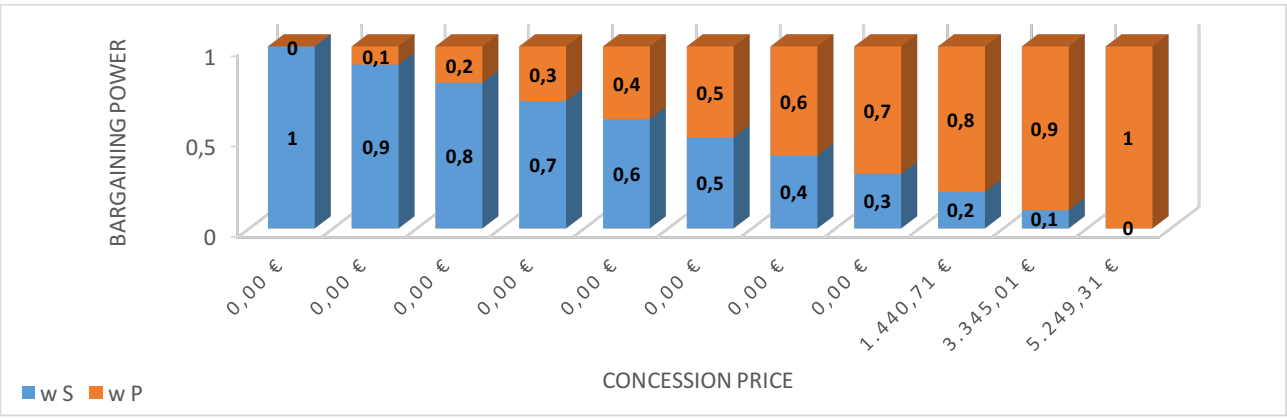
- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Plot 27



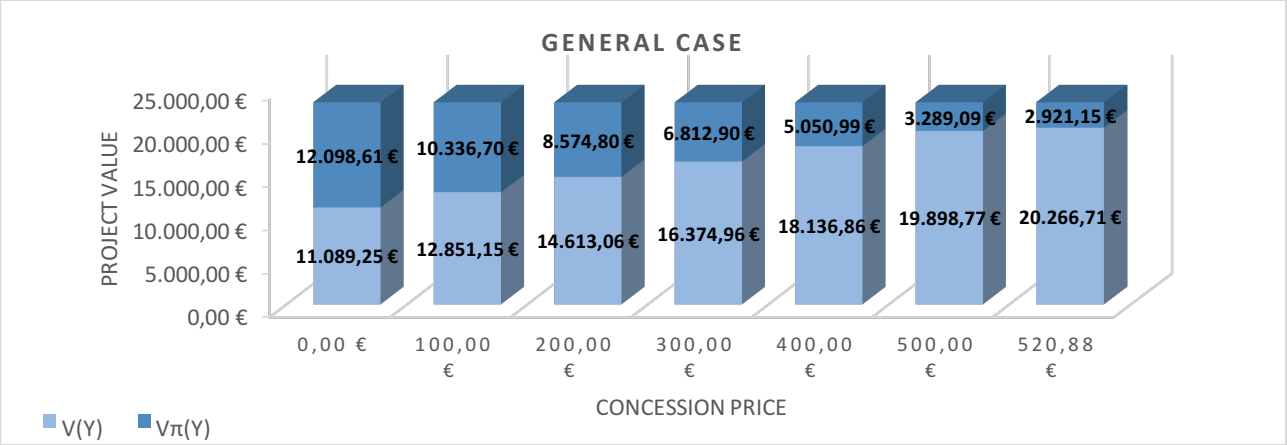
Plot 28



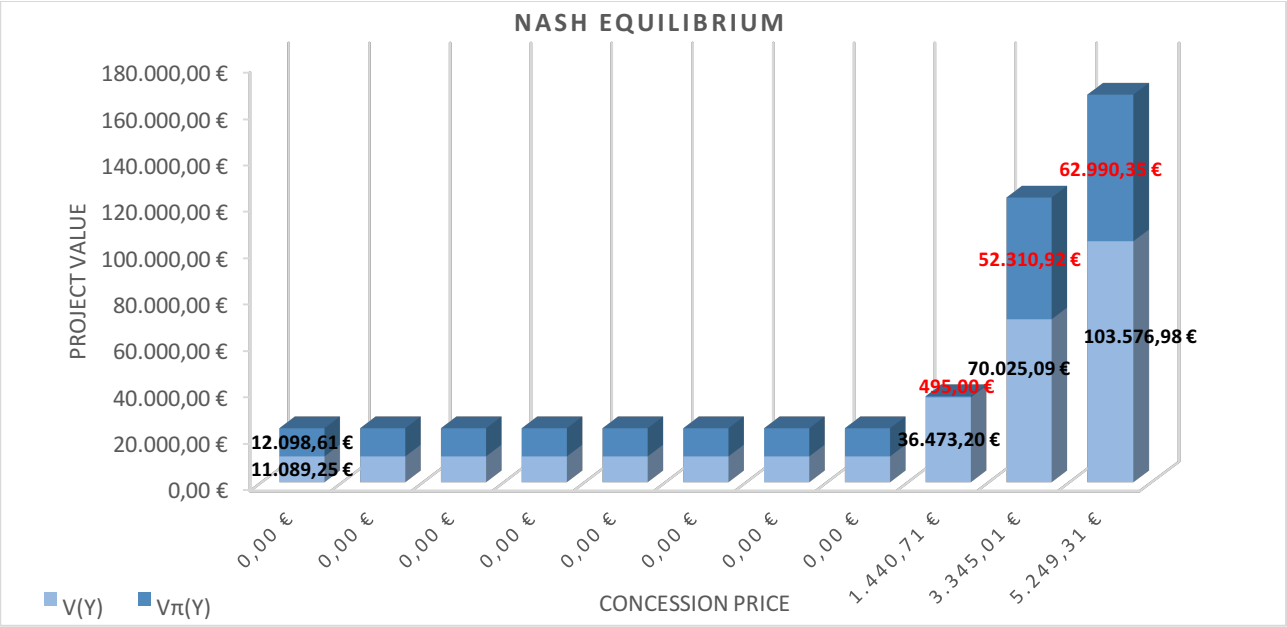


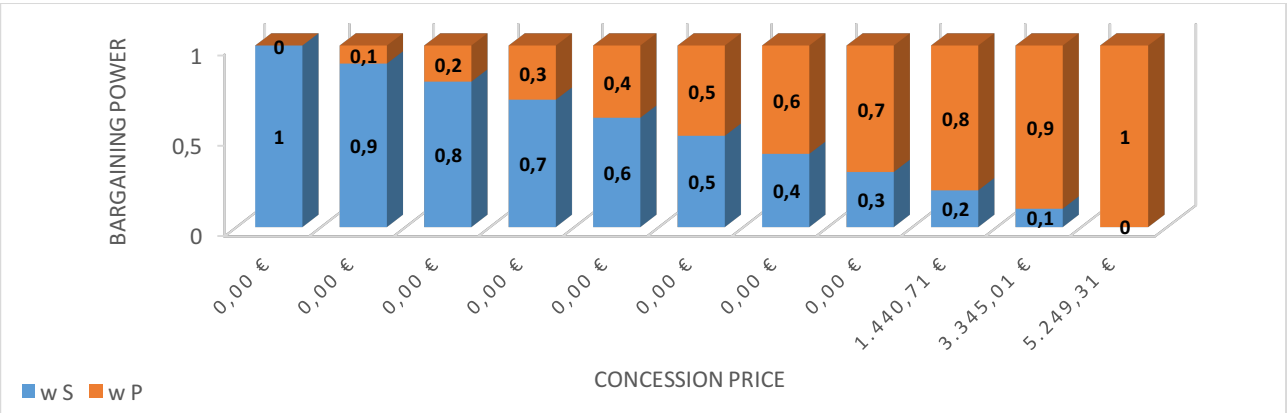
- **Hypothesis 5: investment costs sustained entirely by the State**

Plot 29



Plot 30





- **Results example 1 ($\rho = 4\%$)**

First case ("general case")

The main results in all hypotheses of investment costs distribution are:

- the increase of the upper bound of the concession price range i.e. the increase of the maximum concession price payable by the Private Company, this is due to the application of a lower discount rate;
- the parties' contract values, $V(Y)\ and\ V_\pi(Y)$, are higher than in the general case of the basic model reflecting a lower discount rate;
- the State and the Private Company find optimal to enter in the contract and to invest at the current date for each concession price in the range; this propensity increases for the State and decreases for the Private Company when the concession price increases.

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general case for each hypothesis of investment costs distribution.

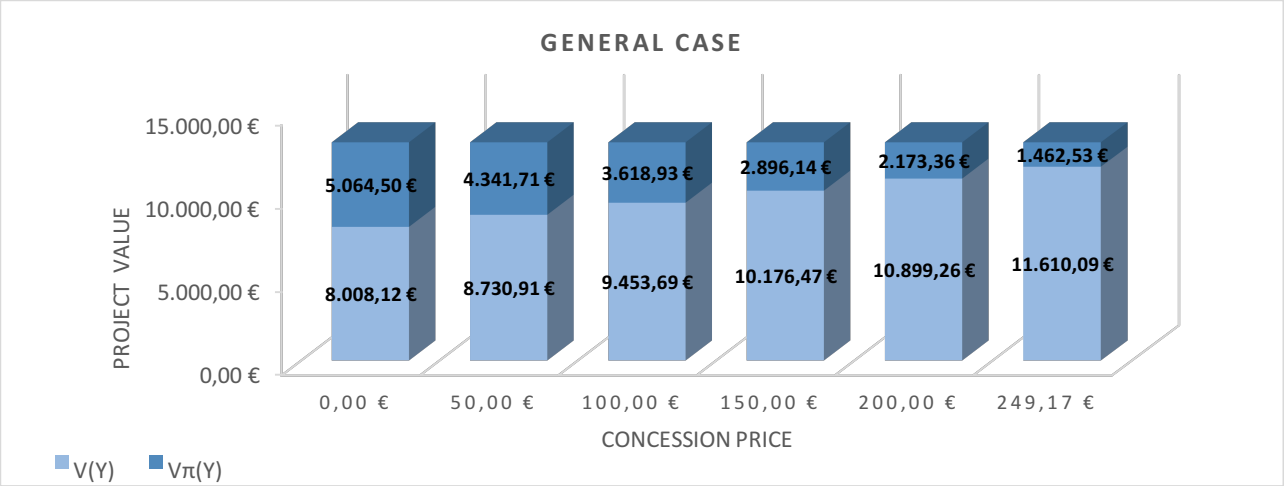
Third case (Nash equilibrium)

The main results in all hypotheses of costs distribution are:

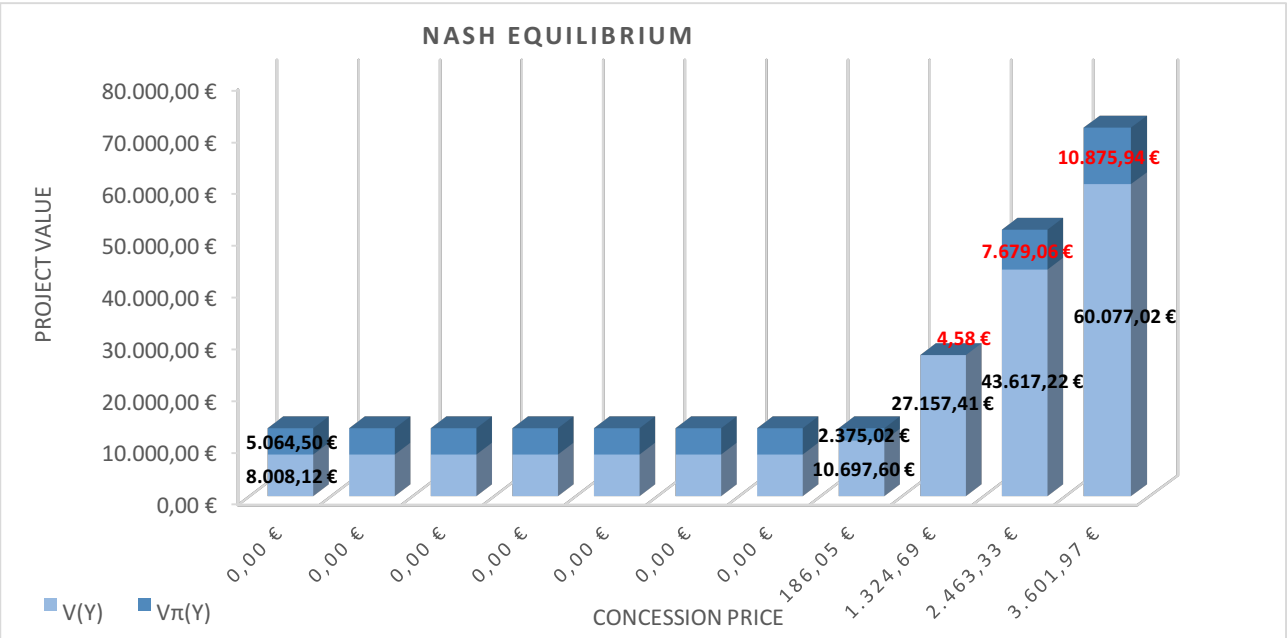
- the increase of the Nash equilibrium concession prices different from 0 wrt the basic model;
- when $P^*_R = 0{,}00€$ the Nash equilibrium does not exist and the model collapses to the case of the cooperative equilibrium.
- the contract values for both parties, $V(Y)\ and\ V_\pi(Y)$, are higher than the basic model reflecting a lower discount rate;
- the State finds optimal to enter in the contract at the current date and this propensity increases with the concession price increase.
- the Private Company, at the current date, finds optimal to wait when the concession price is greater or equal to 1440,71€ and finds optimal to invest when the concession price is lower than 1440,71 €.

- **<u>Example 2 ($\rho = 6\%$)</u>**
- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Plot 31

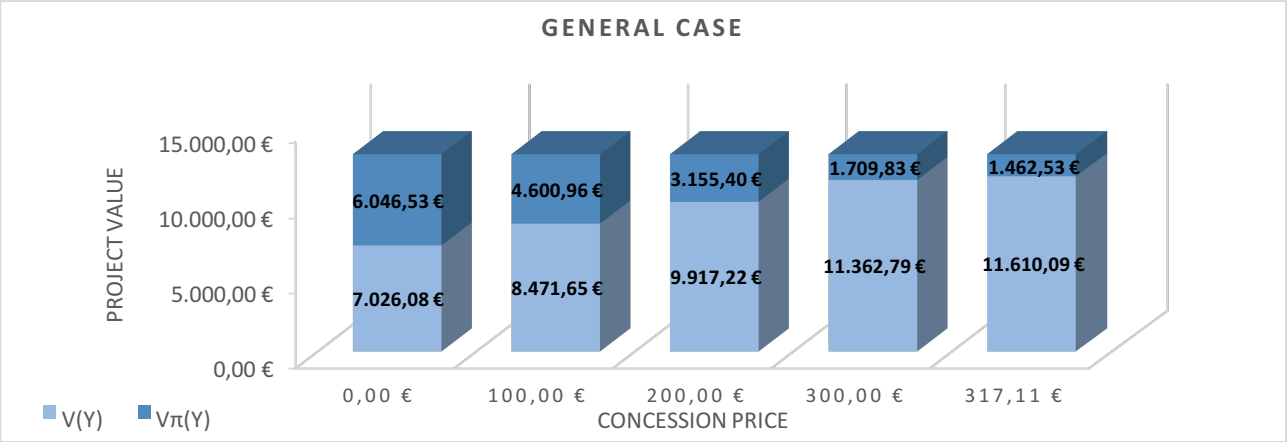


Plot 32

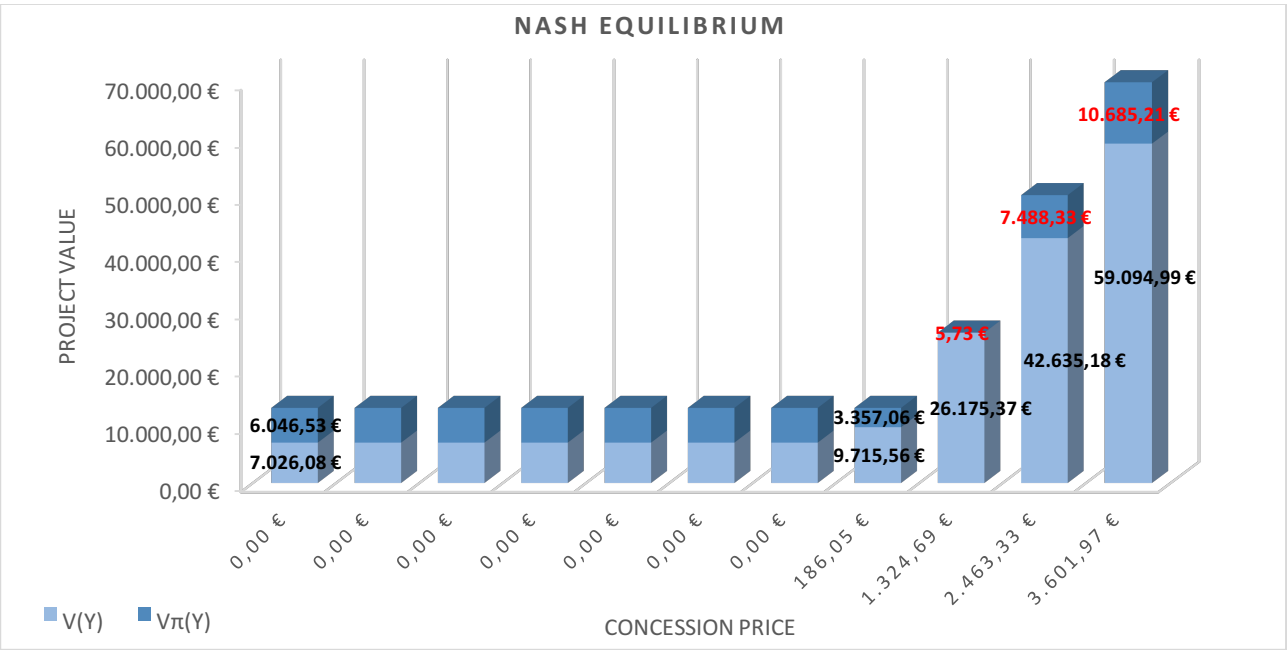


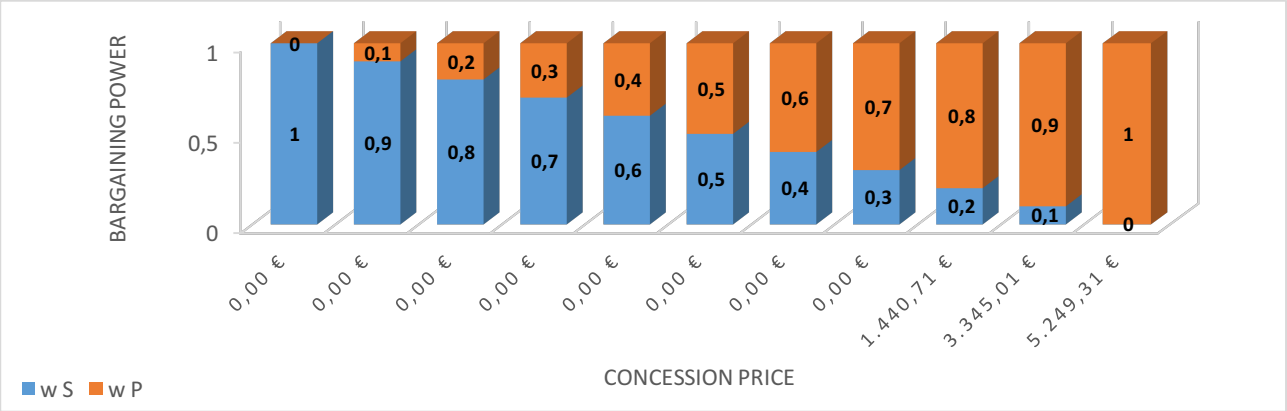
- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Plot 33



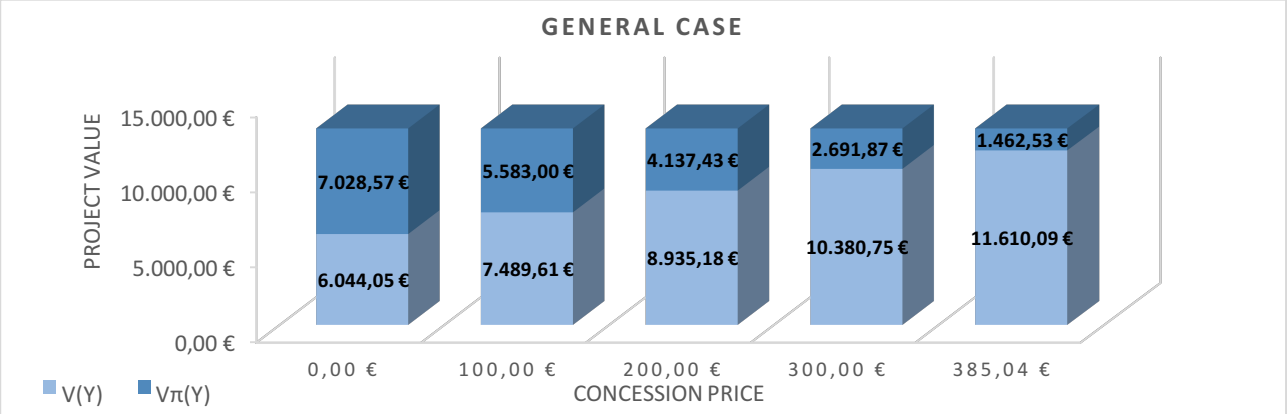
Plot 34



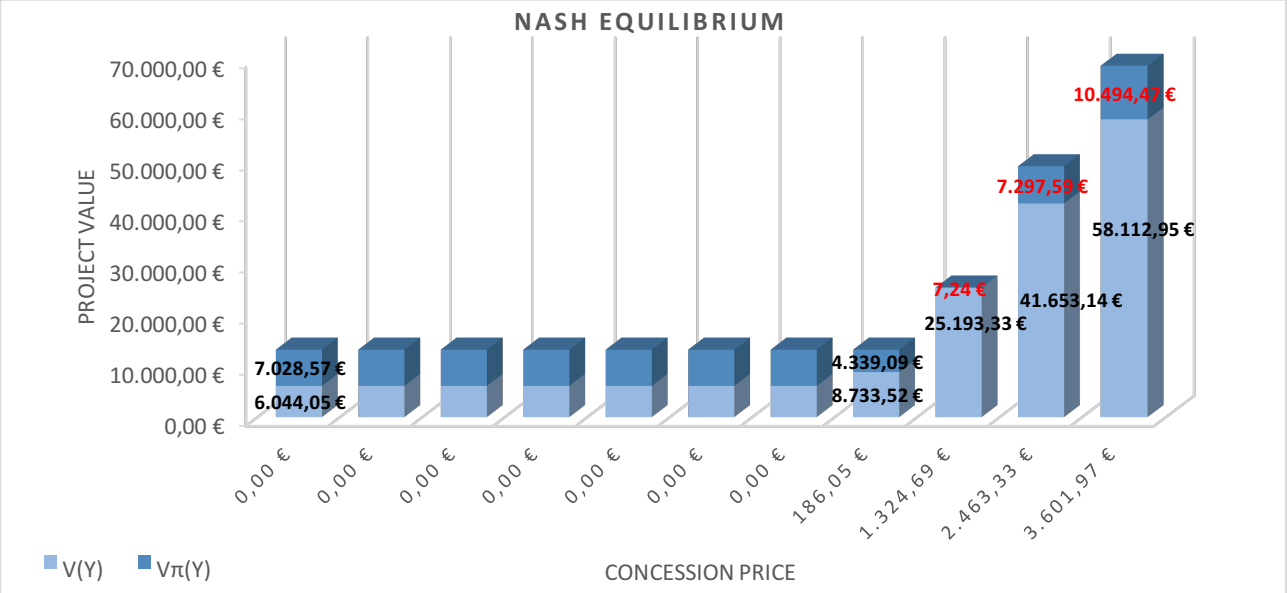


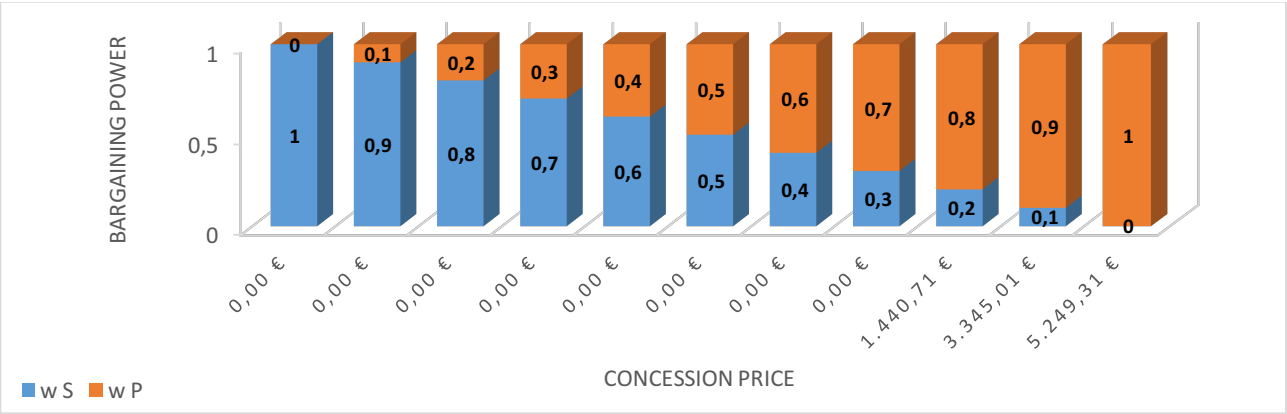
- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Plot 35



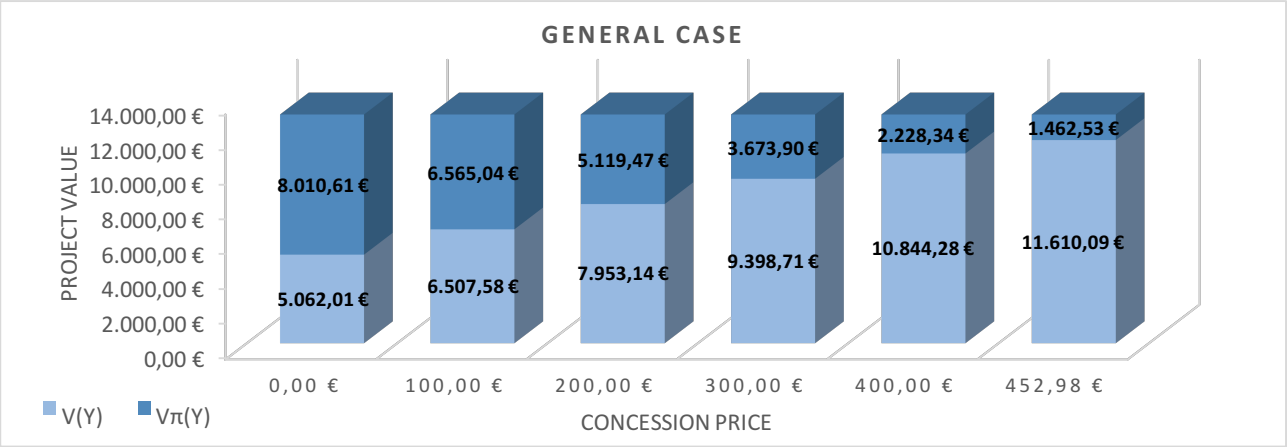
Plot 36



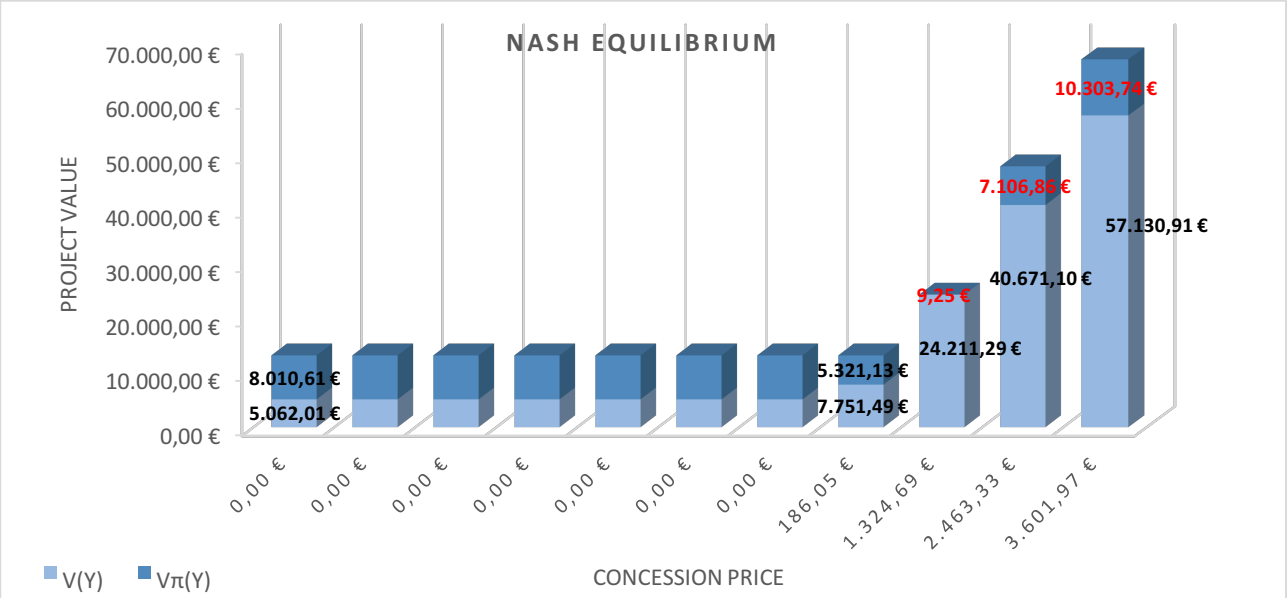


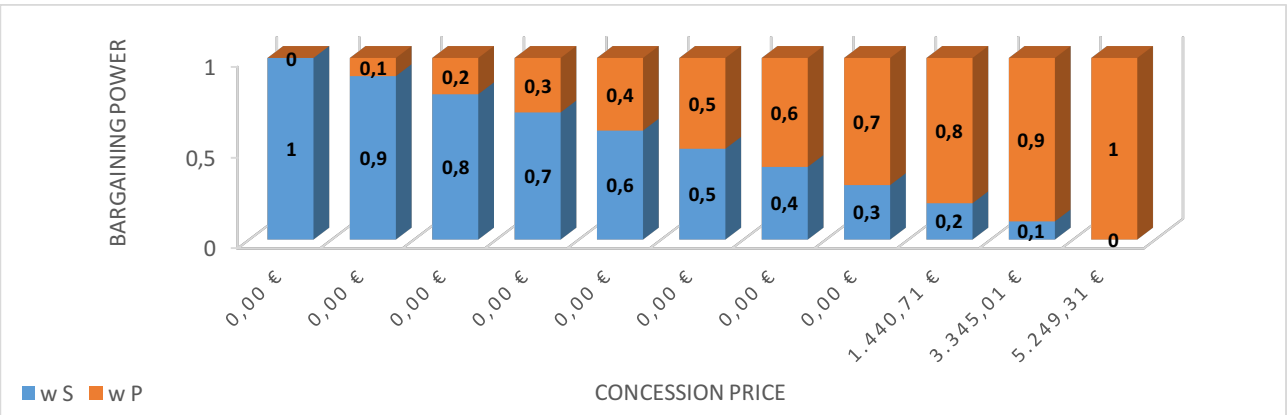
- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Plot 37



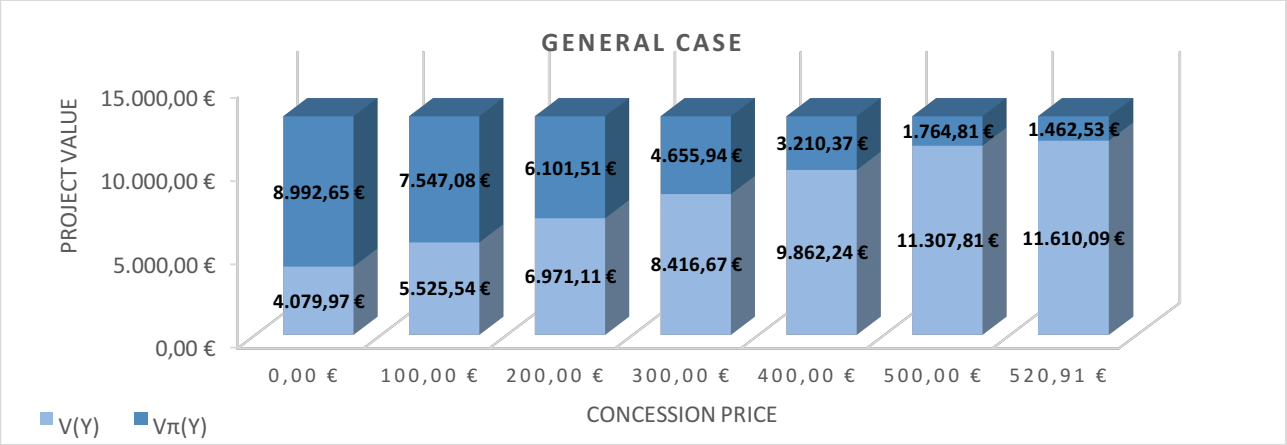
Plot 38



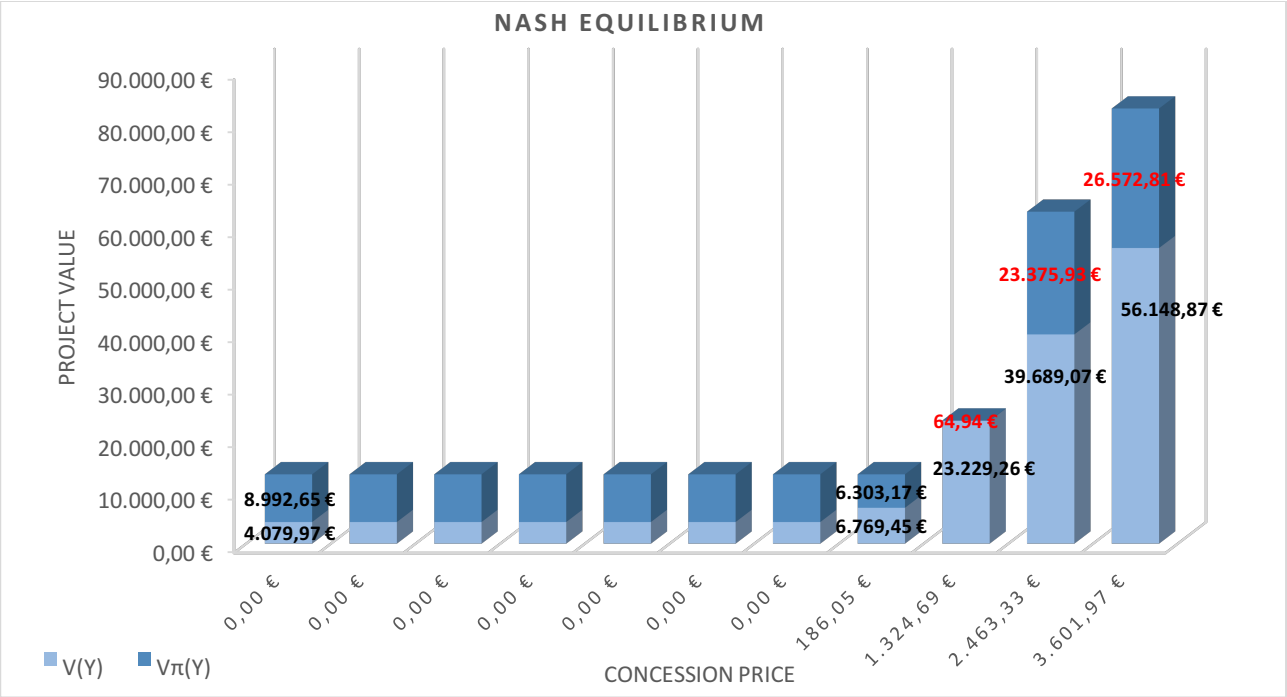


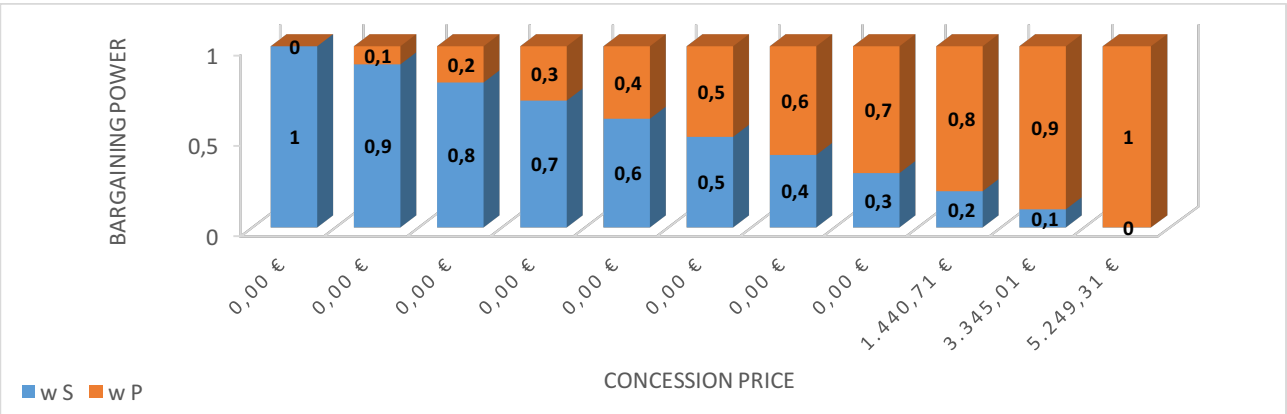
- **Hypothesis 5: investment costs sustained entirely by the State**

Plot 39



Plot 40





- **Results example 2 ($\rho = 6\%$)**

First case ("general case")

The main results in all hypotheses of costs distribution are:

- the decrease of the upper bound of the concession price range i.e. the decrease of the maximum concession price payable by the Private, this is due to the application of a higher discount rate;
- the contract values for the parties, $V(Y)\ and\ V_{\pi}(Y)$, are lower than in the general case of the basic model reflecting a lower discount rate;
- the State and the Private Company find optimal to enter in the contract and to invest at the current date for each concession price in the range; this propensity increases for the State and decreases for the Private company when the concession price increases.

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general model for each hypothesis of costs distribution.

Third case (Nash equilibrium)

The main results in all hypotheses of costs distribution are:

- the decrease of the Nash equilibrium concession prices different from 0;
- when ${P^*}_R = 0{,}00€$ the Nash equilibrium does not exist and the model collapses to the case of the cooperative equilibrium.
- the contract values for both parties, $V(Y)\ and\ V_{\pi}(Y)$, are lower than in the basic model reflectin a higher discount rate;
- the State finds optimal to enter in the contract at the current date and this propensity increases when the concession price increases;
- the Private Company, at the current date, finds optimal to wait when the concession price is greater or equal to 1324,69€ and it finds optimal to invest when the price is lower than 1324,69€.

7.2.2.2 Volatility increase

The second input on which the static comparative analysis is made is the volatility.
In the basic model the standard deviation of the cash flows is really low ($\sigma = 1\%$); in fact, by remembering that the cash flows are computed as the difference between the revenues and the maintenance and operating costs we have that:

- the revenues are computed assuming a constant price and a traffic volume update of an annual 1,5% for the first twenty years while for the last twenty years the traffic volume update is considered constant;
- the operating and maintenance costs are constant over time;

from which it follows that the cash flows variation from the twentieth year to the end of concession period is 0 while in the first twenty years is low. This is the reason for which we have this low standard deviation.

It is indeed important to conjecture higher standard deviations to represent realistically the volatility of the cash flows.
I have assumed $\sigma = 10\%$ (example 3) and $\sigma = 20\%$ (example 4).

The inputs for the example 3 become:

Table 72

α	σ	ρ	δ	T	$y\,avg$	χ	I	β_1	β_2
0,95%	10,00%	5,00%	4,05%	40	523,50 €	-397,96 €	3928,15 €	2,74	-3,64

while for the example 4 the inputs become:

Table 73

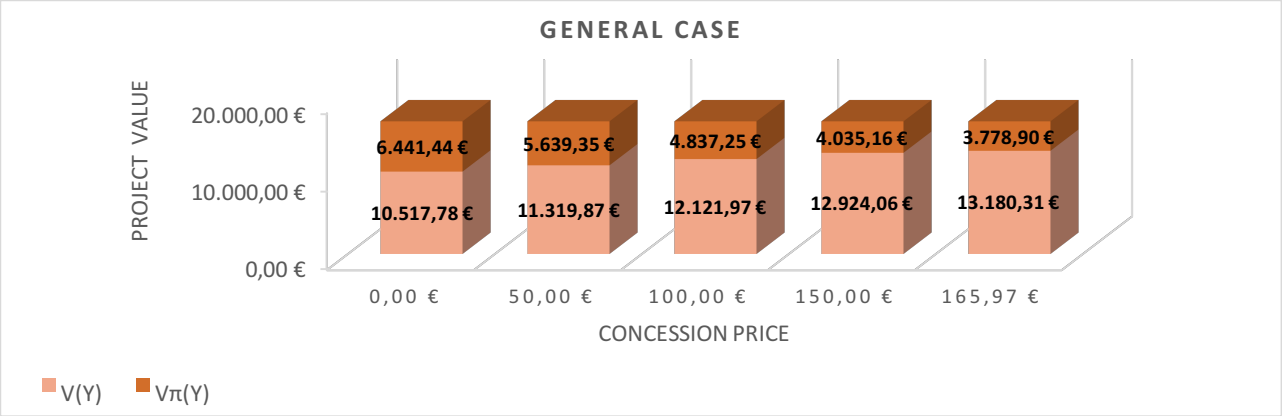
α	σ	ρ	δ	T	$y\,avg$	χ	I	β_1	β_2
0,95%	20,00%	5,00%	4,05%	40	523,50 €	-397,96 €	3928,15 €	1,87	-1,34

Indeed, I have proceeded as follows:

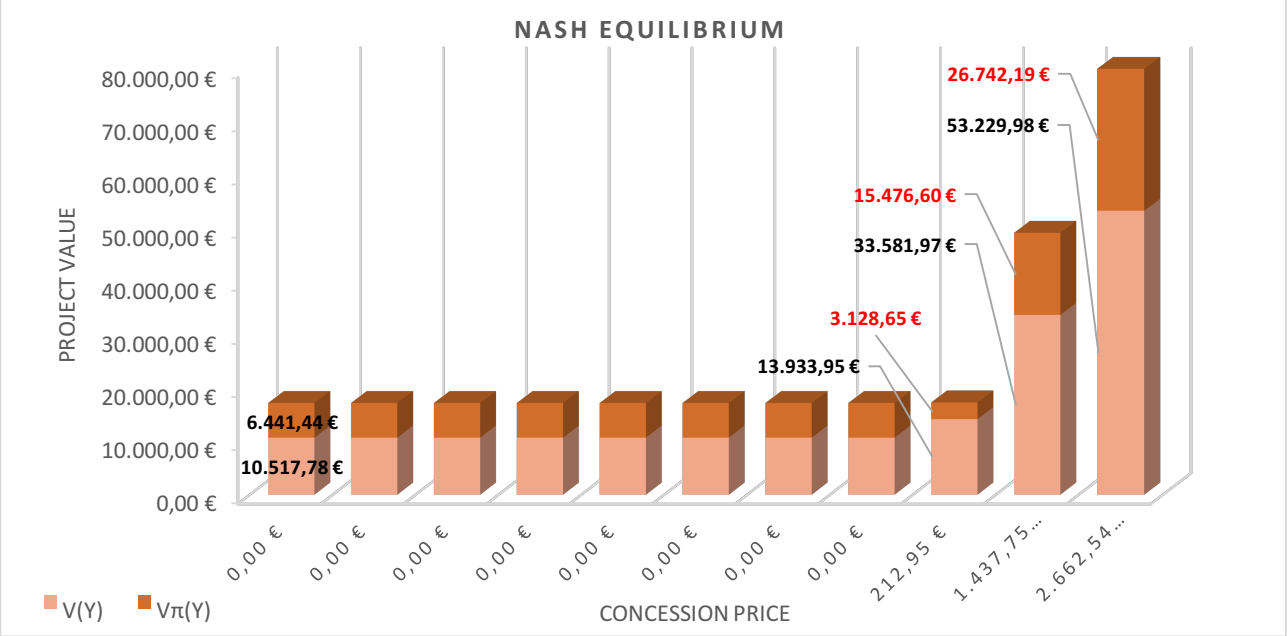
- as in the basic model, I have reported the plots under the different hypotheses of investment costs distribution;
- after the plots of each example, I have done a general comment to understand how the volatility increase affects the outputs of the model.

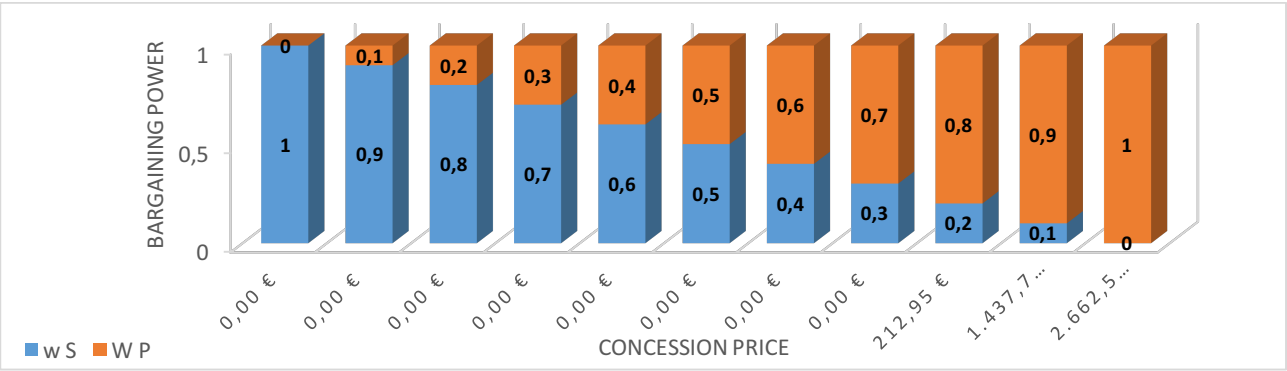
- **<u>Example 3 ($\sigma = 10\%$)</u>**
- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Plot 41



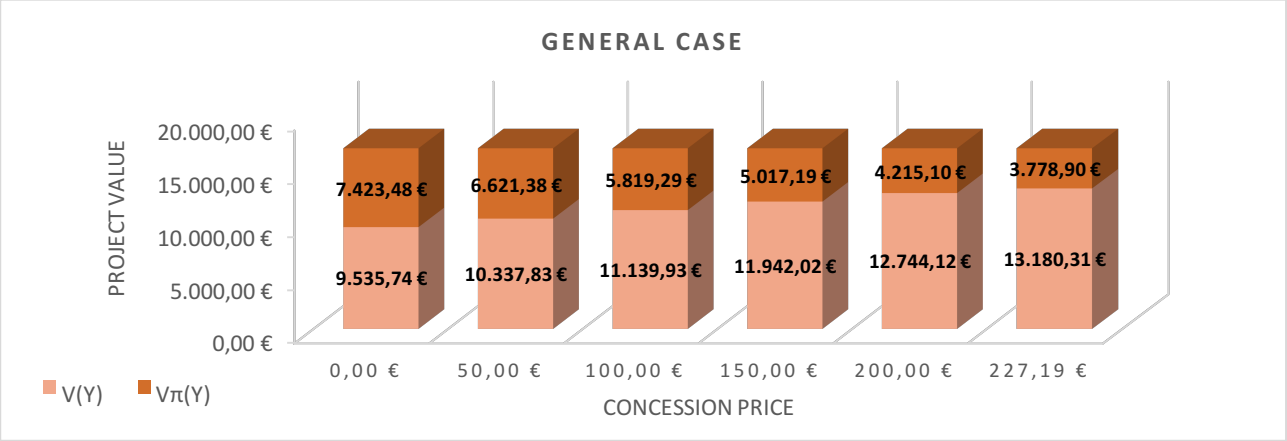
Plot 42



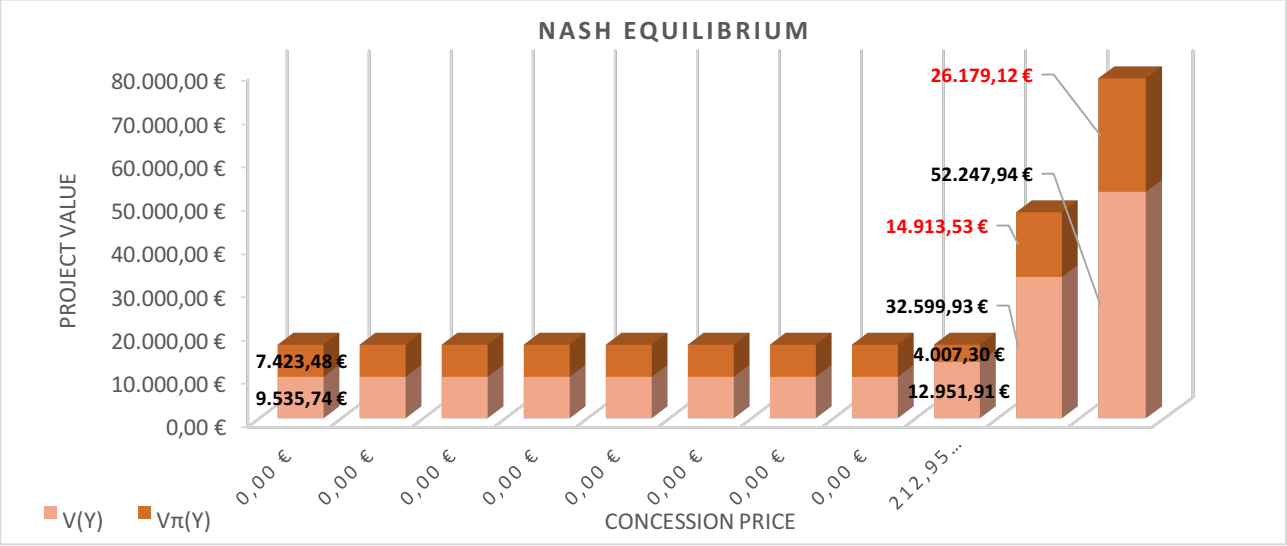


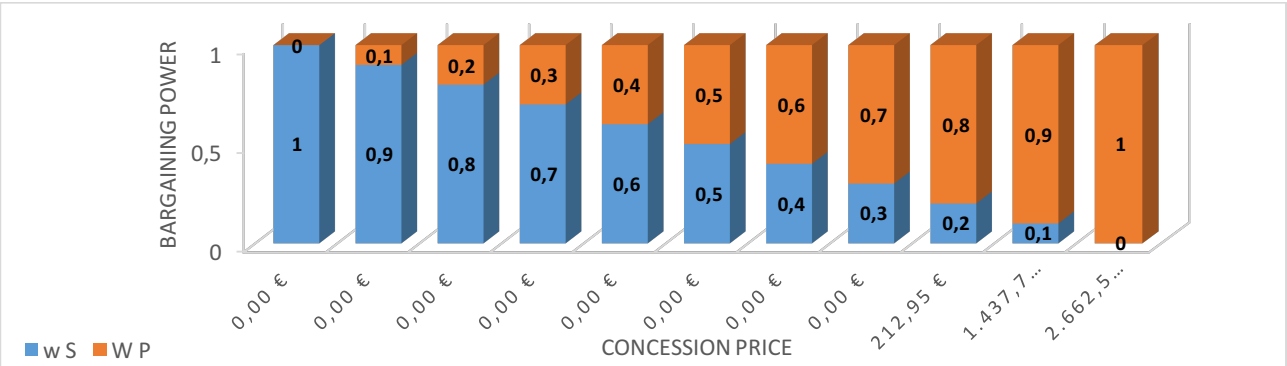
- **Hypothesis 2: investment costs sustained for the 75% by the Private Compnay and for 25% by the State**

Plot 43



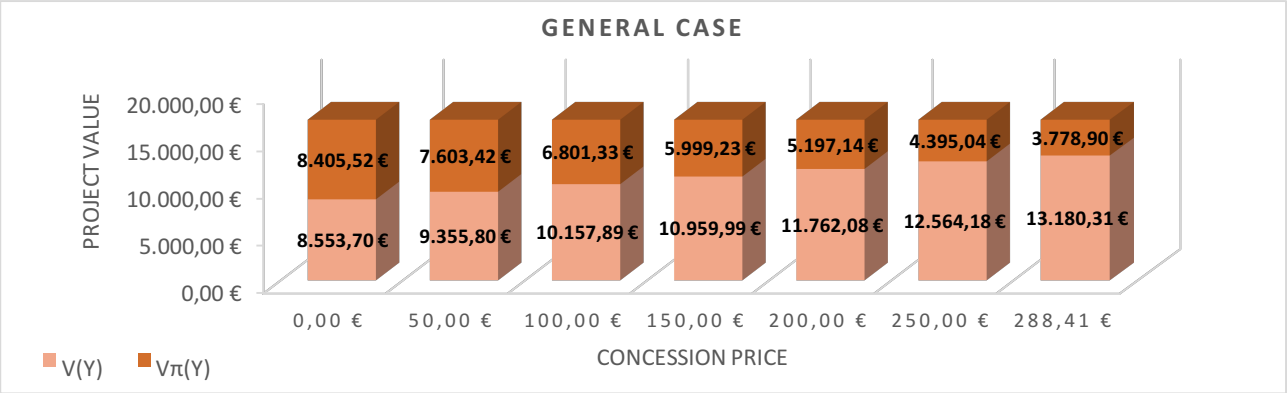
Plot 44



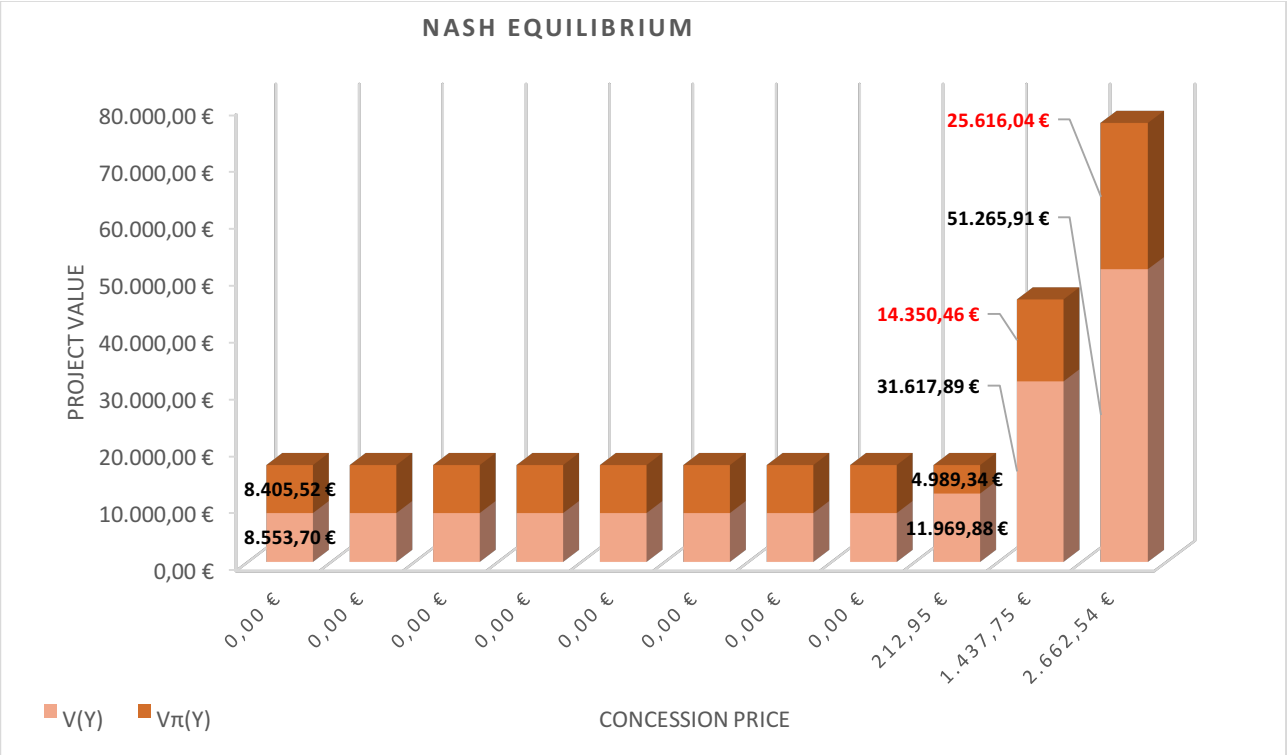


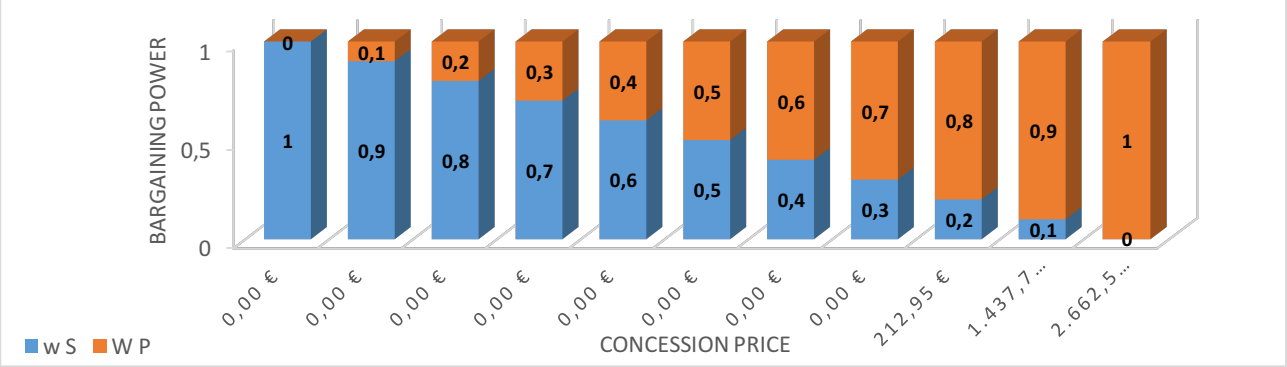
- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Plot 45



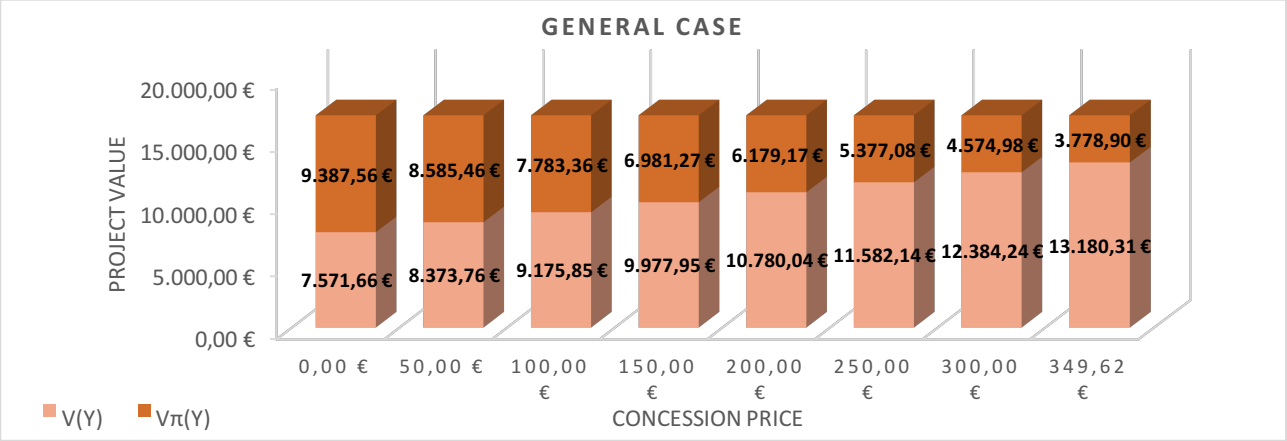
Plot 46



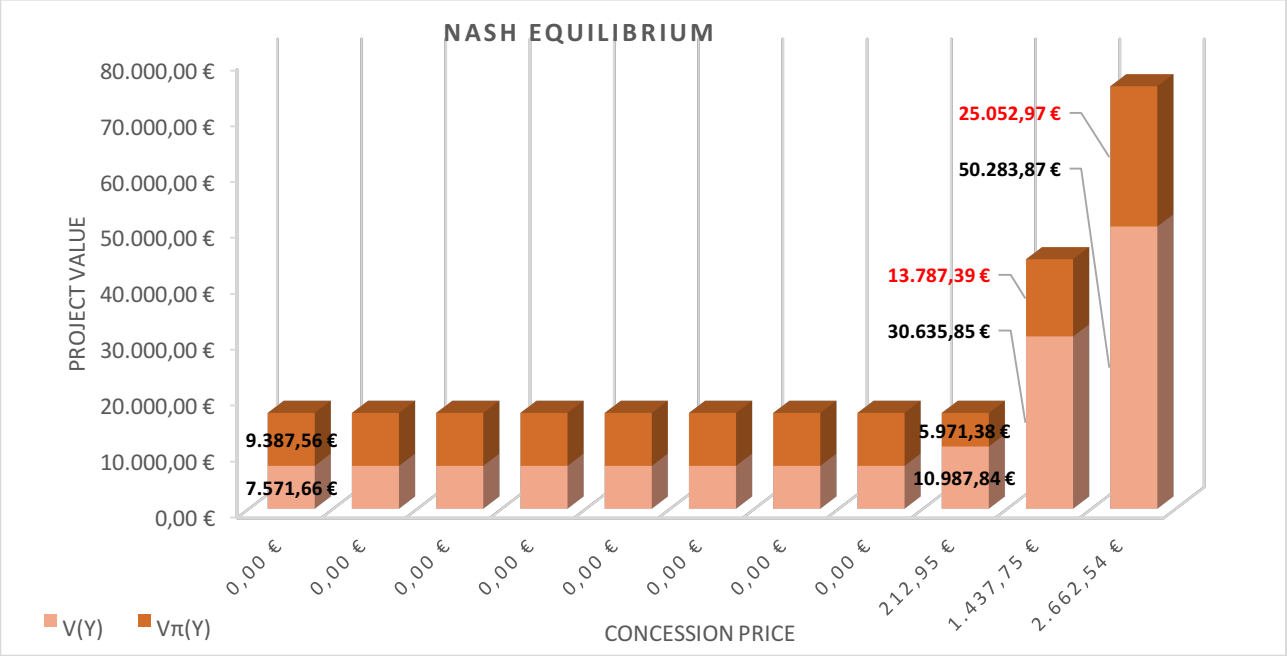


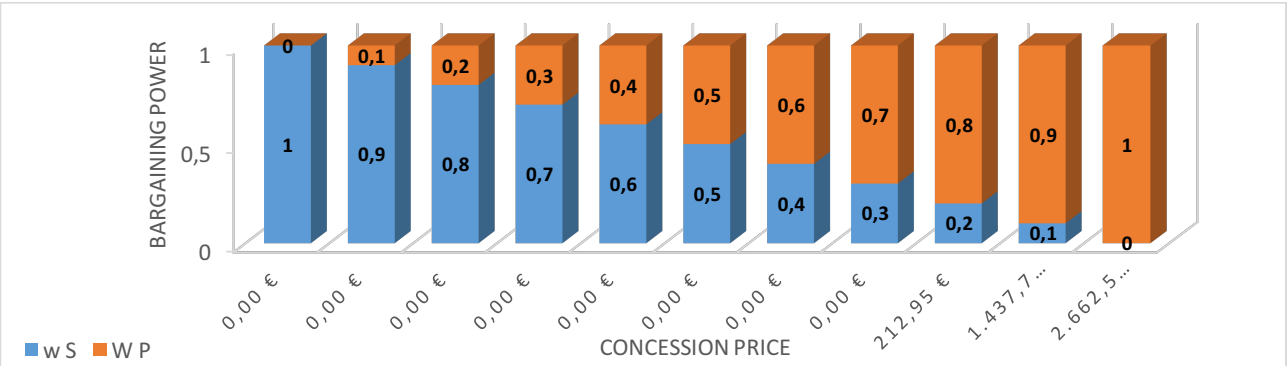
- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Plot 47



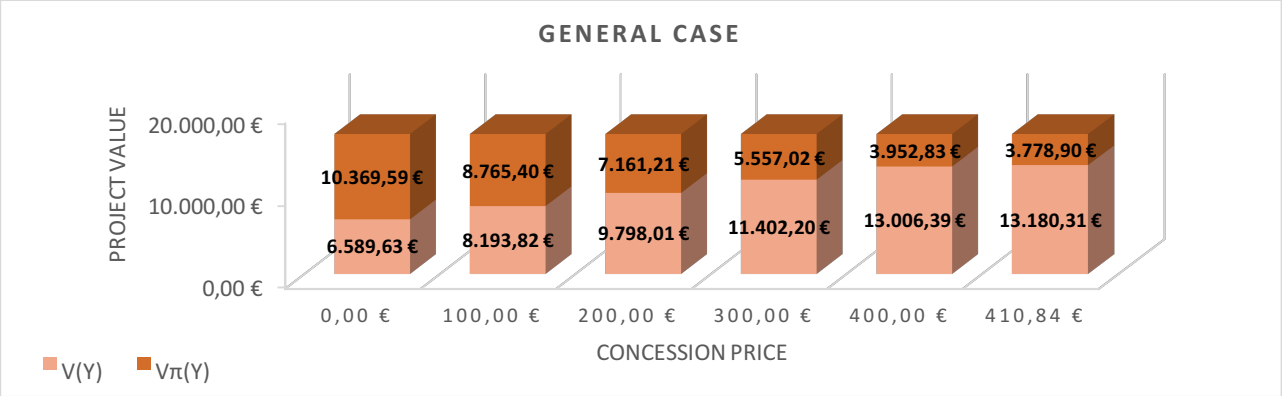
Plot 48



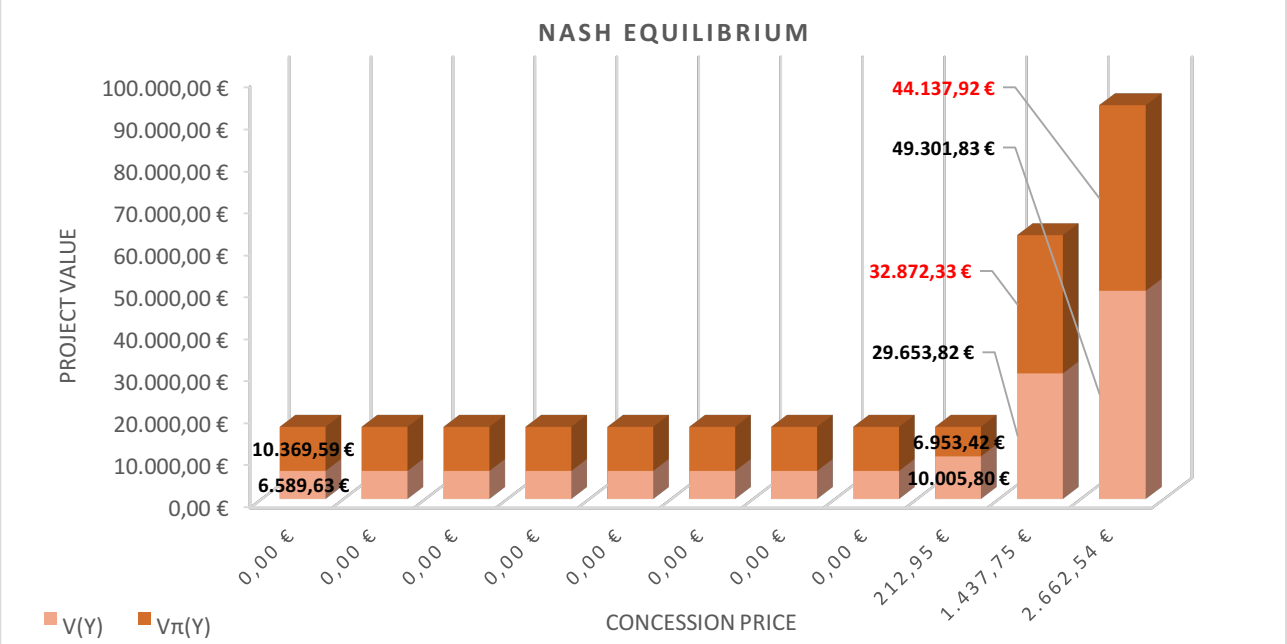


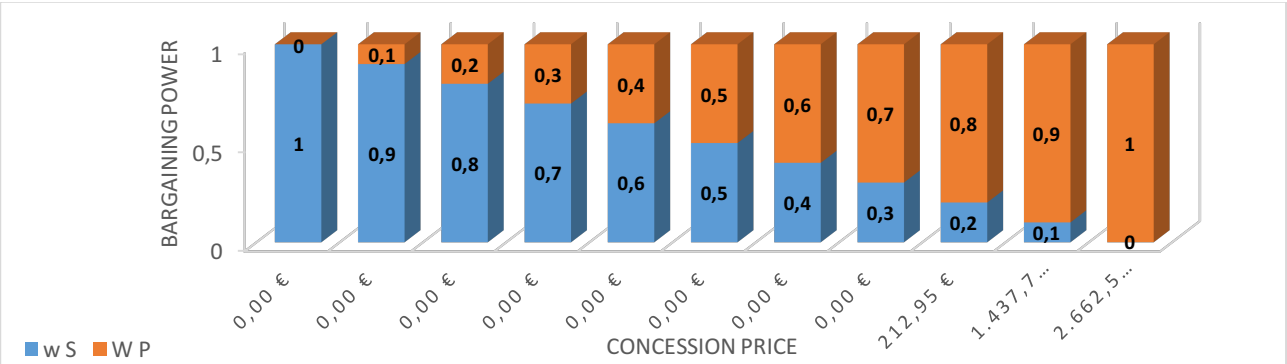
- **Hypothesis 5: investment costs sustained entirely by the State**

Plot 49



Plot 50





- **Results example 3 ($\sigma = 10\%$)**

First case ("general case")

The results in all hypotheses of investment costs distribution are:

- the reduction of the upper bound of the concession prices range and indeed the reduction of the range itself wrt the general case of the basic model; this reduction is due to the fact that the computation of the concession price depends on the cash flows standard deviation which is higher (see equation 3D), in fact if the volatility is higher it is true that the cash flows can be higher but they can also be lower thus the concession price has to be lower because the investment risk is higher;
- the State and the Private Company find optimal to enter in the contract and to invest at the current date for each concession price in the range; this propensity increases for the State and decreases for the Private Company when the concession price increases;

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general model for each hypothesis of costs distribution.

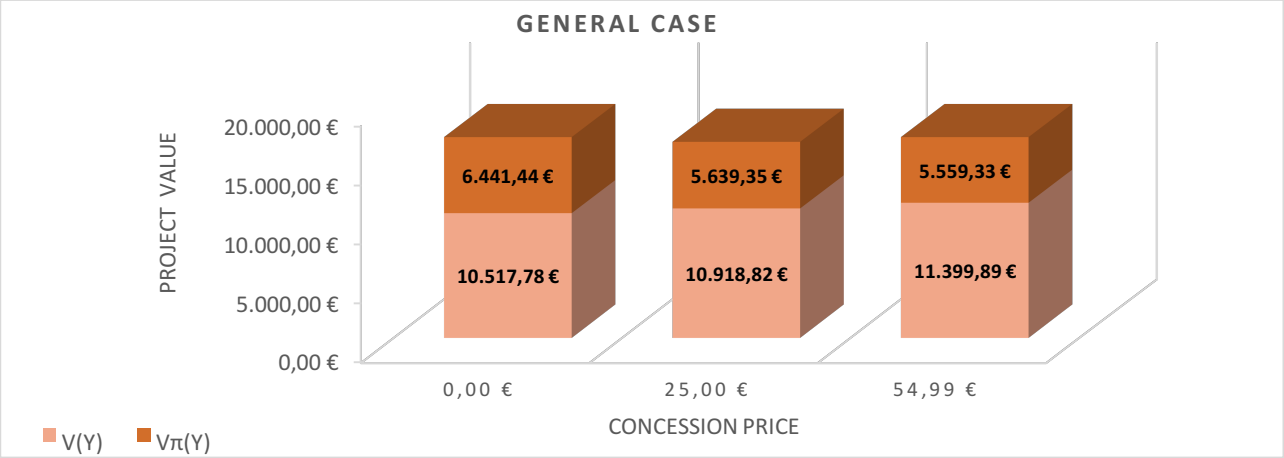
Third case (Nash equilibrium)

The results of the Nash equilibrium in all hypotheses of costs distribution are:

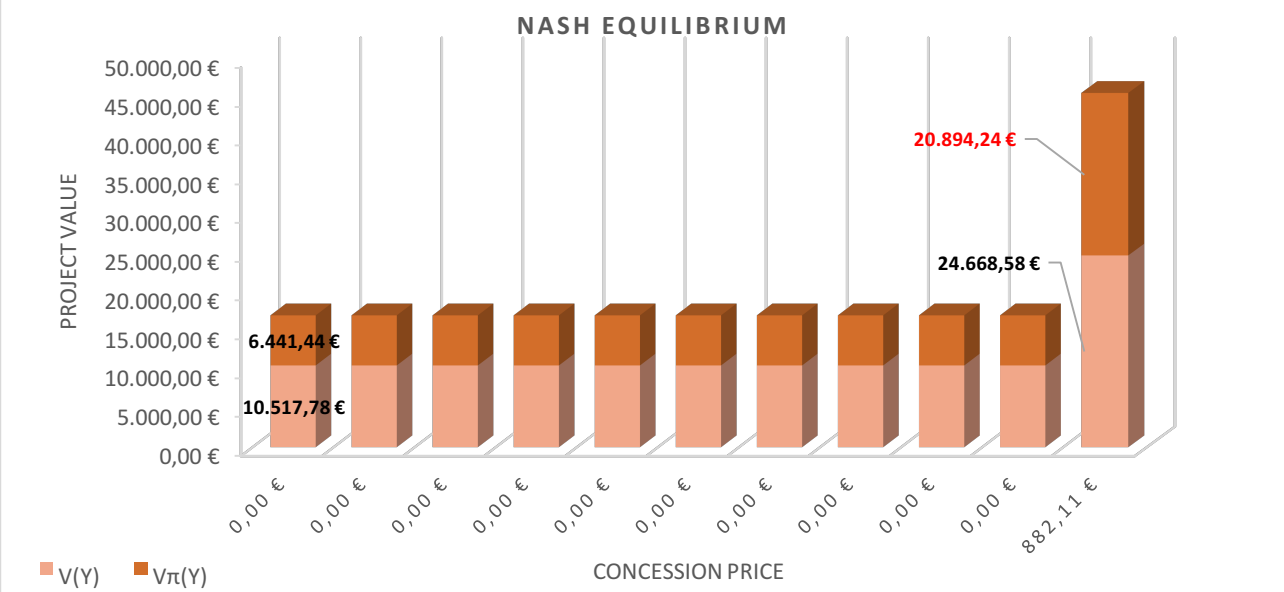
- wrt the Nash equilibrium of the basic model there is the reduction of the Nash equilibrium concession prices caused by a higher volatility (see equation 10);
- when $P^*_R = 0{,}00€$ the Nash equilibrium does not exist and the model collapses to the case of the cooperative equilibrium.
- the State finds optimal to enter in the contract at the current date for each concession price;
- the Private Company,at the current date, finds optimal to enter in the contract at a concession price lower than 1437,95€ (except for the first hypothesis in which it finds optimal to invest at a concession price equal to 0) instead it finds optimal to wait when the concession price is greater or equal to 1437,95€ (except for the first hypothesis in which it finds optimal to wait when the concession price is greater or equal to 212,95€).

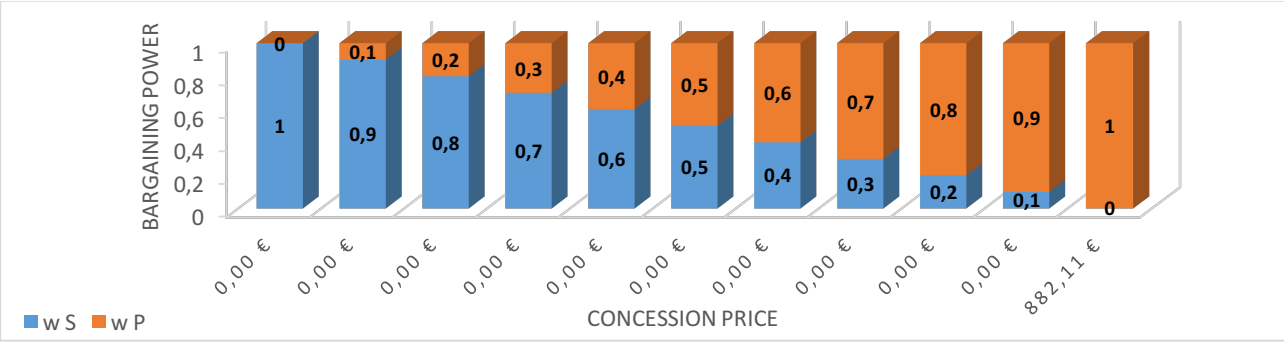
- **<u>Example 4 ($\sigma = 20\%$)</u>**
- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Plot 51



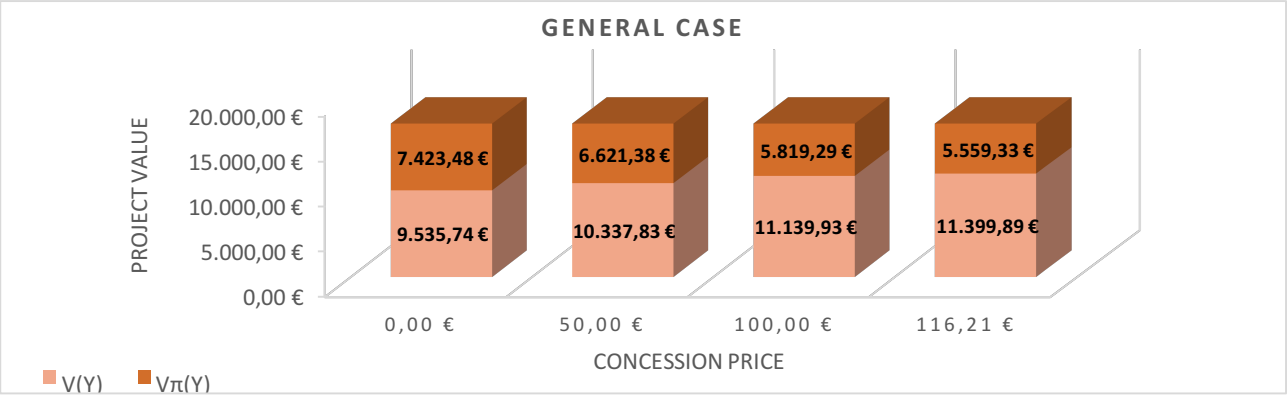
Plot 52



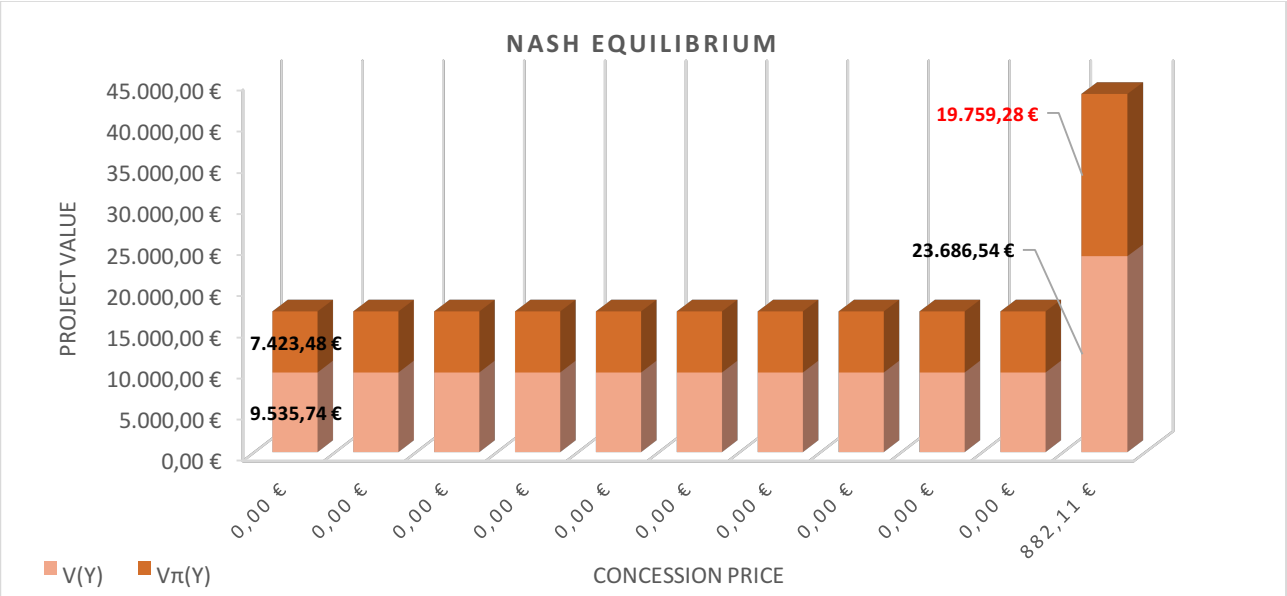


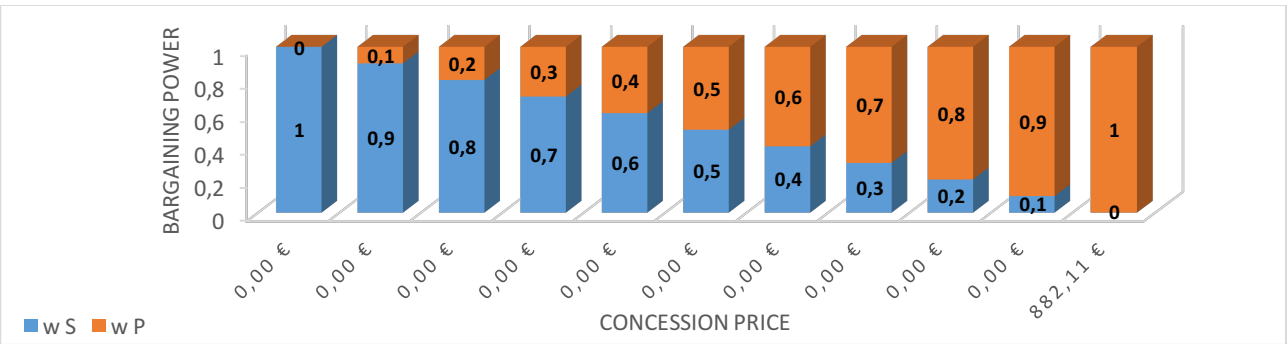
- **Hypothesis 2: investment costs sustained for the 75% by the Private company and for 25% by the State**

Plot 53



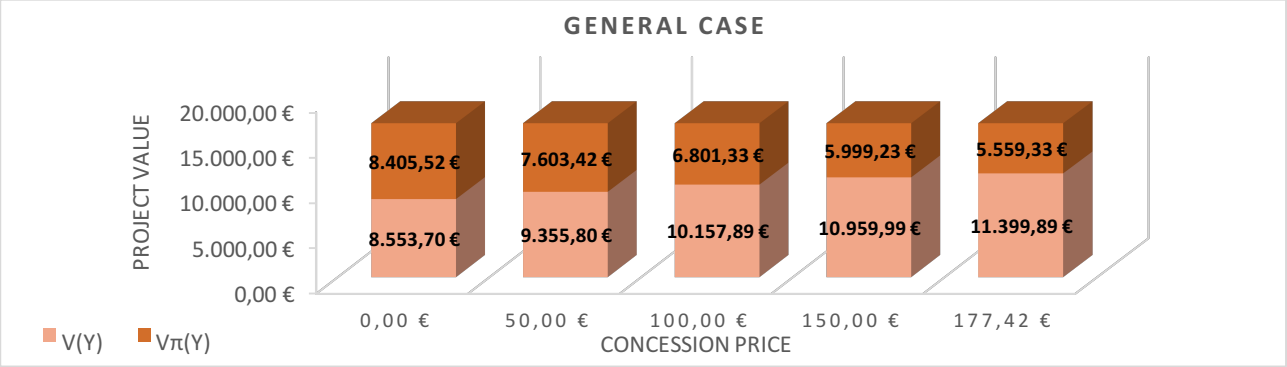
Plot 54



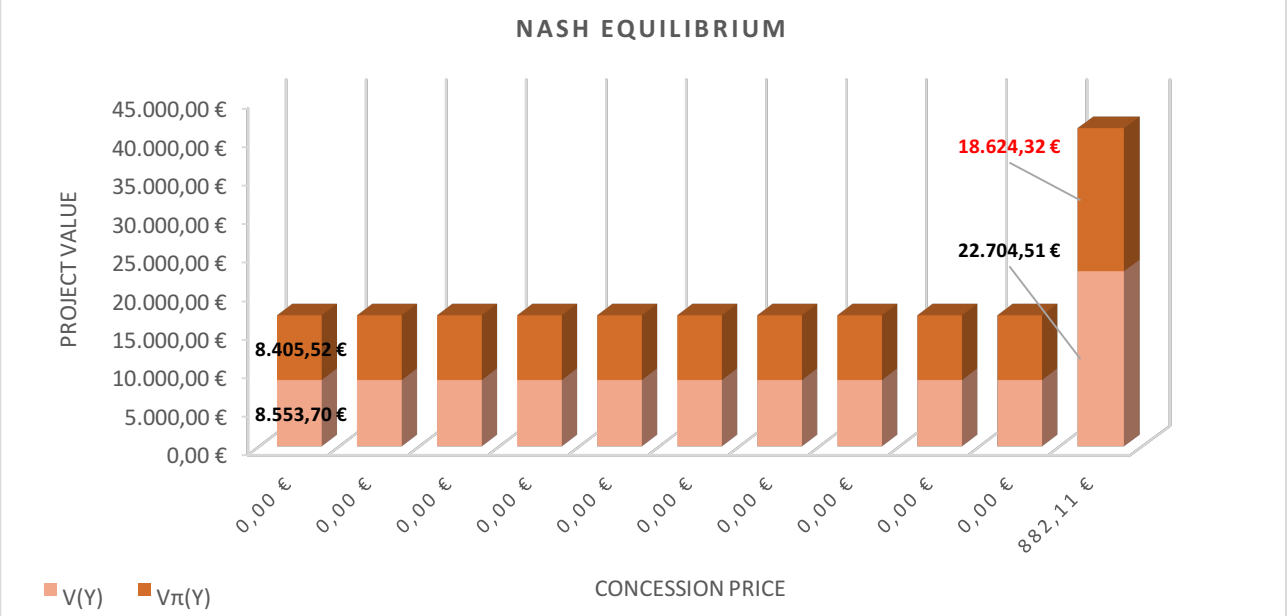


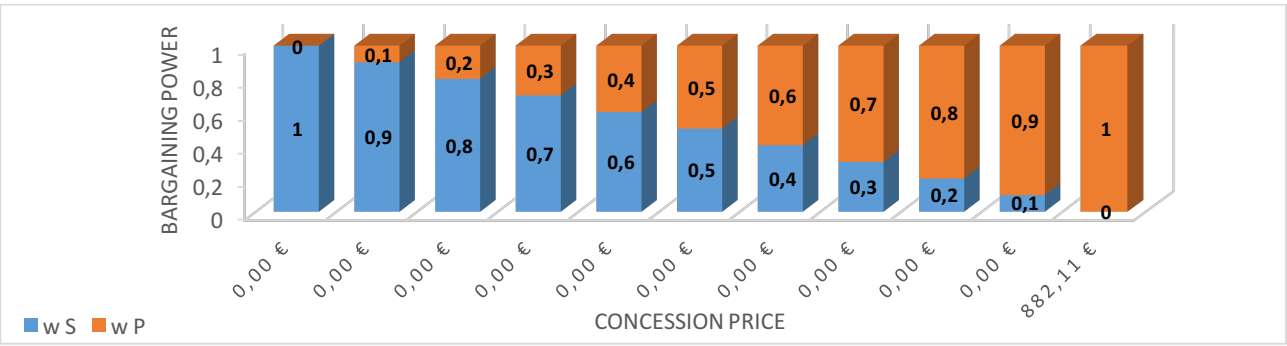
- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Plot 55



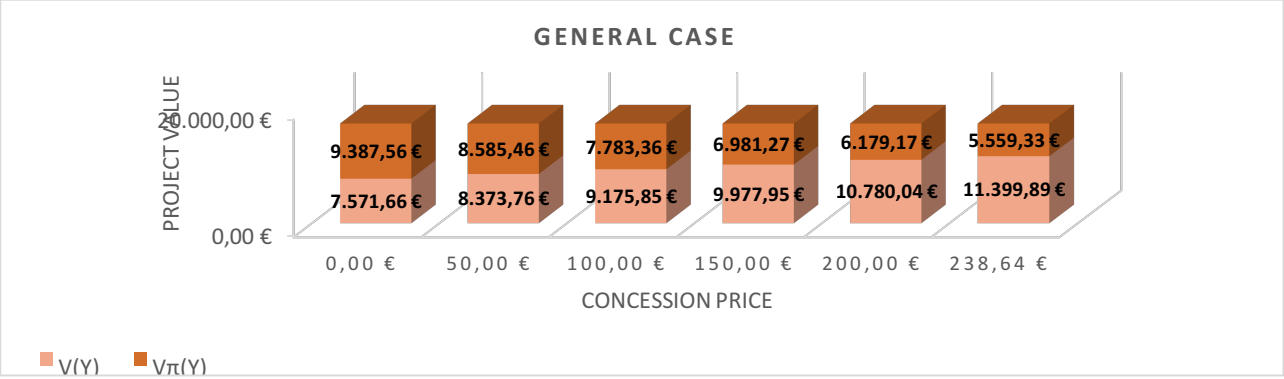
Plot 56



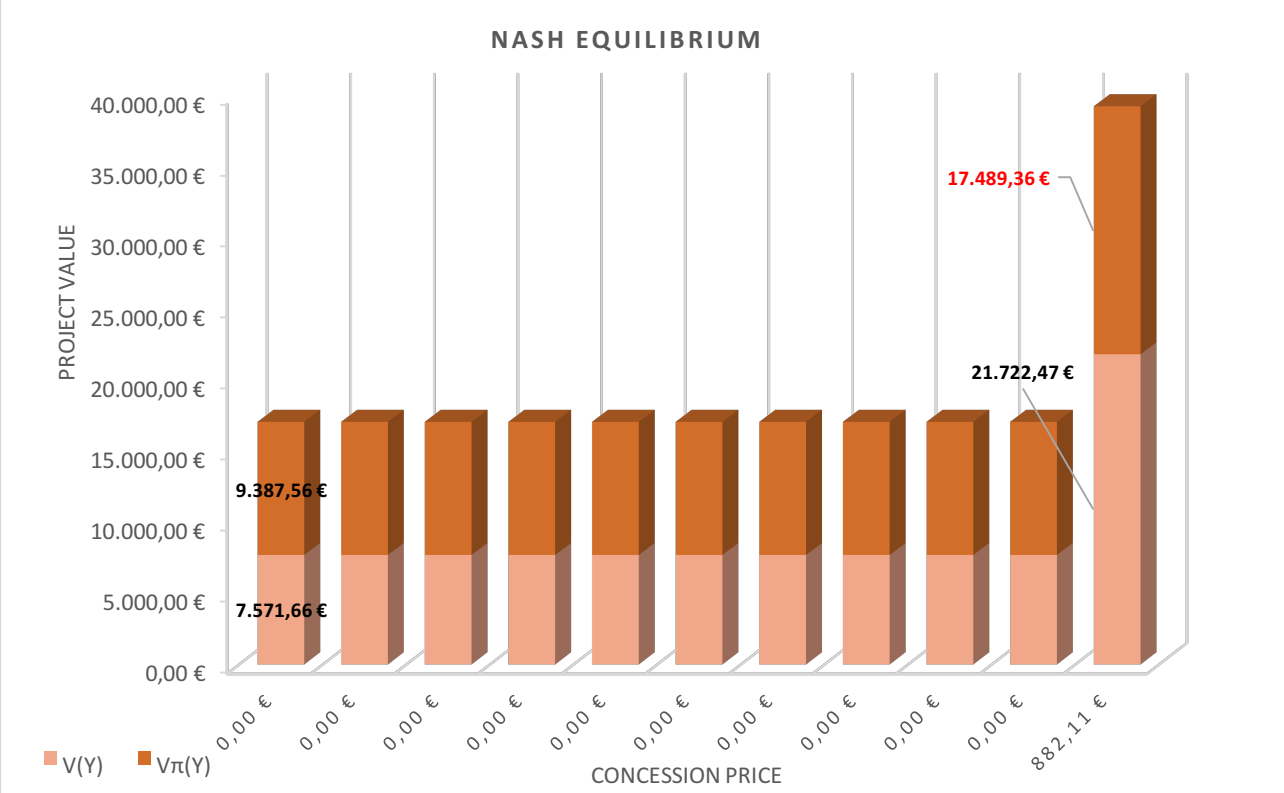


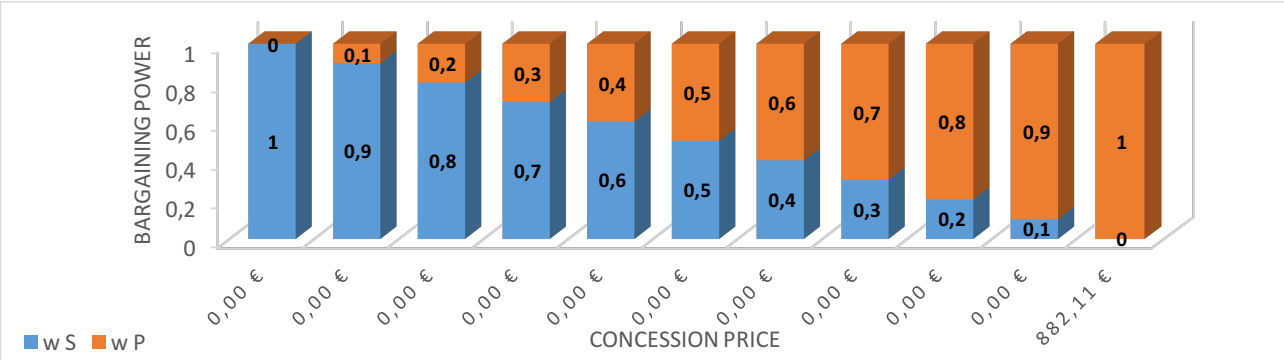
- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Plot 57



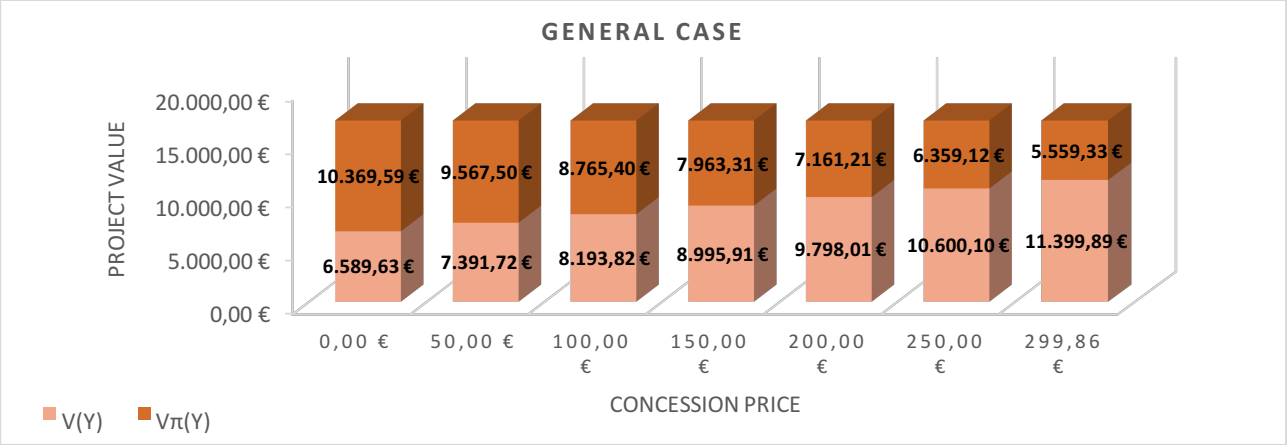
Plot 58



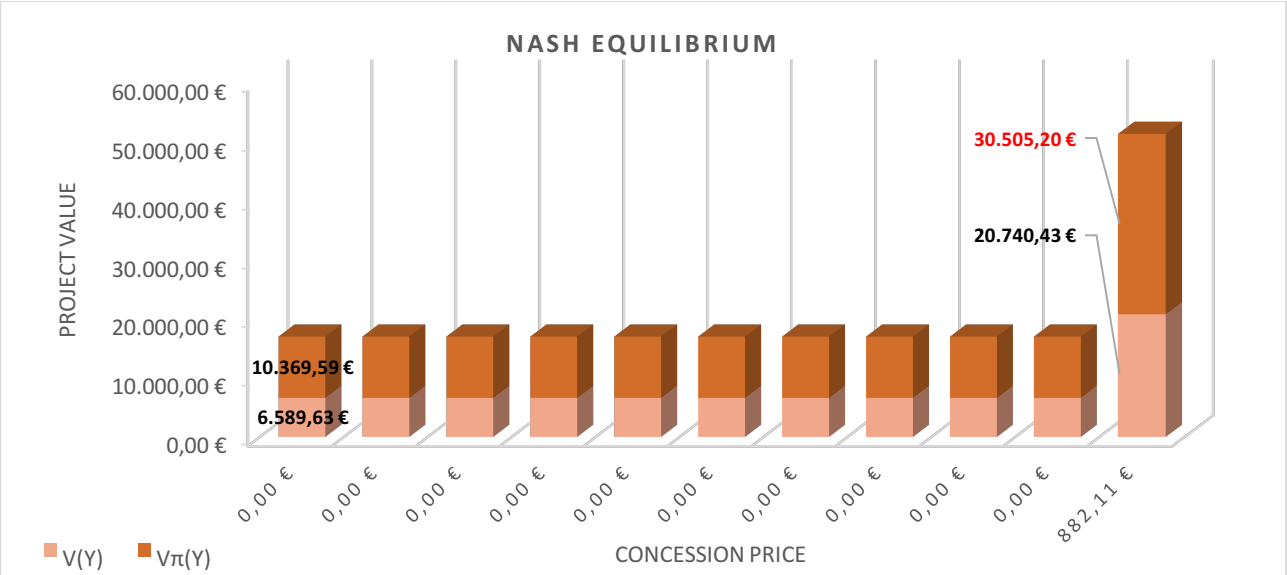


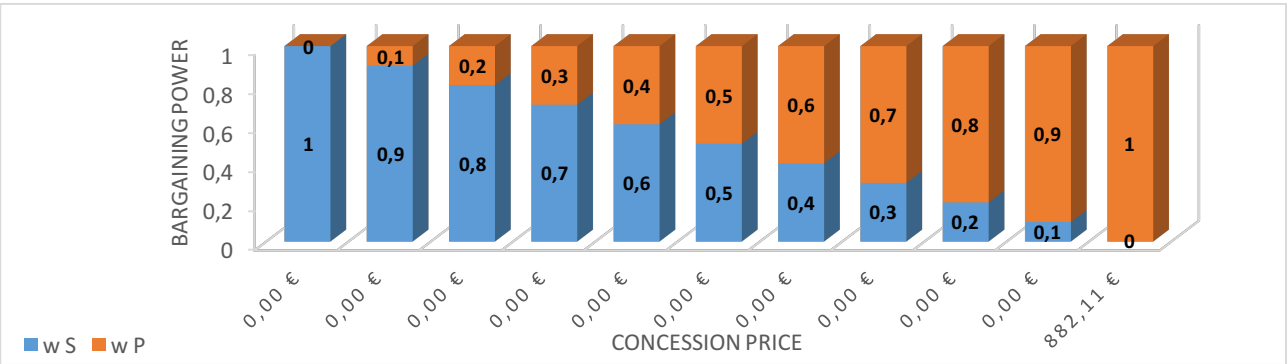
- **Hypothesis 5: investment costs sustained entirely by the State**

Plot 59



Plot 60





- **Results example 4 ($\sigma = 20\%$)**

First case ("general case")

The results in all hypotheses of costs distribution are:

- the further reduction of the upper bound of the concession prices range and indeed the further reduction of the range itself wrt the general case of the basic model; this reduction is due to the fact that the computation of the concession price depends on the cash flows standard deviation which is higher (see equation 3D), in fact if the volatility is higher it is true that the cash flows can be higher but they can also be lower thus the concession price has to be lower because the investment risk is higher;
- the State and the Private Company find optimal to enter in the contract and to invest at the current date for each concession price in the range; this propensity increases for the State and decreases for the Private Company when the concession price increases.

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general model for each hypothesis of costs distribution.

Third case (Nash equilibrium)

The results in all hypotheses of costs distribution are:

- wrt the Nash equilibrium of the basic model there is the reduction of the Nash equilibrium concession prices caused by a higher volatility (see equation 10);
- when $P^*_R = 0{,}00€$ the Nash equilibrium does not exist and the model collapses to the case of the cooperative equilibrium.
- the State finds optimal to enter in the contract at the current date for each concession price;
- the Private Company, ate the current date, finds optimal to enter in the contract at a concession price equal to 0 instead it finds optimal to wait when the concession price is equal to 882,11€.

7.2.2.2 Investment costs increase

The last input on which the comparative static analysis is made is represented by the investment costs.

Since in the major part of the big infrastructures the investment costs differ between the estimation and the realization and in general they increase, I have believed opportune to conjecture an increase of the investment costs of 100% (example 5) and 200% (example 6) considering that the Italian average is around the 170%[39].

The inputs for the example 5 become:

Table 74

α	σ	ρ	δ	T	$y\ avg$	χ	I	β_1	β_2
0,95%	1,00%	5,00%	4,05%	40	523,50 €	-397,96 €	7856,3 €	5,15	-194,16

while for the example 6 become:

Table 75

α	σ	ρ	δ	T	$y\ avg$	χ	I	β_1	β_2
0,95%	1,00%	5,00%	4,05%	40	523,50 €	-397,96 €	11784,45 €	5,15	-194,16

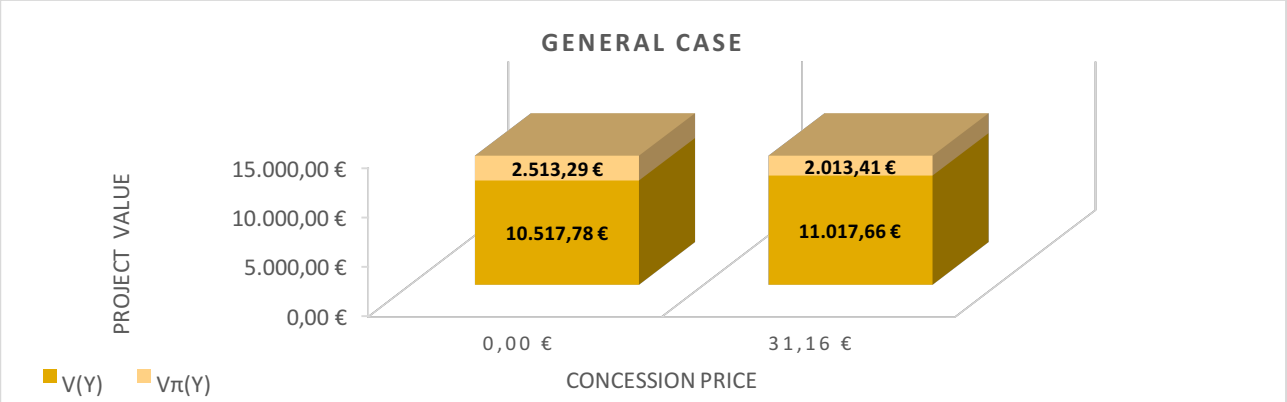
Indeed, I have proceeded as follows:

- as in the basic model, I have reported the plots under the different hypotheses of investment costs distribution;
- after each hypothesis, I have reported a comment to understand how the investment costs increase affects the outputs of the model.

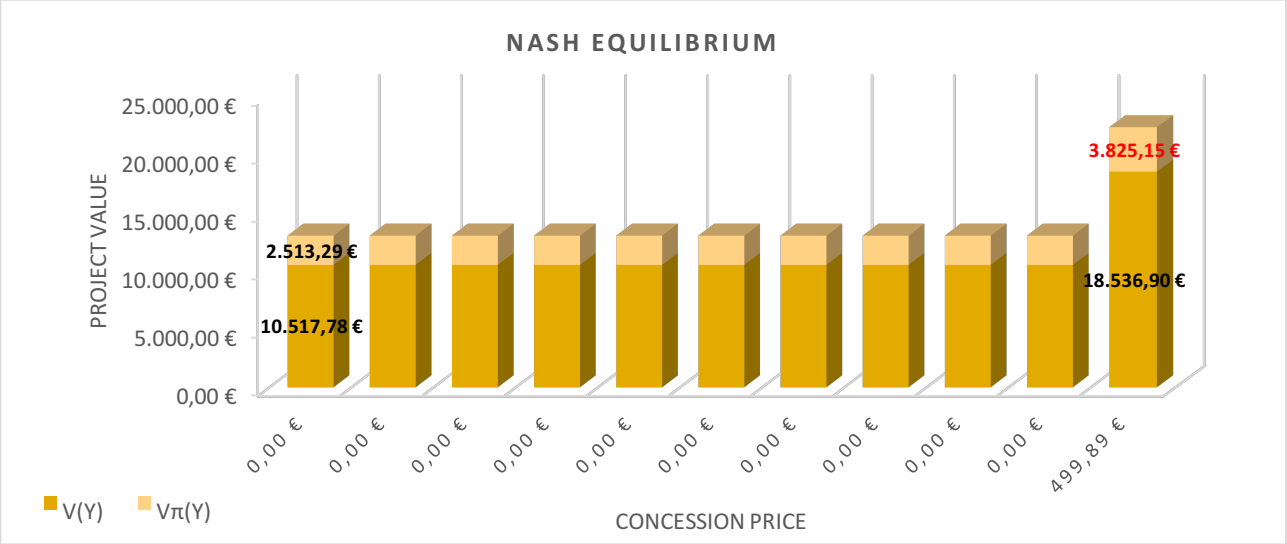
[39] Source CGIA Mestre.

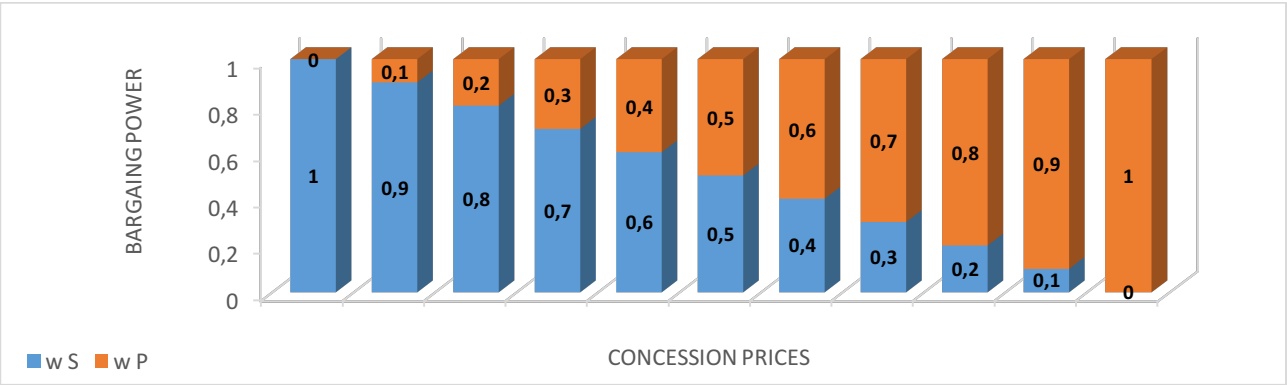
- **<u>Example 5 ($I = 7856,3$ €)</u>**
- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Plot 61



Plot 62





First case ("general case")

It is possible to note:

- the reduction of the upper bound of the concession prices range and indeed the reduction of the range itself wrt the general case of the basic model; this reduction is due to the fact that the Private Company would not invest for high concession prices because it has to pay entirely the investment costs which are doubled;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because the State gains more money from the concession;
- the Private Company finds optimal to invest at the current date for each concession price and this propensity decreases when the concession price increases because the Private has to spend more money for the concession.

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general model.

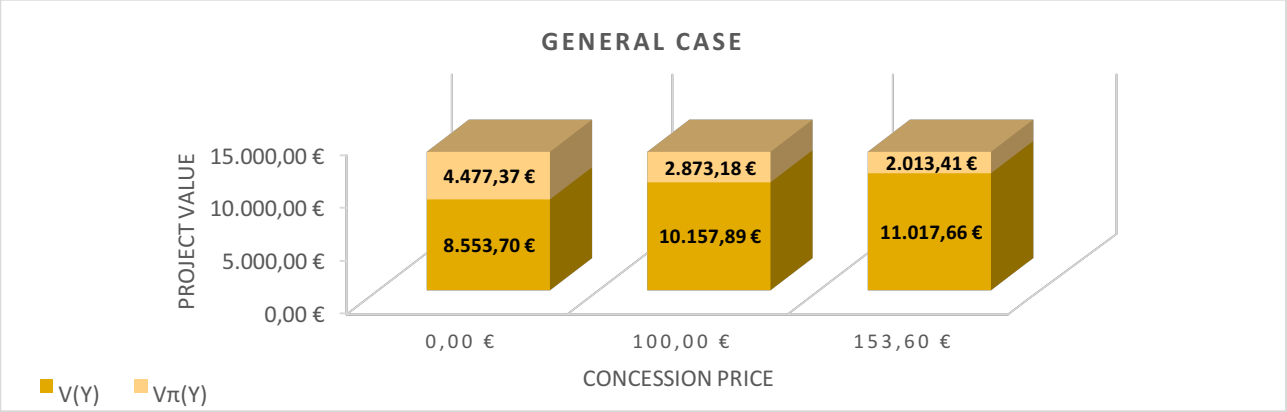
Third case (Nash equilibrium)

It is possible to note that:

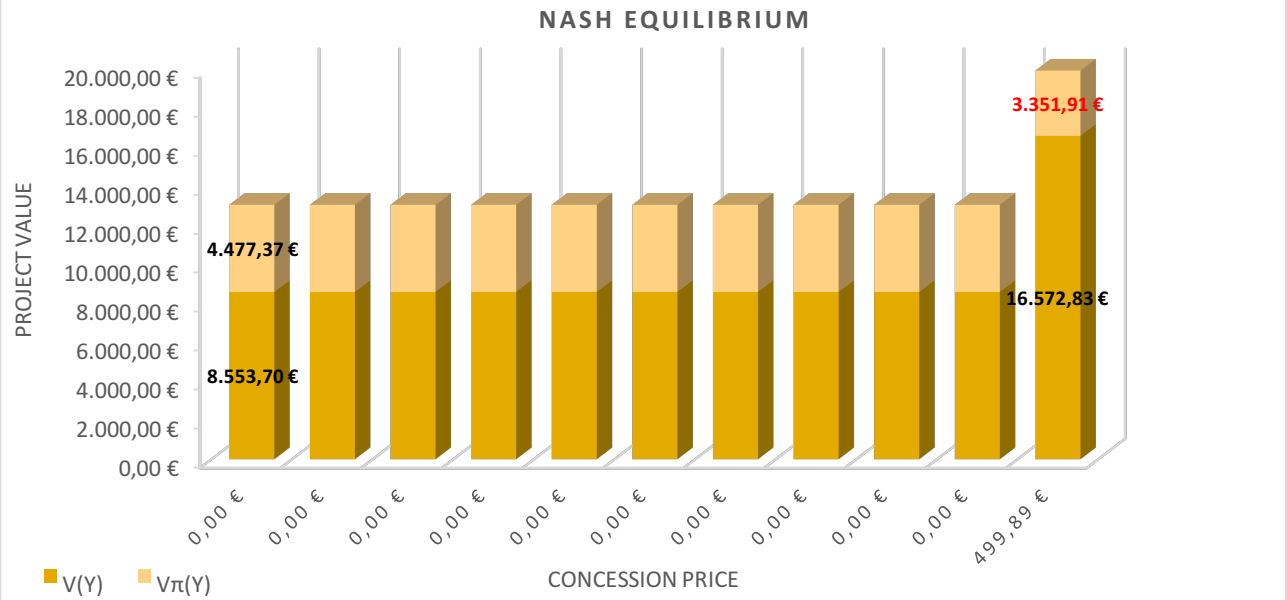
- the major part of Nash equilibrium concession prices is equal to 0 thus they tend to be cooperative concession prices;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because the State gains more money from the concession;
- the Private Company finds optimal to invest at the current date only when the concession price is lower than 499,89€ otherwise it finds optimal to wait.

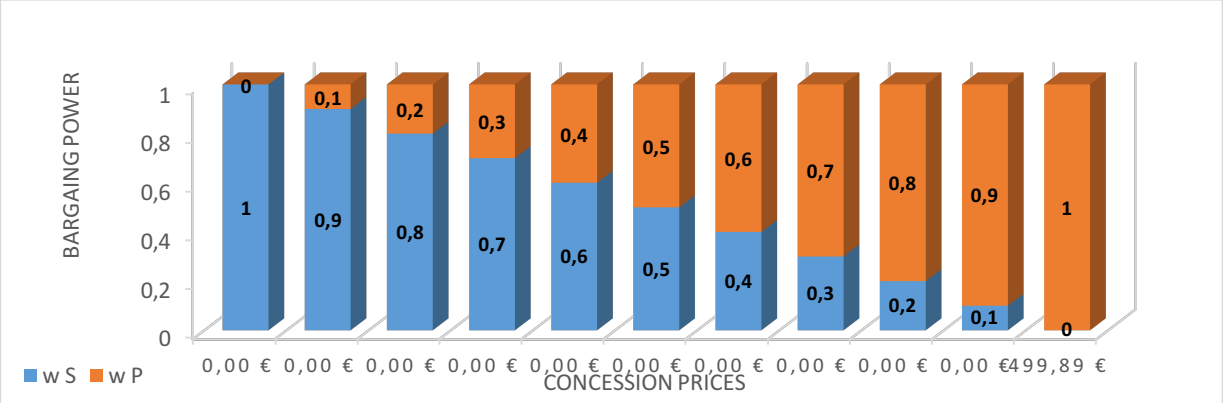
- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Plot 63



Plot 64





First case (“general case”)

It is possible to note:

- the increase of the upper bound of the concession prices range and indeed concession price range increase wrt the general case of the hypothesis 1; this is due to the fact that the Private Company could spend more money to obtain the concession because it has to spend less for the investment costs which are also sustained by the State;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because the State gains more money from the concession;
- the Private Company finds optimal to invest at the current date for each concession price and this propensity decreases when the concession price increases because the Private has to spend more money for the concession.

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general model.

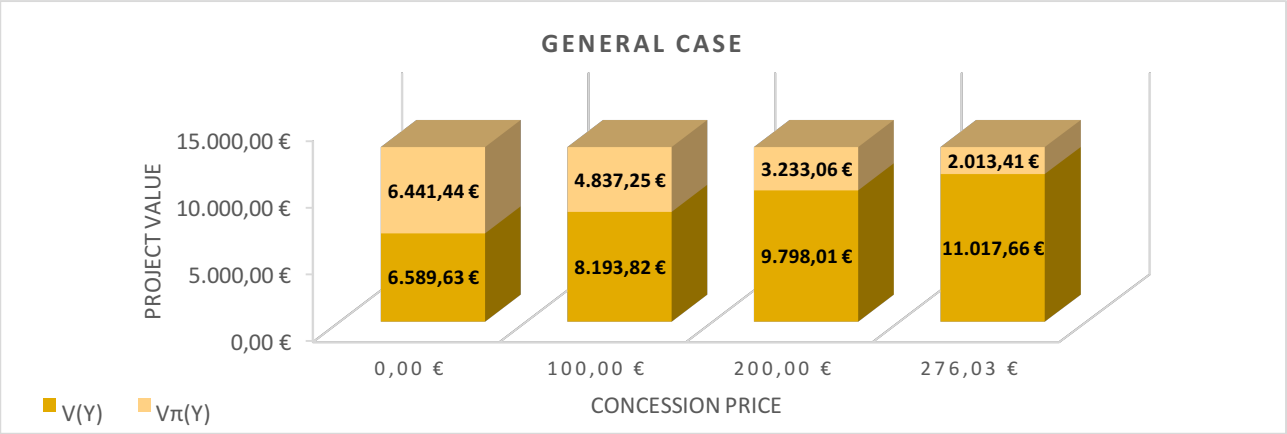
Third case (the Nash equilibrium)

It is possible to note that:

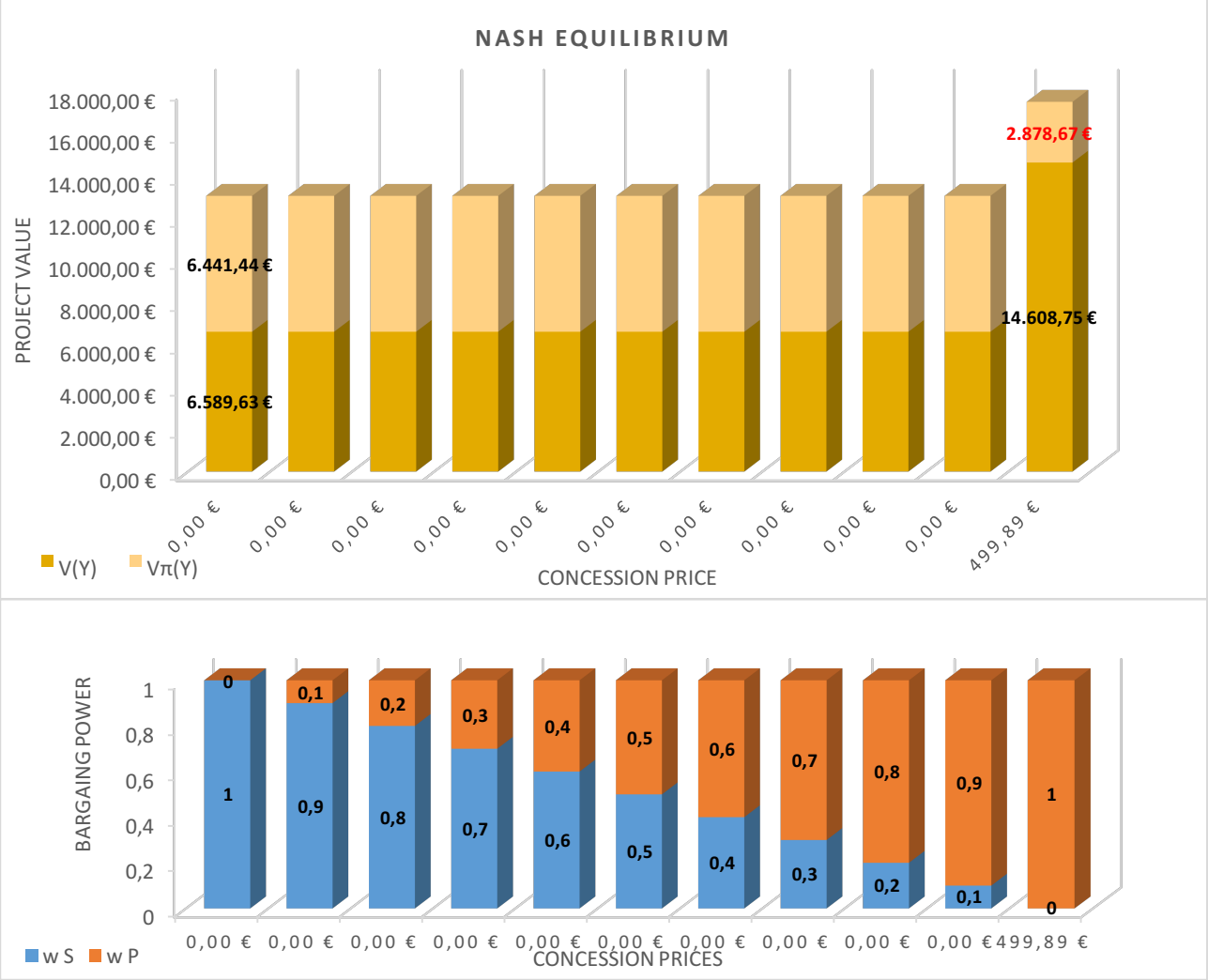
- the major part of Nash equilibrium concession prices is equal to 0 thus they tend to be cooperative concession prices;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because the State gains more money from the concession;
- the Private Company finds optimal to invest at the current date only when the concession price is lower than 499,89€ otherwise it finds optimal to wait.

- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Plot 65



Plot 66



First case ("general case")

It is possible to note:

- the increase of the upper bound of the concession prices range and indeed concession price range increase wrt the general case of the hypothesis 1 and 2; this is due to the fact that the Private Company could spend more money to obtain the concession because it has to spend less for the investment costs which are also sustained by the State;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because the State gains more money from the concession;
- the Private Company finds optimal to invest at the current date for each concession price and this propensity decreases when the concession price increases because the Private has to spend more money for the concession.

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general model.

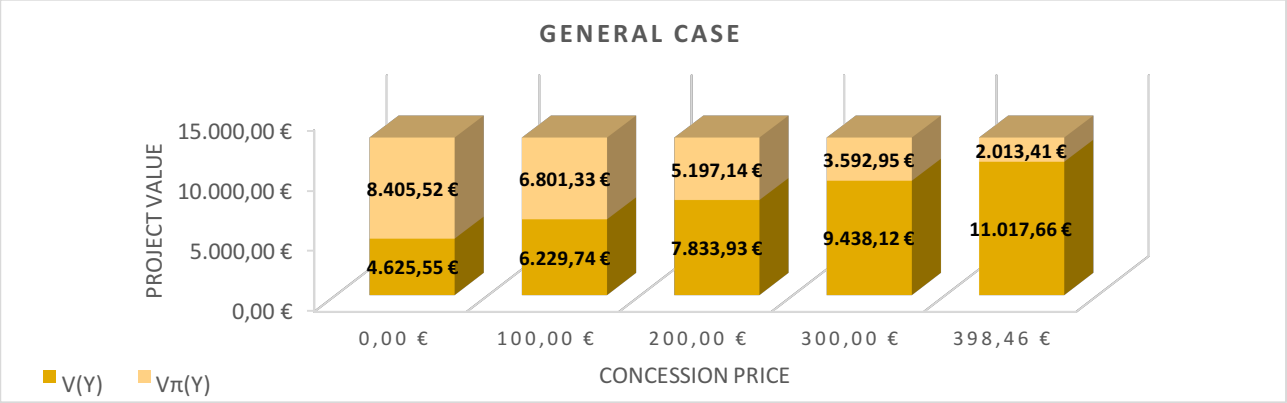
Third case (the Nash equilibrium)

It is possible to note that:

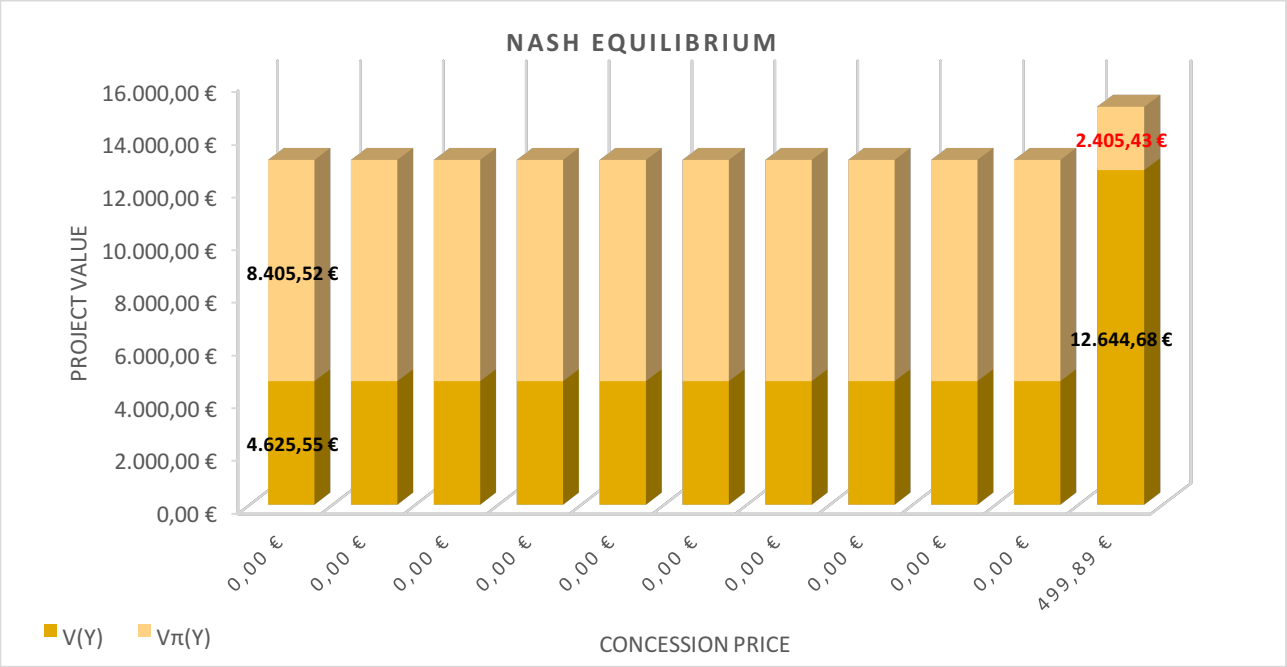
- the major part of Nash equilibrium concession prices are equal to 0 thus they tend to be cooperative concession prices;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because the State gains more money from the concession;
- the Private Company finds optimal to invest at the current date only when the concession price is lower than 499,89€ otherwise it finds optimal to wait.

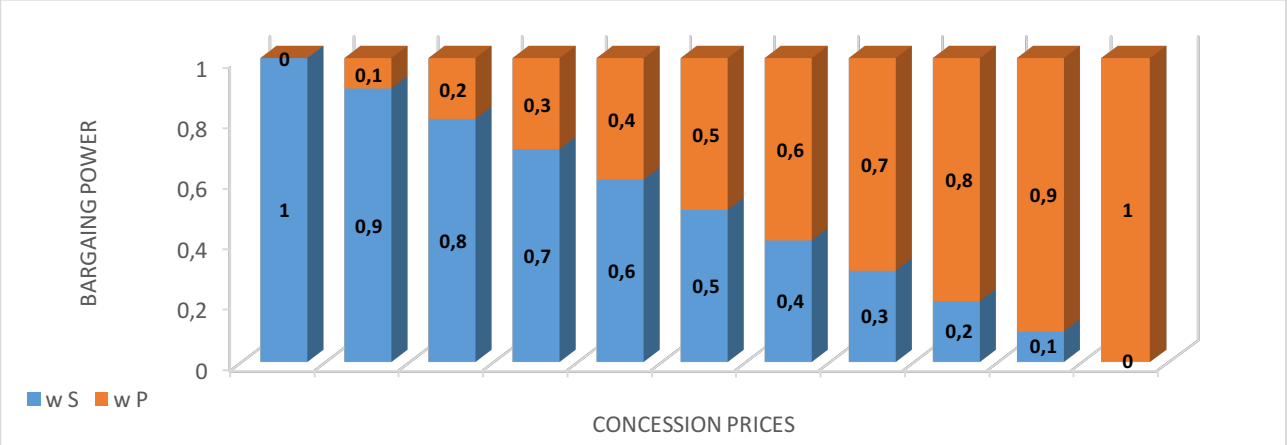
- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Plot 67



Plot 68





First case (“general case”)

It is possible to note:

- the increase of the upper bound of the concession prices range and indeed concession price range increase wrt the general case of the hypothesis 1, 2 and 3; this is due to the fact that the Private Company could spend more money to obtain the concession because it has to spend less for the investment costs which are also sustained by the State;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because the State gains more money from the concession;
- the Private Company finds optimal to invest at the current date for each concession price and this propensity decreases when the concession price increases because the Private has to spend more money for the concession.

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general model.

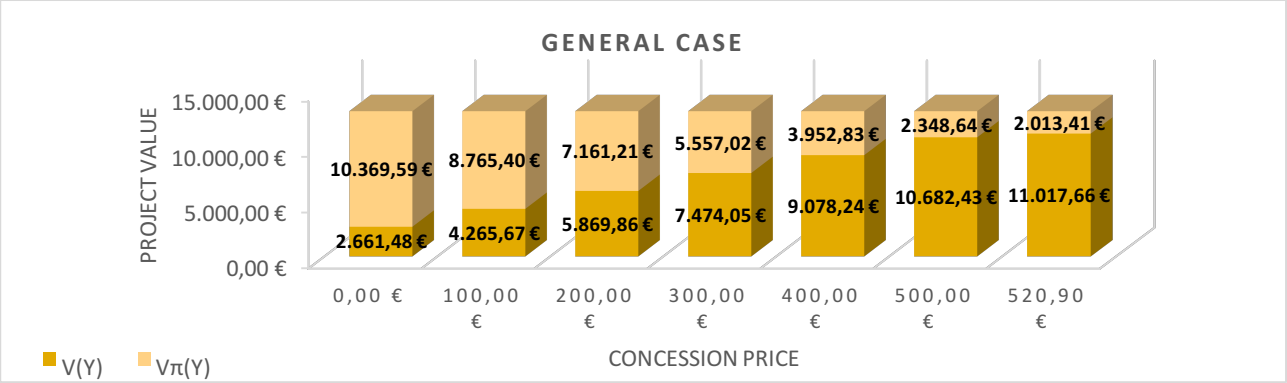
Third case (the Nash equilibrium)

It is possible to note that:

- the major part of Nash equilibrium concession prices are equal to 0 thus they tend to be cooperative concession prices;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because the State gains more money from the concession;
- the Private Company finds optimal to invest at the current date only when the concession price is lower than 499,89€ otherwise it finds optimal to wait.

- **Hypothesis 5: investment costs sustained entirely by the State**

Plot 69



Plot 70

First case (“general case”)

It is possible to note that:

- in this hypothesis of investment costs distribution, the upper bound of the concession price range and so the range itself reaches its maximum since the investments costs are entirely sustained by the State thus the Private company could spend more money to obtain the concession;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because the State gains more money from the concession;
- the Private Company finds optimal to invest at the current date for each concession price and this propensity decreases when the concession price increases;

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general model.

Third case (the Nash equilibrium)

It is possible to note that:

- the major part of Nash equilibrium concession prices is equal to 0 thus they tend to be cooperative concession prices;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession prices increases.
- the Private Company finds optimal to invest at the current date for each concession price even if this propensity decreases when the concession price increases.

A summary is made to allow to synthetize the results of the example 5.

- In the general case:

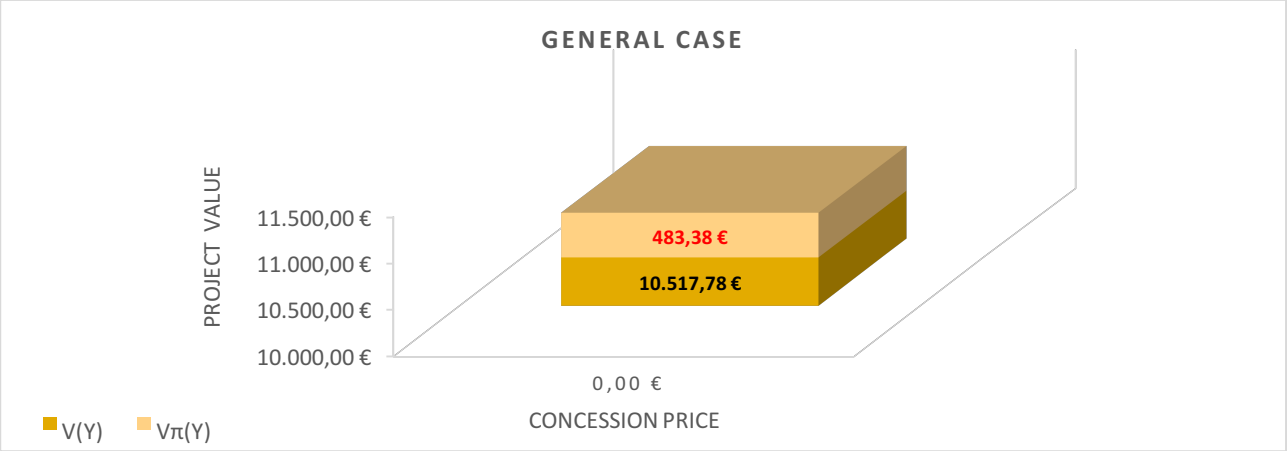
  - the concession price range increases from hypothesis 1 to hypothesis 5 as result of the major propensity of the Private Company to spend more money to obtain the concession when the State assumes a percentage of investment costs;
  - the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because it gains more money;
  - the Private finds optimal to enter in the contract at the current date for each concession price and this propensity decreases when the concession price increases because it has to spend more money for the concession;

- in the Nash equilibrium:

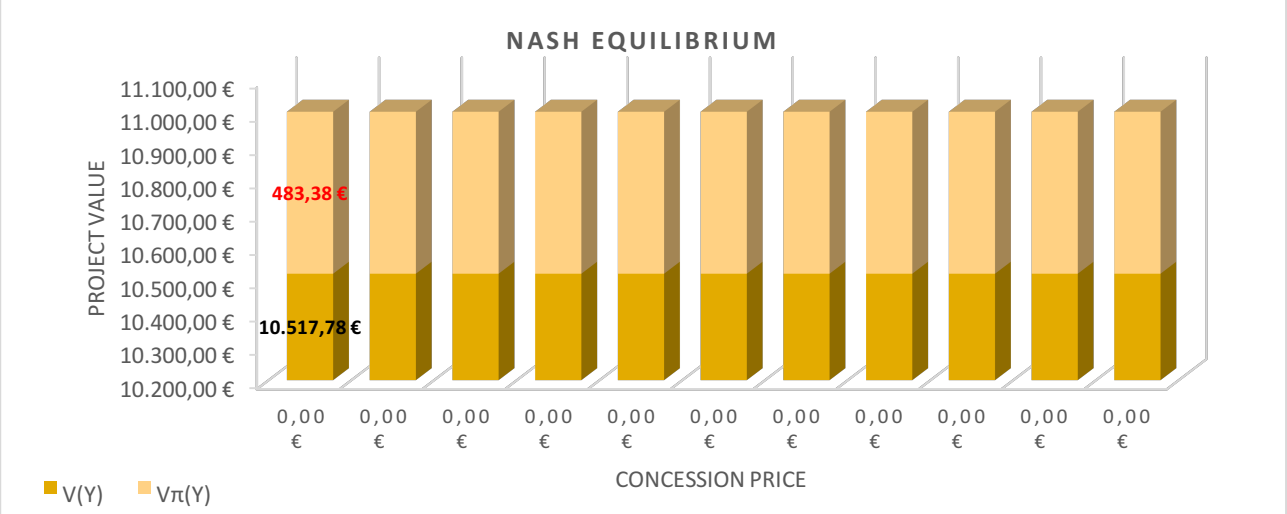
  - the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases because it gains more money;
  - the Private Company finds optimal to enter in the contract at the current date when the concession price is equal to 0 otherwise if it is equal to 499,89€ it finds optimal to wait; this is valid for all hypotheses of costs distribution except for the hypothesis 5 where it finds optimal invest for each concession price since the investment costs are entirely sustained by the State.

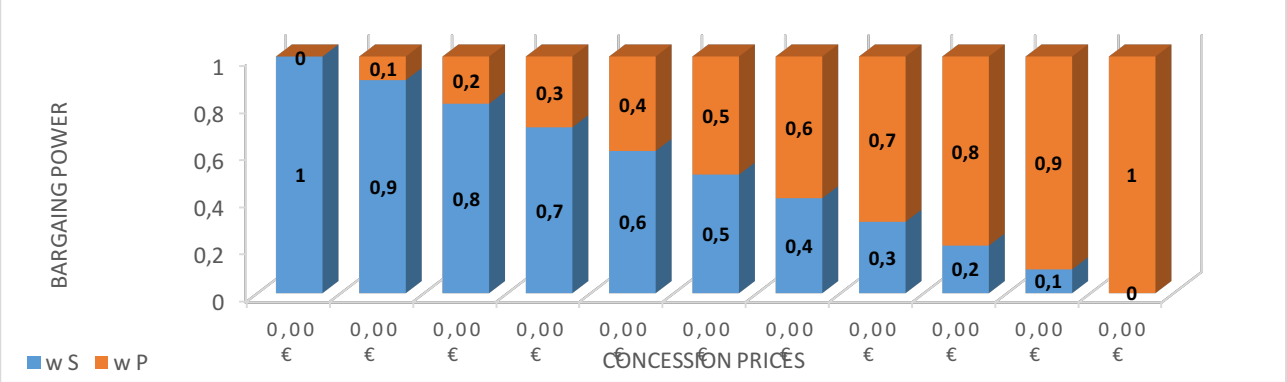
- **<u>Example 6 ($I = 11784,45$ €)</u>**
- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Plot 71



Plot 72





First case (“general case”)

It is possible to note that:

- the concession price range does not exist because the minimum acceptable price by the State coincides with the maximum affordable price by the Private Company;
- the State finds optimal to enter in the contract at the current date;
- the Private Company finds optimal to wait at the current date.

Second case (cooperative equilibrium)

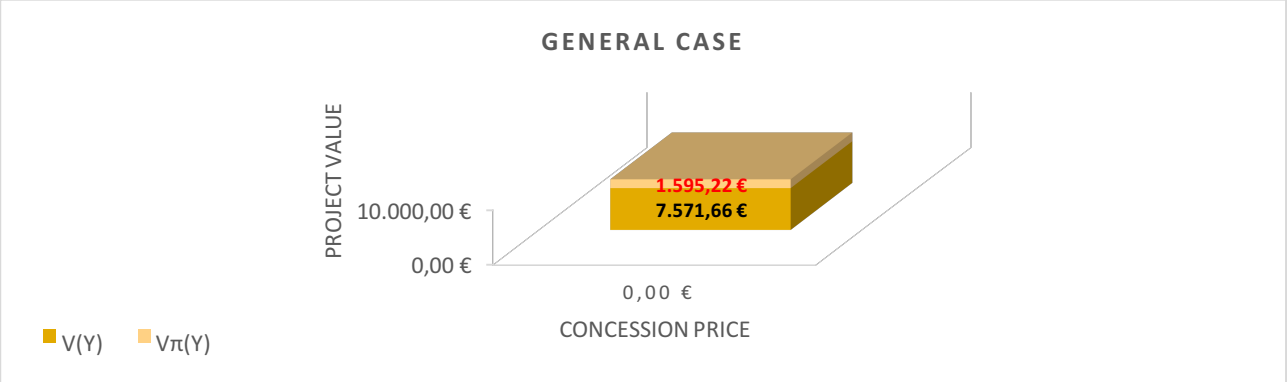
The cooperative price coincides with price of the general model.

Third case (the Nash equilibrium)

The Nash equilibrium coincides with the cooperative equilibrium.

- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Plot 73



Plot 74

First case (“general case”)

It is possible to note that:

- the concession price range does not exist because the minimum acceptable price by the State coincides with the maximum affordable price by the Private Company;
- the State finds optimal to enter in the contract at the current date;
- the Private Company finds optimal to wait at the current date.

Second case (cooperative equilibrium)

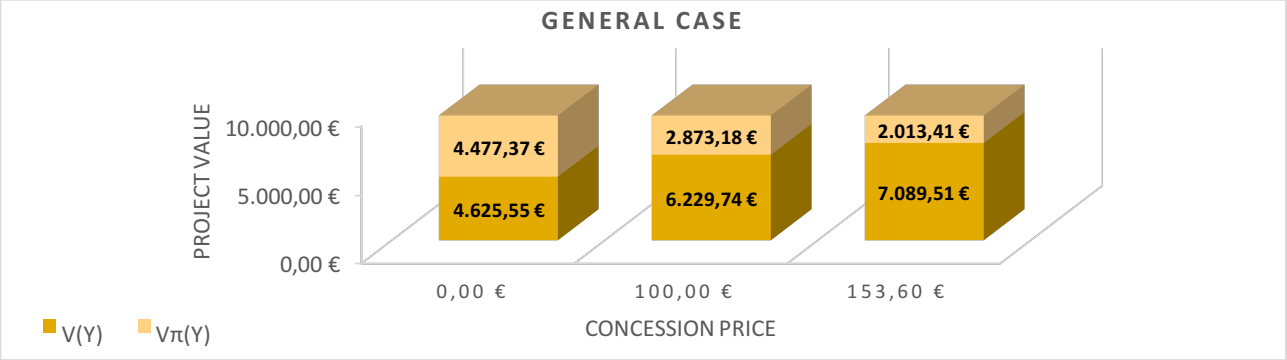
The cooperative price coincides with price of the general model.

Third case (the Nash equilibrium)

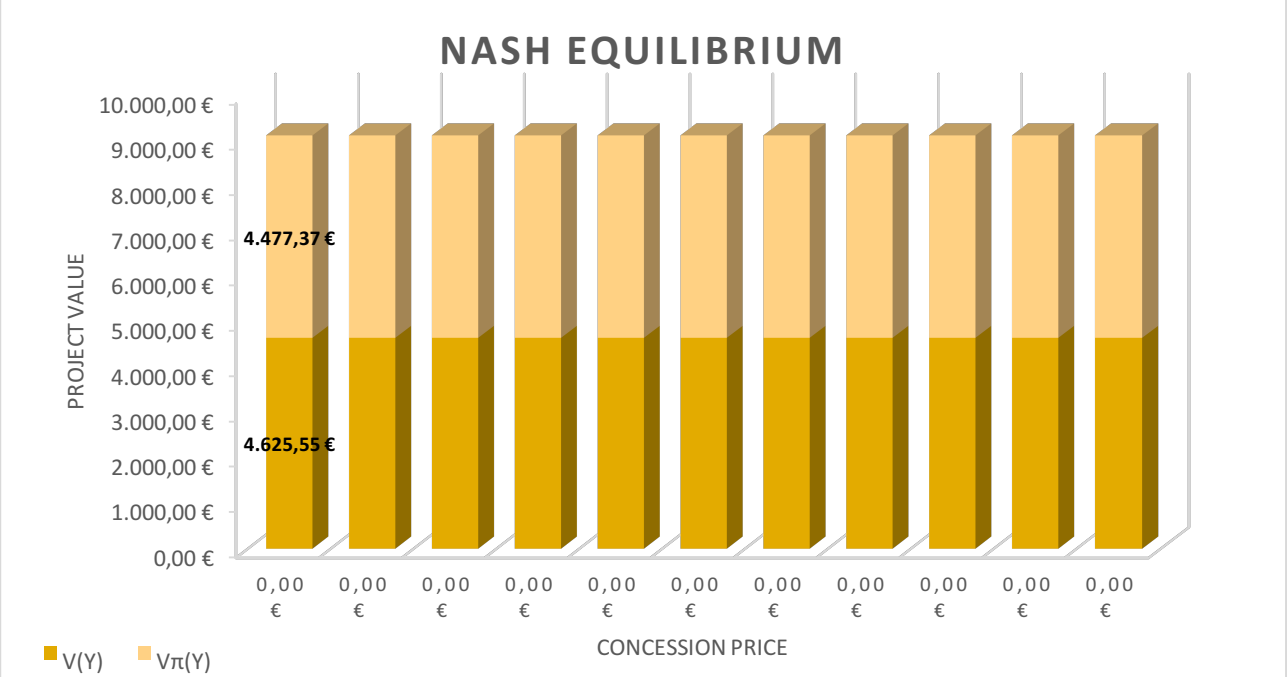
The Nash equilibrium coincides with the cooperative equilibrium.

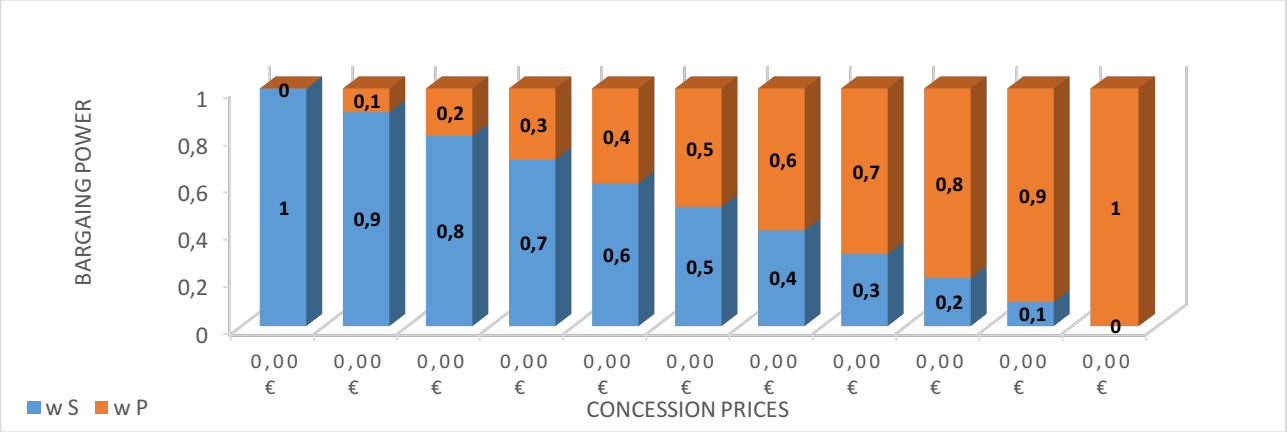
- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Plot 75



Plot 76





First case (general case)

It is possible to note that:

- when the State starts to assume a percentage of investment costs the concession price range increases because the Private Company could spend more money for the concession price when a part of the investment costs is sustained by the State;
- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases;
- the Private Company finds optimal to invest at the current date for each concession price and this propensity decreases when the concession price increases;

Second case (cooperative equilibrium)

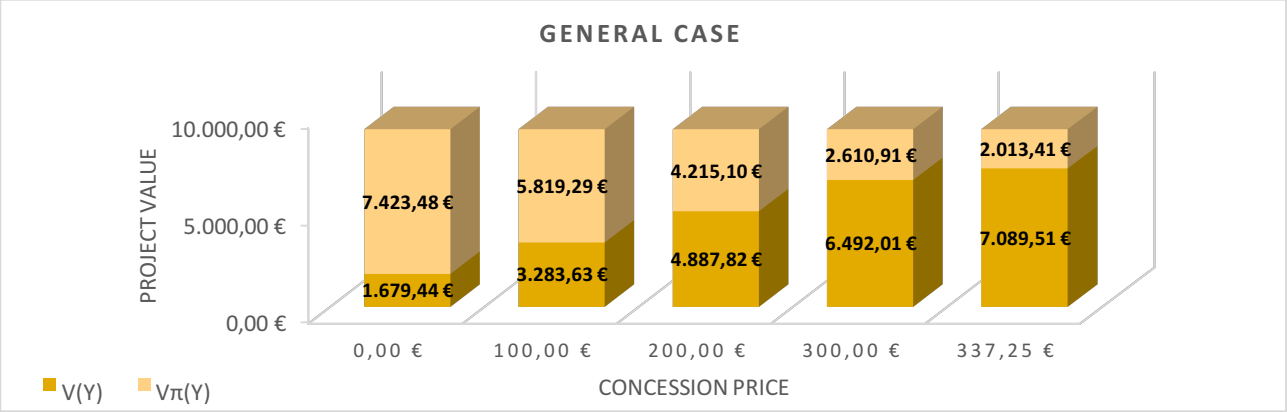
The cooperative price coincides with the lower bound of the concession prices range in the general model.

Third case (Nash equilibrium)

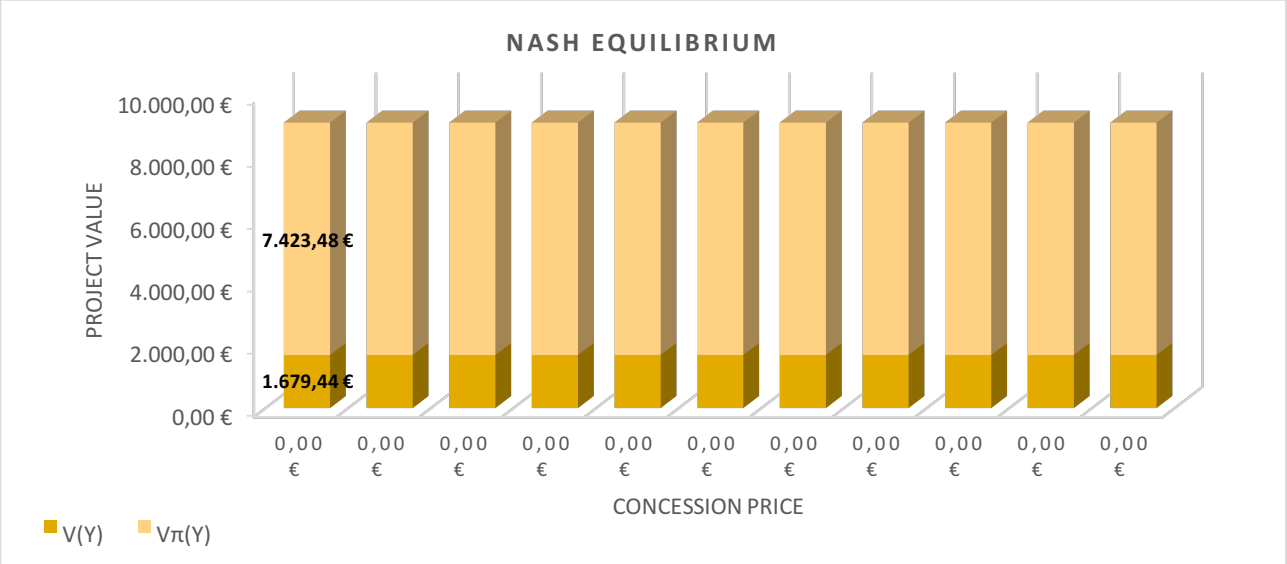
The Nash equilibrium coincides with the cooperative equilibrium.

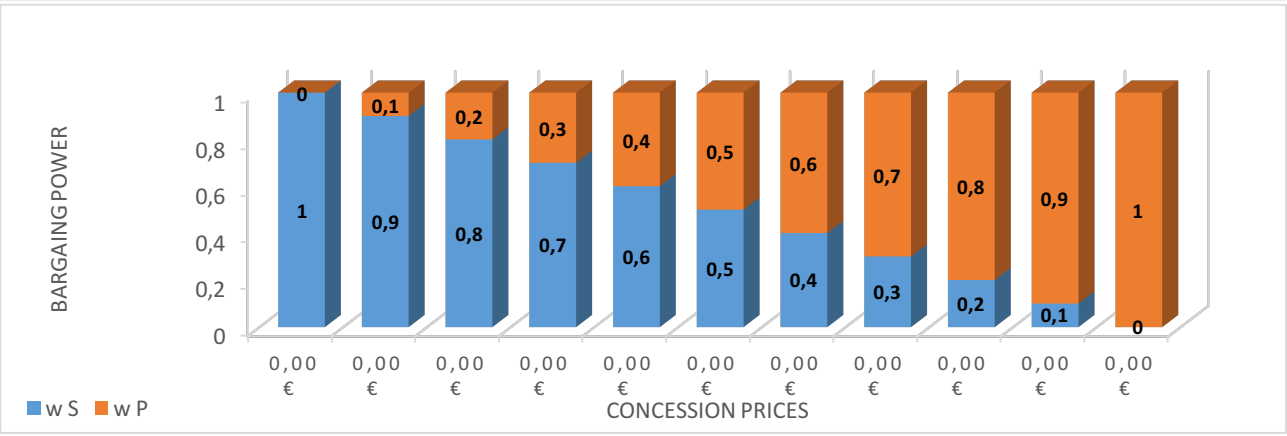
- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Plot 77



Plot 78





First case (“general case”)

It is possible to note that:

- the State finds optimal to enter in the contract at the current date for each concession price and this propensity increases when the concession price increases;
- the Private Company finds optimal to invest at the current date for each concession price and this propensity decreases when the concession price increases;

Second case (cooperative equilibrium)

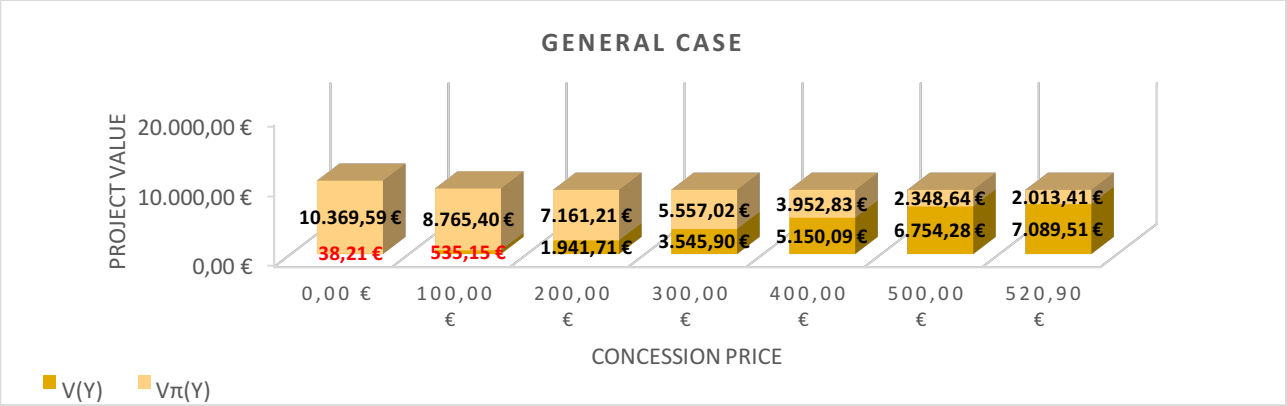
The cooperative price coincides with the lower bound of the concession prices range in the general model.

Third case (Nash equilibrium)

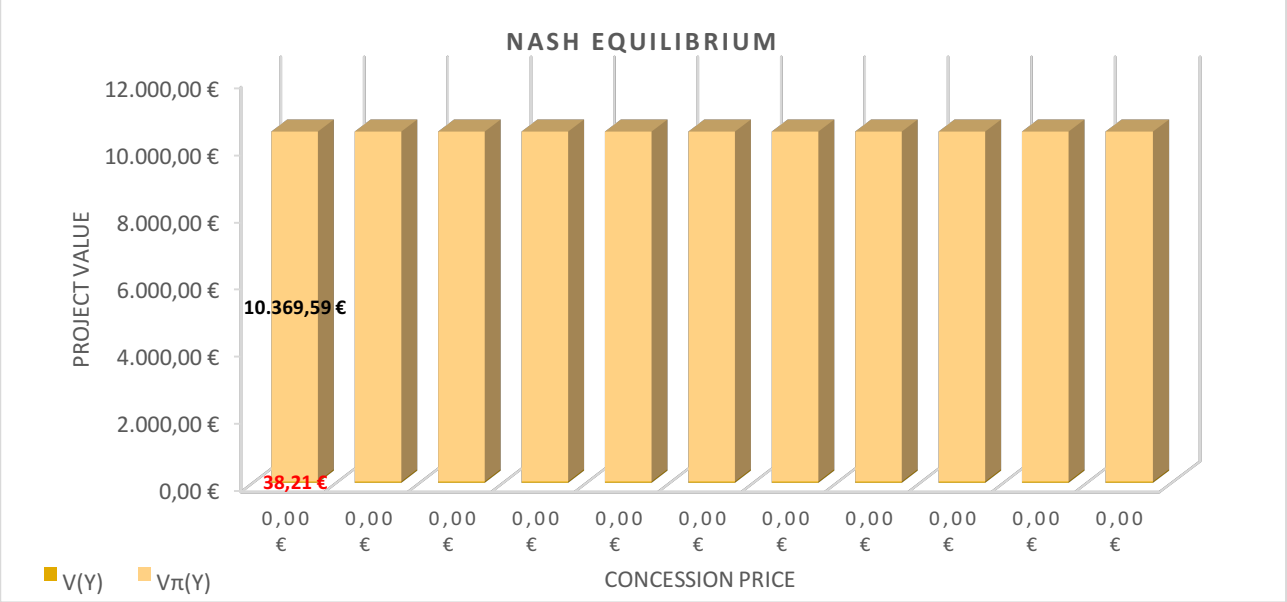
The Nash equilibrium coincides with the cooperative equilibrium.

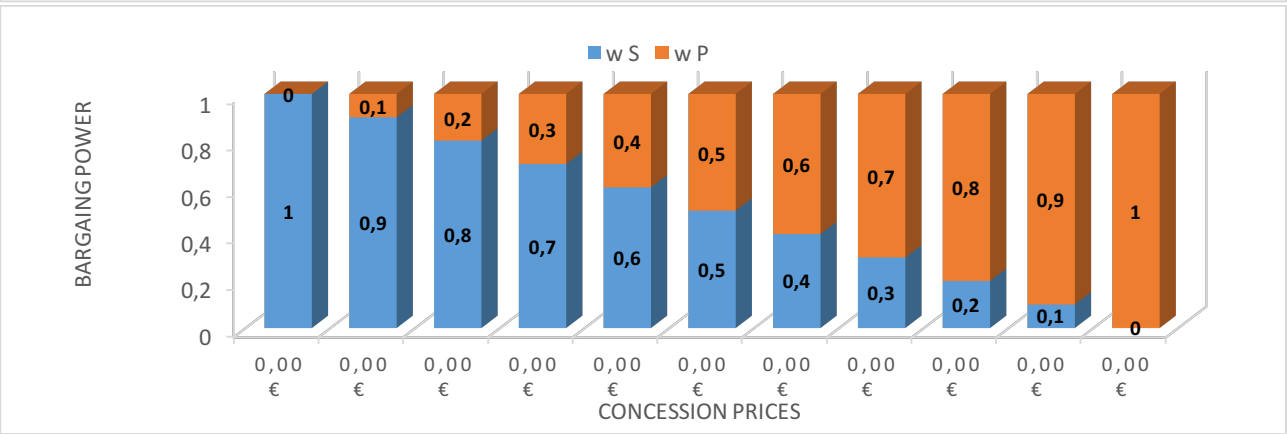
- **Hypothesis 5: investment costs sustained entirely by the State**

Plot 79



Plot 80





First case (“general case”)

It is possible to note that:

- the State finds optimal to wait at the current date for the concession prices equal to 0 and 100,00 € otherwise it finds optimal to enter in the contract when the concession price is higher and so when it gains more money;
- the Private Company finds optimal to invest at the current date for each concession price and this propensity decreases when the concession price increases because it has to spend more money for the concession.

Second case (cooperative equilibrium)

The cooperative price coincides with the lower bound of the concession prices range in the general model.

Third case (Nash equilibrium)

The Nash equilibrium coincides with the cooperative equilibrium.

A summary is made to allow to synthetize the results of the example 6.

- In the general case:

  - the State finds optimal to enter in the contract at the current date for each concession price except under hypothesis 5 of costs distribution (so when it sustains entirely the investment costs) in which for the lower values of concession prices the State finds optimal to wait;
  - the Private, under hypothesis 1 and 2 of costs distribution (so when it sustains entirely or at the level of 75% the investments costs), finds optimal to wait at the current date but this propensity decreases when the State starts to assume a greater percentage of investments costs and the option to wait becomes 0 from the hypothesis 3.

- the Nash equilibrium coincides with the cooperative equilibrium.

Conclusion

At the conclusion of my work I report its main results by giving a general overview.

The economic and financial analysis and the socio-economic analysis, which I have made with the updated data, have confirmed the project solution chosen by RFI; the NPV results positive in both analysis indicating the convenience to realize the project both from the economic point of view both from the social point of view.

Thanks to the application of the model of the economists Scandizzo and Ventura, I could identify how the interaction between the State and the Private Company, with the purpose of enter into a concession contract, varies according to the different hypotheses of investment costs distribution between the two parties and according to the different economic models of equilibrium used to establish the concession price.

The plurality of the obtained results opens a variegated scenario on the possible decisions of the State and the Private Company.

Finally, through the use of the comparative static analysis I highlighted how the obtained results can vary according to the variation of some inputs of the model.

APPENDIX

In this section, I reported the values used in the computations.

5 Economic and financial analysis

Each number of the table (for example 5.1.1 A) indicates the relative paragraph in the thesis (for example 5.1.1); if a table has not a number it implies that it is part of the same paragraph of the precedent table.

In the following tables the values of the economic and financial analysis are reported.

5 A

Annual inflation rate	
2006	1,87%
2007	2,61%
2008	2,24%
2009	1,02%
2010	1,88%
2011	3,29%
2012	2,31%
2013	0,66%
2014	0,00%
2015	0,09%

5.1.1 A

Annual realization costs (millions/year)				
Year	A	B	C	D
2016	597,93 €	544,13 €	512,72 €	566,52 €
2017	609,89 €	555,01 €	522,98 €	577,85 €
2018	622,09 €	566,11 €	533,43 €	589,41 €
2019	634,53 €	577,43 €	544,10 €	601,20 €
2020	647,22 €	588,98 €	554,99 €	613,22 €
2021	660,16 €	600,76 €	566,09 €	625,49 €
2022	673,37 €	612,78 €	577,41 €	638,00 €
2023	686,84 €	625,03 €	588,95 €	650,76 €

5.1.2 A

Annual ordinary maintenance costs (millions/y)				
Year	A	B	C	D
2020	1,29 €	1,61 €	1,50 €	1,18 €
2021	1,31 €	1,64 €	1,53 €	1,20 €
2022	1,34 €	1,67 €	1,56 €	1,23 €
2023	1,37 €	1,71 €	1,59 €	1,25 €
2024	1,39 €	1,74 €	1,63 €	1,28 €
2025	1,42 €	1,78 €	1,66 €	1,30 €
2026	1,45 €	1,81 €	1,69 €	1,33 €
2027	1,48 €	1,85 €	1,72 €	1,36 €
2028	1,51 €	1,89 €	1,76 €	1,38 €
2029	1,54 €	1,92 €	1,79 €	1,41 €
2030	1,57 €	1,96 €	1,83 €	1,44 €
2031	1,60 €	2,00 €	1,87 €	1,47 €
2032	1,63 €	2,04 €	1,90 €	1,50 €
2033	1,67 €	2,08 €	1,94 €	1,53 €
2034	1,70 €	2,12 €	1,98 €	1,56 €
2035	1,73 €	2,17 €	2,02 €	1,59 €
2036	1,77 €	2,21 €	2,06 €	1,62 €
2037	1,80 €	2,25 €	2,10 €	1,65 €
2038	1,84 €	2,30 €	2,14 €	1,69 €
2039	1,88 €	2,34 €	2,19 €	1,72 €
2040	1,91 €	2,39 €	2,23 €	1,75 €
2041	1,95 €	2,44 €	2,28 €	1,79 €
2042	1,99 €	2,49 €	2,32 €	1,82 €
2043	2,03 €	2,54 €	2,37 €	1,86 €
2044	2,07 €	2,59 €	2,42 €	1,90 €
2045	2,11 €	2,64 €	2,46 €	1,94 €
2046	2,15 €	2,69 €	2,51 €	1,97 €
2047	2,20 €	2,75 €	2,56 €	2,01 €
2048	2,24 €	2,80 €	2,61 €	2,05 €
2049	2,29 €	2,86 €	2,67 €	2,10 €
2050	2,33 €	2,91 €	2,72 €	2,14 €
2051	2,38 €	2,97 €	2,77 €	2,18 €
2052	2,43 €	3,03 €	2,83 €	2,22 €
2053	2,47 €	3,09 €	2,89 €	2,27 €
2054	2,52 €	3,15 €	2,94 €	2,31 €
2055	2,57 €	3,22 €	3,00 €	2,36 €
2056	2,63 €	3,28 €	3,06 €	2,41 €
2057	2,68 €	3,35 €	3,12 €	2,45 €
2058	2,73 €	3,41 €	3,19 €	2,50 €
2059	2,79 €	3,48 €	3,25 €	2,55 €
2060	2,84 €	3,55 €	3,32 €	2,61 €

5.1.3 A

Year	**Annual freight operating costs** (millions/year)	**Annual passenger operating costs** (millions/year)
2020	0,00 €	11,96 €
2021	0,00 €	12,20 €
2022	0,00 €	12,45 €
2023	0,00 €	12,69 €
2024	43,78 €	127,93 €
2025	44,66 €	130,49 €
2026	45,55 €	133,10 €
2027	46,46 €	135,76 €
2028	47,39 €	138,48 €
2029	48,34 €	141,25 €
2030	49,31 €	144,07 €
2031	50,29 €	146,95 €
2032	51,30 €	149,89 €
2033	52,32 €	152,89 €
2034	53,37 €	155,95 €
2035	54,44 €	159,07 €
2036	55,53 €	162,25 €
2037	56,64 €	165,49 €
2038	57,77 €	168,80 €
2039	58,92 €	172,18 €
2040	60,10 €	175,62 €
2041	61,30 €	179,14 €
2042	62,53 €	182,72 €
2043	63,78 €	186,37 €
2044	65,06 €	190,10 €
2045	66,36 €	193,90 €
2046	67,69 €	197,78 €
2047	69,04 €	201,74 €
2048	70,42 €	205,77 €
2049	71,83 €	209,89 €
2050	73,26 €	214,08 €
2051	74,73 €	218,37 €
2052	76,22 €	222,73 €
2053	77,75 €	227,19 €
2054	79,30 €	231,73 €
2055	80,89 €	236,37 €
2056	82,51 €	241,09 €
2057	84,16 €	245,91 €
2058	85,84 €	250,83 €
2059	87,56 €	255,85 €
2060	89,31 €	260,97 €

5.2.1 A

In the following tables the annual revenues for the short distance passenger transport service are reported.
The PV of short distance passenger transport service revenues for each solution is computed through the sum of PVs of the annual revenues of the routes composing the same solution.

Benevento-Caserta (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	1900	5.890,00 €	1.484.280,00 €
2021	3,16 €	1928,5	6.097,92 €	1.536.675,08 €
2022	3,23 €	1957,4275	6.313,17 €	1.590.919,71 €
2023	3,29 €	1986,788913	6.536,03 €	1.647.079,18 €
2024	3,36 €	2016,590746	6.766,75 €	1.705.221,08 €
2025	3,42 €	2046,839607	7.005,62 €	1.765.415,38 €
2026	3,49 €	2077,542201	7.252,91 €	1.827.734,54 €
2027	3,56 €	2108,705335	7.508,94 €	1.892.253,57 €
2028	3,63 €	2140,335915	7.774,01 €	1.959.050,12 €
2029	3,70 €	2172,440953	8.048,43 €	2.028.204,59 €
2030	3,78 €	2205,027568	8.332,54 €	2.099.800,21 €
2031	3,85 €	2238,102981	8.626,68 €	2.173.923,16 €
2032	3,93 €	2271,674526	8.931,20 €	2.250.662,65 €
2033	4,01 €	2305,749644	9.246,47 €	2.330.111,04 €
2034	4,09 €	2340,335888	9.572,87 €	2.412.363,96 €
2035	4,17 €	2375,440927	9.910,80 €	2.497.520,41 €
2036	4,26 €	2411,072541	10.260,65 €	2.585.682,88 €
2037	4,34 €	2447,238629	10.622,85 €	2.676.957,48 €
2038	4,43 €	2483,947208	10.997,83 €	2.771.454,08 €
2039	4,52 €	2521,206416	11.386,06 €	2.869.286,41 €
2040	4,61 €	2559,024512	11.787,99 €	2.970.572,22 €
2041	4,70 €	2559,024512	12.023,74 €	3.029.983,67 €
2042	4,79 €	2559,024512	12.264,22 €	3.090.583,34 €
2043	4,89 €	2559,024512	12.509,50 €	3.152.395,01 €
2044	4,99 €	2559,024512	12.759,69 €	3.215.442,91 €
2045	5,09 €	2559,024512	13.014,89 €	3.279.751,77 €
2046	5,19 €	2559,024512	13.275,19 €	3.345.346,80 €
2047	5,29 €	2559,024512	13.540,69 €	3.412.253,74 €
2048	5,40 €	2559,024512	13.811,50 €	3.480.498,81 €
2049	5,51 €	2559,024512	14.087,73 €	3.550.108,79 €
2050	5,62 €	2559,024512	14.369,49 €	3.621.110,96 €
2051	5,73 €	2559,024512	14.656,88 €	3.693.533,18 €
2052	5,84 €	2559,024512	14.950,02 €	3.767.403,85 €
2053	5,96 €	2559,024512	15.249,02 €	3.842.751,92 €
2054	6,08 €	2559,024512	15.554,00 €	3.919.606,96 €
2055	6,20 €	2559,024512	15.865,08 €	3.997.999,10 €
2056	6,32 €	2559,024512	16.182,38 €	4.077.959,08 €
2057	6,45 €	2559,024512	16.506,02 €	4.159.518,27 €
2058	6,58 €	2559,024512	16.836,15 €	4.242.708,63 €
2059	6,71 €	2559,024512	17.172,87 €	4.327.562,80 €
2060	6,84 €	2559,024512	17.516,33 €	4.414.114,06 €

Benevento-Napoli (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	5,10 €	3400	17.340,00 €	4.369.680,00 €
2021	5,20 €	3451	17.952,10 €	4.523.929,70 €
2022	5,31 €	3502,765	18.585,81 €	4.683.624,42 €
2023	5,41 €	3555,306475	19.241,89 €	4.848.956,36 €
2024	5,52 €	3608,636072	19.921,13 €	5.020.124,52 €
2025	5,63 €	3662,765613	20.624,34 €	5.197.334,92 €
2026	5,74 €	3717,707097	21.352,38 €	5.380.800,84 €
2027	5,86 €	3773,472704	22.106,12 €	5.570.743,11 €
2028	5,98 €	3830,074794	22.886,47 €	5.767.390,34 €
2029	6,09 €	3887,525916	23.694,36 €	5.970.979,22 €
2030	6,22 €	3945,838805	24.530,77 €	6.181.754,79 €
2031	6,34 €	4005,026387	25.396,71 €	6.399.970,73 €
2032	6,47 €	4065,101783	26.293,21 €	6.625.889,70 €
2033	6,60 €	4126,07831	27.221,36 €	6.859.783,61 €
2034	6,73 €	4187,969484	28.182,28 €	7.101.933,97 €
2035	6,86 €	4250,789027	29.177,11 €	7.352.632,24 €
2036	7,00 €	4314,550862	30.207,06 €	7.612.180,16 €
2037	7,14 €	4379,269125	31.273,37 €	7.880.890,12 €
2038	7,28 €	4444,958162	32.377,32 €	8.159.085,54 €
2039	7,43 €	4511,632534	33.520,24 €	8.447.101,26 €
2040	7,58 €	4579,307022	34.703,51 €	8.745.283,93 €
2041	7,73 €	4579,307022	35.397,58 €	8.920.189,61 €
2042	7,88 €	4579,307022	36.105,53 €	9.098.593,40 €
2043	8,04 €	4579,307022	36.827,64 €	9.280.565,27 €
2044	8,20 €	4579,307022	37.564,19 €	9.466.176,57 €
2045	8,37 €	4579,307022	38.315,48 €	9.655.500,11 €
2046	8,53 €	4579,307022	39.081,79 €	9.848.610,11 €
2047	8,71 €	4579,307022	39.863,42 €	10.045.582,31 €
2048	8,88 €	4579,307022	40.660,69 €	10.246.493,96 €
2049	9,06 €	4579,307022	41.473,90 €	10.451.423,84 €
2050	9,24 €	4579,307022	42.303,38 €	10.660.452,31 €
2051	9,42 €	4579,307022	43.149,45 €	10.873.661,36 €
2052	9,61 €	4579,307022	44.012,44 €	11.091.134,59 €
2053	9,80 €	4579,307022	44.892,69 €	11.312.957,28 €
2054	10,00 €	4579,307022	45.790,54 €	11.539.216,42 €
2055	10,20 €	4579,307022	46.706,35 €	11.770.000,75 €
2056	10,40 €	4579,307022	47.640,48 €	12.005.400,77 €
2057	10,61 €	4579,307022	48.593,29 €	12.245.508,78 €
2058	10,82 €	4579,307022	49.565,15 €	12.490.418,96 €
2059	11,04 €	4579,307022	50.556,46 €	12.740.227,34 €
2060	11,26 €	4579,307022	51.567,59 €	12.995.031,88 €

Cancello-Benevento (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	7000	21.700,00 €	5.468.400,00 €
2021	3,16 €	7105	22.466,01 €	5.661.434,52 €
2022	3,23 €	7211,575	23.259,06 €	5.861.283,16 €
2023	3,29 €	7319,748625	24.080,10 €	6.068.186,45 €
2024	3,36 €	7429,544854	24.930,13 €	6.282.393,44 €
2025	3,42 €	7540,988027	25.810,17 €	6.504.161,92 €
2026	3,49 €	7654,102848	26.721,27 €	6.733.758,84 €
2027	3,56 €	7768,91439	27.664,53 €	6.971.460,53 €
2028	3,63 €	7885,448106	28.641,08 €	7.217.553,08 €
2029	3,70 €	8003,729828	29.652,11 €	7.472.332,71 €
2030	3,78 €	8123,785775	30.698,83 €	7.736.106,05 €
2031	3,85 €	8245,642562	31.782,50 €	8.009.190,60 €
2032	3,93 €	8369,3272	32.904,42 €	8.291.915,02 €
2033	4,01 €	8494,867108	34.065,95 €	8.584.619,62 €
2034	4,09 €	8622,290115	35.268,48 €	8.887.656,70 €
2035	4,17 €	8751,624467	36.513,46 €	9.201.390,98 €
2036	4,26 €	8882,898834	37.802,38 €	9.526.200,08 €
2037	4,34 €	9016,142316	39.136,81 €	9.862.474,94 €
2038	4,43 €	9151,384451	40.518,33 €	10.210.620,31 €
2039	4,52 €	9288,655218	41.948,63 €	10.571.055,21 €
2040	4,61 €	9427,985046	43.429,42 €	10.944.213,45 €
2041	4,70 €	9427,985046	44.298,01 €	11.163.097,72 €
2042	4,79 €	9427,985046	45.183,97 €	11.386.359,68 €
2043	4,89 €	9427,985046	46.087,65 €	11.614.086,87 €
2044	4,99 €	9427,985046	47.009,40 €	11.846.368,61 €
2045	5,09 €	9427,985046	47.949,59 €	12.083.295,98 €
2046	5,19 €	9427,985046	48.908,58 €	12.324.961,90 €
2047	5,29 €	9427,985046	49.886,75 €	12.571.461,14 €
2048	5,40 €	9427,985046	50.884,49 €	12.822.890,36 €
2049	5,51 €	9427,985046	51.902,18 €	13.079.348,17 €
2050	5,62 €	9427,985046	52.940,22 €	13.340.935,13 €
2051	5,73 €	9427,985046	53.999,02 €	13.607.753,83 €
2052	5,84 €	9427,985046	55.079,00 €	13.879.908,91 €
2053	5,96 €	9427,985046	56.180,58 €	14.157.507,09 €
2054	6,08 €	9427,985046	57.304,20 €	14.440.657,23 €
2055	6,20 €	9427,985046	58.450,28 €	14.729.470,38 €
2056	6,32 €	9427,985046	59.619,28 €	15.024.059,78 €
2057	6,45 €	9427,985046	60.811,67 €	15.324.540,98 €
2058	6,58 €	9427,985046	62.027,90 €	15.631.031,80 €
2059	6,71 €	9427,985046	63.268,46 €	15.943.652,43 €
2060	6,84 €	9427,985046	64.533,83 €	16.262.525,48 €

Foggia-Benevento/Caserta/Napoli (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	16,36 €	2800	45.808,00 €	11.543.616,00 €
2021	16,69 €	2842	47.425,02 €	11.951.105,64 €
2022	17,02 €	2884,63	49.099,13 €	12.372.979,67 €
2023	17,36 €	2927,89945	50.832,32 €	12.809.745,86 €
2024	17,71 €	2971,817942	52.626,71 €	13.261.929,89 €
2025	18,06 €	3016,395211	54.484,43 €	13.730.076,01 €
2026	18,42 €	3061,641139	56.407,73 €	14.214.747,69 €
2027	18,79 €	3107,565756	58.398,92 €	14.716.528,29 €
2028	19,17 €	3154,179242	60.460,40 €	15.236.021,74 €
2029	19,55 €	3201,491931	62.594,66 €	15.773.853,30 €
2030	19,94 €	3249,51431	64.804,25 €	16.330.670,32 €
2031	20,34 €	3298,257025	67.091,84 €	16.907.142,99 €
2032	20,75 €	3347,73088	69.460,18 €	17.503.965,13 €
2033	21,16 €	3397,946843	71.912,12 €	18.121.855,10 €
2034	21,59 €	3448,916046	74.450,62 €	18.761.556,59 €
2035	22,02 €	3500,649787	77.078,73 €	19.423.839,54 €
2036	22,46 €	3553,159533	79.799,61 €	20.109.501,07 €
2037	22,91 €	3606,456926	82.616,53 €	20.819.366,46 €
2038	23,37 €	3660,55378	85.532,90 €	21.554.290,10 €
2039	23,83 €	3715,462087	88.552,21 €	22.315.156,54 €
2040	24,31 €	3771,194018	91.678,10 €	23.102.881,56 €
2041	24,80 €	3771,194018	93.511,66 €	23.564.939,19 €
2042	25,29 €	3771,194018	95.381,90 €	24.036.237,98 €
2043	25,80 €	3771,194018	97.289,53 €	24.516.962,74 €
2044	26,31 €	3771,194018	99.235,33 €	25.007.301,99 €
2045	26,84 €	3771,194018	101.220,03 €	25.507.448,03 €
2046	27,38 €	3771,194018	103.244,43 €	26.017.596,99 €
2047	27,92 €	3771,194018	105.309,32 €	26.537.948,93 €
2048	28,48 €	3771,194018	107.415,51 €	27.068.707,91 €
2049	29,05 €	3771,194018	109.563,82 €	27.610.082,07 €
2050	29,63 €	3771,194018	111.755,09 €	28.162.283,71 €
2051	30,23 €	3771,194018	113.990,20 €	28.725.529,38 €
2052	30,83 €	3771,194018	116.270,00 €	29.300.039,97 €
2053	31,45 €	3771,194018	118.595,40 €	29.886.040,77 €
2054	32,08 €	3771,194018	120.967,31 €	30.483.761,59 €
2055	32,72 €	3771,194018	123.386,65 €	31.093.436,82 €
2056	33,37 €	3771,194018	125.854,39 €	31.715.305,55 €
2057	34,04 €	3771,194018	128.371,47 €	32.349.611,67 €
2058	34,72 €	3771,194018	130.938,90 €	32.996.603,90 €
2059	35,42 €	3771,194018	133.557,68 €	33.656.535,98 €
2060	36,12 €	3771,194018	136.228,84 €	34.329.666,70 €

Bovino-foggia (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	2,50 €	4350	10.875,00 €	2.740.500,00 €
2021	2,55 €	4415,25	11.258,89 €	2.837.239,65 €
2022	2,60 €	4481,47875	11.656,33 €	2.937.394,21 €
2023	2,65 €	4548,700931	12.067,79 €	3.041.084,23 €
2024	2,71 €	4616,931445	12.493,79 €	3.148.434,50 €
2025	2,76 €	4686,185417	12.934,82 €	3.259.574,24 €
2026	2,82 €	4756,478198	13.391,42 €	3.374.637,21 €
2027	2,87 €	4827,825371	13.864,13 €	3.493.761,90 €
2028	2,93 €	4900,242752	14.353,54 €	3.617.091,70 €
2029	2,99 €	4973,746393	14.860,22 €	3.744.775,03 €
2030	3,05 €	5048,352589	15.384,78 €	3.876.965,59 €
2031	3,11 €	5124,077878	15.927,87 €	4.013.822,48 €
2032	3,17 €	5200,939046	16.490,12 €	4.155.510,41 €
2033	3,23 €	5278,953132	17.072,22 €	4.302.199,93 €
2034	3,30 €	5358,137429	17.674,87 €	4.454.067,58 €
2035	3,36 €	5438,50949	18.298,79 €	4.611.296,17 €
2036	3,43 €	5520,087132	18.944,74 €	4.774.074,92 €
2037	3,50 €	5602,888439	19.613,49 €	4.942.599,77 €
2038	3,57 €	5686,931766	20.305,85 €	5.117.073,54 €
2039	3,64 €	5772,235742	21.022,64 €	5.297.706,24 €
2040	3,71 €	5858,819278	21.764,74 €	5.484.715,27 €
2041	3,79 €	5858,819278	22.200,04 €	5.594.409,57 €
2042	3,86 €	5858,819278	22.644,04 €	5.706.297,76 €
2043	3,94 €	5858,819278	23.096,92 €	5.820.423,72 €
2044	4,02 €	5858,819278	23.558,86 €	5.936.832,19 €
2045	4,10 €	5858,819278	24.030,04 €	6.055.568,84 €
2046	4,18 €	5858,819278	24.510,64 €	6.176.680,21 €
2047	4,27 €	5858,819278	25.000,85 €	6.300.213,82 €
2048	4,35 €	5858,819278	25.500,87 €	6.426.218,10 €
2049	4,44 €	5858,819278	26.010,88 €	6.554.742,46 €
2050	4,53 €	5858,819278	26.531,10 €	6.685.837,31 €
2051	4,62 €	5858,819278	27.061,72 €	6.819.554,05 €
2052	4,71 €	5858,819278	27.602,96 €	6.955.945,13 €
2053	4,81 €	5858,819278	28.155,02 €	7.095.064,04 €
2054	4,90 €	5858,819278	28.718,12 €	7.236.965,32 €
2055	5,00 €	5858,819278	29.292,48 €	7.381.704,62 €
2056	5,10 €	5858,819278	29.878,33 €	7.529.338,72 €
2057	5,20 €	5858,819278	30.475,89 €	7.679.925,49 €
2058	5,31 €	5858,819278	31.085,41 €	7.833.524,00 €
2059	5,41 €	5858,819278	31.707,12 €	7.990.194,48 €
2060	5,52 €	5858,819278	32.341,26 €	8.149.998,37 €

Benevento-Caserta (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	1900	5.890,00 €	1.484.280,00 €
2021	3,16 €	1928,5	6.097,92 €	1.536.675,08 €
2022	3,23 €	1957,4275	6.313,17 €	1.590.919,71 €
2023	3,29 €	1986,788913	6.536,03 €	1.647.079,18 €
2024	3,36 €	2016,590746	6.766,75 €	1.705.221,08 €
2025	3,42 €	2046,839607	7.005,62 €	1.765.415,38 €
2026	3,49 €	2077,542201	7.252,91 €	1.827.734,54 €
2027	3,56 €	2108,705335	7.508,94 €	1.892.253,57 €
2028	3,63 €	2140,335915	7.774,01 €	1.959.050,12 €
2029	3,70 €	2172,440953	8.048,43 €	2.028.204,59 €
2030	3,78 €	2205,027568	8.332,54 €	2.099.800,21 €
2031	3,85 €	2238,102981	8.626,68 €	2.173.923,16 €
2032	3,93 €	2271,674526	8.931,20 €	2.250.662,65 €
2033	4,01 €	2305,749644	9.246,47 €	2.330.111,04 €
2034	4,09 €	2340,335888	9.572,87 €	2.412.363,96 €
2035	4,17 €	2375,440927	9.910,80 €	2.497.520,41 €
2036	4,26 €	2411,072541	10.260,65 €	2.585.682,88 €
2037	4,34 €	2447,238629	10.622,85 €	2.676.957,48 €
2038	4,43 €	2483,947208	10.997,83 €	2.771.454,08 €
2039	4,52 €	2521,206416	11.386,06 €	2.869.286,41 €
2040	4,61 €	2559,024512	11.787,99 €	2.970.572,22 €
2041	4,70 €	2559,024512	12.023,74 €	3.029.983,67 €
2042	4,79 €	2559,024512	12.264,22 €	3.090.583,34 €
2043	4,89 €	2559,024512	12.509,50 €	3.152.395,01 €
2044	4,99 €	2559,024512	12.759,69 €	3.215.442,91 €
2045	5,09 €	2559,024512	13.014,89 €	3.279.751,77 €
2046	5,19 €	2559,024512	13.275,19 €	3.345.346,80 €
2047	5,29 €	2559,024512	13.540,69 €	3.412.253,74 €
2048	5,40 €	2559,024512	13.811,50 €	3.480.498,81 €
2049	5,51 €	2559,024512	14.087,73 €	3.550.108,79 €
2050	5,62 €	2559,024512	14.369,49 €	3.621.110,96 €
2051	5,73 €	2559,024512	14.656,88 €	3.693.533,18 €
2052	5,84 €	2559,024512	14.950,02 €	3.767.403,85 €
2053	5,96 €	2559,024512	15.249,02 €	3.842.751,92 €
2054	6,08 €	2559,024512	15.554,00 €	3.919.606,96 €
2055	6,20 €	2559,024512	15.865,08 €	3.997.999,10 €
2056	6,32 €	2559,024512	16.182,38 €	4.077.959,08 €
2057	6,45 €	2559,024512	16.506,02 €	4.159.518,27 €
2058	6,58 €	2559,024512	16.836,15 €	4.242.708,63 €
2059	6,71 €	2559,024512	17.172,87 €	4.327.562,80 €
2060	6,84 €	2559,024512	17.516,33 €	4.414.114,06 €

Benevento-Napoli (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	5,10 €	2600	13.260,00 €	3.341.520,00 €
2021	5,20 €	2639	13.728,08 €	3.459.475,66 €
2022	5,31 €	2678,585	14.212,68 €	3.581.595,15 €
2023	5,41 €	2718,763775	14.714,39 €	3.708.025,46 €
2024	5,52 €	2759,545232	15.233,80 €	3.838.918,75 €
2025	5,63 €	2800,93841	15.771,56 €	3.974.432,59 €
2026	5,74 €	2842,952486	16.328,29 €	4.114.730,06 €
2027	5,86 €	2885,596774	16.904,68 €	4.259.980,03 €
2028	5,98 €	2928,880725	17.501,42 €	4.410.357,32 €
2029	6,09 €	2972,813936	18.119,22 €	4.566.042,94 €
2030	6,22 €	3017,406145	18.758,83 €	4.727.224,25 €
2031	6,34 €	3062,667237	19.421,01 €	4.894.095,27 €
2032	6,47 €	3108,607246	20.106,57 €	5.066.856,83 €
2033	6,60 €	3155,236354	20.816,34 €	5.245.716,88 €
2034	6,73 €	3202,5649	21.551,15 €	5.430.890,68 €
2035	6,86 €	3250,603373	22.311,91 €	5.622.601,12 €
2036	7,00 €	3299,362424	23.099,52 €	5.821.078,94 €
2037	7,14 €	3348,85286	23.914,93 €	6.026.563,03 €
2038	7,28 €	3399,085653	24.759,13 €	6.239.300,70 €
2039	7,43 €	3450,071938	25.633,13 €	6.459.548,02 €
2040	7,58 €	3501,823017	26.537,98 €	6.687.570,06 €
2041	7,73 €	3501,823017	27.068,74 €	6.821.321,47 €
2042	7,88 €	3501,823017	27.610,11 €	6.957.747,89 €
2043	8,04 €	3501,823017	28.162,31 €	7.096.902,85 €
2044	8,20 €	3501,823017	28.725,56 €	7.238.840,91 €
2045	8,37 €	3501,823017	29.300,07 €	7.383.617,73 €
2046	8,53 €	3501,823017	29.886,07 €	7.531.290,08 €
2047	8,71 €	3501,823017	30.483,79 €	7.681.915,88 €
2048	8,88 €	3501,823017	31.093,47 €	7.835.554,20 €
2049	9,06 €	3501,823017	31.715,34 €	7.992.265,29 €
2050	9,24 €	3501,823017	32.349,65 €	8.152.110,59 €
2051	9,42 €	3501,823017	32.996,64 €	8.315.152,80 €
2052	9,61 €	3501,823017	33.656,57 €	8.481.455,86 €
2053	9,80 €	3501,823017	34.329,70 €	8.651.084,98 €
2054	10,00 €	3501,823017	35.016,30 €	8.824.106,68 €
2055	10,20 €	3501,823017	35.716,62 €	9.000.588,81 €
2056	10,40 €	3501,823017	36.430,95 €	9.180.600,59 €
2057	10,61 €	3501,823017	37.159,57 €	9.364.212,60 €
2058	10,82 €	3501,823017	37.902,77 €	9.551.496,85 €
2059	11,04 €	3501,823017	38.660,82 €	9.742.526,79 €
2060	11,26 €	3501,823017	39.434,04 €	9.937.377,32 €

Cancello-Benevento (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	7000	21.700,00 €	5.468.400,00 €
2021	3,16 €	7105	22.466,01 €	5.661.434,52 €
2022	3,23 €	7211,575	23.259,06 €	5.861.283,16 €
2023	3,29 €	7319,748625	24.080,10 €	6.068.186,45 €
2024	3,36 €	7429,544854	24.930,13 €	6.282.393,44 €
2025	3,42 €	7540,988027	25.810,17 €	6.504.161,92 €
2026	3,49 €	7654,102848	26.721,27 €	6.733.758,84 €
2027	3,56 €	7768,91439	27.664,53 €	6.971.460,53 €
2028	3,63 €	7885,448106	28.641,08 €	7.217.553,08 €
2029	3,70 €	8003,729828	29.652,11 €	7.472.332,71 €
2030	3,78 €	8123,785775	30.698,83 €	7.736.106,05 €
2031	3,85 €	8245,642562	31.782,50 €	8.009.190,60 €
2032	3,93 €	8369,3272	32.904,42 €	8.291.915,02 €
2033	4,01 €	8494,867108	34.065,95 €	8.584.619,62 €
2034	4,09 €	8622,290115	35.268,48 €	8.887.656,70 €
2035	4,17 €	8751,624467	36.513,46 €	9.201.390,98 €
2036	4,26 €	8882,898834	37.802,38 €	9.526.200,08 €
2037	4,34 €	9016,142316	39.136,81 €	9.862.474,94 €
2038	4,43 €	9151,384451	40.518,33 €	10.210.620,31 €
2039	4,52 €	9288,655218	41.948,63 €	10.571.055,21 €
2040	4,61 €	9427,985046	43.429,42 €	10.944.213,45 €
2041	4,70 €	9427,985046	44.298,01 €	11.163.097,72 €
2042	4,79 €	9427,985046	45.183,97 €	11.386.359,68 €
2043	4,89 €	9427,985046	46.087,65 €	11.614.086,87 €
2044	4,99 €	9427,985046	47.009,40 €	11.846.368,61 €
2045	5,09 €	9427,985046	47.949,59 €	12.083.295,98 €
2046	5,19 €	9427,985046	48.908,58 €	12.324.961,90 €
2047	5,29 €	9427,985046	49.886,75 €	12.571.461,14 €
2048	5,40 €	9427,985046	50.884,49 €	12.822.890,36 €
2049	5,51 €	9427,985046	51.902,18 €	13.079.348,17 €
2050	5,62 €	9427,985046	52.940,22 €	13.340.935,13 €
2051	5,73 €	9427,985046	53.999,02 €	13.607.753,83 €
2052	5,84 €	9427,985046	55.079,00 €	13.879.908,91 €
2053	5,96 €	9427,985046	56.180,58 €	14.157.507,09 €
2054	6,08 €	9427,985046	57.304,20 €	14.440.657,23 €
2055	6,20 €	9427,985046	58.450,28 €	14.729.470,38 €
2056	6,32 €	9427,985046	59.619,28 €	15.024.059,78 €
2057	6,45 €	9427,985046	60.811,67 €	15.324.540,98 €
2058	6,58 €	9427,985046	62.027,90 €	15.631.031,80 €
2059	6,71 €	9427,985046	63.268,46 €	15.943.652,43 €
2060	6,84 €	9427,985046	64.533,83 €	16.262.525,48 €

Foggia-Benevento/Caserta/Napoli (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	6,00 €	750	4.500,00 €	1.134.000,00 €
2021	6,12 €	761,25	4.658,85 €	1.174.030,20 €
2022	6,24 €	772,66875	4.823,31 €	1.215.473,47 €
2023	6,37 €	784,2587813	4.993,57 €	1.258.379,68 €
2024	6,49 €	796,022663	5.169,84 €	1.302.800,48 €
2025	6,62 €	807,9630029	5.352,34 €	1.348.789,34 €
2026	6,76 €	820,082448	5.541,28 €	1.396.401,60 €
2027	6,89 €	832,3836847	5.736,88 €	1.445.694,58 €
2028	7,03 €	844,8694399	5.939,40 €	1.496.727,60 €
2029	7,17 €	857,5424815	6.149,06 €	1.549.562,08 €
2030	7,31 €	870,4056188	6.366,12 €	1.604.261,62 €
2031	7,46 €	883,4617031	6.590,84 €	1.660.892,06 €
2032	7,61 €	896,7136286	6.823,50 €	1.719.521,55 €
2033	7,76 €	910,164333	7.064,37 €	1.780.220,66 €
2034	7,92 €	923,816798	7.313,74 €	1.843.062,45 €
2035	8,08 €	937,67405	7.571,91 €	1.908.122,55 €
2036	8,24 €	951,7391607	7.839,20 €	1.975.479,28 €
2037	8,40 €	966,0152482	8.115,93 €	2.045.213,70 €
2038	8,57 €	980,5054769	8.402,42 €	2.117.409,74 €
2039	8,74 €	995,213059	8.699,03 €	2.192.154,31 €
2040	8,92 €	1010,141255	9.006,10 €	2.269.537,35 €
2041	9,09 €	1010,141255	9.186,22 €	2.314.928,10 €
2042	9,28 €	1010,141255	9.369,95 €	2.361.226,66 €
2043	9,46 €	1010,141255	9.557,35 €	2.408.451,19 €
2044	9,65 €	1010,141255	9.748,49 €	2.456.620,22 €
2045	9,84 €	1010,141255	9.943,46 €	2.505.752,62 €
2046	10,04 €	1010,141255	10.142,33 €	2.555.867,68 €
2047	10,24 €	1010,141255	10.345,18 €	2.606.985,03 €
2048	10,45 €	1010,141255	10.552,08 €	2.659.124,73 €
2049	10,66 €	1010,141255	10.763,12 €	2.712.307,22 €
2050	10,87 €	1010,141255	10.978,39 €	2.766.553,37 €
2051	11,09 €	1010,141255	11.197,95 €	2.821.884,44 €
2052	11,31 €	1010,141255	11.421,91 €	2.878.322,12 €
2053	11,53 €	1010,141255	11.650,35 €	2.935.888,57 €
2054	11,76 €	1010,141255	11.883,36 €	2.994.606,34 €
2055	12,00 €	1010,141255	12.121,03 €	3.054.498,46 €
2056	12,24 €	1010,141255	12.363,45 €	3.115.588,43 €
2057	12,48 €	1010,141255	12.610,72 €	3.177.900,20 €
2058	12,73 €	1010,141255	12.862,93 €	3.241.458,21 €
2059	12,99 €	1010,141255	13.120,19 €	3.306.287,37 €
2060	13,25 €	1010,141255	13.382,59 €	3.372.413,12 €

Bovino-foggia (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	2,50 €	4350	10.875,00 €	2.740.500,00 €
2021	2,55 €	4415,25	11.258,89 €	2.837.239,65 €
2022	2,60 €	4481,47875	11.656,33 €	2.937.394,21 €
2023	2,65 €	4548,700931	12.067,79 €	3.041.084,23 €
2024	2,71 €	4616,931445	12.493,79 €	3.148.434,50 €
2025	2,76 €	4686,185417	12.934,82 €	3.259.574,24 €
2026	2,82 €	4756,478198	13.391,42 €	3.374.637,21 €
2027	2,87 €	4827,825371	13.864,13 €	3.493.761,90 €
2028	2,93 €	4900,242752	14.353,54 €	3.617.091,70 €
2029	2,99 €	4973,746393	14.860,22 €	3.744.775,03 €
2030	3,05 €	5048,352589	15.384,78 €	3.876.965,59 €
2031	3,11 €	5124,077878	15.927,87 €	4.013.822,48 €
2032	3,17 €	5200,939046	16.490,12 €	4.155.510,41 €
2033	3,23 €	5278,953132	17.072,22 €	4.302.199,93 €
2034	3,30 €	5358,137429	17.674,87 €	4.454.067,58 €
2035	3,36 €	5438,50949	18.298,79 €	4.611.296,17 €
2036	3,43 €	5520,087132	18.944,74 €	4.774.074,92 €
2037	3,50 €	5602,888439	19.613,49 €	4.942.599,77 €
2038	3,57 €	5686,931766	20.305,85 €	5.117.073,54 €
2039	3,64 €	5772,235742	21.022,64 €	5.297.706,24 €
2040	3,71 €	5858,819278	21.764,74 €	5.484.715,27 €
2041	3,79 €	5858,819278	22.200,04 €	5.594.409,57 €
2042	3,86 €	5858,819278	22.644,04 €	5.706.297,76 €
2043	3,94 €	5858,819278	23.096,92 €	5.820.423,72 €
2044	4,02 €	5858,819278	23.558,86 €	5.936.832,19 €
2045	4,10 €	5858,819278	24.030,04 €	6.055.568,84 €
2046	4,18 €	5858,819278	24.510,64 €	6.176.680,21 €
2047	4,27 €	5858,819278	25.000,85 €	6.300.213,82 €
2048	4,35 €	5858,819278	25.500,87 €	6.426.218,10 €
2049	4,44 €	5858,819278	26.010,88 €	6.554.742,46 €
2050	4,53 €	5858,819278	26.531,10 €	6.685.837,31 €
2051	4,62 €	5858,819278	27.061,72 €	6.819.554,05 €
2052	4,71 €	5858,819278	27.602,96 €	6.955.945,13 €
2053	4,81 €	5858,819278	28.155,02 €	7.095.064,04 €
2054	4,90 €	5858,819278	28.718,12 €	7.236.965,32 €
2055	5,00 €	5858,819278	29.292,48 €	7.381.704,62 €
2056	5,10 €	5858,819278	29.878,33 €	7.529.338,72 €
2057	5,20 €	5858,819278	30.475,89 €	7.679.925,49 €
2058	5,31 €	5858,819278	31.085,41 €	7.833.524,00 €
2059	5,41 €	5858,819278	31.707,12 €	7.990.194,48 €
2060	5,52 €	5858,819278	32.341,26 €	8.149.998,37 €

The solution C presents the same tables of the solution A except for the line Benevento-Caserta and Benevento-Napoli which are reported in the following tables.

Benevento-Caserta (solution C)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	1700	5.270,00 €	1.328.040,00 €
2021	3,16 €	1725,5	5.456,03 €	1.374.919,81 €
2022	3,23 €	1751,3825	5.648,63 €	1.423.454,48 €
2023	3,29 €	1777,653238	5.848,03 €	1.473.702,42 €
2024	3,36 €	1804,318036	6.054,46 €	1.525.724,12 €
2025	3,42 €	1831,382807	6.268,18 €	1.579.582,18 €
2026	3,49 €	1858,853549	6.489,45 €	1.635.341,43 €
2027	3,56 €	1886,736352	6.718,53 €	1.693.068,99 €
2028	3,63 €	1915,037397	6.955,69 €	1.752.834,32 €
2029	3,70 €	1943,762958	7.201,23 €	1.814.709,37 €
2030	3,78 €	1972,919403	7.455,43 €	1.878.768,61 €
2031	3,85 €	2002,513194	7.718,61 €	1.945.089,14 €
2032	3,93 €	2032,550891	7.991,07 €	2.013.750,79 €
2033	4,01 €	2063,039155	8.273,16 €	2.084.836,19 €
2034	4,09 €	2093,984742	8.565,20 €	2.158.430,91 €
2035	4,17 €	2125,394513	8.867,55 €	2.234.623,52 €
2036	4,26 €	2157,275431	9.180,58 €	2.313.505,73 €
2037	4,34 €	2189,634562	9.504,65 €	2.395.172,49 €
2038	4,43 €	2222,479081	9.840,17 €	2.479.722,07 €
2039	4,52 €	2255,816267	10.187,52 €	2.567.256,26 €
2040	4,61 €	2289,653511	10.547,14 €	2.657.880,41 €
2041	4,70 €	2289,653511	10.758,09 €	2.711.038,02 €
2042	4,79 €	2289,653511	10.973,25 €	2.765.258,78 €
2043	4,89 €	2289,653511	11.192,71 €	2.820.563,95 €
2044	4,99 €	2289,653511	11.416,57 €	2.876.975,23 €
2045	5,09 €	2289,653511	11.644,90 €	2.934.514,74 €
2046	5,19 €	2289,653511	11.877,80 €	2.993.205,03 €
2047	5,29 €	2289,653511	12.115,35 €	3.053.069,13 €
2048	5,40 €	2289,653511	12.357,66 €	3.114.130,52 €
2049	5,51 €	2289,653511	12.604,81 €	3.176.413,13 €
2050	5,62 €	2289,653511	12.856,91 €	3.239.941,39 €
2051	5,73 €	2289,653511	13.114,05 €	3.304.740,22 €
2052	5,84 €	2289,653511	13.376,33 €	3.370.835,02 €
2053	5,96 €	2289,653511	13.643,86 €	3.438.251,72 €
2054	6,08 €	2289,653511	13.916,73 €	3.507.016,76 €
2055	6,20 €	2289,653511	14.195,07 €	3.577.157,09 €
2056	6,32 €	2289,653511	14.478,97 €	3.648.700,23 €
2057	6,45 €	2289,653511	14.768,55 €	3.721.674,24 €
2058	6,58 €	2289,653511	15.063,92 €	3.796.107,72 €
2059	6,71 €	2289,653511	15.365,20 €	3.872.029,88 €
2060	6,84 €	2289,653511	15.672,50 €	3.949.470,47 €

Benevento-Napoli (solution C)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	5,10 €	3100	15.810,00 €	3.984.120,00 €
2021	5,20 €	3146,5	16.368,09 €	4.124.759,44 €
2022	5,31 €	3193,6975	16.945,89 €	4.270.363,44 €
2023	5,41 €	3241,602963	17.544,08 €	4.421.107,27 €
2024	5,52 €	3290,227007	18.163,38 €	4.577.172,36 €
2025	5,63 €	3339,580412	18.804,55 €	4.738.746,54 €
2026	5,74 €	3389,674118	19.468,35 €	4.906.024,30 €
2027	5,86 €	3440,51923	20.155,58 €	5.079.206,96 €
2028	5,98 €	3492,127018	20.867,08 €	5.258.502,96 €
2029	6,09 €	3544,508924	21.603,68 €	5.444.128,12 €
2030	6,22 €	3597,676558	22.366,29 €	5.636.305,84 €
2031	6,34 €	3651,641706	23.155,82 €	5.835.267,43 €
2032	6,47 €	3706,416332	23.973,22 €	6.041.252,37 €
2033	6,60 €	3762,012577	24.819,48 €	6.254.508,58 €
2034	6,73 €	3818,442765	25.695,61 €	6.475.292,74 €
2035	6,86 €	3875,719407	26.602,66 €	6.703.870,57 €
2036	7,00 €	3933,855198	27.541,73 €	6.940.517,20 €
2037	7,14 €	3992,863026	28.513,96 €	7.185.517,46 €
2038	7,28 €	4052,755971	29.520,50 €	7.439.166,22 €
2039	7,43 €	4113,547311	30.562,57 €	7.701.768,79 €
2040	7,58 €	4175,25052	31.641,43 €	7.973.641,23 €
2041	7,73 €	4175,25052	32.274,26 €	8.133.114,06 €
2042	7,88 €	4175,25052	32.919,75 €	8.295.776,34 €
2043	8,04 €	4175,25052	33.578,14 €	8.461.691,86 €
2044	8,20 €	4175,25052	34.249,71 €	8.630.925,70 €
2045	8,37 €	4175,25052	34.934,70 €	8.803.544,21 €
2046	8,53 €	4175,25052	35.633,39 €	8.979.615,10 €
2047	8,71 €	4175,25052	36.346,06 €	9.159.207,40 €
2048	8,88 €	4175,25052	37.072,98 €	9.342.391,55 €
2049	9,06 €	4175,25052	37.814,44 €	9.529.239,38 €
2050	9,24 €	4175,25052	38.570,73 €	9.719.824,17 €
2051	9,42 €	4175,25052	39.342,15 €	9.914.220,65 €
2052	9,61 €	4175,25052	40.128,99 €	10.112.505,06 €
2053	9,80 €	4175,25052	40.931,57 €	10.314.755,16 €
2054	10,00 €	4175,25052	41.750,20 €	10.521.050,27 €
2055	10,20 €	4175,25052	42.585,20 €	10.731.471,27 €
2056	10,40 €	4175,25052	43.436,91 €	10.946.100,70 €
2057	10,61 €	4175,25052	44.305,65 €	11.165.022,71 €
2058	10,82 €	4175,25052	45.191,76 €	11.388.323,17 €
2059	11,04 €	4175,25052	46.095,59 €	11.616.089,63 €
2060	11,26 €	4175,25052	47.017,51 €	11.848.411,42 €

The solution D presents the same tables of the solution B except for the line Benevento-Caserta and Benevento-Napoli which are reported in the following tables.

Benevento-Caserta (solution D)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	1700	5.270,00 €	1.328.040,00 €
2021	3,16 €	1725,5	5.456,03 €	1.374.919,81 €
2022	3,23 €	1751,3825	5.648,63 €	1.423.454,48 €
2023	3,29 €	1777,653238	5.848,03 €	1.473.702,42 €
2024	3,36 €	1804,318036	6.054,46 €	1.525.724,12 €
2025	3,42 €	1831,382807	6.268,18 €	1.579.582,18 €
2026	3,49 €	1858,853549	6.489,45 €	1.635.341,43 €
2027	3,56 €	1886,736352	6.718,53 €	1.693.068,99 €
2028	3,63 €	1915,037397	6.955,69 €	1.752.834,32 €
2029	3,70 €	1943,762958	7.201,23 €	1.814.709,37 €
2030	3,78 €	1972,919403	7.455,43 €	1.878.768,61 €
2031	3,85 €	2002,513194	7.718,61 €	1.945.089,14 €
2032	3,93 €	2032,550891	7.991,07 €	2.013.750,79 €
2033	4,01 €	2063,039155	8.273,16 €	2.084.836,19 €
2034	4,09 €	2093,984742	8.565,20 €	2.158.430,91 €
2035	4,17 €	2125,394513	8.867,55 €	2.234.623,52 €
2036	4,26 €	2157,275431	9.180,58 €	2.313.505,73 €
2037	4,34 €	2189,634562	9.504,65 €	2.395.172,49 €
2038	4,43 €	2222,479081	9.840,17 €	2.479.722,07 €
2039	4,52 €	2255,816267	10.187,52 €	2.567.256,26 €
2040	4,61 €	2289,653511	10.547,14 €	2.657.880,41 €
2041	4,70 €	2289,653511	10.758,09 €	2.711.038,02 €
2042	4,79 €	2289,653511	10.973,25 €	2.765.258,78 €
2043	4,89 €	2289,653511	11.192,71 €	2.820.563,95 €
2044	4,99 €	2289,653511	11.416,57 €	2.876.975,23 €
2045	5,09 €	2289,653511	11.644,90 €	2.934.514,74 €
2046	5,19 €	2289,653511	11.877,80 €	2.993.205,03 €
2047	5,29 €	2289,653511	12.115,35 €	3.053.069,13 €
2048	5,40 €	2289,653511	12.357,66 €	3.114.130,52 €
2049	5,51 €	2289,653511	12.604,81 €	3.176.413,13 €
2050	5,62 €	2289,653511	12.856,91 €	3.239.941,39 €
2051	5,73 €	2289,653511	13.114,05 €	3.304.740,22 €
2052	5,84 €	2289,653511	13.376,33 €	3.370.835,02 €
2053	5,96 €	2289,653511	13.643,86 €	3.438.251,72 €
2054	6,08 €	2289,653511	13.916,73 €	3.507.016,76 €
2055	6,20 €	2289,653511	14.195,07 €	3.577.157,09 €
2056	6,32 €	2289,653511	14.478,97 €	3.648.700,23 €
2057	6,45 €	2289,653511	14.768,55 €	3.721.674,24 €
2058	6,58 €	2289,653511	15.063,92 €	3.796.107,72 €
2059	6,71 €	2289,653511	15.365,20 €	3.872.029,88 €
2060	6,84 €	2289,653511	15.672,50 €	3.949.470,47 €

Benevento-Napoli (solution D)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	5,10 €	2300	11.730,00 €	2.955.960,00 €
2021	5,20 €	2334,5	12.144,07 €	3.060.305,39 €
2022	5,31 €	2369,5175	12.572,75 €	3.168.334,17 €
2023	5,41 €	2405,060263	13.016,57 €	3.280.176,36 €
2024	5,52 €	2441,136166	13.476,06 €	3.395.966,59 €
2025	5,63 €	2477,753209	13.951,76 €	3.515.844,21 €
2026	5,74 €	2514,919507	14.444,26 €	3.639.953,51 €
2027	5,86 €	2552,6433	14.954,14 €	3.768.443,87 €
2028	5,98 €	2590,932949	15.482,02 €	3.901.469,94 €
2029	6,09 €	2629,796943	16.028,54 €	4.039.191,83 €
2030	6,22 €	2669,243898	16.594,35 €	4.181.775,30 €
2031	6,34 €	2709,282556	17.180,13 €	4.329.391,97 €
2032	6,47 €	2749,921794	17.786,59 €	4.482.219,50 €
2033	6,60 €	2791,170621	18.414,45 €	4.640.441,85 €
2034	6,73 €	2833,038181	19.064,48 €	4.804.249,45 €
2035	6,86 €	2875,533753	19.737,46 €	4.973.839,46 €
2036	7,00 €	2918,66676	20.434,19 €	5.149.415,99 €
2037	7,14 €	2962,446761	21.155,52 €	5.331.190,37 €
2038	7,28 €	3006,883462	21.902,31 €	5.519.381,39 €
2039	7,43 €	3051,986714	22.675,46 €	5.714.215,56 €
2040	7,58 €	3097,766515	23.475,90 €	5.915.927,36 €
2041	7,73 €	3097,766515	23.945,42 €	6.034.245,91 €
2042	7,88 €	3097,766515	24.424,33 €	6.154.930,83 €
2043	8,04 €	3097,766515	24.912,82 €	6.278.029,45 €
2044	8,20 €	3097,766515	25.411,07 €	6.403.590,04 €
2045	8,37 €	3097,766515	25.919,29 €	6.531.661,84 €
2046	8,53 €	3097,766515	26.437,68 €	6.662.295,07 €
2047	8,71 €	3097,766515	26.966,43 €	6.795.540,97 €
2048	8,88 €	3097,766515	27.505,76 €	6.931.451,79 €
2049	9,06 €	3097,766515	28.055,88 €	7.070.080,83 €
2050	9,24 €	3097,766515	28.616,99 €	7.211.482,45 €
2051	9,42 €	3097,766515	29.189,33 €	7.355.712,10 €
2052	9,61 €	3097,766515	29.773,12 €	7.502.826,34 €
2053	9,80 €	3097,766515	30.368,58 €	7.652.882,86 €
2054	10,00 €	3097,766515	30.975,95 €	7.805.940,52 €
2055	10,20 €	3097,766515	31.595,47 €	7.962.059,33 €
2056	10,40 €	3097,766515	32.227,38 €	8.121.300,52 €
2057	10,61 €	3097,766515	32.871,93 €	8.283.726,53 €
2058	10,82 €	3097,766515	33.529,37 €	8.449.401,06 €
2059	11,04 €	3097,766515	34.199,96 €	8.618.389,08 €
2060	11,26 €	3097,766515	34.883,96 €	8.790.756,86 €

5.2.2 A

In the following tables the annual revenues for the long distance passenger transport service are reported.

The PV of long distance passenger transport service revenues is computed through the sum of PVs of the annual revenues of the routes.

Roma-Bari AV				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	59,00 €	6909	407.631,00 €	148.785.315,00 €
2025	60,18 €	7012,635	422.020,37 €	154.037.436,62 €
2026	61,38 €	7117,824525	436.917,69 €	159.474.958,13 €
2027	62,61 €	7224,591893	452.340,89 €	165.104.424,15 €
2028	63,86 €	7332,960771	468.308,52 €	170.932.610,33 €
2029	65,14 €	7442,955183	484.839,81 €	176.966.531,47 €
2030	66,44 €	7554,599511	501.954,66 €	183.213.450,03 €
2031	67,77 €	7667,918503	519.673,66 €	189.680.884,82 €
2032	69,13 €	7782,937281	538.018,14 €	196.376.620,05 €
2033	70,51 €	7899,68134	557.010,18 €	203.308.714,74 €
2034	71,92 €	8018,17656	576.672,64 €	210.485.512,37 €
2035	73,36 €	8138,449209	597.029,18 €	217.915.650,96 €
2036	74,83 €	8260,525947	618.104,31 €	225.608.073,44 €
2037	76,32 €	8384,433836	639.923,39 €	233.572.038,43 €
2038	77,85 €	8510,200343	662.512,69 €	241.817.131,39 €
2039	79,41 €	8637,853349	685.899,39 €	250.353.276,12 €
2040	80,99 €	8767,421149	710.111,63 €	259.190.746,77 €
2041	82,61 €	8898,932466	735.178,58 €	268.340.180,13 €
2042	84,27 €	9032,416453	761.130,38 €	277.812.588,49 €
2043	85,95 €	9167,9027	787.998,28 €	287.619.372,86 €
2044	87,67 €	9305,42124	815.814,62 €	297.772.336,73 €
2045	89,42 €	9305,42124	832.130,91 €	303.727.783,46 €
2046	91,21 €	9305,42124	848.773,53 €	309.802.339,13 €
2047	93,04 €	9305,42124	865.749,00 €	315.998.385,91 €
2048	94,90 €	9305,42124	883.063,98 €	322.318.353,63 €
2049	96,80 €	9305,42124	900.725,26 €	328.764.720,70 €
2050	98,73 €	9305,42124	918.739,77 €	335.340.015,12 €
2051	100,71 €	9305,42124	937.114,56 €	342.046.815,42 €
2052	102,72 €	9305,42124	955.856,85 €	348.887.751,73 €
2053	104,77 €	9305,42124	974.973,99 €	355.865.506,76 €
2054	106,87 €	9305,42124	994.473,47 €	362.982.816,90 €
2055	109,01 €	9305,42124	1.014.362,94 €	370.242.473,24 €
2056	111,19 €	9305,42124	1.034.650,20 €	377.647.322,70 €
2057	113,41 €	9305,42124	1.055.343,20 €	385.200.269,15 €
2058	115,68 €	9305,42124	1.076.450,07 €	392.904.274,54 €
2059	117,99 €	9305,42124	1.097.979,07 €	400.762.360,03 €
2060	120,35 €	9305,42124	1.119.938,65 €	408.777.607,23 €

Milano-Bari AV				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	159,00 €	2590	411.810,00 €	150.310.650,00 €
2025	162,18 €	2628,85	426.346,89 €	155.616.615,95 €
2026	165,42 €	2668,28275	441.396,94 €	161.109.882,49 €
2027	168,73 €	2708,306991	456.978,25 €	166.797.061,34 €
2028	172,11 €	2748,931596	473.109,58 €	172.684.997,60 €
2029	175,55 €	2790,16557	489.810,35 €	178.780.778,02 €
2030	179,06 €	2832,018054	507.100,66 €	185.091.739,48 €
2031	182,64 €	2874,498324	525.001,31 €	191.625.477,89 €
2032	186,29 €	2917,615799	543.533,86 €	198.389.857,26 €
2033	190,02 €	2961,380036	562.720,60 €	205.393.019,22 €
2034	193,82 €	3005,800737	582.584,64 €	212.643.392,80 €
2035	197,70 €	3050,887748	603.149,88 €	220.149.704,56 €
2036	201,65 €	3096,651064	624.441,07 €	227.920.989,13 €
2037	205,68 €	3143,10083	646.483,84 €	235.966.600,05 €
2038	209,80 €	3190,247342	669.304,72 €	244.296.221,03 €
2039	213,99 €	3238,101053	692.931,17 €	252.919.877,63 €
2040	218,27 €	3286,672568	717.391,64 €	261.847.949,32 €
2041	222,64 €	3335,972657	742.715,57 €	271.091.181,93 €
2042	227,09 €	3386,012247	768.933,43 €	280.660.700,65 €
2043	231,63 €	3436,802431	796.076,78 €	290.568.023,38 €
2044	236,27 €	3488,354467	824.178,29 €	300.825.074,61 €
2045	240,99 €	3488,354467	840.661,85 €	306.841.576,10 €
2046	245,81 €	3488,354467	857.475,09 €	312.978.407,62 €
2047	250,73 €	3488,354467	874.624,59 €	319.237.975,77 €
2048	255,74 €	3488,354467	892.117,08 €	325.622.735,29 €
2049	260,86 €	3488,354467	909.959,42 €	332.135.189,99 €
2050	266,07 €	3488,354467	928.158,61 €	338.777.893,79 €
2051	271,39 €	3488,354467	946.721,79 €	345.553.451,67 €
2052	276,82 €	3488,354467	965.656,22 €	352.464.520,70 €
2053	282,36 €	3488,354467	984.969,35 €	359.513.811,12 €
2054	288,01 €	3488,354467	1.004.668,73 €	366.704.087,34 €
2055	293,77 €	3488,354467	1.024.762,11 €	374.038.169,09 €
2056	299,64 €	3488,354467	1.045.257,35 €	381.518.932,47 €
2057	305,63 €	3488,354467	1.066.162,50 €	389.149.311,12 €
2058	311,75 €	3488,354467	1.087.485,75 €	396.932.297,34 €
2059	317,98 €	3488,354467	1.109.235,46 €	404.870.943,29 €
2060	324,34 €	3488,354467	1.131.420,17 €	412.968.362,15 €

Napoli-Bari ES				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	47,10 €	3750	176.625,00 €	64.468.125,00 €
2025	48,04 €	3806,25	182.859,86 €	66.743.849,81 €
2026	49,00 €	3863,34375	189.314,82 €	69.099.907,71 €
2027	49,98 €	3921,293906	195.997,63 €	71.539.134,45 €
2028	50,98 €	3980,113315	202.916,34 €	74.064.465,90 €
2029	52,00 €	4039,815015	210.079,29 €	76.678.941,55 €
2030	53,04 €	4100,41224	217.495,09 €	79.385.708,18 €
2031	54,10 €	4161,918423	225.172,67 €	82.188.023,68 €
2032	55,19 €	4224,3472	233.121,26 €	85.089.260,92 €
2033	56,29 €	4287,712408	241.350,44 €	88.092.911,83 €
2034	57,41 €	4352,028094	249.870,11 €	91.202.591,61 €
2035	58,56 €	4417,308515	258.690,53 €	94.422.043,10 €
2036	59,73 €	4483,568143	267.822,30 €	97.755.141,22 €
2037	60,93 €	4550,821665	277.276,43 €	101.205.897,71 €
2038	62,15 €	4619,08399	287.064,29 €	104.778.465,89 €
2039	63,39 €	4688,37025	297.197,66 €	108.477.145,74 €
2040	64,66 €	4758,695804	307.688,74 €	112.306.388,98 €
2041	65,95 €	4830,076241	318.550,15 €	116.270.804,52 €
2042	67,27 €	4902,527384	329.794,97 €	120.375.163,92 €
2043	68,62 €	4976,065295	341.436,73 €	124.624.407,20 €
2044	69,99 €	5050,706275	353.489,45 €	129.023.648,78 €
2045	71,39 €	5050,706275	360.559,24 €	131.604.121,75 €
2046	72,82 €	5050,706275	367.770,42 €	134.236.204,19 €
2047	74,27 €	5050,706275	375.125,83 €	136.920.928,27 €
2048	75,76 €	5050,706275	382.628,35 €	139.659.346,84 €
2049	77,27 €	5050,706275	390.280,91 €	142.452.533,77 €
2050	78,82 €	5050,706275	398.086,53 €	145.301.584,45 €
2051	80,39 €	5050,706275	406.048,26 €	148.207.616,14 €
2052	82,00 €	5050,706275	414.169,23 €	151.171.768,46 €
2053	83,64 €	5050,706275	422.452,61 €	154.195.203,83 €
2054	85,32 €	5050,706275	430.901,67 €	157.279.107,91 €
2055	87,02 €	5050,706275	439.519,70 €	160.424.690,06 €
2056	88,76 €	5050,706275	448.310,09 €	163.633.183,86 €
2057	90,54 €	5050,706275	457.276,29 €	166.905.847,54 €
2058	92,35 €	5050,706275	466.421,82 €	170.243.964,49 €
2059	94,19 €	5050,706275	475.750,26 €	173.648.843,78 €
2060	96,08 €	5050,706275	485.265,26 €	177.121.820,66 €

Roma-Bari IC				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	49,00 €	2200	107.800,00 €	39.347.000,00 €
2025	49,98 €	2233	111.605,34 €	40.735.949,10 €
2026	50,98 €	2266,495	115.545,01 €	42.173.928,10 €
2027	52,00 €	2300,492425	119.623,75 €	43.662.667,77 €
2028	53,04 €	2334,999811	123.846,47 €	45.203.959,94 €
2029	54,10 €	2370,024809	128.218,25 €	46.799.659,72 €
2030	55,18 €	2405,575181	132.744,35 €	48.451.687,71 €
2031	56,29 €	2441,658808	137.430,23 €	50.162.032,29 €
2032	57,41 €	2478,283691	142.281,51 €	51.932.752,03 €
2033	58,56 €	2515,457946	147.304,05 €	53.765.978,17 €
2034	59,73 €	2553,189815	152.503,88 €	55.663.917,20 €
2035	60,93 €	2591,487662	157.887,27 €	57.628.853,48 €
2036	62,14 €	2630,359977	163.460,69 €	59.663.152,01 €
2037	63,39 €	2669,815377	169.230,85 €	61.769.261,27 €
2038	64,65 €	2709,862608	175.204,70 €	63.949.716,20 €
2039	65,95 €	2750,510547	181.389,43 €	66.207.141,18 €
2040	67,27 €	2791,768205	187.792,47 €	68.544.253,26 €
2041	68,61 €	2833,644728	194.421,55 €	70.963.865,40 €
2042	69,98 €	2876,149399	201.284,63 €	73.468.889,85 €
2043	71,38 €	2919,29164	208.389,98 €	76.062.341,66 €
2044	72,81 €	2963,081014	215.746,14 €	78.747.342,32 €
2045	74,27 €	2963,081014	220.061,07 €	80.322.289,17 €
2046	75,75 €	2963,081014	224.462,29 €	81.928.734,95 €
2047	77,27 €	2963,081014	228.951,53 €	83.567.309,65 €
2048	78,81 €	2963,081014	233.530,56 €	85.238.655,85 €
2049	80,39 €	2963,081014	238.201,18 €	86.943.428,96 €
2050	82,00 €	2963,081014	242.965,20 €	88.682.297,54 €
2051	83,64 €	2963,081014	247.824,50 €	90.455.943,49 €
2052	85,31 €	2963,081014	252.780,99 €	92.265.062,36 €
2053	87,02 €	2963,081014	257.836,61 €	94.110.363,61 €
2054	88,76 €	2963,081014	262.993,34 €	95.992.570,88 €
2055	90,53 €	2963,081014	268.253,21 €	97.912.422,30 €
2056	92,34 €	2963,081014	273.618,28 €	99.870.670,75 €
2057	94,19 €	2963,081014	279.090,64 €	101.868.084,16 €
2058	96,07 €	2963,081014	284.672,45 €	103.905.445,84 €
2059	97,99 €	2963,081014	290.365,90 €	105.983.554,76 €
2060	99,95 €	2963,081014	296.173,22 €	108.103.225,86 €

Caserta-Bari IC				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	31,50 €	200	6.300,00 €	2.299.500,00 €
2025	32,13 €	203	6.522,39 €	2.380.672,35 €
2026	32,77 €	206,045	6.752,63 €	2.464.710,08 €
2027	33,43 €	209,135675	6.991,00 €	2.551.714,35 €
2028	34,10 €	212,2727101	7.237,78 €	2.641.789,87 €
2029	34,78 €	215,4568008	7.493,27 €	2.735.045,05 €
2030	35,47 €	218,6886528	7.757,79 €	2.831.592,14 €
2031	36,18 €	221,9689826	8.031,64 €	2.931.547,34 €
2032	36,91 €	225,2985173	8.315,15 €	3.035.030,96 €
2033	37,65 €	228,6779951	8.608,68 €	3.142.167,56 €
2034	38,40 €	232,108165	8.912,56 €	3.253.086,07 €
2035	39,17 €	235,5897875	9.227,18 €	3.367.920,01 €
2036	39,95 €	239,1236343	9.552,90 €	3.486.807,58 €
2037	40,75 €	242,7104888	9.890,11 €	3.609.891,89 €
2038	41,56 €	246,3511461	10.239,24 €	3.737.321,08 €
2039	42,39 €	250,0464133	10.600,68 €	3.869.248,51 €
2040	43,24 €	253,7971095	10.974,88 €	4.005.832,98 €
2041	44,11 €	257,6040662	11.362,30 €	4.147.238,89 €
2042	44,99 €	261,4681272	11.763,39 €	4.293.636,42 €
2043	45,89 €	265,3901491	12.178,64 €	4.445.201,79 €
2044	46,81 €	269,3710013	12.608,54 €	4.602.117,41 €
2045	47,74 €	269,3710013	12.860,71 €	4.694.159,76 €
2046	48,70 €	269,3710013	13.117,93 €	4.788.042,95 €
2047	49,67 €	269,3710013	13.380,28 €	4.883.803,81 €
2048	50,67 €	269,3710013	13.647,89 €	4.981.479,89 €
2049	51,68 €	269,3710013	13.920,85 €	5.081.109,48 €
2050	52,71 €	269,3710013	14.199,26 €	5.182.731,67 €
2051	53,77 €	269,3710013	14.483,25 €	5.286.386,31 €
2052	54,84 €	269,3710013	14.772,92 €	5.392.114,03 €
2053	55,94 €	269,3710013	15.068,37 €	5.499.956,31 €
2054	57,06 €	269,3710013	15.369,74 €	5.609.955,44 €
2055	58,20 €	269,3710013	15.677,14 €	5.722.154,55 €
2056	59,36 €	269,3710013	15.990,68 €	5.836.597,64 €
2057	60,55 €	269,3710013	16.310,49 €	5.953.329,59 €
2058	61,76 €	269,3710013	16.636,70 €	6.072.396,19 €
2059	63,00 €	269,3710013	16.969,44 €	6.193.844,11 €
2060	64,26 €	269,3710013	17.308,82 €	6.317.720,99 €

Napoli-Bari IC				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	34,60 €	3200	110.720,00 €	40.412.800,00 €
2025	35,29 €	3248	114.628,42 €	41.839.371,84 €
2026	36,00 €	3296,72	118.674,80 €	43.316.301,67 €
2027	36,72 €	3346,1708	122.864,02 €	44.845.367,11 €
2028	37,45 €	3396,363362	127.201,12 €	46.428.408,57 €
2029	38,20 €	3447,308812	131.691,32 €	48.067.331,40 €
2030	38,97 €	3499,018445	136.340,02 €	49.764.108,19 €
2031	39,74 €	3551,503721	141.152,83 €	51.520.781,21 €
2032	40,54 €	3604,776277	146.135,52 €	53.339.464,79 €
2033	41,35 €	3658,847921	151.294,10 €	55.222.347,90 €
2034	42,18 €	3713,73064	156.634,79 €	57.171.696,78 €
2035	43,02 €	3769,4366	162.163,99 €	59.189.857,68 €
2036	43,88 €	3825,978149	167.888,38 €	61.279.259,65 €
2037	44,76 €	3883,367821	173.814,84 €	63.442.417,52 €
2038	45,65 €	3941,618338	179.950,51 €	65.681.934,86 €
2039	46,57 €	4000,742613	186.302,76 €	68.000.507,16 €
2040	47,50 €	4060,753752	192.879,25 €	70.400.925,06 €
2041	48,45 €	4121,665059	199.687,88 €	72.886.077,71 €
2042	49,42 €	4183,490035	206.736,87 €	75.458.956,26 €
2043	50,41 €	4246,242385	214.034,68 €	78.122.657,41 €
2044	51,41 €	4309,936021	221.590,10 €	80.880.387,22 €
2045	52,44 €	4309,936021	226.021,90 €	82.497.994,96 €
2046	53,49 €	4309,936021	230.542,34 €	84.147.954,86 €
2047	54,56 €	4309,936021	235.153,19 €	85.830.913,96 €
2048	55,65 €	4309,936021	239.856,25 €	87.547.532,24 €
2049	56,76 €	4309,936021	244.653,38 €	89.298.482,88 €
2050	57,90 €	4309,936021	249.546,45 €	91.084.452,54 €
2051	59,06 €	4309,936021	254.537,37 €	92.906.141,59 €
2052	60,24 €	4309,936021	259.628,12 €	94.764.264,42 €
2053	61,44 €	4309,936021	264.820,68 €	96.659.549,71 €
2054	62,67 €	4309,936021	270.117,10 €	98.592.740,71 €
2055	63,93 €	4309,936021	275.519,44 €	100.564.595,52 €
2056	65,21 €	4309,936021	281.029,83 €	102.575.887,43 €
2057	66,51 €	4309,936021	286.650,43 €	104.627.405,18 €
2058	67,84 €	4309,936021	292.383,43 €	106.719.953,28 €
2059	69,20 €	4309,936021	298.231,10 €	108.854.352,35 €
2060	70,58 €	4309,936021	304.195,72 €	111.031.439,40 €

5.2.3 A

In the following tables the annual revenues for the freight transport service are reported.

Napoli-Bari freight transport service				
	Price/km	Km	Wagons/year	Annual revenues
2024	3,80 €	300	85000	96.900.000,00 €
2025	3,88 €	300	86275	100.320.570,00 €
2026	3,95 €	300	87569,125	103.861.886,12 €
2027	4,03 €	300	88882,66188	107.528.210,70 €
2028	4,11 €	300	90215,9018	111.323.956,54 €
2029	4,20 €	300	91569,14033	115.253.692,20 €
2030	4,28 €	300	92942,67744	119.322.147,54 €
2031	4,37 €	300	94336,8176	123.534.219,35 €
2032	4,45 €	300	95751,86986	127.894.977,29 €
2033	4,54 €	300	97188,14791	132.409.669,99 €
2034	4,63 €	300	98645,97013	137.083.731,34 €
2035	4,72 €	300	100125,6597	141.922.787,06 €
2036	4,82 €	300	101627,5446	146.932.661,44 €
2037	4,92 €	300	103151,9577	152.119.384,39 €
2038	5,01 €	300	104699,2371	157.489.198,66 €
2039	5,11 €	300	106269,7257	163.048.567,37 €
2040	5,22 €	300	107863,7716	168.804.181,80 €
2041	5,32 €	300	109481,7281	174.762.969,41 €
2042	5,43 €	300	111123,954	180.932.102,24 €
2043	5,54 €	300	112790,8134	187.319.005,44 €
2044	5,65 €	300	114482,6756	193.931.366,34 €
2045	5,76 €	300	114482,6756	197.809.993,66 €
2046	5,87 €	300	114482,6756	201.766.193,54 €
2047	5,99 €	300	114482,6756	205.801.517,41 €
2048	6,11 €	300	114482,6756	209.917.547,75 €
2049	6,23 €	300	114482,6756	214.115.898,71 €
2050	6,36 €	300	114482,6756	218.398.216,68 €
2051	6,49 €	300	114482,6756	222.766.181,02 €
2052	6,62 €	300	114482,6756	227.221.504,64 €
2053	6,75 €	300	114482,6756	231.765.934,73 €
2054	6,88 €	300	114482,6756	236.401.253,43 €
2055	7,02 €	300	114482,6756	241.129.278,49 €
2056	7,16 €	300	114482,6756	245.951.864,06 €
2057	7,30 €	300	114482,6756	250.870.901,35 €
2058	7,45 €	300	114482,6756	255.888.319,37 €
2059	7,60 €	300	114482,6756	261.006.085,76 €
2060	7,75 €	300	114482,6756	266.226.207,47 €

6 Socio-economic analysis

From table 6.1.1 A to table 6.2.3 A the description is the same made from table 5.1.1 A to table 5.2.3 taking into account that the values in the socio-economic analysis are costant over time so there is not inflation and the same values are converted through conversion factors as we have said in chapter 6.

Instead table 6.4.3 A takes into account some of the external benefits of the project.

6 A

Conversion factors	
Item	Value
Realization costs	0,8706
Maintenance costs	1,0182
Operating costs	0,7144
Revenues	1
Salvage value	0,8706

6.1.1 A

Annual realization costs				
Year	A	B	C	D
2016	491,02 €	446,84 €	421,04 €	465,23 €
2017	491,02 €	446,84 €	421,04 €	465,23 €
2018	491,02 €	446,84 €	421,04 €	465,23 €
2019	491,02 €	446,84 €	421,04 €	465,23 €
2020	491,02 €	446,84 €	421,04 €	465,23 €
2021	491,02 €	446,84 €	421,04 €	465,23 €
2022	491,02 €	446,84 €	421,04 €	465,23 €
2023	491,02 €	446,84 €	421,04 €	465,23 €

6.1.2 A

Annual ordinary maintenance costs (millions/year)				
Year	A	B	C	D
2020	1,22184	1,5273	1,42548	1,12002
2021	1,22184	1,5273	1,42548	1,12002
2022	1,22184	1,5273	1,42548	1,12002
2023	1,22184	1,5273	1,42548	1,12002
2024	1,22184	1,5273	1,42548	1,12002
2025	1,22184	1,5273	1,42548	1,12002
2026	1,22184	1,5273	1,42548	1,12002
2027	1,22184	1,5273	1,42548	1,12002
2028	1,22184	1,5273	1,42548	1,12002
2029	1,22184	1,5273	1,42548	1,12002
2030	1,22184	1,5273	1,42548	1,12002
2031	1,22184	1,5273	1,42548	1,12002
2032	1,22184	1,5273	1,42548	1,12002
2033	1,22184	1,5273	1,42548	1,12002
2034	1,22184	1,5273	1,42548	1,12002
2035	1,22184	1,5273	1,42548	1,12002
2036	1,22184	1,5273	1,42548	1,12002
2037	1,22184	1,5273	1,42548	1,12002
2038	1,22184	1,5273	1,42548	1,12002
2039	1,22184	1,5273	1,42548	1,12002
2040	1,22184	1,5273	1,42548	1,12002
2041	1,22184	1,5273	1,42548	1,12002
2042	1,22184	1,5273	1,42548	1,12002
2043	1,22184	1,5273	1,42548	1,12002
2044	1,22184	1,5273	1,42548	1,12002
2045	1,22184	1,5273	1,42548	1,12002
2046	1,22184	1,5273	1,42548	1,12002
2047	1,22184	1,5273	1,42548	1,12002
2048	1,22184	1,5273	1,42548	1,12002
2049	1,22184	1,5273	1,42548	1,12002
2050	1,22184	1,5273	1,42548	1,12002
2051	1,22184	1,5273	1,42548	1,12002
2052	1,22184	1,5273	1,42548	1,12002
2053	1,22184	1,5273	1,42548	1,12002
2054	1,22184	1,5273	1,42548	1,12002
2055	1,22184	1,5273	1,42548	1,12002
2056	1,22184	1,5273	1,42548	1,12002
2057	1,22184	1,5273	1,42548	1,12002
2058	1,22184	1,5273	1,42548	1,12002
2059	1,22184	1,5273	1,42548	1,12002
2060	1,22184	1,5273	1,42548	1,12002

6.1.3 A

Year	**Annual freight operating costs** (millions/year)	**Annual passenger operating costs** (millions/year)
2020	0,00 €	8,90 €
2021	0,00 €	8,90 €
2022	0,00 €	8,90 €
2023	0,00 €	8,90 €
2024	32,56 €	95,14 €
2025	32,56 €	95,14 €
2026	32,56 €	95,14 €
2027	32,56 €	95,14 €
2028	32,56 €	95,14 €
2029	32,56 €	95,14 €
2030	32,56 €	95,14 €
2031	32,56 €	95,14 €
2032	32,56 €	95,14 €
2033	32,56 €	95,14 €
2034	32,56 €	95,14 €
2035	32,56 €	95,14 €
2036	32,56 €	95,14 €
2037	32,56 €	95,14 €
2038	32,56 €	95,14 €
2039	32,56 €	95,14 €
2040	32,56 €	95,14 €
2041	32,56 €	95,14 €
2042	32,56 €	95,14 €
2043	32,56 €	95,14 €
2044	32,56 €	95,14 €
2045	32,56 €	95,14 €
2046	32,56 €	95,14 €
2047	32,56 €	95,14 €
2048	32,56 €	95,14 €
2049	32,56 €	95,14 €
2050	32,56 €	95,14 €
2051	32,56 €	95,14 €
2052	32,56 €	95,14 €
2053	32,56 €	95,14 €
2054	32,56 €	95,14 €
2055	32,56 €	95,14 €
2056	32,56 €	95,14 €
2057	32,56 €	95,14 €
2058	32,56 €	95,14 €
2059	32,56 €	95,14 €
2060	32,56 €	95,14 €

6.2.1 A

In the following tables the annual revenues for the short distance passenger transport service are reported.
The PV of short distance passenger transport service revenues for each solution is computed through the sum of PVs of the annual revenues of the routes composing the same solution.

Benevento-Caserta (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	1900	5.890,00 €	1.484.280,00 €
2021	3,10 €	1928,5	5.978,35 €	1.506.544,20 €
2022	3,10 €	1957,4275	6.068,03 €	1.529.142,36 €
2023	3,10 €	1986,788913	6.159,05 €	1.552.079,50 €
2024	3,10 €	2016,590746	6.251,43 €	1.575.360,69 €
2025	3,10 €	2046,839607	6.345,20 €	1.598.991,10 €
2026	3,10 €	2077,542201	6.440,38 €	1.622.975,97 €
2027	3,10 €	2108,705335	6.536,99 €	1.647.320,61 €
2028	3,10 €	2140,335915	6.635,04 €	1.672.030,42 €
2029	3,10 €	2172,440953	6.734,57 €	1.697.110,87 €
2030	3,10 €	2205,027568	6.835,59 €	1.722.567,54 €
2031	3,10 €	2238,102981	6.938,12 €	1.748.406,05 €
2032	3,10 €	2271,674526	7.042,19 €	1.774.632,14 €
2033	3,10 €	2305,749644	7.147,82 €	1.801.251,62 €
2034	3,10 €	2340,335888	7.255,04 €	1.828.270,40 €
2035	3,10 €	2375,440927	7.363,87 €	1.855.694,45 €
2036	3,10 €	2411,072541	7.474,32 €	1.883.529,87 €
2037	3,10 €	2447,238629	7.586,44 €	1.911.782,82 €
2038	3,10 €	2483,947208	7.700,24 €	1.940.459,56 €
2039	3,10 €	2521,206416	7.815,74 €	1.969.566,45 €
2040	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2041	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2042	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2043	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2044	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2045	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2046	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2047	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2048	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2049	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2050	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2051	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2052	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2053	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2054	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2055	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2056	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2057	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2058	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2059	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2060	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €

Benevento-Napoli (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	5,10 €	3400	17.340,00 €	4.369.680,00 €
2021	5,10 €	3451	17.600,10 €	4.435.225,20 €
2022	5,10 €	3502,765	17.864,10 €	4.501.753,58 €
2023	5,10 €	3555,306475	18.132,06 €	4.569.279,88 €
2024	5,10 €	3608,636072	18.404,04 €	4.637.819,08 €
2025	5,10 €	3662,765613	18.680,10 €	4.707.386,37 €
2026	5,10 €	3717,707097	18.960,31 €	4.777.997,16 €
2027	5,10 €	3773,472704	19.244,71 €	4.849.667,12 €
2028	5,10 €	3830,074794	19.533,38 €	4.922.412,13 €
2029	5,10 €	3887,525916	19.826,38 €	4.996.248,31 €
2030	5,10 €	3945,838805	20.123,78 €	5.071.192,03 €
2031	5,10 €	4005,026387	20.425,63 €	5.147.259,91 €
2032	5,10 €	4065,101783	20.732,02 €	5.224.468,81 €
2033	5,10 €	4126,07831	21.043,00 €	5.302.835,84 €
2034	5,10 €	4187,969484	21.358,64 €	5.382.378,38 €
2035	5,10 €	4250,789027	21.679,02 €	5.463.114,06 €
2036	5,10 €	4314,550862	22.004,21 €	5.545.060,77 €
2037	5,10 €	4379,269125	22.334,27 €	5.628.236,68 €
2038	5,10 €	4444,958162	22.669,29 €	5.712.660,23 €
2039	5,10 €	4511,632534	23.009,33 €	5.798.350,13 €
2040	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2041	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2042	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2043	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2044	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2045	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2046	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2047	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2048	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2049	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2050	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2051	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2052	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2053	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2054	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2055	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2056	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2057	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2058	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2059	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €
2060	5,10 €	4579,307022	23.354,47 €	5.885.325,39 €

Cancello-Benevento (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	7000	21.700,00 €	5.468.400,00 €
2021	3,10 €	7105	22.025,50 €	5.550.426,00 €
2022	3,10 €	7211,575	22.355,88 €	5.633.682,39 €
2023	3,10 €	7319,748625	22.691,22 €	5.718.187,63 €
2024	3,10 €	7429,544854	23.031,59 €	5.803.960,44 €
2025	3,10 €	7540,988027	23.377,06 €	5.891.019,85 €
2026	3,10 €	7654,102848	23.727,72 €	5.979.385,14 €
2027	3,10 €	7768,91439	24.083,63 €	6.069.075,92 €
2028	3,10 €	7885,448106	24.444,89 €	6.160.112,06 €
2029	3,10 €	8003,729828	24.811,56 €	6.252.513,74 €
2030	3,10 €	8123,785775	25.183,74 €	6.346.301,45 €
2031	3,10 €	8245,642562	25.561,49 €	6.441.495,97 €
2032	3,10 €	8369,3272	25.944,91 €	6.538.118,41 €
2033	3,10 €	8494,867108	26.334,09 €	6.636.190,18 €
2034	3,10 €	8622,290115	26.729,10 €	6.735.733,04 €
2035	3,10 €	8751,624467	27.130,04 €	6.836.769,03 €
2036	3,10 €	8882,898834	27.536,99 €	6.939.320,57 €
2037	3,10 €	9016,142316	27.950,04 €	7.043.410,38 €
2038	3,10 €	9151,384451	28.369,29 €	7.149.061,53 €
2039	3,10 €	9288,655218	28.794,83 €	7.256.297,46 €
2040	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2041	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2042	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2043	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2044	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2045	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2046	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2047	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2048	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2049	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2050	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2051	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2052	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2053	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2054	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2055	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2056	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2057	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2058	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2059	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2060	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €

Foggia-Benevento/Caserta/Napoli (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	16,36 €	2800	45.808,00 €	11.543.616,00 €
2021	16,36 €	2842	46.495,12 €	11.716.770,24 €
2022	16,36 €	2884,63	47.192,55 €	11.892.521,79 €
2023	16,36 €	2927,89945	47.900,44 €	12.070.909,62 €
2024	16,36 €	2971,817942	48.618,94 €	12.251.973,26 €
2025	16,36 €	3016,395211	49.348,23 €	12.435.752,86 €
2026	16,36 €	3061,641139	50.088,45 €	12.622.289,16 €
2027	16,36 €	3107,565756	50.839,78 €	12.811.623,49 €
2028	16,36 €	3154,179242	51.602,37 €	13.003.797,85 €
2029	16,36 €	3201,491931	52.376,41 €	13.198.854,81 €
2030	16,36 €	3249,51431	53.162,05 €	13.396.837,64 €
2031	16,36 €	3298,257025	53.959,48 €	13.597.790,20 €
2032	16,36 €	3347,73088	54.768,88 €	13.801.757,05 €
2033	16,36 €	3397,946843	55.590,41 €	14.008.783,41 €
2034	16,36 €	3448,916046	56.424,27 €	14.218.915,16 €
2035	16,36 €	3500,649787	57.270,63 €	14.432.198,89 €
2036	16,36 €	3553,159533	58.129,69 €	14.648.681,87 €
2037	16,36 €	3606,456926	59.001,64 €	14.868.412,10 €
2038	16,36 €	3660,55378	59.886,66 €	15.091.438,28 €
2039	16,36 €	3715,462087	60.784,96 €	15.317.809,86 €
2040	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2041	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2042	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2043	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2044	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2045	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2046	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2047	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2048	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2049	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2050	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2051	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2052	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2053	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2054	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2055	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2056	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2057	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2058	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2059	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €
2060	16,36 €	3771,194018	61.696,73 €	15.547.577,00 €

Bovino-foggia (solution A)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	2,50 €	4350	10.875,00 €	2.740.500,00 €
2021	2,50 €	4415,25	11.038,13 €	2.781.607,50 €
2022	2,50 €	4481,47875	11.203,70 €	2.823.331,61 €
2023	2,50 €	4548,700931	11.371,75 €	2.865.681,59 €
2024	2,50 €	4616,931445	11.542,33 €	2.908.666,81 €
2025	2,50 €	4686,185417	11.715,46 €	2.952.296,81 €
2026	2,50 €	4756,478198	11.891,20 €	2.996.581,26 €
2027	2,50 €	4827,825371	12.069,56 €	3.041.529,98 €
2028	2,50 €	4900,242752	12.250,61 €	3.087.152,93 €
2029	2,50 €	4973,746393	12.434,37 €	3.133.460,23 €
2030	2,50 €	5048,352589	12.620,88 €	3.180.462,13 €
2031	2,50 €	5124,077878	12.810,19 €	3.228.169,06 €
2032	2,50 €	5200,939046	13.002,35 €	3.276.591,60 €
2033	2,50 €	5278,953132	13.197,38 €	3.325.740,47 €
2034	2,50 €	5358,137429	13.395,34 €	3.375.626,58 €
2035	2,50 €	5438,50949	13.596,27 €	3.426.260,98 €
2036	2,50 €	5520,087132	13.800,22 €	3.477.654,89 €
2037	2,50 €	5602,888439	14.007,22 €	3.529.819,72 €
2038	2,50 €	5686,931766	14.217,33 €	3.582.767,01 €
2039	2,50 €	5772,235742	14.430,59 €	3.636.508,52 €
2040	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2041	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2042	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2043	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2044	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2045	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2046	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2047	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2048	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2049	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2050	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2051	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2052	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2053	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2054	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2055	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2056	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2057	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2058	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2059	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2060	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €

Benevento-Caserta (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	1900	5.890,00 €	1.484.280,00 €
2021	3,10 €	1928,5	5.978,35 €	1.506.544,20 €
2022	3,10 €	1957,4275	6.068,03 €	1.529.142,36 €
2023	3,10 €	1986,788913	6.159,05 €	1.552.079,50 €
2024	3,10 €	2016,590746	6.251,43 €	1.575.360,69 €
2025	3,10 €	2046,839607	6.345,20 €	1.598.991,10 €
2026	3,10 €	2077,542201	6.440,38 €	1.622.975,97 €
2027	3,10 €	2108,705335	6.536,99 €	1.647.320,61 €
2028	3,10 €	2140,335915	6.635,04 €	1.672.030,42 €
2029	3,10 €	2172,440953	6.734,57 €	1.697.110,87 €
2030	3,10 €	2205,027568	6.835,59 €	1.722.567,54 €
2031	3,10 €	2238,102981	6.938,12 €	1.748.406,05 €
2032	3,10 €	2271,674526	7.042,19 €	1.774.632,14 €
2033	3,10 €	2305,749644	7.147,82 €	1.801.251,62 €
2034	3,10 €	2340,335888	7.255,04 €	1.828.270,40 €
2035	3,10 €	2375,440927	7.363,87 €	1.855.694,45 €
2036	3,10 €	2411,072541	7.474,32 €	1.883.529,87 €
2037	3,10 €	2447,238629	7.586,44 €	1.911.782,82 €
2038	3,10 €	2483,947208	7.700,24 €	1.940.459,56 €
2039	3,10 €	2521,206416	7.815,74 €	1.969.566,45 €
2040	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2041	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2042	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2043	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2044	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2045	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2046	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2047	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2048	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2049	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2050	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2051	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2052	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2053	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2054	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2055	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2056	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2057	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2058	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2059	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €
2060	3,10 €	2559,024512	7.932,98 €	1.999.109,95 €

Benevento-Napoli (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	5,10 €	2600	13.260,00 €	3.341.520,00 €
2021	5,10 €	2639	13.458,90 €	3.391.642,80 €
2022	5,10 €	2678,585	13.660,78 €	3.442.517,44 €
2023	5,10 €	2718,763775	13.865,70 €	3.494.155,20 €
2024	5,10 €	2759,545232	14.073,68 €	3.546.567,53 €
2025	5,10 €	2800,93841	14.284,79 €	3.599.766,04 €
2026	5,10 €	2842,952486	14.499,06 €	3.653.762,54 €
2027	5,10 €	2885,596774	14.716,54 €	3.708.568,97 €
2028	5,10 €	2928,880725	14.937,29 €	3.764.197,51 €
2029	5,10 €	2972,813936	15.161,35 €	3.820.660,47 €
2030	5,10 €	3017,406145	15.388,77 €	3.877.970,38 €
2031	5,10 €	3062,667237	15.619,60 €	3.936.139,93 €
2032	5,10 €	3108,607246	15.853,90 €	3.995.182,03 €
2033	5,10 €	3155,236354	16.091,71 €	4.055.109,76 €
2034	5,10 €	3202,5649	16.333,08 €	4.115.936,41 €
2035	5,10 €	3250,603373	16.578,08 €	4.177.675,46 €
2036	5,10 €	3299,362424	16.826,75 €	4.240.340,59 €
2037	5,10 €	3348,85286	17.079,15 €	4.303.945,70 €
2038	5,10 €	3399,085653	17.335,34 €	4.368.504,88 €
2039	5,10 €	3450,071938	17.595,37 €	4.434.032,45 €
2040	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2041	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2042	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2043	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2044	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2045	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2046	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2047	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2048	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2049	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2050	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2051	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2052	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2053	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2054	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2055	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2056	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2057	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2058	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2059	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €
2060	5,10 €	3501,823017	17.859,30 €	4.500.542,94 €

Cancello-Benevento (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	7000	21.700,00 €	5.468.400,00 €
2021	3,10 €	7105	22.025,50 €	5.550.426,00 €
2022	3,10 €	7211,575	22.355,88 €	5.633.682,39 €
2023	3,10 €	7319,748625	22.691,22 €	5.718.187,63 €
2024	3,10 €	7429,544854	23.031,59 €	5.803.960,44 €
2025	3,10 €	7540,988027	23.377,06 €	5.891.019,85 €
2026	3,10 €	7654,102848	23.727,72 €	5.979.385,14 €
2027	3,10 €	7768,91439	24.083,63 €	6.069.075,92 €
2028	3,10 €	7885,448106	24.444,89 €	6.160.112,06 €
2029	3,10 €	8003,729828	24.811,56 €	6.252.513,74 €
2030	3,10 €	8123,785775	25.183,74 €	6.346.301,45 €
2031	3,10 €	8245,642562	25.561,49 €	6.441.495,97 €
2032	3,10 €	8369,3272	25.944,91 €	6.538.118,41 €
2033	3,10 €	8494,867108	26.334,09 €	6.636.190,18 €
2034	3,10 €	8622,290115	26.729,10 €	6.735.733,04 €
2035	3,10 €	8751,624467	27.130,04 €	6.836.769,03 €
2036	3,10 €	8882,898834	27.536,99 €	6.939.320,57 €
2037	3,10 €	9016,142316	27.950,04 €	7.043.410,38 €
2038	3,10 €	9151,384451	28.369,29 €	7.149.061,53 €
2039	3,10 €	9288,655218	28.794,83 €	7.256.297,46 €
2040	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2041	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2042	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2043	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2044	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2045	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2046	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2047	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2048	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2049	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2050	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2051	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2052	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2053	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2054	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2055	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2056	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2057	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2058	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2059	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €
2060	3,10 €	9427,985046	29.226,75 €	7.365.141,92 €

Foggia-Benevento/Caserta/Napoli (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	6,00 €	750	4.500,00 €	1.134.000,00 €
2021	6,00 €	761,25	4.567,50 €	1.151.010,00 €
2022	6,00 €	772,66875	4.636,01 €	1.168.275,15 €
2023	6,00 €	784,2587813	4.705,55 €	1.185.799,28 €
2024	6,00 €	796,022663	4.776,14 €	1.203.586,27 €
2025	6,00 €	807,9630029	4.847,78 €	1.221.640,06 €
2026	6,00 €	820,082448	4.920,49 €	1.239.964,66 €
2027	6,00 €	832,3836847	4.994,30 €	1.258.564,13 €
2028	6,00 €	844,8694399	5.069,22 €	1.277.442,59 €
2029	6,00 €	857,5424815	5.145,25 €	1.296.604,23 €
2030	6,00 €	870,4056188	5.222,43 €	1.316.053,30 €
2031	6,00 €	883,4617031	5.300,77 €	1.335.794,10 €
2032	6,00 €	896,7136286	5.380,28 €	1.355.831,01 €
2033	6,00 €	910,164333	5.460,99 €	1.376.168,47 €
2034	6,00 €	923,816798	5.542,90 €	1.396.811,00 €
2035	6,00 €	937,67405	5.626,04 €	1.417.763,16 €
2036	6,00 €	951,7391607	5.710,43 €	1.439.029,61 €
2037	6,00 €	966,0152482	5.796,09 €	1.460.615,06 €
2038	6,00 €	980,5054769	5.883,03 €	1.482.524,28 €
2039	6,00 €	995,213059	5.971,28 €	1.504.762,15 €
2040	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2041	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2042	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2043	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2044	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2045	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2046	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2047	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2048	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2049	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2050	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2051	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2052	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2053	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2054	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2055	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2056	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2057	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2058	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2059	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €
2060	6,00 €	1010,141255	6.060,85 €	1.527.333,58 €

Bovino-foggia (solution B)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	2,50 €	4350	10.875,00 €	2.740.500,00 €
2021	2,50 €	4415,25	11.038,13 €	2.781.607,50 €
2022	2,50 €	4481,47875	11.203,70 €	2.823.331,61 €
2023	2,50 €	4548,700931	11.371,75 €	2.865.681,59 €
2024	2,50 €	4616,931445	11.542,33 €	2.908.666,81 €
2025	2,50 €	4686,185417	11.715,46 €	2.952.296,81 €
2026	2,50 €	4756,478198	11.891,20 €	2.996.581,26 €
2027	2,50 €	4827,825371	12.069,56 €	3.041.529,98 €
2028	2,50 €	4900,242752	12.250,61 €	3.087.152,93 €
2029	2,50 €	4973,746393	12.434,37 €	3.133.460,23 €
2030	2,50 €	5048,352589	12.620,88 €	3.180.462,13 €
2031	2,50 €	5124,077878	12.810,19 €	3.228.169,06 €
2032	2,50 €	5200,939046	13.002,35 €	3.276.591,60 €
2033	2,50 €	5278,953132	13.197,38 €	3.325.740,47 €
2034	2,50 €	5358,137429	13.395,34 €	3.375.626,58 €
2035	2,50 €	5438,50949	13.596,27 €	3.426.260,98 €
2036	2,50 €	5520,087132	13.800,22 €	3.477.654,89 €
2037	2,50 €	5602,888439	14.007,22 €	3.529.819,72 €
2038	2,50 €	5686,931766	14.217,33 €	3.582.767,01 €
2039	2,50 €	5772,235742	14.430,59 €	3.636.508,52 €
2040	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2041	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2042	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2043	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2044	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2045	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2046	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2047	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2048	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2049	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2050	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2051	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2052	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2053	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2054	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2055	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2056	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2057	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2058	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2059	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €
2060	2,50 €	5858,819278	14.647,05 €	3.691.056,15 €

The solution C presents the same tables of the solution A except for the line Benevento-Caserta and Benevento-Napoli.

Benevento-Caserta (solution C)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	1700	5.270,00 €	1.328.040,00 €
2021	3,10 €	1725,5	5.349,05 €	1.347.960,60 €
2022	3,10 €	1751,3825	5.429,29 €	1.368.180,01 €
2023	3,10 €	1777,653238	5.510,73 €	1.388.702,71 €
2024	3,10 €	1804,318036	5.593,39 €	1.409.533,25 €
2025	3,10 €	1831,382807	5.677,29 €	1.430.676,25 €
2026	3,10 €	1858,853549	5.762,45 €	1.452.136,39 €
2027	3,10 €	1886,736352	5.848,88 €	1.473.918,44 €
2028	3,10 €	1915,037397	5.936,62 €	1.496.027,21 €
2029	3,10 €	1943,762958	6.025,67 €	1.518.467,62 €
2030	3,10 €	1972,919403	6.116,05 €	1.541.244,64 €
2031	3,10 €	2002,513194	6.207,79 €	1.564.363,31 €
2032	3,10 €	2032,550891	6.300,91 €	1.587.828,76 €
2033	3,10 €	2063,039155	6.395,42 €	1.611.646,19 €
2034	3,10 €	2093,984742	6.491,35 €	1.635.820,88 €
2035	3,10 €	2125,394513	6.588,72 €	1.660.358,19 €
2036	3,10 €	2157,275431	6.687,55 €	1.685.263,57 €
2037	3,10 €	2189,634562	6.787,87 €	1.710.542,52 €
2038	3,10 €	2222,479081	6.889,69 €	1.736.200,66 €
2039	3,10 €	2255,816267	6.993,03 €	1.762.243,67 €
2040	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2041	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2042	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2043	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2044	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2045	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2046	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2047	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2048	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2049	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2050	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2051	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2052	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2053	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2054	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2055	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2056	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2057	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2058	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2059	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2060	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €

Benevento-Napoli (solution C)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	5,10 €	3100	15.810,00 €	3.984.120,00 €
2021	5,10 €	3146,5	16.047,15 €	4.043.881,80 €
2022	5,10 €	3193,6975	16.287,86 €	4.104.540,03 €
2023	5,10 €	3241,602963	16.532,18 €	4.166.108,13 €
2024	5,10 €	3290,227007	16.780,16 €	4.228.599,75 €
2025	5,10 €	3339,580412	17.031,86 €	4.292.028,75 €
2026	5,10 €	3389,674118	17.287,34 €	4.356.409,18 €
2027	5,10 €	3440,51923	17.546,65 €	4.421.755,31 €
2028	5,10 €	3492,127018	17.809,85 €	4.488.081,64 €
2029	5,10 €	3544,508924	18.077,00 €	4.555.402,87 €
2030	5,10 €	3597,676558	18.348,15 €	4.623.733,91 €
2031	5,10 €	3651,641706	18.623,37 €	4.693.089,92 €
2032	5,10 €	3706,416332	18.902,72 €	4.763.486,27 €
2033	5,10 €	3762,012577	19.186,26 €	4.834.938,56 €
2034	5,10 €	3818,442765	19.474,06 €	4.907.462,64 €
2035	5,10 €	3875,719407	19.766,17 €	4.981.074,58 €
2036	5,10 €	3933,855198	20.062,66 €	5.055.790,70 €
2037	5,10 €	3992,863026	20.363,60 €	5.131.627,56 €
2038	5,10 €	4052,755971	20.669,06 €	5.208.601,97 €
2039	5,10 €	4113,547311	20.979,09 €	5.286.731,00 €
2040	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2041	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2042	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2043	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2044	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2045	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2046	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2047	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2048	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2049	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2050	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2051	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2052	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2053	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2054	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2055	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2056	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2057	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2058	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2059	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €
2060	5,10 €	4175,25052	21.293,78 €	5.366.031,97 €

The solution D presents the same tables of the solution B except for the line Benevento-Caserta and Benevento-Napoli.

Benevento-Caserta (solution D)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	3,10 €	1700	5.270,00 €	1.328.040,00 €
2021	3,10 €	1725,5	5.349,05 €	1.347.960,60 €
2022	3,10 €	1751,3825	5.429,29 €	1.368.180,01 €
2023	3,10 €	1777,653238	5.510,73 €	1.388.702,71 €
2024	3,10 €	1804,318036	5.593,39 €	1.409.533,25 €
2025	3,10 €	1831,382807	5.677,29 €	1.430.676,25 €
2026	3,10 €	1858,853549	5.762,45 €	1.452.136,39 €
2027	3,10 €	1886,736352	5.848,88 €	1.473.918,44 €
2028	3,10 €	1915,037397	5.936,62 €	1.496.027,21 €
2029	3,10 €	1943,762958	6.025,67 €	1.518.467,62 €
2030	3,10 €	1972,919403	6.116,05 €	1.541.244,64 €
2031	3,10 €	2002,513194	6.207,79 €	1.564.363,31 €
2032	3,10 €	2032,550891	6.300,91 €	1.587.828,76 €
2033	3,10 €	2063,039155	6.395,42 €	1.611.646,19 €
2034	3,10 €	2093,984742	6.491,35 €	1.635.820,88 €
2035	3,10 €	2125,394513	6.588,72 €	1.660.358,19 €
2036	3,10 €	2157,275431	6.687,55 €	1.685.263,57 €
2037	3,10 €	2189,634562	6.787,87 €	1.710.542,52 €
2038	3,10 €	2222,479081	6.889,69 €	1.736.200,66 €
2039	3,10 €	2255,816267	6.993,03 €	1.762.243,67 €
2040	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2041	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2042	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2043	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2044	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2045	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2046	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2047	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2048	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2049	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2050	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2051	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2052	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2053	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2054	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2055	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2056	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2057	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2058	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2059	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €
2060	3,10 €	2289,653511	7.097,93 €	1.788.677,32 €

Benevento-Napoli (solution D)				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2020	5,10 €	2300	11.730,00 €	2.955.960,00 €
2021	5,10 €	2334,5	11.905,95 €	3.000.299,40 €
2022	5,10 €	2369,5175	12.084,54 €	3.045.303,89 €
2023	5,10 €	2405,060263	12.265,81 €	3.090.983,45 €
2024	5,10 €	2441,136166	12.449,79 €	3.137.348,20 €
2025	5,10 €	2477,753209	12.636,54 €	3.184.408,42 €
2026	5,10 €	2514,919507	12.826,09 €	3.232.174,55 €
2027	5,10 €	2552,6433	13.018,48 €	3.280.657,17 €
2028	5,10 €	2590,932949	13.213,76 €	3.329.867,03 €
2029	5,10 €	2629,796943	13.411,96 €	3.379.815,03 €
2030	5,10 €	2669,243898	13.613,14 €	3.430.512,26 €
2031	5,10 €	2709,282556	13.817,34 €	3.481.969,94 €
2032	5,10 €	2749,921794	14.024,60 €	3.534.199,49 €
2033	5,10 €	2791,170621	14.234,97 €	3.587.212,48 €
2034	5,10 €	2833,038181	14.448,49 €	3.641.020,67 €
2035	5,10 €	2875,533753	14.665,22 €	3.695.635,98 €
2036	5,10 €	2918,66676	14.885,20 €	3.751.070,52 €
2037	5,10 €	2962,446761	15.108,48 €	3.807.336,58 €
2038	5,10 €	3006,883462	15.335,11 €	3.864.446,63 €
2039	5,10 €	3051,986714	15.565,13 €	3.922.413,33 €
2040	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2041	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2042	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2043	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2044	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2045	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2046	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2047	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2048	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2049	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2050	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2051	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2052	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2053	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2054	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2055	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2056	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2057	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2058	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2059	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €
2060	5,10 €	3097,766515	15.798,61 €	3.981.249,53 €

6.2.2 A

In the following tables the annual revenues for the long distance passenger transport service are reported.
The PV of long distance passenger transport service revenues is computed through the sum of PVs of the annual revenues of the routes.

Roma-Bari AV				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	59,00 €	6909	407.631,00 €	148.785.315,00 €
2025	59,00 €	7012,635	413.745,47 €	151.017.094,73 €
2026	59,00 €	7117,824525	419.951,65 €	153.282.351,15 €
2027	59,00 €	7224,591893	426.250,92 €	155.581.586,41 €
2028	59,00 €	7332,960771	432.644,69 €	157.915.310,21 €
2029	59,00 €	7442,955183	439.134,36 €	160.284.039,86 €
2030	59,00 €	7554,599511	445.721,37 €	162.688.300,46 €
2031	59,00 €	7667,918503	452.407,19 €	165.128.624,97 €
2032	59,00 €	7782,937281	459.193,30 €	167.605.554,34 €
2033	59,00 €	7899,68134	466.081,20 €	170.119.637,66 €
2034	59,00 €	8018,17656	473.072,42 €	172.671.432,22 €
2035	59,00 €	8138,449209	480.168,50 €	175.261.503,71 €
2036	59,00 €	8260,525947	487.371,03 €	177.890.426,26 €
2037	59,00 €	8384,433836	494.681,60 €	180.558.782,65 €
2038	59,00 €	8510,200343	502.101,82 €	183.267.164,39 €
2039	59,00 €	8637,853349	509.633,35 €	186.016.171,86 €
2040	59,00 €	8767,421149	517.277,85 €	188.806.414,44 €
2041	59,00 €	8898,932466	525.037,02 €	191.638.510,65 €
2042	59,00 €	9032,416453	532.912,57 €	194.513.088,31 €
2043	59,00 €	9167,9027	540.906,26 €	197.430.784,64 €
2044	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2045	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2046	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2047	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2048	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2049	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2050	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2051	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2052	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2053	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2054	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2055	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2056	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2057	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2058	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2059	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €
2060	59,00 €	9305,42124	549.019,85 €	200.392.246,41 €

Milano-Bari AV				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	159,00 €	2590	411.810,00 €	150.310.650,00 €
2025	159,00 €	2628,85	417.987,15 €	152.565.309,75 €
2026	159,00 €	2668,28275	424.256,96 €	154.853.789,40 €
2027	159,00 €	2708,306991	430.620,81 €	157.176.596,24 €
2028	159,00 €	2748,931596	437.080,12 €	159.534.245,18 €
2029	159,00 €	2790,16557	443.636,33 €	161.927.258,86 €
2030	159,00 €	2832,018054	450.290,87 €	164.356.167,74 €
2031	159,00 €	2874,498324	457.045,23 €	166.821.510,26 €
2032	159,00 €	2917,615799	463.900,91 €	169.323.832,91 €
2033	159,00 €	2961,380036	470.859,43 €	171.863.690,40 €
2034	159,00 €	3005,800737	477.922,32 €	174.441.645,76 €
2035	159,00 €	3050,887748	485.091,15 €	177.058.270,45 €
2036	159,00 €	3096,651064	492.367,52 €	179.714.144,50 €
2037	159,00 €	3143,10083	499.753,03 €	182.409.856,67 €
2038	159,00 €	3190,247342	507.249,33 €	185.146.004,52 €
2039	159,00 €	3238,101053	514.858,07 €	187.923.194,59 €
2040	159,00 €	3286,672568	522.580,94 €	190.742.042,51 €
2041	159,00 €	3335,972657	530.419,65 €	193.603.173,15 €
2042	159,00 €	3386,012247	538.375,95 €	196.507.220,74 €
2043	159,00 €	3436,802431	546.451,59 €	199.454.829,05 €
2044	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2045	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2046	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2047	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2048	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2049	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2050	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2051	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2052	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2053	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2054	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2055	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2056	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2057	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2058	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2059	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €
2060	159,00 €	3488,354467	554.648,36 €	202.446.651,49 €

Napoli-Bari ES				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	47,10 €	3750	176.625,00 €	64.468.125,00 €
2025	47,10 €	3806,25	179.274,38 €	65.435.146,88 €
2026	47,10 €	3863,34375	181.963,49 €	66.416.674,08 €
2027	47,10 €	3921,293906	184.692,94 €	67.412.924,19 €
2028	47,10 €	3980,113315	187.463,34 €	68.424.118,05 €
2029	47,10 €	4039,815015	190.275,29 €	69.450.479,82 €
2030	47,10 €	4100,41224	193.129,42 €	70.492.237,02 €
2031	47,10 €	4161,918423	196.026,36 €	71.549.620,58 €
2032	47,10 €	4224,3472	198.966,75 €	72.622.864,88 €
2033	47,10 €	4287,712408	201.951,25 €	73.712.207,86 €
2034	47,10 €	4352,028094	204.980,52 €	74.817.890,98 €
2035	47,10 €	4417,308515	208.055,23 €	75.940.159,34 €
2036	47,10 €	4483,568143	211.176,06 €	77.079.261,73 €
2037	47,10 €	4550,821665	214.343,70 €	78.235.450,66 €
2038	47,10 €	4619,08399	217.558,86 €	79.408.982,42 €
2039	47,10 €	4688,37025	220.822,24 €	80.600.117,15 €
2040	47,10 €	4758,695804	224.134,57 €	81.809.118,91 €
2041	47,10 €	4830,076241	227.496,59 €	83.036.255,69 €
2042	47,10 €	4902,527384	230.909,04 €	84.281.799,53 €
2043	47,10 €	4976,065295	234.372,68 €	85.546.026,52 €
2044	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2045	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2046	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2047	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2048	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2049	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2050	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2051	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2052	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2053	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2054	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2055	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2056	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2057	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2058	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2059	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €
2060	47,10 €	5050,706275	237.888,27 €	86.829.216,92 €

Roma-Bari IC				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	49,00 €	2200	107.800,00 €	39.347.000,00 €
2025	49,00 €	2233	109.417,00 €	39.937.205,00 €
2026	49,00 €	2266,495	111.058,26 €	40.536.263,08 €
2027	49,00 €	2300,492425	112.724,13 €	41.144.307,02 €
2028	49,00 €	2334,999811	114.414,99 €	41.761.471,63 €
2029	49,00 €	2370,024809	116.131,22 €	42.387.893,70 €
2030	49,00 €	2405,575181	117.873,18 €	43.023.712,11 €
2031	49,00 €	2441,658808	119.641,28 €	43.669.067,79 €
2032	49,00 €	2478,283691	121.435,90 €	44.324.103,80 €
2033	49,00 €	2515,457946	123.257,44 €	44.988.965,36 €
2034	49,00 €	2553,189815	125.106,30 €	45.663.799,84 €
2035	49,00 €	2591,487662	126.982,90 €	46.348.756,84 €
2036	49,00 €	2630,359977	128.887,64 €	47.043.988,19 €
2037	49,00 €	2669,815377	130.820,95 €	47.749.648,02 €
2038	49,00 €	2709,862608	132.783,27 €	48.465.892,74 €
2039	49,00 €	2750,510547	134.775,02 €	49.192.881,13 €
2040	49,00 €	2791,768205	136.796,64 €	49.930.774,34 €
2041	49,00 €	2833,644728	138.848,59 €	50.679.735,96 €
2042	49,00 €	2876,149399	140.931,32 €	51.439.932,00 €
2043	49,00 €	2919,29164	143.045,29 €	52.211.530,98 €
2044	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2045	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2046	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2047	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2048	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2049	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2050	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2051	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2052	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2053	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2054	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2055	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2056	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2057	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2058	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2059	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €
2060	49,00 €	2963,081014	145.190,97 €	52.994.703,94 €

Caserta-Bari IC				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	31,50 €	200	6.300,00 €	2.299.500,00 €
2025	31,50 €	203	6.394,50 €	2.333.992,50 €
2026	31,50 €	206,045	6.490,42 €	2.369.002,39 €
2027	31,50 €	209,135675	6.587,77 €	2.404.537,42 €
2028	31,50 €	212,2727101	6.686,59 €	2.440.605,48 €
2029	31,50 €	215,4568008	6.786,89 €	2.477.214,57 €
2030	31,50 €	218,6886528	6.888,69 €	2.514.372,79 €
2031	31,50 €	221,9689826	6.992,02 €	2.552.088,38 €
2032	31,50 €	225,2985173	7.096,90 €	2.590.369,70 €
2033	31,50 €	228,6779951	7.203,36 €	2.629.225,25 €
2034	31,50 €	232,108165	7.311,41 €	2.668.663,63 €
2035	31,50 €	235,5897875	7.421,08 €	2.708.693,58 €
2036	31,50 €	239,1236343	7.532,39 €	2.749.323,99 €
2037	31,50 €	242,7104888	7.645,38 €	2.790.563,85 €
2038	31,50 €	246,3511461	7.760,06 €	2.832.422,30 €
2039	31,50 €	250,0464133	7.876,46 €	2.874.908,64 €
2040	31,50 €	253,7971095	7.994,61 €	2.918.032,27 €
2041	31,50 €	257,6040662	8.114,53 €	2.961.802,75 €
2042	31,50 €	261,4681272	8.236,25 €	3.006.229,79 €
2043	31,50 €	265,3901491	8.359,79 €	3.051.323,24 €
2044	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2045	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2046	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2047	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2048	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2049	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2050	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2051	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2052	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2053	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2054	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2055	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2056	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2057	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2058	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2059	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €
2060	31,50 €	269,3710013	8.485,19 €	3.097.093,09 €

Napoli-Bari IC				
Year	Price	Passengers/day	Revenues/day	Revenues/year
2024	34,60 €	3200	110.720,00 €	40.412.800,00 €
2025	34,60 €	3248	112.380,80 €	41.018.992,00 €
2026	34,60 €	3296,72	114.066,51 €	41.634.276,88 €
2027	34,60 €	3346,1708	115.777,51 €	42.258.791,03 €
2028	34,60 €	3396,363362	117.514,17 €	42.892.672,90 €
2029	34,60 €	3447,308812	119.276,88 €	43.536.062,99 €
2030	34,60 €	3499,018445	121.066,04 €	44.189.103,94 €
2031	34,60 €	3551,503721	122.882,03 €	44.851.940,50 €
2032	34,60 €	3604,776277	124.725,26 €	45.524.719,60 €
2033	34,60 €	3658,847921	126.596,14 €	46.207.590,40 €
2034	34,60 €	3713,73064	128.495,08 €	46.900.704,25 €
2035	34,60 €	3769,4366	130.422,51 €	47.604.214,82 €
2036	34,60 €	3825,978149	132.378,84 €	48.318.278,04 €
2037	34,60 €	3883,367821	134.364,53 €	49.043.052,21 €
2038	34,60 €	3941,618338	136.379,99 €	49.778.697,99 €
2039	34,60 €	4000,742613	138.425,69 €	50.525.378,46 €
2040	34,60 €	4060,753752	140.502,08 €	51.283.259,14 €
2041	34,60 €	4121,665059	142.609,61 €	52.052.508,03 €
2042	34,60 €	4183,490035	144.748,76 €	52.833.295,65 €
2043	34,60 €	4246,242385	146.919,99 €	53.625.795,08 €
2044	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2045	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2046	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2047	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2048	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2049	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2050	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2051	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2052	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2053	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2054	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2055	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2056	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2057	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2058	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2059	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €
2060	34,60 €	4309,936021	149.123,79 €	54.430.182,01 €

6.2.3 A

In the following tables the annual revenues for the freight transport service are reported.

Napoli-Bari freight transport services				
Year	Price/km	Km	Wagons/year	Annual revenues
2024	3,8	300	85000	96.900.000,00 €
2025	3,8	300	86275	98.353.500,00 €
2026	3,8	300	87569,125	99.828.802,50 €
2027	3,8	300	88882,66188	101.326.234,54 €
2028	3,8	300	90215,9018	102.846.128,06 €
2029	3,8	300	91569,14033	104.388.819,98 €
2030	3,8	300	92942,67744	105.954.652,28 €
2031	3,8	300	94336,8176	107.543.972,06 €
2032	3,8	300	95751,86986	109.157.131,64 €
2033	3,8	300	97188,14791	110.794.488,62 €
2034	3,8	300	98645,97013	112.456.405,94 €
2035	3,8	300	100125,6597	114.143.252,03 €
2036	3,8	300	101627,5446	115.855.400,81 €
2037	3,8	300	103151,9577	117.593.231,83 €
2038	3,8	300	104699,2371	119.357.130,30 €
2039	3,8	300	106269,7257	121.147.487,26 €
2040	3,8	300	107863,7716	122.964.699,57 €
2041	3,8	300	109481,7281	124.809.170,06 €
2042	3,8	300	111123,954	126.681.307,61 €
2043	3,8	300	112790,8134	128.581.527,23 €
2044	3,8	300	114482,6756	130.510.250,13 €
2045	3,8	300	114482,6756	130.510.250,13 €
2046	3,8	300	114482,6756	130.510.250,13 €
2047	3,8	300	114482,6756	130.510.250,13 €
2048	3,8	300	114482,6756	130.510.250,13 €
2049	3,8	300	114482,6756	130.510.250,13 €
2050	3,8	300	114482,6756	130.510.250,13 €
2051	3,8	300	114482,6756	130.510.250,13 €
2052	3,8	300	114482,6756	130.510.250,13 €
2053	3,8	300	114482,6756	130.510.250,13 €
2054	3,8	300	114482,6756	130.510.250,13 €
2055	3,8	300	114482,6756	130.510.250,13 €
2056	3,8	300	114482,6756	130.510.250,13 €
2057	3,8	300	114482,6756	130.510.250,13 €
2058	3,8	300	114482,6756	130.510.250,13 €
2059	3,8	300	114482,6756	130.510.250,13 €
2060	3,8	300	114482,6756	130.510.250,13 €

6.4.3 A

Year	**Annual ceasing costs freight traffic** (millions/year)	**Annual ceasing costs passengers traffic** (millions/year)	**Annual time savings** (millions/year)
2016	0,00 €	0,00 €	0,00 €
2017	0,00 €	0,00 €	0,00 €
2018	0,00 €	0,00 €	0,00 €
2019	0,00 €	0,00 €	0,00 €
2020	0,00 €	15,80 €	0,00 €
2021	0,00 €	15,80 €	0,00 €
2022	0,00 €	15,80 €	0,00 €
2023	0,00 €	15,80 €	0,00 €
2024	89,18 €	232,37 €	46,31 €
2025	89,18 €	232,37 €	46,31 €
2026	89,18 €	232,37 €	46,31 €
2027	89,18 €	232,37 €	46,31 €
2028	89,18 €	232,37 €	46,31 €
2029	89,18 €	232,37 €	46,31 €
2030	89,18 €	232,37 €	46,31 €
2031	89,18 €	232,37 €	46,31 €
2032	89,18 €	232,37 €	46,31 €
2033	89,18 €	232,37 €	46,31 €
2034	89,18 €	232,37 €	46,31 €
2035	89,18 €	232,37 €	46,31 €
2036	89,18 €	232,37 €	46,31 €
2037	89,18 €	232,37 €	46,31 €
2038	89,18 €	232,37 €	46,31 €
2039	89,18 €	232,37 €	46,31 €
2040	89,18 €	232,37 €	46,31 €
2041	89,18 €	232,37 €	46,31 €
2042	89,18 €	232,37 €	46,31 €
2043	89,18 €	232,37 €	46,31 €
2044	89,18 €	232,37 €	46,31 €
2045	89,18 €	232,37 €	46,31 €
2046	89,18 €	232,37 €	46,31 €
2047	89,18 €	232,37 €	46,31 €
2048	89,18 €	232,37 €	46,31 €
2049	89,18 €	232,37 €	46,31 €
2050	89,18 €	232,37 €	46,31 €
2051	89,18 €	232,37 €	46,31 €
2052	89,18 €	232,37 €	46,31 €
2053	89,18 €	232,37 €	46,31 €
2054	89,18 €	232,37 €	46,31 €
2055	89,18 €	232,37 €	46,31 €
2056	89,18 €	232,37 €	46,31 €
2057	89,18 €	232,37 €	46,31 €
2058	89,18 €	232,37 €	46,31 €
2059	89,18 €	232,37 €	46,31 €
2060	89,18 €	232,37 €	46,31 €

7.2.2 Comparative static analysis

In this section the values of the comparative static analysis are reported.

The number of the tables accompanied by the letter A refer to the numbers of the plots in the thesis (for example the table 21 A refers to the plot 21 in the thesis).

All the numbers are expressed in millions of Euros unless otherwise specified.

- **Example 1 ($\rho = 4\%$)**
- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Table 21 A

P	0	50	100	150	200	250	297,93
y_p	0	0	0	0	0	0	0
$V(y)$	15.017,4	15.898,35	16.779,3	17.660,26	18.541,25	19.422,16	20.266,71
y_π	224,1	274,36	324,62	374,88	425,14	475,4	523,58
$V_\pi(y)$	8.170,46	7.289,5	6.408,55	5.527,6	4.646,65	3.765,7	2.921,15
V project	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86

Table 22 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	15.017,4	224,1	8.170,46	23.187,86
0,9	0,1	0	0	15.017,4	224,1	8.170,46	23.187,86
0,8	0,2	0	0	15.017,4	224,1	8.170,46	23.187,86
0,7	0,3	0	0	15.017,4	224,1	8.170,46	23.187,86
0,6	0,4	0	0	15.017,4	224,1	8.170,46	23.187,86
0,5	0,5	0	0	15.017,4	224,1	8.170,46	23.187,86
0,4	0,6	0	0	15.017,4	224,1	8.170,46	23.187,86
0,3	0,7	0	0	15.017,4	224,1	8.170,46	23.187,86
0,2	0,8	1.440,71	0	40.401,35	1.672,27	76,05	40.477,4
0,1	0,9	3.345,01	0	73.953,24	3.586,43	20.009,35	93.962,58
0	1	5.249,31	0	107.505,13	5.500,59	30.688,77	138.193,9

- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Table 23 A

P	0	100	200	300	353,67
y_p	0	0	0	0	0
$V(y)$	14.035,36	15.797,27	17.559,17	19.321,07	20.266,71
y_π	168,08	268,6	369,11	469,63	523,58
$V_\pi(y)$	9.152,49	7.390,59	5.628,69	3.866,78	2.921,15
V project	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86

Table 24 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	14.035,36	168,08	9.152,49	23.187,86
0,9	0,1	0	0	14.035,36	168,08	9.152,49	23.187,86
0,8	0,2	0	0	14.035,36	168,08	9.152,49	23.187,86
0,7	0,3	0	0	14.035,36	168,08	9.152,49	23.187,86
0,6	0,4	0	0	14.035,36	168,08	9.152,49	23.187,86
0,5	0,5	0	0	14.035,36	168,08	9.152,49	23.187,86
0,4	0,6	0	0	14.035,36	168,08	9.152,49	23.187,86
0,3	0,7	0	0	14.035,36	168,08	9.152,49	23.187,86
0,2	0,8	1.440,71	0	39.419,31	1.616,25	84,64	39.503,96
0,1	0,9	3.345,01	0	72.971,2	3.530,41	19.696,77	92.667,97
0	1	5.249.31	0	106.523,09	5.444,56	30.376,19	136.899,28

- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Table 25 A

P	0	100	200	300	409,41
y_p	0	0	0	0	0
$V(y)$	13.053,33	14.815,23	16.577,13	18.339,04	20.266,71
y_π	112,05	212,57	313,09	413,6	523,58
$V_\pi(y)$	10.134,53	8.372,63	6.610,72	4.848,82	2.921,15
V project	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86

Table 26 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	13.053,33	112,05	10.134,53	23.187,86
0,9	0,1	0	0	13.053,33	112,05	10.134,53	23.187,86
0,8	0,2	0	0	13.053,33	112,05	10.134,53	23.187,86
0,7	0,3	0	0	13.053,33	112,05	10.134,53	23.187,86
0,6	0,4	0	0	13.053,33	112,05	10.134,53	23.187,86
0,5	0,5	0	0	13.053,33	112,05	10.134,53	23.187,86
0,4	0,6	0	0	13.053,33	112,05	10.134,53	23.187,86
0,3	0,7	0	0	13.053,33	112,05	10.134,53	23.187,86
0,2	0,8	1.440,71	0	38.437,27	1.560,22	94,57	38.531,84
0,1	0,9	3.345,01	0	71.989,16	3.474,38	19.384,19	91.373,35
0	1	5.249.31	0	105.541,05	5.388,54	30.063,62	135.604,67

- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Table 27 A

P	0	100	200	300	400	465,15
y_p	0	0	0	0	0	0
$V(y)$	12.071,29	13.833,19	15.595,1	17.357	19.118,9	20.266,71
y_π	56,03	156,54	257,06	357,58	458,1	523,58
$V_\pi(y)$	11.116,57	9.354,66	7.592,76	5.830,86	4.068,96	2.921,15
V project	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86

Table 28 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	12.071,29	56,03	11.116,57	23.187,86
0,9	0,1	0	0	12.071,29	56,03	11.116,57	23.187,86
0,8	0,2	0	0	12.071,29	56,03	11.116,57	23.187,86
0,7	0,3	0	0	12.071,29	56,03	11.116,57	23.187,86
0,6	0,4	0	0	12.071,29	56,03	11.116,57	23.187,86
0,5	0,5	0	0	12.071,29	56,03	11.116,57	23.187,86
0,4	0,6	0	0	12.071,29	56,03	11.116,57	23.187,86
0,3	0,7	0	0	12.071,29	56,03	11.116,57	23.187,86
0,2	0,8	1.440,71	0	37.455,24	1.504,2	106,08	37.561,32
0,1	0,9	3.345,01	0	71.007,12	3.418,35	19.071,61	90.078,74
0	1	5.249.31	0	104.559,01	5.332,51	29.751,04	134.310,05

- **Hypothesis 5: investment costs sustained entirely by the State**

Table 29 A

P	0	100	200	300	400	500	520,88
y_p	0	0	0	0	0	0	0
$V(y)$	11.089,25	12.851,15	14.613,06	16.374,96	18.136,86	19.898,77	20.266,71
y_π	0	100,52	201,04	301,55	402,07	502,59	523,58
$V_\pi(y)$	12.098,61	10.336,7	8.574,8	6.812,9	5.050,99	3.289,09	2.921,15
V project	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86	23.187,86

Table 30 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	11.089,25	0	12.098,61	23.187,86
0,9	0,1	0	0	11.089,25	0	12.098,61	23.187,86
0,8	0,2	0	0	11.089,25	0	12.098,61	23.187,86
0,7	0,3	0	0	11.089,25	0	12.098,61	23.187,86
0,6	0,4	0	0	11.089,25	0	12.098,61	23.187,86
0,5	0,5	0	0	11.089,25	0	12.098,61	23.187,86
0,4	0,6	0	0	11.089,25	0	12.098,61	23.187,86
0,3	0,7	0	0	11.089,25	0	12.098,61	23.187,86
0,2	0,8	1.440,71	0	36.473,2	1.448,17	495	36.968,2
0,1	0,9	3.345,01	0	70.025,09	3.362,33	52.310,92	122.336,01
0	1	5.249.31	0	103.576,98	5.276,49	62.990,35	166.567,32

- **Example 2 ($\rho = 6\%$)**

- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Table 31 A

P	0	50	100	150	200	249,17
y_p	0	0	0	0	0	0
$V(y)$	8.008,12	8.730,91	9.453,69	10.176,47	10.899,26	11.610,09
y_π	273,13	323,39	373,64	423,9	474,15	523,58
$V_\pi(y)$	5.064,5	4.341,71	3.618,93	2.896,14	2.173,36	1.462,53
V project	13.072,62	13.072,62	13.072,62	13.072,62	13.072,62	13.072,62

Table 32 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	8.008,12	273,12	5.064,5	13.072,62
0,9	0,1	0	0	8.008,12	273,12	5.064,5	13.072,62
0,8	0,2	0	0	8.008,12	273,12	5.064,5	13.072,62
0,7	0,3	0	0	8.008,12	273,12	5.064,5	13.072,62
0,6	0,4	0	0	8.008,12	273,12	5.064,5	13.072,62
0,5	0,5	0	0	8.008,12	273,12	5.064,5	13.072,62
0,4	0,6	0	0	8.008,12	273,12	5.064,5	13.072,62
0,3	0,7	186,05	0	10.697,6	460,13	2.375,02	13.072,62
0,2	0,8	1.324,69	0	27.157,41	1.604,6	4,58	27.161,99
0,1	0,9	2.463,33	0	43.617,22	2.749,08	7.679,06	51.296,28
0	1	3.601,97	0	60.077,02	3.893,55	10.875,94	70.952,96

- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Table 33 A

P	0	100	200	300	317,11
y_p	0	0	0	0	0
$V(y)$	7.026,08	8.471,65	9.917,22	11.362,79	11.610,09
y_π	204,85	305,36	405,87	506,38	523,58
$V_\pi(y)$	6.046,53	4.600,96	3.155,4	1.709,83	1462,53
V project	13.072,62	13.072,62	13.072,62	13.072,62	13.072,62

Table 34 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	7.026,08	204,85	6046,53	13.072,62
0,9	0,1	0	0	7.026,08	204,85	6046,53	13.072,62
0,8	0,2	0	0	7.026,08	204,85	6046,53	13.072,62
0,7	0,3	0	0	7.026,08	204,85	6046,53	13.072,62
0,6	0,4	0	0	7.026,08	204,85	6046,53	13.072,62
0,5	0,5	0	0	7.026,08	204,85	6046,53	13.072,62
0,4	0,6	0	0	7.026,08	204,85	6046,53	13.072,62
0,3	0,7	186,05	0	9.715,56	391,85	3357,05	13.072,62
0,2	0,8	1.324,69	0	26.175,37	1.536,32	5,73	26.181,1
0,1	0,9	2.463,33	0	42.635,18	2.680,80	7.488,33	50.123,5
0	1	3.601,97	0	59.094,99	3.825,27	10.685,21	69.780,19

- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Table 35 A

P	0	100	200	300	385,04
y_p	0	0	0	0	0
$V(y)$	6.044,05	7.489,61	8.935,18	10.380,75	11.610,09
y_π	136,56	237,08	337,59	438,10	523,58
$V_\pi(y)$	7.028,57	5.583	4.137,43	2.691,87	1.462,53
V project	13.072,62	13.072,62	13.072,62	13.072,62	13.072,62

Table 36 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	6.044,05	136,56	7.028,57	13.072,62
0,9	0,1	0	0	6.044,05	136,56	7.028,57	13.072,62
0,8	0,2	0	0	6.044,05	136,56	7.028,57	13.072,62
0,7	0,3	0	0	6.044,05	136,56	7.028,57	13.072,62
0,6	0,4	0	0	6.044,05	136,56	7.028,57	13.072,62
0,5	0,5	0	0	6.044,05	136,56	7.028,57	13.072,62
0,4	0,6	0	0	6.044,05	136,56	7.028,57	13.072,62
0,3	0,7	186,05	0	8.733,52	323,57	4.339,09	13.072,62
0,2	0,8	1.324,69	0	25.193,33	1.468,04	7,24	25.200,57
0,1	0,9	2.463,33	0	41.653,14	2.612,52	7.297,59	48.950,73
0	1	3.601,97	0	58.112,95	3.756,99	10.494,47	68.607,42

- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Table 37 A

P	0	100	200	300	400	452,98
y_p	0	0	0	0	0	0
$V(y)$	5.062,01	6.507,58	7.953,14	9.398,71	10.844,28	11.610,09
y_π	68,28	168,79	269,31	369,82	470,33	523,58
$V_\pi(y)$	8.010,6	6.565,04	5.119,47	3.673,9	2.228,34	1.462,53
V project	13.072,62	13.072,62	13.072,62	13.072,62	13.072,62	13.072,62

Table 38 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	5.062,01	68,28	8.010,61	13.072,62
0,9	0,1	0	0	5.062,01	68,28	8.010,61	13.072,62
0,8	0,2	0	0	5.062,01	68,28	8.010,61	13.072,62
0,7	0,3	0	0	5.062,01	68,28	8.010,61	13.072,62
0,6	0,4	0	0	5.062,01	68,28	8.010,61	13.072,62
0,5	0,5	0	0	5.062,01	68,28	8.010,61	13.072,62
0,4	0,6	0	0	5.062,01	68,28	8.010,61	13.072,62
0,3	0,7	186,05	0	7.751,49	255,29	5.321,13	13.072,62
0,2	0,8	1.324,69	0	24.211,29	1.399,76	9,25	24.220,55
0,1	0,9	2.463,33	0	40.671,1	2.544,23	7.106,86	47.777,96
0	1	3.601,97	0	57.130,91	3.688,71	10.303,74	67.434,65

- **Hypothesis 5: investment costs sustained entirely by the State**

Table 39 A

P	0	100	200	300	400	500	520,91
y_p	0	0	0	0	0	0	0
$V(y)$	4.079,97	5.525,54	6.971,11	8.416,67	9.862,24	11.307,81	11.610,09
y_π	0	100,51	201,02	301,54	402,05	502,56	523,58
$V_\pi(y)$	8.992,65	7.547,08	6.101,51	4.655,94	3.210,37	1.764,81	1.462,53
V project	13.072,62	13.072,62	13.072,62	13.072,62	13.072,62	13.072,62	13.072,62

Table 40 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	4.079,97	0	8.992,65	13.072,62
0,9	0,1	0	0	4.079,97	0	8.992,65	13.072,62
0,8	0,2	0	0	4.079,97	0	8.992,65	13.072,62
0,7	0,3	0	0	4.079,97	0	8.992,65	13.072,62
0,6	0,4	0	0	4.079,97	0	8.992,65	13.072,62
0,5	0,5	0	0	4.079,97	0	8.992,65	13.072,62
0,4	0,6	0	0	4.079,97	0	8.992,65	13.072,62
0,3	0,7	186,05	0	6.769,45	187	6.303,17	13.072,62
0,2	0,8	1.324,69	0	23.229,26	1.331,48	64,94	23.294,2
0,1	0,9	2.463,33	0	39.689,07	2.475,95	23.375,93	63.064,99
0	1	3.601,97	0	56.148,87	3.620,43	26.572,81	82.721,68

- **Example 3 ($\sigma = 10\%$)**

- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Table 41 A

P	0	50	100	150	165,97
y_p	0	0	0	0	0
$V(y)$	10.517,78	11.319,87	12.121,97	12.924,06	13.180,31
y_π	312,06	375,78	439,5	503,22	523,58
$V_\pi(y)$	6.441,44	5.639,35	4.837,25	4.035,16	3.778,9
V project	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22

Table 42 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	10.517,78	312,06	6.441,44	16.959,22
0,9	0,1	0	0	10.517,78	312,06	6.441,44	16.959,22
0,8	0,2	0	0	10.517,78	312,06	6.441,44	16.959,22
0,7	0,3	0	0	10.517,78	312,06	6.441,44	16.959,22
0,6	0,4	0	0	10.517,78	312,06	6.441,44	16.959,22
0,5	0,5	0	0	10.517,78	312,06	6.441,44	16.959,22
0,4	0,6	0	0	10.517,78	312,06	6.441,44	16.959,22
0,3	0,7	0	0	10.517,78	312,06	6.441,44	16.959,22
0,2	0,8	212,95	0	13.933,95	583,45	3128,65	17.062,6
0,1	0,9	1.437,75	0	33.581,97	2.144,34	15.476,60	49.058,57
0	1	2.662,54	0	53.229,98	3.705,22	26.742,19	79.972,17

- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Table 43 A

P	0	50	100	150	200	227,19
y_p	0	0	0	0	0	0
$V(y)$	9.535,74	10.337,83	11.139,93	11.942,02	12.744,12	13.180,31
y_π	234,05	297,77	361,49	425,21	488,93	523,58
$V_\pi(y)$	7.423,48	6.621,38	5.819,29	5.017,19	4.215,1	3.778,9
V project	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22

Table 44 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	9.535,74	234,05	7.423,48	16.959,22
0,9	0,1	0	0	9.535,74	234,05	7.423,48	16.959,22
0,8	0,2	0	0	9.535,74	234,05	7.423,48	16.959,22
0,7	0,3	0	0	9.535,74	234,05	7.423,48	16.959,22
0,6	0,4	0	0	9.535,74	234,05	7.423,48	16.959,22
0,5	0,5	0	0	9.535,74	234,05	7.423,48	16.959,22
0,4	0,6	0	0	9.535,74	234,05	7.423,48	16.959,22
0,3	0,7	0	0	9.535,74	234,05	7.423,48	16.959,22
0,2	0,8	212,95	0	12.951,91	505,44	4.007,3	16.959,22
0,1	0,9	1.437,75	0	32.599,93	2.066,32	14.913,53	47.513,46
0	1	2.662,54	0	52.247,94	3.627,21	26.179,12	78.427,06

- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Table 45 A

P	0	50	100	150	200	250	288,41
y_p	0	0	0	0	0	0	0
$V(y)$	8.553,7	9.355,8	10.157,89	10.959,99	11.762,08	12.564,18	13.180,31
y_π	156,03	219,75	283,47	347,19	410,91	474,63	523,58
$V_\pi(y)$	8.405,52	7.603,42	6.801,33	5.999,23	5.197,14	4.395,04	3.778,9
V project	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22

Table 46 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	8.553,7	156,03	8.405,52	16.959,22
0,9	0,1	0	0	8.553,7	156,03	8.405,52	16.959,22
0,8	0,2	0	0	8.553,7	156,03	8.405,52	16.959,22
0,7	0,3	0	0	8.553,7	156,03	8.405,52	16.959,22
0,6	0,4	0	0	8.553,7	156,03	8.405,52	16.959,22
0,5	0,5	0	0	8.553,7	156,03	8.405,52	16.959,22
0,4	0,6	0	0	8.553,7	156,03	8.405,52	16.959,22
0,3	0,7	0	0	8.553,7	156,03	8.405,52	16.959,22
0,2	0,8	212,95	0	11.969,88	427,42	4.989,34	16.959,22
0,1	0,9	1.437,75	0	31.617,89	1.988,3	14.350,46	45.968,35
0	1	2.662,54	0	51.265,91	3.549,19	25.616,04	76.881,95

- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Table 47 A

P	0	100	200	300	349,62
y_p	0	0	0	0	0
$V(y)$	7.571,66	9.175,85	10.780,04	12.384,24	13.180,31
y_π	78,02	205,46	332,9	460,34	523,58
$V_\pi(y)$	9.387,56	7.783,36	6.179,17	4.574,98	3.778,9
V project	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22

Table 48 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	7.571,66	78,02	9.387,56	16.959,22
0,9	0,1	0	0	7.571,66	78,02	9.387,56	16.959,22
0,8	0,2	0	0	7.571,66	78,02	9.387,56	16.959,22
0,7	0,3	0	0	7.571,66	78,02	9.387,56	16.959,22
0,6	0,4	0	0	7.571,66	78,02	9.387,56	16.959,22
0,5	0,5	0	0	7.571,66	78,02	9.387,56	16.959,22
0,4	0,6	0	0	7.571,66	78,02	9.387,56	16.959,22
0,3	0,7	0	0	7.571,66	78,02	9.387,56	16.959,22
0,2	0,8	212,95	0	10.987,84	349,4	5.971,38	16.959,22
0,1	0,9	1.437,75	0	30.635,85	1.910,29	13.787,39	44.423,24
0	1	2.662,54	0	50.283,87	3.471,17	25.052,97	75.336,84

- **Hypothesis 5: investment costs sustained entirely by the State**

Table 49 A

P	0	100	200	300	400	410.84
y_p	0	0	0	0	0	0
$V(y)$	6.589,63	8.193,82	9.798,01	11.402,2	13.006,39	13.180,31
y_π	0	127,44	254,88	382,32	509,76	523,58
$V_\pi(y)$	10.369,59	8.765,4	7.161,21	5.557,02	3.952,83	3.778,9
V project	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22

Table 50 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	6.589,63	0	10.369,59	16.959,22
0,9	0,1	0	0	6.589,63	0	10.369,59	16.959,22
0,8	0,2	0	0	6.589,63	0	10.369,59	16.959,22
0,7	0,3	0	0	6.589,63	0	10.369,59	16.959,22
0,6	0,4	0	0	6.589,63	0	10.369,59	16.959,22
0,5	0,5	0	0	6.589,63	0	10.369,59	16.959,22
0,4	0,6	0	0	6.589,63	0	10.369,59	16.959,22
0,3	0,7	0	0	6.589,63	0	10.369,59	16.959,22
0,2	0,8	212,95	0	10.005,8	271,39	6.953,42	16.959,22
0,1	0,9	1.437,75	0	29.653,82	1.832,27	32.872,33	62.526,15
0	1	2.662,54	0	49.301,83	3.393,16	44.137,92	93.439,75

- **Example 4 ($\sigma = 20\%$)**

- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Table 51 A

P	0	25	54,99
y_p	0	0	0
$V(y)$	10.517,78	10.918,82	11.399,89
y_π	427,56	514,87	523,58
$V_\pi(y)$	6.441,44	5.639,35	5.559,33
V project	16.959,22	16.959,22	16.959,22

Table 52A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	10.517,78	427,56	6.441,44	16.959,22
0,9	0,1	0	0	10.517,78	427,56	6.441,44	16.959,22
0,8	0,2	0	0	10.517,78	427,56	6.441,44	16.959,22
0,7	0,3	0	0	10.517,78	427,56	6.441,44	16.959,22
0,6	0,4	0	0	10.517,78	427,56	6.441,44	16.959,22
0,5	0,5	0	0	10.517,78	427,56	6.441,44	16.959,22
0,4	0,6	0	0	10.517,78	427,56	6.441,44	16.959,22
0,3	0,7	0	0	10.517,78	427,56	6.441,44	16.959,22
0,2	0,8	0	0	10.517,78	427,56	6.441,44	16.959,22
0,1	0,9	0	0	10.517,78	427,56	6.441,44	16.959,22
0	1	882,11	0	24.668,58	1.967,83	20.894,24	45.562,82

- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Table 53 A

P	0	50	100	116,21
y_p	0	0	0	0
$V(y)$	9.535,74	10.337,83	11.139,93	11.399,89
y_π	320,67	407,98	495,28	523,58
$V_\pi(y)$	7.423,48	6.621,38	5.819,29	5.559,33
V project	16.959,22	16.959,22	16.959,22	16.959,22

Table 54 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	9.535,74	320,67	7.423,48	16.959,22
0,9	0,1	0	0	9.535,74	320,67	7.423,48	16.959,22
0,8	0,2	0	0	9.535,74	320,67	7.423,48	16.959,22
0,7	0,3	0	0	9.535,74	320,67	7.423,48	16.959,22
0,6	0,4	0	0	9.535,74	320,67	7.423,48	16.959,22
0,5	0,5	0	0	9.535,74	320,67	7.423,48	16.959,22
0,4	0,6	0	0	9.535,74	320,67	7.423,48	16.959,22
0,3	0,7	0	0	9.535,74	320,67	7.423,48	16.959,22
0,2	0,8	0	0	9.535,74	320,67	7.423,48	16.959,22
0,1	0,9	0	0	9.535,74	320,67	7.423,48	16.959,22
0	1	882,11	0	23.686,54	1.860,94	19.759,28	43.445,82

- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Table 55 A

P	0	50	100	150	177,42
y_p	0	0	0	0	0
$V(y)$	8.553,7	9.355,8	10.157,89	10.959,99	11.399,89
y_π	213,78	301,09	388,39	475,7	523,58
$V_\pi(y)$	8.405,52	7.603,42	6.801,33	5.999,23	5.559,33
V project	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22

Table 56 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	8.553,7	213,78	8.405,52	16.959,22
0,9	0,1	0	0	8.553,7	213,78	8.405,52	16.959,22
0,8	0,2	0	0	8.553,7	213,78	8.405,52	16.959,22
0,7	0,3	0	0	8.553,7	213,78	8.405,52	16.959,22
0,6	0,4	0	0	8.553,7	213,78	8.405,52	16.959,22
0,5	0,5	0	0	8.553,7	213,78	8.405,52	16.959,22
0,4	0,6	0	0	8.553,7	213,78	8.405,52	16.959,22
0,3	0,7	0	0	8.553,7	213,78	8.405,52	16.959,22
0,2	0,8	0	0	8.553,7	213,78	8.405,52	16.959,22
0,1	0,9	0	0	8.553,7	213,78	8.405,52	16.959,22
0	1	882,11	0	22.704,51	1.754,05	18.624,32	41.328,82

- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Table 57 A

P	0	50	100	150	200	238,64
y_p	0	0	0	0	0	0
$V(y)$	7.571,66	8.373,76	9.175,85	9.977,95	10.780,04	11.399,89
y_π	106,89	194,2	281,5	368,81	456,11	523,58
$V_\pi(y)$	9.387,56	8.585,46	7.783,36	6.981,27	6.179,17	5.559,33
V project	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22

Table 58 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	7.571,66	106,89	9.387,56	16.959,22
0,9	0,1	0	0	7.571,66	106,89	9.387,56	16.959,22
0,8	0,2	0	0	7.571,66	106,89	9.387,56	16.959,22
0,7	0,3	0	0	7.571,66	106,89	9.387,56	16.959,22
0,6	0,4	0	0	7.571,66	106,89	9.387,56	16.959,22
0,5	0,5	0	0	7.571,66	106,89	9.387,56	16.959,22
0,4	0,6	0	0	7.571,66	106,89	9.387,56	16.959,22
0,3	0,7	0	0	7.571,66	106,89	9.387,56	16.959,22
0,2	0,8	0	0	7.571,66	106,89	9.387,56	16.959,22
0,1	0,9	0	0	7.571,66	106,89	9.387,56	16.959,22
0	1	882,11	0	21.722,47	1.647,16	17.489,36	39.211,83

- **Hypothesis 5: investment costs sustained entirely by the State**

Table 59 A

P	0	50	100	150	200	250	299,86
y_p	0	0	0	0	0	0	0
$V(y)$	6.589,63	7.391,72	8.193,82	8.995,91	9.798,01	10.600,1	11.399,89
y_π	0	87,31	174,61	261,92	349,22	436,53	523,58
$V_\pi(y)$	10.369,59	9.567,5	8.765,4	7.963,31	7.161,21	6.359,12	5.559,33
V project	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22	16.959,22

Table 60 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	6.589,63	0	10.369,59	16.959,22
0,9	0,1	0	0	6.589,63	0	10.369,59	16.959,22
0,8	0,2	0	0	6.589,63	0	10.369,59	16.959,22
0,7	0,3	0	0	6.589,63	0	10.369,59	16.959,22
0,6	0,4	0	0	6.589,63	0	10.369,59	16.959,22
0,5	0,5	0	0	6.589,63	0	10.369,59	16.959,22
0,4	0,6	0	0	6.589,63	0	10.369,59	16.959,22
0,3	0,7	0	0	6.589,63	0	10.369,59	16.959,22
0,2	0,8	0	0	6.589,63	0	10.369,59	16.959,22
0,1	0,9	0	0	6.589,63	0	10.369,59	16.959,22
0	1	882,11	0	20.740,43	1.540,26	30.505,20	51.245,63

- **Example 5 ($I = 7856,3$ €)**

- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Table 61 A

P	0	31,16
y_p	0	0
$V(y)$	10.517,78	11.017,66
y_π	492,26	523,58
$V_\pi(y)$	2.513,29	2.013,41
V project	13.031,07	13.031,07

Table 62 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	10.517,78	492,26	2.513,29	13.031,07
0,9	0,1	0	0	10.517,78	492,26	2.513,29	13.031,07
0,8	0,2	0	0	10.517,78	492,26	2.513,29	13.031,07
0,7	0,3	0	0	10.517,78	492,26	2.513,29	13.031,07
0,6	0,4	0	0	10.517,78	492,26	2.513,29	13.031,07
0,5	0,5	0	0	10.517,78	492,26	2.513,29	13.031,07
0,4	0,6	0	0	10.517,78	492,26	2.513,29	13.031,07
0,3	0,7	0	0	10.517,78	492,26	2.513,29	13.031,07
0,2	0,8	0	0	10.517,78	492,26	2.513,29	13.031,07
0,1	0,9	0	0	10.517,78	492,26	2.513,29	13.031,07
0	1	499,89	0	18.536,9	994,72	3.825,15	22.362,06

- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Table 63 A

P	0	100	153,6
y_p	0	0	0
$V(y)$	8.553,7	10.157,89	11.017,66
y_π	369,19	469,71	523,58
$V_\pi(y)$	4.477,37	2.873,18	2.013,41
V project	13.031,07	13.031,07	13.031,07

Table 64 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	8.553,7	369,19	4.477,37	13.031,07
0,9	0,1	0	0	8.553,7	369,19	4.477,37	13.031,07
0,8	0,2	0	0	8.553,7	369,19	4.477,37	13.031,07
0,7	0,3	0	0	8.553,7	369,19	4.477,37	13.031,07
0,6	0,4	0	0	8.553,7	369,19	4.477,37	13.031,07
0,5	0,5	0	0	8.553,7	369,19	4.477,37	13.031,07
0,4	0,6	0	0	8.553,7	369,19	4.477,37	13.031,07
0,3	0,7	0	0	8.553,7	369,19	4.477,37	13.031,07
0,2	0,8	0	0	8.553,7	369,19	4.477,37	13.031,07
0,1	0,9	0	0	8.553,7	369,19	4.477,37	13.031,07
0	1	499,89	0	16.572,83	871,65	3.351,91	19.924,74

- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Table 65 A

P	0	100	200	276,03
y_p	0	0	0	0
$V(y)$	6.589,63	8.193,82	9.798,01	11.017,66
y_π	246,13	346,64	447,16	523,58
$V_\pi(y)$	6.441,44	4.837,25	3.233,06	2.013,41
V project	13.031,07	13.031,07	13.031,07	13.031,07

Table 66 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	6.589,63	246,13	6.441,44	13.031,07
0,9	0,1	0	0	6.589,63	246,13	6.441,44	13.031,07
0,8	0,2	0	0	6.589,63	246,13	6.441,44	13.031,07
0,7	0,3	0	0	6.589,63	246,13	6.441,44	13.031,07
0,6	0,4	0	0	6.589,63	246,13	6.441,44	13.031,07
0,5	0,5	0	0	6.589,63	246,13	6.441,44	13.031,07
0,4	0,6	0	0	6.589,63	246,13	6.441,44	13.031,07
0,3	0,7	0	0	6.589,63	246,13	6.441,44	13.031,07
0,2	0,8	0	0	6.589,63	246,13	6.441,44	13.031,07
0,1	0,9	0	0	6.589,63	246,13	6.441,44	13.031,07
0	1	499,89	0	14.608,75	748,59	2.878,67	17.487,43

- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Table 67 A

P	0	100	200	300	398,46
y_p	0	0	0	0	0
$V(y)$	4.625,55	6.229,74	7.833,93	9.438,12	11.017,66
y_π	123,06	223,58	324,09	424,61	523,58
$V_\pi(y)$	8.405,52	6.801,33	5.197,14	3.592,95	2.013,41
V project	13.031,07	13.031,07	13.031,07	13.031,07	13.031,07

Table 68 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	4.625,55	123,06	8.405,52	13.031,07
0,9	0,1	0	0	4.625,55	123,06	8.405,52	13.031,07
0,8	0,2	0	0	4.625,55	123,06	8.405,52	13.031,07
0,7	0,3	0	0	4.625,55	123,06	8.405,52	13.031,07
0,6	0,4	0	0	4.625,55	123,06	8.405,52	13.031,07
0,5	0,5	0	0	4.625,55	123,06	8.405,52	13.031,07
0,4	0,6	0	0	4.625,55	123,06	8.405,52	13.031,07
0,3	0,7	0	0	4.625,55	123,06	8.405,52	13.031,07
0,2	0,8	0	0	4.625,55	123,06	8.405,52	13.031,07
0,1	0,9	0	0	4.625,55	123,06	8.405,52	13.031,07
0	1	499,89	0	12.644,68	625,53	2.405,43	15.050,11

- **Hypothesis 5: investment costs sustained entirely by the State**

Table 69 A

P	0	100	200	300	400	500	520,9
y_p	0	0	0	0	0	0	0
$V(y)$	2.661,48	4.265,67	5.869,86	7.474,05	9.078,24	10.682,43	11.017,66
y_π	0	100,52	201,03	301,55	402,06	502,58	523,58
$V_\pi(y)$	10.369,59	8.765,4	7.161,21	5.557,02	3.952,83	2.348,64	2.013,41
V project	13.031,07	13.031,07	13.031,07	13.031,07	13.031,07	13.031,07	13.031,07

Table 70 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	2.661,48	0	10.369,59	13.031,07
0,9	0,1	0	0	2.661,48	0	10.369,59	13.031,07
0,8	0,2	0	0	2.661,48	0	10.369,59	13.031,07
0,7	0,3	0	0	2.661,48	0	10.369,59	13.031,07
0,6	0,4	0	0	2.661,48	0	10.369,59	13.031,07
0,5	0,5	0	0	2.661,48	0	10.369,59	13.031,07
0,4	0,6	0	0	2.661,48	0	10.369,59	13.031,07
0,3	0,7	0	0	2.661,48	0	10.369,59	13.031,07
0,2	0,8	0	0	2.661,48	0	10.369,59	13.031,07
0,1	0,9	0	0	2.661,48	0	10.369,59	13.031,07
0	1	499,89	0	10.680,6	502,46	2.350,46	13.031,07

- **Example 6 ($I = 11.784,45€$)**

- **Hypothesis 1: investment costs sustained entirely by the Private Company**

Table 71 A

P	0
y_p	0
$V(y)$	10.517,78
y_π	738,39
$V_\pi(y)$	483,38
V project	11.001,16

Table 72 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	10.517,78	738,39	483,38	11.001,16
0,9	0,1	0	0	10.517,78	738,39	483,38	11.001,16
0,8	0,2	0	0	10.517,78	738,39	483,38	11.001,16
0,7	0,3	0	0	10.517,78	738,39	483,38	11.001,16
0,6	0,4	0	0	10.517,78	738,39	483,38	11.001,16
0,5	0,5	0	0	10.517,78	738,39	483,38	11.001,16
0,4	0,6	0	0	10.517,78	738,39	483,38	11.001,16
0,3	0,7	0	0	10.517,78	738,39	483,38	11.001,16
0,2	0,8	0	0	10.517,78	738,39	483,38	11.001,16
0,1	0,9	0	0	10.517,78	738,39	483,38	11.001,16
0	1	0	0	10.517,78	738,39	483,38	11.001,16

- **Hypothesis 2: investment costs sustained for the 75% by the Private Company and for 25% by the State**

Table 73 A

P	0
y_p	0
$V(y)$	7.571,66
y_π	553,79
$V_\pi(y)$	1.595,22
V project	9.166,88

Table 74 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	7.571,66	553,79	1.595,22	9.166,88
0,9	0,1	0	0	7.571,66	553,79	1.595,22	9.166,88
0,8	0,2	0	0	7.571,66	553,79	1.595,22	9.166,88
0,7	0,3	0	0	7.571,66	553,79	1.595,22	9.166,88
0,6	0,4	0	0	7.571,66	553,79	1.595,22	9.166,88
0,5	0,5	0	0	7.571,66	553,79	1.595,22	9.166,88
0,4	0,6	0	0	7.571,66	553,79	1.595,22	9.166,88
0,3	0,7	0	0	7.571,66	553,79	1.595,22	9.166,88
0,2	0,8	0	0	7.571,66	553,79	1.595,22	9.166,88
0,1	0,9	0	0	7.571,66	553,79	1.595,22	9.166,88
0	1	0	0	7.571,66	553,79	1.595,22	9.166,88

- **Hypothesis 3: investment costs sustained for the 50% by the Private Company and for 50% by the State**

Table 75 A

P	0	100	153,6
y_p	0	0	0
$V(y)$	4.625,55	6.229,74	7.089,51
y_π	369,19	469,71	523,58
$V_\pi(y)$	4.477,37	2.873,18	2.013,41
V project	9.102,92	9.102,92	9.102,92

Table 76 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	0	4.625,55	369,19	4.477,37	9.102,92
0,9	0,1	0	0	4.625,55	369,19	4.477,37	9.102,92
0,8	0,2	0	0	4.625,55	369,19	4.477,37	9.102,92
0,7	0,3	0	0	4.625,55	369,19	4.477,37	9.102,92
0,6	0,4	0	0	4.625,55	369,19	4.477,37	9.102,92
0,5	0,5	0	0	4.625,55	369,19	4.477,37	9.102,92
0,4	0,6	0	0	4.625,55	369,19	4.477,37	9.102,92
0,3	0,7	0	0	4.625,55	369,19	4.477,37	9.102,92
0,2	0,8	0	0	4.625,55	369,19	4.477,37	9.102,92
0,1	0,9	0	0	4.625,55	369,19	4.477,37	9.102,92
0	1	0	0	4.625,55	369,19	4.477,37	9.102,92

- **Hypothesis 4: investment costs sustained for the 25% by the Private Company and for 75% by the State**

Table 77 A

P	0	100	200	300	337,25
y_p	223,25	0	0	0	0
$V(y)$	1.679,44	3.283,63	4.887,82	6.492,01	7.089,51
y_π	184,6	285,11	385,63	486,14	523,58
$V_\pi(y)$	7.423,48	5.819,29	4.215,1	2.610,91	2.013,41
V project	9.102,92	9.102,92	9.102,92	9.102,92	9.102,92

Table 78 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0,9	0,1	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0,8	0,2	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0,7	0,3	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0,6	0,4	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0,5	0,5	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0,4	0,6	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0,3	0,7	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0,2	0,8	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0,1	0,9	0	223,25	1.679,44	184,6	7.423,48	9.102,92
0	1	0	223,25	1.679,44	184,6	7.423,48	9.102,92

- **Hypothesis 5: investment costs sustained entirely by the State**

Table 79 A

P	0	100	200	300	400	500	520,9
y_p	971,41	564,02	156,64	0	0	0	0
$V(y)$	38,21	535,15	1.941,71	3.545,9	5.150,09	6.754,28	7.089,51
y_π	0	100,52	201,03	301,55	402,06	502,58	523,58
$V_\pi(y)$	10.369,59	8.765,4	7.161,21	5.557,02	3.952,83	2.348,64	2.013,41
V project	10.407,8	9.300,55	9.102,92	9.102,92	9.102,92	9.102,92	9.102,92

Table 80 A

w S	w P	P^*_R	y_p	$V(y)$	y_π	$V_\pi(y)$	V project
1	0	0	971,41	38,21	0	10.369,59	10.407,8
0,9	0,1	0	971,41	38,21	0	10.369,59	10.407,8
0,8	0,2	0	971,41	38,21	0	10.369,59	10.407,8
0,7	0,3	0	971,41	38,21	0	10.369,59	10.407,8
0,6	0,4	0	971,41	38,21	0	10.369,59	10.407,8
0,5	0,5	0	971,41	38,21	0	10.369,59	10.407,8
0,4	0,6	0	971,41	38,21	0	10.369,59	10.407,8
0,3	0,7	0	971,41	38,21	0	10.369,59	10.407,8
0,2	0,8	0	971,41	38,21	0	10.369,59	10.407,8
0,1	0,9	0	971,41	38,21	0	10.369,59	10.407,8
0	1	0	971,41	38,21	0	10.369,59	10.407,8

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