

Slow Tourism Project to Redistribute Tourist Demand in Lazio: Cost-Benefit Analysis Using Monte Carlo Simulation

By Michele Angelaccio* & Ulviyya Hajiyeva[‡]

This paper examines the potential financial advantages and disadvantages of a project called Feudo Turistico, which proposes the establishment of a slow tourism destination between Rome and Fiuggi. The objective of the project is to reduce the concentration of tourist demand in the city centers of Rome and Fiuggi and instead distribute it across the Lazio region by providing a local cultural and active tourism experience with new services that are currently unavailable in the region. To assess the project's feasibility, a cost-benefit analysis is conducted using Monte Carlo Simulation with 10,000 trials. This method allows for obtaining the net present value, internal rate of return, and discounted payback period for each simulated combination of input variables and then exploring the location and dispersion of these indicators. A simple random sampling technique is employed to simulate different sets of input parameters using a factor range between pessimistic and optimistic scenarios, where minimum and maximum values are determined based on existing literature, historical data in statistical reports of research institutions, and calculations derived from this data. Furthermore, two different settings are considered regarding the initial distribution of input parameters, and their outcomes are compared. The results and distribution of net present value, internal rate of return, and discounted payback period indicate that the Feudo Turistico project possesses a financially self-sufficient business model, generating cash flows that can repay the initial investment within a few years with a high probability.

Keywords: *slow tourism, cost-benefit analysis, discounted cash flow, Monte Carlo Simulation*

Introduction

In recent years slow tourism is becoming a trending phenomenon in the tourism industry. It originated with the Slow Food and Cittaslow movements in Italy in the late 1980s and encompassed the travel and tourism industry (Clancy 2018). It can be argued that slow tourism has emerged as a travel concept that caters to individuals seeking alternative experiences in their journeys, characterized by a deep respect for the environment and local communities (Staehele et al. 2012). According to Valls et al. (2019), spending more time in a single place to experience the local culture deeper, understand the local history better and taste local food more as well as reduce mobility and protect the ecological well-being

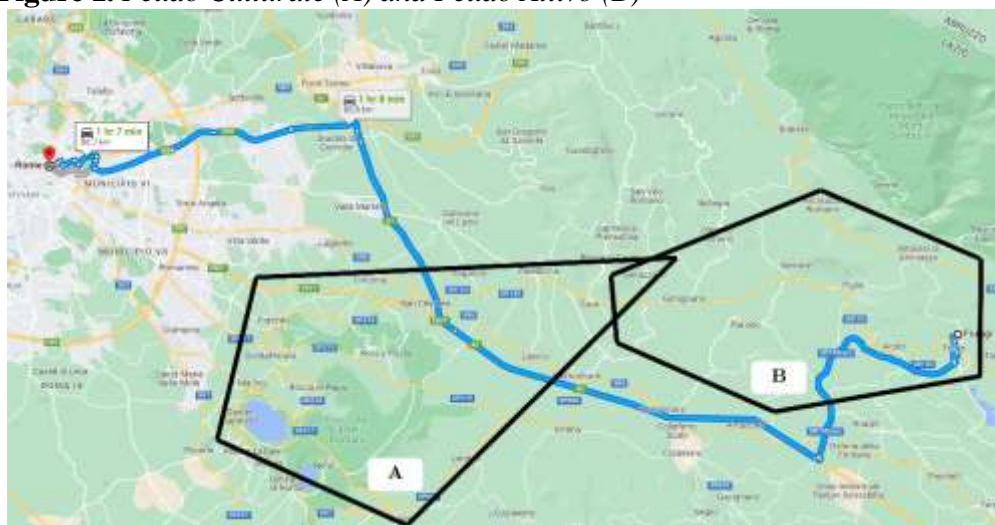
*Associate Professor, University of Rome "Tor Vergata". Italy.

[‡]Graduate Student, University of Rome Tor Vergata, Italy.

are the main characteristics and objectives of slow tourism. Similarly, Dickinson and Lumsdon (2010) assert that the fundamental principles of slow tourism revolve around the notion of conducting activities at an appropriate pace and forging authentic connections with the destination. Furthermore, this concept encompasses a unique perspective on the natural environment, surpassing the superficial observation of landscapes and encouraging active engagement with all sensory aspects, thereby establishing a genuine bond with the place (Moirá et al. 2017). That's to say, slow tourism aims to protect environmental well-being, preserve the socio-cultural richness and improve economic conditions in local communities; and these common goals ensure similarities in various practices (Fennell and Cooper 2020, Hall 2019, Machnik 2021, Qian et al. 2018, Weaver 2020).

In this regard, various types of practices, techniques and methods are implemented by various tourism businesses and destinations to achieve better environmental, social, and economic efficiency, and gain competitive advantages in the sustainable and slow tourism sectors. One example of these practices is offering products and services relevant to the local culture, geography, nature, climate, and the season of the year.

Following the above discussion, the present work offers a project intending to create a slow tourism region where it will be possible to provide users with experiential paths in terms of cultural tourism and active tourism in the Lazio region, between Rome and Fiuggi, and later performs cost-benefit analysis using Monte Carlo Simulation technique. In more detail, the present study analyses two non-exclusive options that have an as common purpose to contribute to the depolarization of tourist demand from the city centres of Rome and Fiuggi and redistribute it in the territory between the two poles, where tourism contributes little to local added value. We divided the territory into different touristic scenarios named "touristic feudos". This division and naming trace the origins of today's society and allow the visitors to immerse themselves in the local culture and to take part in experiential paths that lead them to be active users and in the foreground both from a cultural and sporting point of view. In this regard, the project develops two feudos called Feudo Culturale and Feudo Attivo (Figure 1), which constitute the macro feud, called Feudo Turistico, together. The first Feudo aims to provide users with a contextualized account of the historical and artistic evolution of Lazio culture through the connection of some museums within a system, and an itinerary that links local cultures and experiences spread over the territory; the second Feudo connects sports practices in Lazio by the modernization of a Greenway to the required standards of safety and accessibility which allows practicing outdoor sports exploring the territorial context.

Figure 1. *Feudo Culturale (A) and Feudo Attivo (B)*

Source: Illustrated on Google Maps.

In more detail, the project seeks to establish a comprehensive museum network within the Cultural Feud, consisting of four museums. This network functions as a Strategic Network, catering to a homogeneous target audience and proposes coordination in terms of museum access by establishing appropriate links to manage the local cultural system and facilitate site accessibility. The museums included in the network are the Civic Archaeological Museum of Villa Ferrajoli, the Museum of the II Parthian Legion, Palazzo Chigi Ariccia, and the Velletri Diocesan Museum. These museums will be interconnected through a designated itinerary, which can be accessed from either Roma Termini station or Fiuggi, with the assistance of a shuttle service and tourist guides.

Furthermore, the project entails the redevelopment of the cycle path within the Active Feud, specifically the segment between Paliano and Fiuggi. The greenway follows the historical route of the former Rome-Fiuggi-Frosinone railway and is part of the Bicaltalia and Eurovelo networks. Despite its relatively low visibility, the path is widely regarded as one of the most picturesque cycling routes in Lazio, offering a serene experience as it bypasses populated areas. The objective is to create a contemporary and user-friendly greenway that caters to potential users, incorporating new amenities. Importantly, the greenway is exclusively designated for non-motorized individuals, including pedestrians, cyclists, and horse riders, ensuring safety throughout its entirety. The project envisions modifying the terrain to accommodate horseback riders, employing a less rigid surface compared to conventional asphalt. The greenway provides a variety of itineraries that can be explored either with the guidance of tour operators or independently. To facilitate active tourism, the responsible social cooperative proposes the acquisition of e-bikes available for on-site rentals. This endeavor not only promotes active tourism but also generates revenue to sustain the greenway project itself.

The main objectives of the project are to generate growth in tourism demand within the two feudos. The direct beneficiaries of the project are tourists and some

resident inhabitants who are particularly interested in contact with nature or museum tours, while the indirect beneficiaries of the project are all accommodation and catering establishments that can enjoy growth in demand. Indeed, tourism plays a vital role in the development of different destinations around the world and culture is considered one of the key components of this development, as MacCannell (1993, as cited in Mousavi et al. 2016) argues “every form of tourism is a cultural experience.” Similarly, the popularity of active tourism has been seen growing dramatically since the end of the eighties (Millington et al. 2001).

In summary, to achieve growth in demand, this project offers both cultural and active tourism as the components of slow tourism practices by expanding the local tourism offer through the provision of new services not currently available. It provides the visitors with a smart and guided approach to discovering the area between Rome and Fiuggi, with particular attention to the relationship between man and territory, as it has changed in the various historical periods that see these lands inhabited from prehistoric times to the nineteenth century.

The project proposes a financially self-sustainable business model that allows cash flows to be able to reach the break-even point in a few years. To do that, the present study performs a financial analysis referring to the evaluation of the investment, from the point of view of the crucial stakeholders. As a methodology, the financial and economic viability of the project has been assessed through a cost-benefit analysis (CBA) using Monte Carlo Simulation with the Discounted Cash Flows (DCF) method. Particularly, we referred to the document “Guide to the cost-benefit analysis of investment projects. Economic evaluation tool for cohesion policy 2014-2020”, published by the European Commission, Directorate General for Regional and Urban Policy (2015). We analysed location and dispersion of net present values (NPV), internal rate of return (IRR) and discounted payback period (DPB) for the Feudo Turistico project using Monte Carlo Simulation with 10,000 trials. The inputs were obtained based on the existing and forecasted market factors from historical data, previous studies and calculations based on them. Two settings were constructed from which in the first one, it was assumed that input parameters have a normal distribution, while in the second, they are uniformly distributed. The results of the simulations provide a fairly high probability for positive NPV, considerably large mean value for IRR and acceptable average DPB in both cases.

A preliminary analysis has been introduced in the (Nardone 2018) in which a partial data set has been used to provide a benefit cost analysis.

The paper is organized as follows. Section 2 introduces the methodology used to assess the cost-benefit analysis for the project. Section 3 outlines the results of the analyses. Section 4 recaps the main findings and concludes the report.

Methodology

The present study investigates the cost and benefits of the Feudo Touristico project as well as its sub-projects of Feudo Attivo and Feudo Culturale using net present value (NPV), internal rate of return (IRR) and discounted payback period

(DPB) techniques. Furthermore, since the input values are not fixed, the Monte Carlo Simulation technique with a simple random sampling method was exploited to analyse the NPV, IRR and DPB. Monte Carlo is a computerized probability simulation method that concerns the influences of uncertainties in estimating models by calculating the outcomes using a random variable based on a range rather than a fixed value (Mooney 1997). It is a well-known technique used for a wide range of purposes including cost-benefit analysis (Gentilello et al. 2005, Loving et al. 2014, Mahdiyar et al. 2016).

NPV is one of the most sophisticated economic valuation methods for projects (Žižlavský 2014). This technique discounts all future cash inflows and outflows given a discount rate and sums them before deducting the initial investment amount as in the following equation (Khan 1999).

$$NPV = \sum_{t=1}^n \frac{NCF_t}{(1+r)^t} - I_0 \quad (1)$$

where NCF_t is net cash flow during the period t , r is the real discount rate, t is the number of time periods, and I_0 is the total amount of initial investments.

IRR is a discount factor which equates the aggregated discounted cash inflows to the sum of discounted cash outflows (Promislow and Spring 1996). The present paper calculates this rate (r^*) according to the following formula (Di Lorenzo et al. 2012):

$$IRR = r^* \ni NPV(r^*) = 0 \quad (2)$$

where r^* is the internal rate of return when the NPV of the projects becomes zero in Equation 1.

If there are significant uncertainties as in the case of the present study, the payback period (PB) – the time which is required to recover project cost, is usually suggested to assess the duration of the risky period of initial investment (Orioli and Gangi 2015). To consider the time value of money, this paper employs Discounted Payback Period (DPB) rather than a simple PB using the following equation:

$$DPB = t^* \ni NPV(t^*) = 0 \quad (3)$$

where DPB is a payback period when the NPV equals zero.

In general, two scenarios were constructed. In the pessimistic scenario, the lowest possible revenues, highest possible costs and highest possible discount factor were employed, while the optimistic scenario was built using the highest possible income, lowest possible expenses and lowest possible discount rate. Later, Monte Carlo Simulation with 10,000 trials was run based on the cash flows calculated for each scenario. Moreover, we decided to construct two different settings for the distribution of the variables. In the first context, it was assumed that the variables have a normal distribution, while in the second, they are uniformly distributed. The lifespan of the project was defined as 10 years.

To summarize the following procedure was performed:

1. Input parameters for two (pessimistic and optimistic) scenarios were obtained from previous literature and historical data.
2. Cash flows were calculated for both scenarios.
3. Two different distribution functions were assigned for the input parameters (cash flows and discount factor).
4. A simple random sampling method was employed to simulate stochastic input parameters using an input range between pessimistic and optimistic scenarios.
5. Monte Carlo Simulation with 10,000 trials was performed to get 10,000 input combinations and corresponding solution matrix of NPV, IRR and DPB.
6. A statistical representation of NPV, IRR and DPB was examined after the simulations.

Input Parameters

The inputs which are used for this study vary and depend on various conditions and all these factors influence the final outputs. Therefore, it is important to accurately define the ranges for each variable to be used as inputs in simulations. The present study considers historical data in the statistical reports of reliable research institutes, self-calculations based on this data, and previous findings to identify the ranges for each factor.

Table 1 summarizes the inputs to calculate NPV, IRR and DPB for the project using the Monte Carlo Simulation. Minimum and maximum values for the discounting factor were identified following the recent literature for the project evaluation studies in Italy (Boggia et al. 2022, Coppola et al. 2020, Fioriti et al. 2022). Variable costs were defined as a percentage of total revenues; in which according to Frey and Meier (2006) and Plaza (2006), variable costs constitute a very low proportion of the total costs in similar projects including the operation of museums and other attractions. Regarding the staff, initially, 14 persons are employed in both scenarios while in an optimistic scenario, one new employee is going to be hired each year. The average salary for the project was calculated (rounded and increasing by 5% per year) based on the average salary for Italy which was €29,700 in 2021 (Trading Economics 2022). Other expenses were determined concerning the financial statements of similar projects and are assumed to increase by 5% each year. Taxes are not included.

Considering the inputs, forecasting demand is the main limitation of this paper. However, we tried to control this limitation by estimating demand based on average growth rates using the available data provided by national and regional statistical offices and service providers. We first found the number of visitors, and residents living in the surrounding areas, namely in the provinces of Frosinone, Latina and Rome (ISTAT 2022, UPI Lazio 2018), and then calculated average growth rates based on the available data. Later, we forecasted the number of visitors and residents in these provinces for 2024. Finally, some proportion of these visitors and residents were assumed that will use the services of Feudo Culturale and Feudo Attivo (Appendix).

Table 1. Input Parameters

Input	Value (min)	Value (max)	Time Frame	Distribution	Reference
Discount Rate	2%	4%	Annual	ND / UD*	Fioriti et al. 2022, Boggia et al. 2022, Coppola et al. 2020
Variable Cost	8% of revenues	10% of revenues	Annual	ND / UD	Frey and Meier 2006, Plaza 2006
Average Salary	30,000	30,000	Annual	Constant	Trading Economics 2022
Number of Employees	14	14	Annual	Constant	
Advertising & Marketing	75,000	100,000	Annual	ND / UD	Based on the desk research using historical financial statements of similar projects
Maintenance Cost	60,000	120,000	Annual	ND / UD	
General and Adm. Cost	30,000	50,000	Annual	ND / UD	
Miscellaneous	30,000	40,000	Annual	ND / UD	
Extraordinary Maintenance	150,000	200,000	per 5 years	ND / UD	
Initial Investment	1,312,000	1,706,000	Uniform	ND / UD	
Tax					
Regional Tax (IRAP)	3.9%	3.9%	Annual	Constant	Agenzia Entrate (2023a)
Income Tax (IRES)	24%	24%	Annual	Constant	Agenzia Entrate (2023b)
Number of Visitors**					
Feudo Culturale	10,996	22,196	Annual	ND / UD	Appendix ISTAT (2022) UPI Lazio (2018)
Feudo Attivo					
<i>On foot</i>	38,762	71,220	Annual	ND / UD	
<i>Bike rental</i>	6,299	11,573	Annual	ND / UD	
<i>Other services</i>	3,392	6,232	Annual	ND / UD	
Price of the Services					
Feudo Culturale	€ 35	€ 35	per visitor	Constant	
Feudo Attivo					
<i>On foot</i>	€ 0	€ 0	per visitor	Constant	
<i>Bike rental</i>	€ 8	€ 8	per visitor	Constant	
<i>Other services</i>	€ 12	€ 12	per visitor	Constant	
Lifespan	10	10	10 years	Constant	

Notes:

*ND: Normal Distribution; UD: Uniform Distribution.

***Optimistic Scenario*: the number of visitors increases by 20% each year in the first 2 years, by 15% in the following 3 years, and later by 10% each year. *Pessimistic Scenario*: the number of visitors increases by 7% each year in the first 2 years, by 5% in the following 3 years, and later by 0% each year**Results**

This section provides the results obtained through the implementation of the methods explained in Section 2 to the input parameters developed for the Feudo

Turistico project. Before performing Monte Carlo Simulation, net present value, internal rate of return and the discounted payback period were calculated for optimistic and pessimistic scenarios (Table 2). In the positive scenario, values obtained for NPV (€5.38 million), and IRR (37.24%) is considerably high, and the payback period is notably short (around 3 years and 7 days). In the second scenario, a large amount of loss (NPV = -€4.96 million) is expected, while IRR and DPB cannot be obtained since no positive cash flow is observed.

Table 2. Profitability of the Project with Optimistic and Pessimistic Scenarios

Indicator	Optimistic Scenario	Pessimistic Scenario
NPV	€5,378,928	-€3,651,581
IRR	37.24%	-
DPB	3.02	-

Later, one simulation was performed for each different random combination of input parameters using the input space with 10,000 simulations. This process was conducted separately for the settings when the variables are normally distributed and when they are uniformly distributed. Consequently, we obtained 10,000 NPV, IRR and DPB for each case.

Table 3 outlines the potential financial benefits and drawbacks of the project. In the first setting with normally distributed variables, the probability of a positive net present value is 62.01% (1-37.99%), while it is even higher (76.94%) in the second context. So, in both cases, the probability of profit is around twice as high as the probability of loss. The probability of a negative internal rate of return was also reported since a negative IRR is obtained when the sum of the nominal cash flows is less than the initial amount invested for a project, meaning that it is a sign of a negative return on investment (Kuchta 2000). The results provide that the aggregated value of nominal cash flows is higher than the initial investment in 85.81% (1-14.19%) of 10,000 simulations when the inputs are normally distributed, while this probability is 87.84% (1-12.16%) when the factors have a uniform distribution. For discounted payback period, 5 years and less was defined as a period with a financial advantage. The probability of financially advantageous DPB is 35.87% (1-64.13%) in the first setting, while it is considerably low (2.58% = 1 - 97.42%) in the second one.

Table 3. Probability of Financial Disadvantages with Monte Carlo Simulation with 10,000 Trials

Indicator	Normal Distribution	Uniform Distribution
Probability (NPV < 0)	37.99%	23.06%
Probability (IRR < 0)	14.19%	12.16%
Probability (DPB > 5)	64.13%	97.42%

To have a better understanding of the quality of representation, Table 4 outlines the summary statistics with seven moments of the distribution illustrating the location and dispersion of NPV, IRR and DPB after 10,000 simulations. The average value of NPV is around €590,811 with a high variance when the variables have a normal distribution. The minimum net present value of the project is €7.07

million in loss, while its maximum value can be up to €7.87 million in profit. The median value is just €15,012 higher than the mean and the skewness is -0.05 which indicates that the distribution of NPV is fairly symmetrical with very modest left skewness. At the same time, kurtosis is 0.06 meaning that the net present values of the project with 10,000 trials have very light tails with a lack of outliers.

Table 4. Outcomes of Monte Carlo Simulation with 10,000 Trials

Indicator	Normal Distribution			Uniform Distribution		
	NPV	IRR	DPB	NPV	IRR	DPB
Mean	€590,811	0.12	5.55	€590,799	0.08	8.46
Standard Deviation	€1,982,110	0.13	3.19	€798,365	0.07	3.00
Median	€605,823	0.12	5.78	€596,018	0.08	7.86
Minimum	-€7,070,383	-0.55	-15.57	-€2,100,787	-0.37	-29.82
Maximum	€7,874,200	0.89	25.03	€3,321,108	0.28	42.54
Skewness	-0.05	-0.06	-0.99	-0.01	-0.86	0.79
Kurtosis	0.06	1.02	3.47	-0.14	1.82	12.53

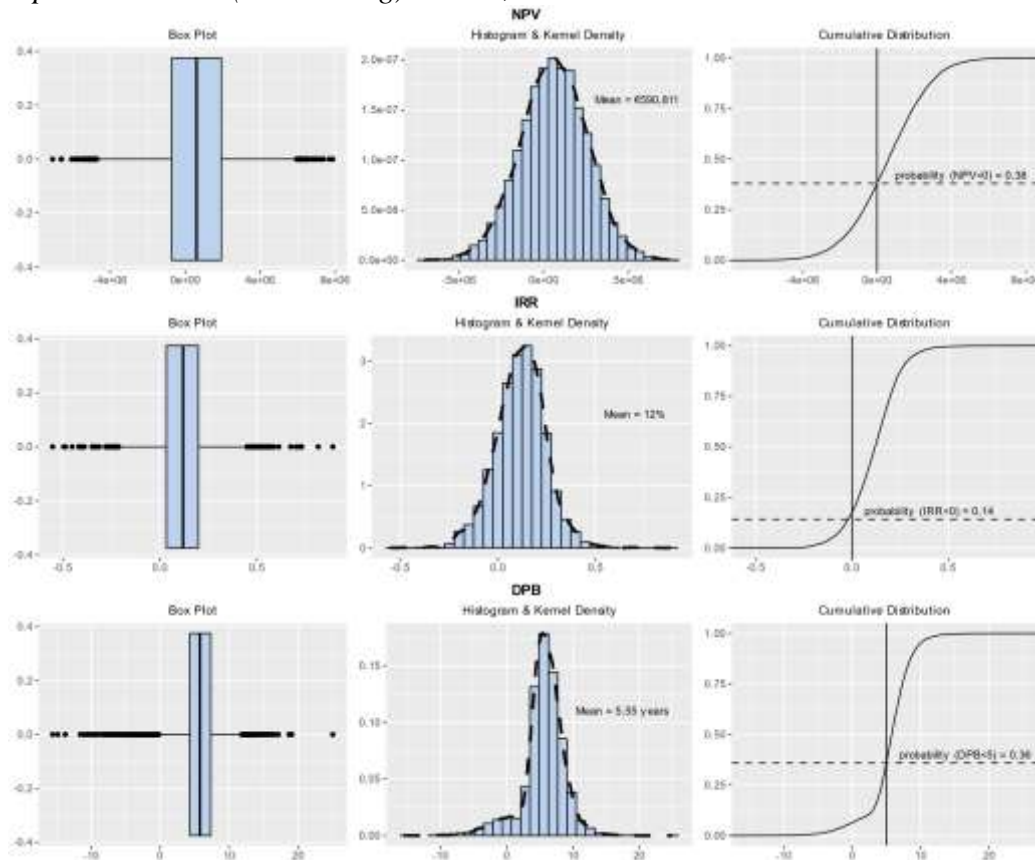
Considering the internal rate of return, the mean value is 12% (with a high standard deviation), notably larger than the discount factors found in pertinent literature for Italy. A higher value of IRR implies that the project looks profitable (Dorfman 1981). As NPV, IRR has also a median value (12%) close to the mean with very small skewness (-0.06), and kurtosis (1.02). On the other hand, the discounted payback period has less symmetry with a moderate left skewness (-0.99) and heavier tail (kurtosis = 3.47) compared to NPV and IRR. The average DPB is about 5 years, 6 months and 18 days, while the median is around 5 years, 9 months and 11 days.

The location and dispersion of NPV, IRR and DPB when the input parameters have a normal distribution as interpreted above can be also seen visually in Figure 2 where the distribution and density of outcomes are demonstrated in the box plot, histogram, kernel density and the cumulative distribution plots.

Considering the simulation setting when the input parameters have a uniform distribution, the most probable NPV (€590,799) is almost the same as the mean NPV in the previous setting. However, maximum loss and maximum profit have notably lower values (respectively €2.10 million and €3.32 million) compared to the results obtained when the factors are normally distributed. Taking look into the symmetry and “tailedness” of the distribution of net present values, even though we observe the slightly weaker sign of asymmetry and larger tail in comparison with the prior case, still it has a sufficiently symmetrical normal distribution with a bell-shaped curve (Figure 3).

Similarly, the internal rate of return also has a significantly lower mean (0.08), standard deviation (0.7), median (0.08), minimum (-0.37; lower in absolute value) and maximum (0.28) values, and kurtosis (1.82) as well compared to the previous scenario. An important difference is in symmetry in which skewness equals -0.86 depicting a moderate left skewness of the distribution.

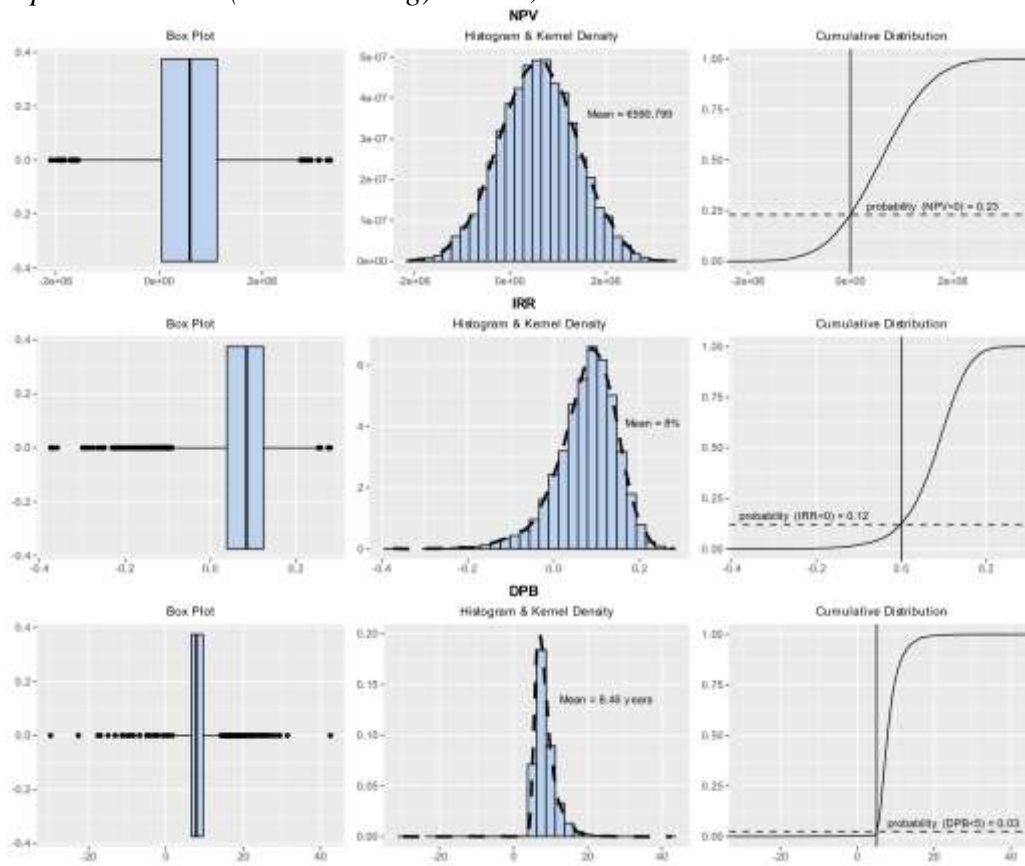
Figure 2. Box Plot (left), Histogram and Kernel Density (centre) and Cumulative Distribution (right) of the Project NPV, IRR and DPB having Normally Distributed Input Parameters (First Setting) with 10,000 Times MC Simulation



The main contradiction between the two cases was detected in the discounted payback periods. The average DPB is about 8 years, 5 months and 16 days when the input parameters are uniformly distributed, and the median is around 7 years, 10 months and 10 days lower than the mean, unlike the other case. The asymmetry is a bit high with a moderate right skewness; however, the distribution of the outcomes is affected by a strong leptokurtosis, greater than 12. It assigns a greater probability to events very far from the mean value of the distribution than the probabilities that would be assigned to such events by a normal distribution (Adams and Thornton 2013). So, the DPB has a distribution with fat tails meaning that high fluctuations away from the mean are expected for the payback period. This effect as well as other interpretations for the outcomes obtained with input parameters with uniform distribution can also be observed in Figure 3.

To summarize, from the economical perspective the expected financial outcomes are almost the same when the input parameters are normally distributed in comparison with the setting when the factors have a uniform distribution. However, the risk assessment is more controversial as on one hand, the probability of loss is higher in the first setting; on the other hand, asymmetry and “tailedness” is larger in the second one.

Figure 3. Box Plot (left), Histogram and Kernel Density (centre) and Cumulative Distribution (right) of the Project NPV, IRR and DPB having Uniformly Distributed Input Parameters (Second Setting) with 10,000 Times MC Simulation



Conclusions

This research paper presents a project proposal that aims to establish a slow tourism region by offering experiential pathways in cultural and active tourism. The project seeks to expand the tourism offerings in the Lazio region by introducing new services that are currently not available. The main objective is to alleviate the concentration of tourist demand in the city centers of Rome and Fiumicino and redistribute it across the territory between these two poles. The project includes the development of two touristic feuds: Feudo Culturale, which focuses on providing a touristic experience centered around the historical and artistic evolution of Lazio's culture, and Feudo Attivo, which aims to enhance outdoor tourism experiences through the modernization of a Greenway. These two projects collectively form the macro feud known as Feudo Turistico.

To assess the financial viability of the Feudo Turistico project, a cost-benefit analysis is conducted using the Monte Carlo Simulation method. Two scenarios are considered: an optimistic scenario utilizing the best possible input parameters and a pessimistic scenario using the worst possible input parameters to calculate discounted cash flows over a ten-year period. Additionally, 10,000 combinations

of stochastic input parameters are simulated using a simple random sampling method within the range defined by the optimistic and pessimistic scenarios. Furthermore, two simulation settings are implemented in which, the first assumes input parameters are normally distributed, while the second assumes they have uniform distribution. Each distribution scenario is performed with 10,000 trials of Monte Carlo Simulation for ten years, and the outcomes are compared.

The results reveal that the project yields a positive net present value (NPV), an internal rate of return (IRR) that exceeds the discount factor, and a relatively short payback period in the optimistic scenario. However, the pessimistic scenario results in a negative NPV over the ten-year period. Therefore, the Monte Carlo Simulation provides a more reliable understanding of the financial outcomes due to its alignment with the law of large numbers (Metropolis and Ulam 1949). In the scenario with normally distributed input parameters, the expected average return is approximately €0.6 million, the mean internal rate of return was 12%, and the discounted payback period is approximately 5 years and 7 months. In the scenario with uniformly distributed factors, the NPV remained almost the same, while the IRR decreased significantly (8%) and the DPB increased to approximately 8 years and 5.5 months. However, all indicators except for DPB exhibited a fairly symmetrical distribution in both settings. The probability of achieving a positive NPV and IRR is high in both scenarios.

Considering the results and the distribution of net present value, internal rate of return, and discounted payback period, it can be argued that the project possesses a financially self-sustainable business model capable of generating cash flows that can repay the initial investment within a few years.

References

- Adams M, Thornton B (2013) Black swans and VaR. *Journal of Finance and Accountancy* 14(1).
- Agenzia Entrate (2023a) *Corporate income tax – Ires*. Available at: <https://www.agenziaentrate.gov.it/portale/web/english/corporate-income-tax-ires>.
- Agenzia Entrate (2023b) *Regional production tax – Irap*. Available at: <https://www.agenziaentrate.gov.it/portale/web/english/nse/business/taxes-on-corporate-income>.
- Boggia A, Paolotti L, Martino G, Rocchi L (2022) Comparative analysis of different alternatives for sustainable short rotation woody crops in Central Italy. *Science of the Total Environment* 836: 155638.
- Clancy M (2018) *Slow tourism, food and cities*. New York, NY: Routledge.
- Coppola G, Costantini M, Orsi L, Facchinetti D, Santoro F, Pessina D, et al. (2020) A comparative cost-benefit analysis of conventional and organic hazelnuts production systems in center Italy. *Agriculture* 10(9): 409.
- Di Lorenzo G, Pilidis P, Witton J, Probert D (2012) Monte-Carlo simulation of investment integrity and value for power-plants with carbon-capture. *Applied Energy* 98: 467–478.
- Dickinson J, Lumsdon L (2010) *Slow travel and tourism*. London, the UK: Earthscan.
- Dorfman R (1981) The meaning of internal rates of return. *The Journal of Finance* 36(5): 1011–1021.

- European Commission, Directorate-General for Regional and Urban Policy (2015) *Guide to cost-benefit analysis of investment projects: economic appraisal tool for cohesion policy 2014-2020*. Available at: <https://data.europa.eu/doi/10.2769/97516>.
- Fennell DA, Cooper C (2020) Sustainable tourism. In R Dowling (ed.), *Sustainable Tourism*, 490. Bristol, U.K.: Channel View Publications.
- Fioriti D, Pellegrino L, Lutzemberger G, Micolano E, Poli D (2022) Optimal sizing of residential battery systems with multi-year dynamics and a novel rainflow-based model of storage degradation: an extensive Italian case study. *Electric Power Systems Research* 203(Feb): 107675.
- Frey BS, Meier S (2006) The economics of museums. In VA Ginsburgh, D Throsby (eds.), *Handbook of the Economics of Art and Culture*, 1017–1047 (1st Edition). Elsevier.
- Gentilello LM, Ebel BE, Wickizer TM, Salkever DS, Rivara FP (2005) Alcohol interventions for trauma patients treated in emergency departments and hospitals: a cost benefit analysis. *Annals of Surgery* 241(4): 541–550.
- Hall CM (2019) Constructing sustainable tourism development: the 2030 agenda and the managerial ecology of sustainable tourism. *Journal of Sustainable Tourism* 27(7): 1044–1060.
- ISTAT (2022) *Popolazione residente al 1° gennaio*. (Resident population on 1 January.) Available at: http://dati.istat.it/Index.aspx?DataSetCode=DCIS_POPRES1.
- Khan MY (1999) *Theory & problems in financial management*. Boston, MA: McGraw Hill Higher Education.
- Kuchta D (2000) Fuzzy capital budgeting. *Fuzzy Sets and Systems* 111(3): 367–385.
- Loving VA, Edwards DB, Roche KT, Steele JR, Sapareto SA, Byrum SC, et al. (2014) Monte Carlo simulation to analyze the cost-benefit of radioactive seed localization versus wire localization for breast-conserving surgery in fee-for-service health care systems compared with accountable care organizations. *American Journal of Roentgenology* 202(6): 1383–1388.
- Machnik A (2021) Ecotourism as a core of sustainability in tourism. In A Lubowiecki-Vikuk, BM Barbosa de Sousa, BM Đerčan, WL Filho (eds.), *Handbook of Sustainable Development and Leisure Services*, 223–240. Cham, Switzerland: Springer.
- Mahdiyari A, Tabatabaee S, Sadeghifam AN, Mohandes SR, Abdullah A, Meynagh MM (2016) Probabilistic private cost-benefit analysis for green roof installation: A Monte Carlo simulation approach. *Urban Forestry & Urban Greening* 20: 317–327.
- Metropolis N, Ulam S (1949) The Monte Carlo method. *Journal of the American Statistical Association* 44(247): 335–341.
- Millington K, Locke T, Locke A (2001) Adventure travel. *Travel & Tourism Analyst* 4: 65–98.
- Moira P, Mylonopoulos D, Kondoudaki A (2017) The application of slow movement to tourism: is slow tourism a new paradigm? *Journal of Tourism and Leisure Studies* 2(3): 1–10.
- Mooney CZ (1997) *Monte Carlo simulation* (No. 116). SAGE Publications.
- Mousavi SS, Doratli N, Mousavi SN, Moradiahari F (2016) Defining cultural tourism. In *International Conference on Civil, Architecture and Sustainable Development* 1(2): 70–75.
- Nardone D (2018) *Il Feudo Turistico tra Roma e Fiuggi*. (The tourist fiefdom between Rome and Fiuggi.) Bachelor's Degree Thesis. Management Engineering-University of Rome Tor Vergata.

- Orioli A, Di Gangi A (2015) The recent change in the Italian policies for photovoltaics: Effects on the payback period and levelized cost of electricity of grid-connected photovoltaic systems installed in urban contexts. *Energy* 93: 1989–2005.
- Plaza B (2006) The return on investment of the Guggenheim Museum Bilbao. *International Journal of Urban and Regional Research* 30(2): 452–467.
- Promislow SD, Spring D (1996) Postulates for the internal rate of return of an investment project. *Journal of Mathematical Economics* 26(3): 325–361.
- Qian J, Shen H, Law R (2018) Research in sustainable tourism: a longitudinal study of articles between 2008 and 2017. *Sustainability* 10(3): 590.
- Staeble RL, Anderson B, Betts B, Blaney D, Chow C, Friedman L, et al. (2012) *Interplanetary CubeSats: opening the solar system to a broad community at lower cost*. No. HQ-E-DAA-TN64569.
- Trading Economics (2022) *Italy average nominal monthly wages*. Available at: <https://tradingeconomics.com/italy/wages>.
- UPI Lazio (2018) *La risorsa turismo*. (The tourism resource.) Available at: https://www.upilazio.it/pdf/rapporto-2018/R_2018_CAP_09_TURISMO_18_11.pdf.
- Valls JF, Mota L, Freitas-Vieira SC, Santos R (2019) Opportunities for slow tourism in Madeira. *Sustainability* 11(17): 1–23.
- Weaver D (2020) *Advanced introduction to sustainable tourism*. Cheltenham, the UK: Edward Elgar Publishing.
- Žižlavský O (2014) Net present value approach: method for economic assessment of innovation projects. *Procedia-Social and Behavioral Sciences* 156: 506–512.

Appendix

Table A1. Number of Visitors

Provinces	Number of Visitors	Average Annual Variation (%)	2024 (forecast)	Potential Visitors (%)		Effective Users		
				min	max	% of P.V.	min	max
Feudo Attivo								
<i>Visitors</i>								
Frosinone (2017)	435,649	0.18	441,155	10	15	20	8,823	13,235
Latina (2017)	522,736	-5.99	339,179	4	7	20	2,713	4,749
Rome (2019)	11,416,314	4.48	14,215,150	1	2	20	28,430	56,861
<i>Residents</i>								
Frosinone (2021)	468,438	-1.24	451,227	8	12	20	7,220	10,829
Latina (2021)	565,840	-0.54	556,723	4	8	2	445	891
Rome (2021)	4,222,631	-0.96	4,102,183	1	3	2	820	2,461
Feudo Culturale								
<i>Visitors</i>								
Frosinone (2017)	435,649	0.18	441,155	5	10	6	1,323	2,647
Latina (2017)	522,736	-5.99	339,179	3	5	6	611	1,018
Rome (2019)	11,416,314	4.48	14,215,150	1.5	2.5	6	12,794	21,323
<i>Residents</i>								
Frosinone (2021)	468,438	-1.24	451,227	3	6	2	271	541
Latina (2021)	565,840	-0.54	556,723	1	2	2	111	223
Rome (2021)	4,222,631	-0.96	4,102,183	0.5	1	2	410	820

Source: ISTAT 2022, UPI Lazio 2018.

