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Inter-American Development Bank
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The Economic Benefits of Investing in Cultural Tourism: Evidence from the Colonial City of Santo Domingo

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Abstract

This paper draws together quantitative methodologies from environmental and tourism economics to develop a framework for evaluating investments in cultural tourism. Indirect and induced benefits of investment in cultural tourism contribute to the overall returns on investment and not including these considerations can result in a nontrivial undervaluation of returns. To illustrate the approach, the framework is applied to a hypothetical US$90 million investment in cultural tourism in the Colonial City of Santo Domingo in the Dominican Republic. While there is an opportunity cost of allocating resources to cultural tourism, this paper demonstrates the costs of not doing so by considering a disinvestment in cultural tourism. Results of the analysis show greater economic growth and household well-being with increased investment, with disinvestment generating significant negative consequences for economic output, employment and terms of trade.

Keywords: cultural tourism; valuation of cultural heritage; cost benefit analysis; tourism demand; contingent valuation; economy wide model; computable general equilibrium; autoregressive integrated moving average; Colonial City of Santo Domingo, Dominican Republic; UNESCO World Heritage Site.

JEL Codes: Z30 Tourism Economics; Z19 Cultural Economics: Other; C68 Computable General Equilibrium Models; O10 Economic Development; O20 Development Planning and Policy.

Highlights

- This study examines the economic impact of a US$90 million investment in cultural tourism.
- The study develops a contingent valuation and autoregressive approach to estimating tourism demand.
- The analysis shows that the investment would generate a NPV of US$29 million at a 12% discount rate.
- Disinvestment in cultural tourism has strong negative impacts, reducing GDP, income and unemployment.
- The study makes a strong case for increasing investment in cultural tourism to enhance wellbeing.

1.0 Introduction

Cultural heritage is a primary driver of tourism and is responsible for 40% of global travel. It is considered the most significant and diverse tourism phenomena of recent years (UNWTO, 2012). Cultural tourism is a tourism modality that capitalizes on cultural heritage and can generate higher than average local returns due to the higher purchasing power and spending patterns that its participants typically possess (Csapo, 2012; Zadel & Bogdan, 2013). Increasingly, cities and regions are investing in enhancing their cultural tourism opportunities to capture this large and growing market.

Decisions on investment in cultural heritage were frequently based on historical, archeological and cultural assessments and therefore were typically the domain of archaeologists, architects and urban planners (Throsby, 2012). With public resources increasingly scarce however, economic approaches, particularly within a cost-benefit analytical framework, are increasingly applied to generate advice on the allocation limited public budgets among competing priorities. Quantitative economic methods may be used ex-ante to assess the potential economic impacts of investments in preservation and enhancement of cultural heritage and the potentially catalyzing effects on private sector investments.

This paper draws together quantitative methodologies from environmental and tourism economics to comprehensively evaluate the potential benefits of investment in cultural tourism, as well as demonstrate the potential costs of not doing so. To illustrate the approach, we take a potential US$90 million investment in cultural tourism in the Colonial City of Santo Domingo in the Dominican Republic.

The Government of the Dominican Republic is pursuing the strategic directive of increasing the competitiveness of the tourism sector through diversification into new forms of cultural tourism. As such, the Ministry of Tourism has prioritized tourism development in the Colonial City of Santo Domingo (CCSD), based on its comparative advantage as: (i) a significant cultural resource as the oldest city in the Americas and the country's only UNESCO World Heritage site, since 1980; (ii) the CCSD is integrated into the existing tourist routes with neighboring Santo Domingo which is one of the three main entry and departure points for tourists; (iii) the CCSD has a critical mass of services and tourism opportunities, and; (iv) there is good connectivity between CCSD and the other traditional tourist destinations of the country (Velasco et al., 2015).

To capture the potential economy wide impacts of the tourism investment on the economy and the direct, indirect and induced benefits, a dynamic computable general equilibrium model (DCGE) was used and extended for the purposes of this study. A DCGE approach is considered the appropriate methodology for tourism impact analysis where investments are multi-sectoral and inter-sectoral linkages present (Banerjee, Cicowiez, & Cotta, 2016; Banerjee, Cicowiez, & Gachot, 2015a, 2015b; Burnett, Cutler, & Thresher, 2007; L. Dwyer, Forsyth, & Spurr, 2003; Larry Dwyer & Kim, 2003; Polo & Valle, 2008a, 2008b). To calibrate the model simulations, tourism arrival and expenditure forecasts were generated with auto-regressive integrated moving average (ARIMA) methods. These forecasts were coupled with results from a quasi-contingent valuation study undertaken to quantify current tourism expenditure and estimate potential with investment tourism expenditure. These projections and information on potential investment structuring and costs were used to calibrate the DCGE model scenarios.

This paper is structured as follows. Section 2 provides a brief overview of cultural tourism and valuation. Section 3 presents the DCGE approach. Section 4 describes the estimation of program benefits and section 5 the investment costs. Section 6 evaluates the break-even demand, considering only direct program benefits. Section 7 presents the scenario design, results and analysis, and section 8 the program cost benefit analysis. The paper concludes with final remarks on the role of cultural tourism as a diversification strategy and the risks of not doing so.

2.0. Cultural Heritage and Valuation

Intangible cultural heritage as formally defined by the UNESCO Convention for the Safeguarding of Intangible Cultural Heritage (2003) as: "the practices, representations, expressions, knowledge, skills – as well as in the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals, recognize as part of their cultural heritage."

While clearly not all aspects of cultural heritage may be estimated in dollar value terms, economics, and environmental economics specifically, offers various methodologies that capture many of the use and non-use values of cultural heritage. Use values are typically estimated based on market price or revealed preference approaches such as replacement cost or hedonic pricing, while non-use values are estimated through stated preference approaches such as contingent valuation and choice modelling (Rama, 2013). These methods have been covered extensively elsewhere in the context of environmental valuation and cost benefit analysis (Pearce, Atkinson, & Mourato, 2006), and in the context of cultural capital valuation (Nijkamp, 2013; Pagiola, 1996; Throsby, 2012, 2013).

Throsby (2012) provides a concise overview of the literature on the valuation of cultural heritage, finding that empirical work in this domain has tended to focus on estimating the impact of cultural heritage on overnight stays, employment and/or fiscal revenues. For example, Plaza (2006) estimated the economic impact of the Guggenheim Museum Bilbao using autoregressive integrated moving average methods (Plaza, 2006). Greffe (2004) estimated a functional relationship between the number of museum visitors and jobs (Greffe, 2004). A project appraisal of Zanzibar's Urban Services Project estimated the net present value of the investment using infrastructure replacement costs, and assumptions on rising property values and tourism revenue (World Bank, 2011). Laplante et al. (2005) demonstrate the application of a stated preferences approach to simultaneously capture environmental and cultural values associated with Armenia's Lake Sevan, from the perspective of Armenian diaspora (Laplante, Meisner, & Wang, 2005; Nijkamp, 2013). Finally, Nijkamp (2013) provides a literature review of hedonic pricing studies, observing an emphasis on urban cultural heritage assets.

From the literature, one may conclude that the methods developed to address problems of the environment and environmental externalities have been well suited to the field of cultural valuation where, similar with natural capital, cultural heritage is viewed as a capital asset. Many economic assessments of cultural heritage investments have covered the issue of non-use value relatively well. If not in a quantitative and/or monetary sense, then these non-monetized benefits are frequently well articulated in the discussion.

What is missing from the literature on cultural heritage valuation is consideration of the indirect and induced benefits that investment in cultural heritage generates. These second round benefits arise due to the multi-sectoral nature of tourism investments and the strong inter-sectoral linkages present in many local economies (Banerjee et al., 2015b; L. Dwyer, Forsyth, Madden, &

Spurr, 2000; L. Dwyer, Forsyth, & Spurr, 2004). The magnitude of these second round benefits are a function of the broad reach of the tourism sector in its inter-sectoral linkages.

The tourism sector is not an isolated sector; it is composed of many subsectors beyond the cultural asset including the hotel and lodging sector, the restaurant and food and beverage sector, and travel, tours and transportation to name a few. Other sectors provide intermediate inputs into these subsectors, such as the agricultural sector and the manufacturing sector. Furthermore, investments in heritage tourism, as discussed throughout Licciardi and Amirtahmasebi (2013), include investments in many components of urban infrastructure such as water and sanitation and other basic public services (Licciardi & Amirtahmasebi, 2013). Cost-benefit analyses that do not take into consideration intersectoral linkages and the second-round and induced impacts of investments in cultural heritage are likely to underestimate the impacts significantly.

3.0. Methods and Data

A CGE model is a multi-market model of an economy based on real data for a base year. The approach uses a system of mathematical equations that represent an economy incorporating its various institutional and structural characteristics. CGE models have been used for decades to analyze the sectoral and distributional effects of external shocks and macro policies, such as fiscal, trade, investment and environmental policies. Increasingly, these models are used to estimate the impacts of tourism policies and investments.

Most equations are derived from rigorous microeconomic foundations specifying how agents adjust the quantities supplied and demanded in each market in response to price changes. There are also macroeconomic equations ensuring that the behaviors of economic agents are consistent

with macroeconomic constraints. The resulting model is then used as a laboratory to conduct simulations of shocks and policies to explore their respective impacts. CGE models in fact have long been considered the 'workhorse' of policy analysis (Jones, 1965)

The DCGE model used in this analysis is based on the well tested and documented PEP 1-t by Decaluwé et al. (2013)[1]. This DCGE model captures impacts on production, consumption, factor markets and prices in an economy in which producers adopt a cost minimization approach and consumers a welfare maximizing behavior. Normally, in this type of model, market prices adjust in order to reconcile endogenous supply and demand decisions, thus determining levels of production, employment and consumption. This model has been customized to capture a number of structural features of the particular economy under analysis, such as the initial production structure, market segmentation and price rigidities (Decaluwé, Lemelin, Robichaud, & Maisonnave, 2013). For additional detail on the DCGE model developed for this study, Decaluwé et al. (2013) provides an overview of its main features.

The core database of the DCGE is the SAM. The SAM for the DR was constructed based on Supply and Use Tables (SUT) and the Integrated Economic Accounts (IEA). The SAM has a base year of 2010, which is the most recent year for which comprehensive economic accounts were available. The SAM and DCGE model developed in this paper is the most recent for the country, taking the place of the SAM and model developed in Díaz-Bonilla et al. (2007) which has a base year of 2004 (Diaz-Bonilla, Lofgren, & Cicowiez, 2007).

[1] The basic PEP-1-t model and documentation is available here: https://www.pep-net.org/pep-1-t-single-country-recursive-dynamic-version

4.0. Estimated Program Benefits

This section summarizes the approach implemented to project tourist arrivals and demand with and without the hypothetical ITDP investment program. This estimation of benefits is a critical input into the DCGE model simulations.

4.1. Baseline Projections of CCSD Visitors and Expenditure

In 2011, the consulting firm EPYPSA conducted 1,420 surveys of international tourists at the International Airport of Las Americas (819 interviews) and Punta Cana International Airport (593 interviews). The surveys were conducted upon the tourists' departure from the country and were applied to: tourists who visited the CCSD for their perceptions of the CCSD, and; tourists who did not visit the CCSD to understand the factors that influenced their decision not to visit.

EPYPSA estimated that in 2010, 14.8% of those interviewed visited the CCSD and 13.9% of them stayed overnight. In terms of duration of the visit, 46.8% stayed one day, 20.7% visited for half a day, 14.8% stayed two days, 9.5% stayed three days and 8.3% stayed for more than three days (EPYPSA, 2011). To estimate the number of visitors to the CCSD in the base year of the model, the percentage of those that visited the CCSD (14.8%) was applied to the time series of arrivals to the DR (Banco Central de la Republica Dominicana, 2015).

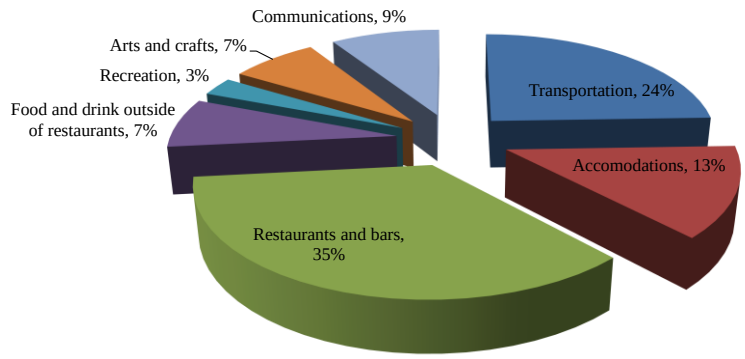
Based on EPYPSA data, it was estimated that the average expenditure per person per day for the tourists who visited and stayed overnight in the CCSD was US$141.02 and US$65.01 for those who did not stay overnight. For those who did stay overnight, the distribution of their spending was 46% hotels, restaurants 21.8%, 13.5% entertainment, shopping 11.3%, 7.0% rental cars, tours 2.3%, and 1.7% other. In 2010, total tourist spending in the CCSD was estimated at US$91,033,776 (EPYPSA, 2011). This value represents 2.16% of total tourist expenditure in the

country in 2010 which was approximately US$4,209,100,00[2]. This amount of tourist expenditure was estimated based on the total expenditure in hotels, bars and restaurants in 2010 (Central Bank of the Dominican Republic, 2015). To estimate tourist expenditure in the CCSD, the proportion of total tourist expenditure spent in the CCSD (2.16%) was applied to the historical series of tourist expenditure.

Between April 17 and May 2, 2015, a new round of tourist exit surveys was conducted. A total of 916 tourists were surveyed at the airports of Las Americas (33.5%), Punta Cana (40.8%) and the airport of Puerto Plata (25.7%). Of these 916 tourists, 10.3% said they had visited the CCSD, of which 55.3% stayed overnight in Santo Domingo and 11.3% spent the night in the CCSD. Thirty-three percent stayed one night, 33.3% two nights and 33.3% stayed 7 nights. Of those who visited the CCSD, 14.9% stayed half a day in the CCSD, 55.3% stayed 1 day, 19.1% stayed 2 days, and 2.1% stayed 3 days. In terms of current expenditure, the average total expenditure per person was estimated at US$143.67. The distribution of tourist expenditure across expenditure categories is presented in Figure 1.

[2] Considering that 14.8% of those interviewed visited the CCSD and that only 2.16% of total tourist expenditure occurs in the CCSD reflects the fact that only 13.9% of the 14.8% of total visitors to the DR CCSD. Further, the majority of those that did overnight in the CCSD stayed only one night. The DR's sun and sand destinations currently capture the largest proportion of visitors; tourists also tend to stay more nights and consequently, spend more overall in these destinations. It was precisely the combination of these factors that motivated the Government of the Dominican Republic to diversify its tourism product supply and invest in the CCSD.

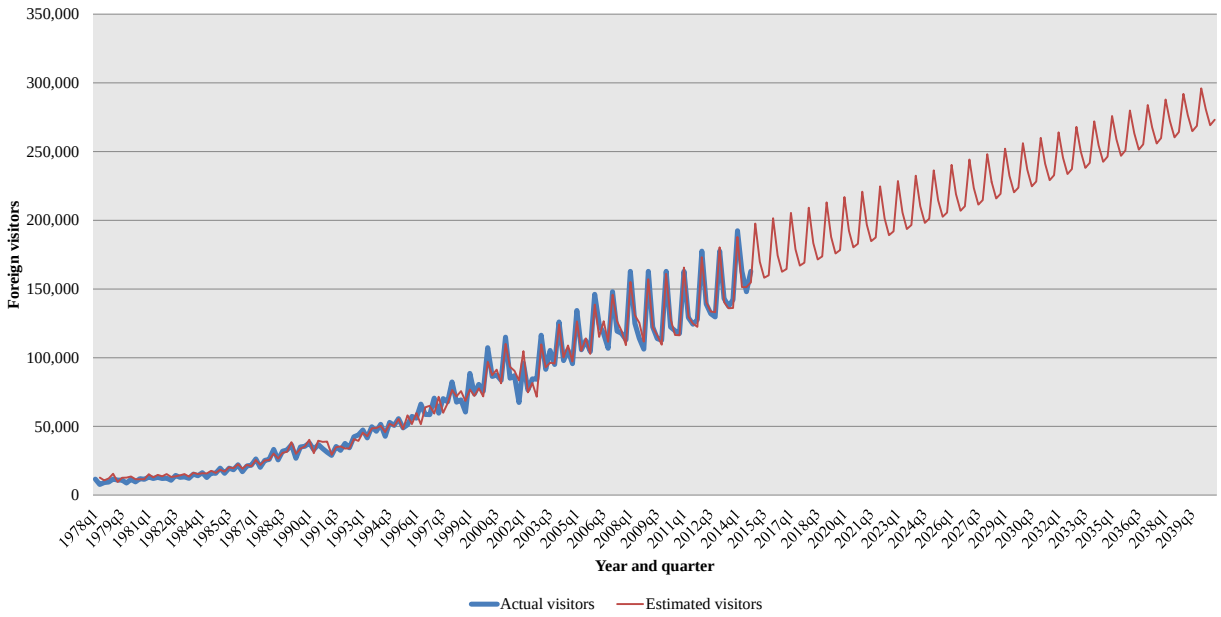
Figure 1. Distribution of tourist expenditure in the CCSD.



Source: Authors' own elaboration; calculations based on 2015 tourist exit survey data.

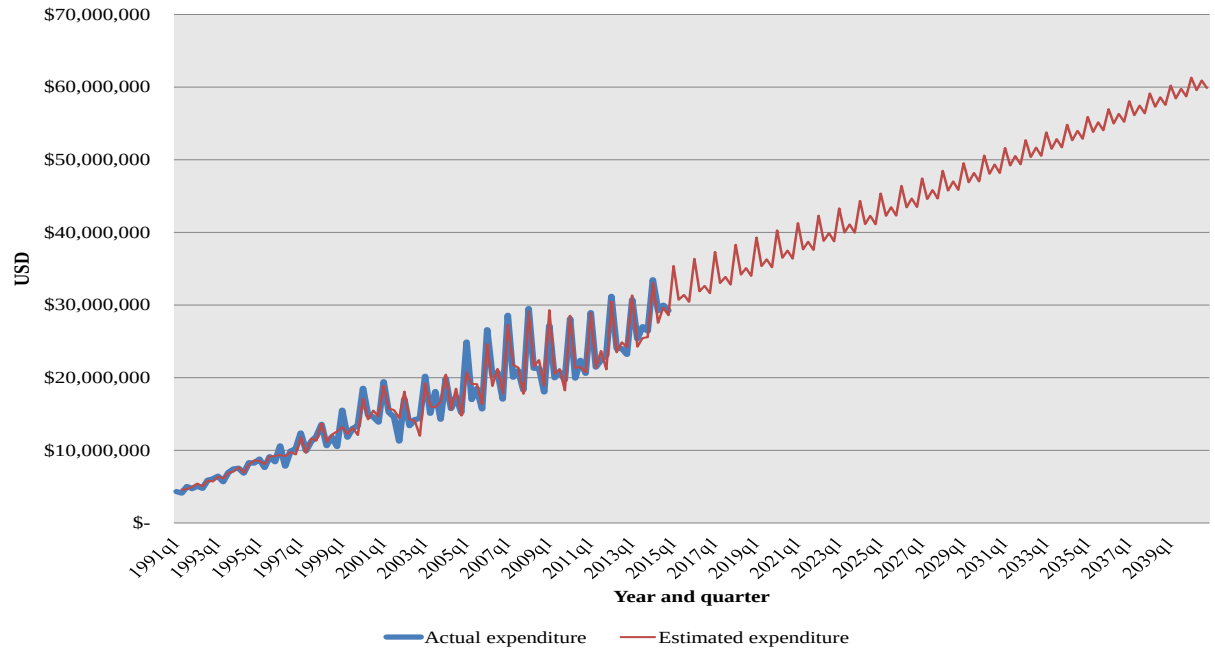
To simulate the current and projected demand, following Banerjee et al (2016), an auto-regressive integrated moving average model (ARIMA) was estimated to predict and forecast arrivals of foreign non-resident visitors and tourism expenditure at the national and CCSD level. Figure 2 shows the current and predicted number of visitors by quarter, while Figure 3 presents the current and predicted tourist expenditure by quarter. The proximity of the blue line (actual visitors/expenditure) to the red line (predicted visitors/expenditure) in the historical series indicates that the model is well calibrated to the data.

Figure 2. Non-resident foreign visitors to the CCSD, actual and estimated.



Source: Authors' own elaboration.

Figure 3. Non-resident foreign visitor expenditure in the CCSD, actual and estimated.



Source: Authors' own elaboration.

4.2. With Program Projections of CCSD Visitors and Expenditure

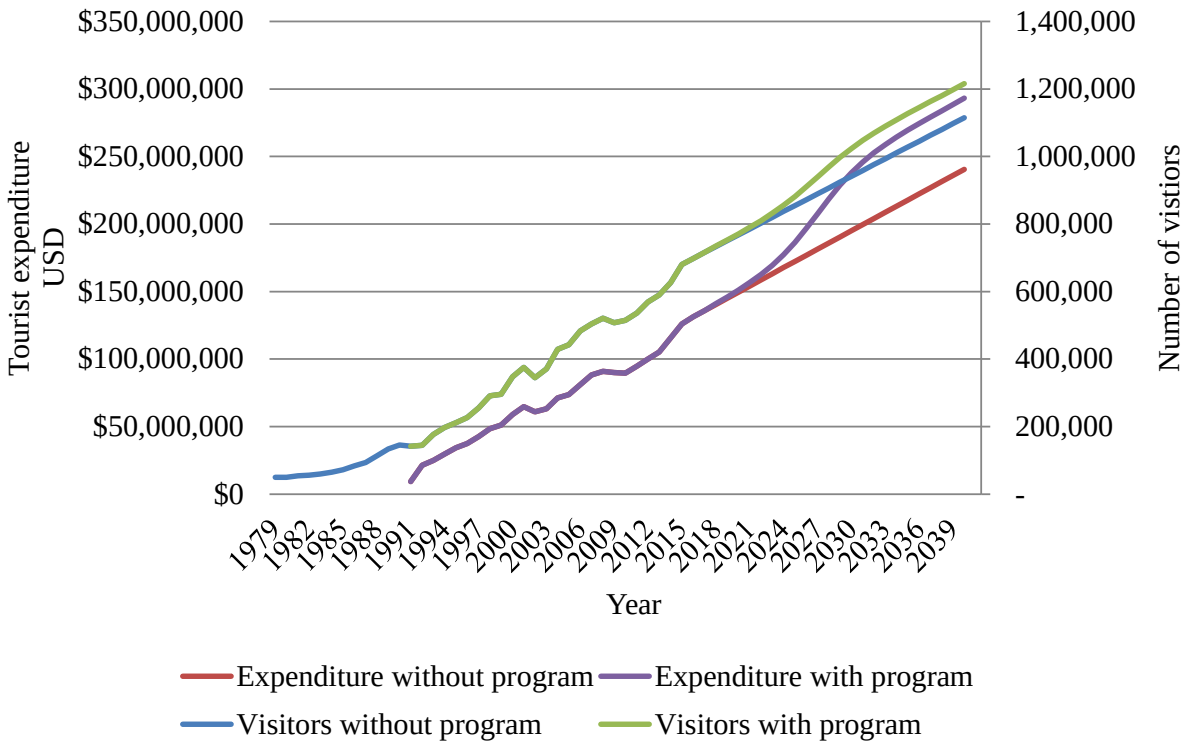
The 2015 tourist exit surveys form the basis of the with program demand estimation. In the exit surveys, respondents were asked about their current expenses in the CCSD. The average expenditure was US$144.26 per person with an average length of stay of 1.68 days. Respondents were then presented with a scenario where they had to choose options of improvements to the CCSD and a series of activities and sightseeing opportunities that would be available with the ITDP investments. Based on this scenario, tourists were then asked if the improvements were implemented, if they would be willing to return to the CCSD, for how long and how much would they would be willing to spend in addition to what they spent on the current visit. To this question, 91.5% responded in the affirmative; 18.1% would stay for 1 night, 21.7% for 2 nights, 16.9% for 3 nights, 15.7% for 4 nights, and 27.7% said they would stay for 5 nights or more. On average, those that responded positively would stay an additional 2 nights and spend on average US$215.09 per day.

Among the respondents who did not visit the CCSD, the main explanation was not having sufficient time. Respondents were then asked if on a future trip, they would be interested in visiting the CCSD; almost 80% said yes, 72% of which responded that the motivation would be related to an interest exploring the cultural heritage of the CCSD. Thirty-five percent of those who had not visited the CCSD, had visited the City on a previous trip. This figure (35%) is used in this analysis to represent the visitor return rate. These tourists were then presented with a scenario where they had to choose from a series of activities and tourism opportunities that they would be interested in participating in, and which would be made available with ITDP. Based on this scenario, tourists were asked if the activities and tourism opportunities were available, if they would be willing to visit the CCSD on a future visit, for how many days, and how much

they would be willing to spend. Results of this analysis, revealed an average daily expenditure of US$85 per day and an average length of stay of 2.19 days, resulting in a total expenditure per individual of US$185.11.

Based on these estimates of willingness to pay and the number of potential future visitors, it was estimated that the number of visitors with program and total expenditure would be 14.7% and 41.7% higher, respectively, with ITDP compared to the without program baseline. It is assumed that the increase in arrivals and expenditure begins in 2018 and ends in 2040, and that, in the absence of other data, the additional expenditure is distributed according to a logistical function. Figure 4 shows the projections of visitors and spending with and without program.

Figure 4. Projections of tourism expenditure and visitors to the CCSD with and without program.



Source: Authors' own elaboration.

5.0. Program Costs

A number of assumptions were made in the establishing the value of the investment and how it would be structured. The investment amount is fixed at US$90 million, 70% of which would be allocated to infrastructure (equal to US$63 million), with the remaining 30% allocated to tourism subsectors. The first disbursement is modelled to begin in 2017 and be completed in 2022. This investment is distributed 14.3% in the first year, 24.5% the second year, 28.2% in the third year, 15.2% in the fourth year, 13.5% in the fifth year and 4.3% in the last year. It was estimated that the cost of operation and maintenance of infrastructure would be 5% of the value of the investment in infrastructure, starting in the first year of the investment and continuing on to the end of the period of analysis in 2040.

6.0. Scenario Design, Results and Analysis

6.1. Scenario design

This section presents the simulations, results and analysis. The following main scenarios were implemented: (i) the baseline scenario, which is the scenario without investment in cultural tourism through ITDP; (ii) the with ITDP scenario which is comprised of investment in cultural tourism infrastructure and management, and a concomitant increase in tourist expenditure, and; (iii) a "non-investment" scenario in the tourism sector, where the government does not invest in ITDP and reduces expenditure on cultural tourism. These three scenarios are described in detail in turn:

Baseline scenario: this first simulation assumes that the DR economy grows at the GDP growth rate forecasted by International Monetary Fund forecasts for the period of analysis (IMF, 2015). In DCGE modelling, scenarios are compared with the baseline or reference scenario, most often

in terms of a percent deviation from baseline. In other words, the GDP for instance, in a given simulation for a given year will be compared to the GDP for the same year in the baseline scenario in terms of percent deviation from the baseline.

COMBI scenario: this simulation imposes increased investment in cultural tourism infrastructure and management through ITDP. The annual additional investment was structured as described in section 5. Together with the investment program, tourism expenditure responds positively as forecast in section 4. The distribution of additional tourist expenditure across commodity types is presented in Figure 1. The tourism expenditure shock is introduced in the model as a quantity shock to the export demand function.

Assuming ITDP were financed by a reimbursable international source, for modelling purposes, this would be represented by a transfer from the rest of the world account in the SAM to two sectors of the economy. Seventy percent of the loan is directed to the construction and infrastructure sector, and the remaining 30% is allocated to the tourism sector, which is composed of hotel accommodations, restaurants and bars. This is a labor-intensive sector, and represents 7.7% of the GDP in 2010[3]. This volume of investment in the two sectors is additional to the investment made in an average year.

NO-INV scenario: The third scenario presents a situation where no government investment at all is made in cultural tourism. After a couple of years of a non-intervention in the sector, tourists would decrease their spending, and visitation may also suffer. In this scenario, there are two main impacts: (i) first, there is a decrease in the stock of capital in the tourism sector which is modelled by an increase in the rate of capital depreciation, and after a couple of years, a decrease

[3] Computation derived from the National Accounts, 2010.

in tourist demand for some goods and services. After a few years of disinvestment, it is reasonable to assume that tourists would be less inclined to visit the destination as some of the country's tourism infrastructure is not renewed or improved. In terms of magnitude, the capital depreciation rate slowly increases through the period, from 4% per year in 2016 to 5.6% by 2040. Tourists' expenditure is expected to begin to decrease by 1.5% in 2020, which continues on until 2040.

6.2. Aggregate results

This section presents the results and analysis of the scenarios explained above. The years 2022, 2030 and 2040 were selected for illustrative purposes; the year 2022 corresponds to the last year of the investment program. Table 1 shows the impact of the simulations on macro-indicators as percent deviations from the baseline.

Table1. Impact on macro-variables (% deviation from baseline).

	COMBI			NO-INV		
	2022	2030	2040	2022	2030	2040
Absorption	0.04	0.03	0.00	-0.95	-1.16	-1.26
GDP at market prices	0.03	0.02	0.00	-0.97	-1.10	-1.16
Private consumption	0.01	0.01	0.01	-0.27	-0.39	-0.48
Total investment	0.05	0.04	0.00	-1.39	-1.62	-1.73
Real exchange rate	-0.02	-0.01	0.02	0.90	0.90	0.85
Wage average	0.03	0.01	-0.01	-0.72	-0.68	-0.61
Unemployment rate	-0.01	-0.04	-0.02	0.75	0.49	0.37

Source: Authors' own elaboration.

Results from the COMBI scenario are positive. This scenario combines a gradual increase in investment in the construction/infrastructure sector and the tourism sector, and an increase in tourist expenditure. The investment program spans six years (2017 to 2022), while the increase in tourism demand covers the full period of analysis up to 2040. This scenario represents a combined positive shock: on the one hand, the construction and tourism sectors will directly

benefit from the increase in investments, their capital stock will increase and they will hire more workers in order to produce more. On the other hand, the increase in tourist expenditure will stimulate the activities producing the main goods and services tourists purchase. For these activities as well, there will be an increase in production, they will attract more investment and workers, and there will be a positive impact on the rest of the economy through intersectoral links.

These interactions are expressed at the macro-level with GDP increasing throughout the period, by 0.02% in 2030. Given both positive demand shocks, economic sectors are hiring more workers to meet increasing demand which leads reduces the unemployment rate by -0.04% by 2030, and an increase in private wage rate, with producers having to increase the wages they offer in order to attract new workers. The increased wages remain higher than the baseline level in the long run. Conservative calculations based on labor force participation rates show that the program would be directly responsible for creating 1,136 jobs. The household consumption budget also increases which translates into greater demand for some commodities and, ceteris paribus, a positive impact on the economic sectors that produce those commodities.

Private investment is also stimulated by ITDP. Economic sectors produce more in response to the increase in the demand and the investment program; private savings also increase, which translates into an increase in the budget available for private investment. Some sectors will benefit from this increase in private investment, most notably the construction sector.

The third scenario, where there is a disinvestment in cultural tourism (NO-INV), the direction of impacts is opposite to that of the COMBI scenario. The starting point of analysis here is the slow decline in tourism sector capital stock. At the beginning of the period of analysis, this sector and

those directly related to it suffer. Then, after a couple of years, as tourist expenditure begins to grow less quickly, impacts begin to be felt at the sectoral level. These impacts permeate the economy and eventually, workers are laid off and the unemployment rate increases 0.75% by 2022. This increase in unemployment has a negative impact on household wages (-0.72% in 2022), and as a consequence, real household consumption also falls by -0.27% in 2022. Overall, at the end of the period, total investment drops markedly by-1.73% and GDP falls -1.16% below the baseline in 2040.

6.3. Sectoral results

At the sectoral level, for the COMBI scenario, all sectors benefit from the investment program, especially the tourism and the construction sectors (0.03% and 0.04% in 2040, respectively). All other sectors benefit from indirect effects of the investment. For instance, the investment program leads to an increase in wages which leads to an increase in household real consumption. Activities producing food commodities and other mainstays of household consumption then benefit indirectly from the investment program.

In the case of the disinvestment in cultural tourism (NO-INV), the tourism sector suffers significantly. By 2040, tourism sector output decreases by 7.5%. Most other sectors see a fall in output due to the intersectoral linkages with the tourism sector, as well as the decrease in tourist expenditure on some commodities.

With regard to exports in the COMBI scenario, exports increase given the increase in production and tourist expenditure. Exports in telecommunications, transport and tourism among others increase throughout the period of analysis. Given this increase in exports and the model closure rule chosen with the current account balance fixed in proportion to GDP, imports of most

commodities also grow faster. In the NO-INV disinvestment scenario, tourism sector exports decline strongly by -9.18%. With less foreign exchange generated through exports, imports also fall as the government moves away from cultural tourism.

7.0. Cost-Benefit Analysis

The results of the COMBI scenario represent the direct and indirect economic impacts of an increase in investment in tourism infrastructure combined with an increase in inbound tourism. Thus, given that the project cost is part of the simulations, the cost-benefit analysis can be conducted by simply analyzing the DCGE results for the indicator of interest which is GDP in this case. In other words, the simulated direct and indirect impacts using the DCGE model provide the benefit and cost estimates for this calculation. Notice, however, that conventional cost-benefit accounting does not capture all of the indirect benefits highlighted by simulations using economy-wide models. Analytically:

$$NPV = \sum_{t=0}^{23} \frac{Y_t - Y_t^0}{(1+r)^t}$$

where

NPV = net present value

$t = 0$ is 2017

$t = 23$ is 2040

Y_t = value of GDP in year t

Y_t^0 = value of GDP in year t in reference scenario

r = discount rate (12%)

Results of the analysis show that the investment and resulting increase in tourism demand results in a NPV of over US$29 million.

8.0. Concluding Remarks

This paper assessed the economic returns to investment in cultural tourism. To contrast the expected economic and social benefits such an investment was estimated to generate, a disinvestment in cultural tourism was also simulated. To capture the direct, indirect and induced benefits, a DCGE model was calibrated to a new SAM for 2010. ARIMA methods were used to generate without program demand forecasts; with program demand forecasts were estimated through a quasi-contingent valuation approach and ARIMA model forecasts. These projections and information on investment structuring and costs were used to calibrate the DCGE model scenarios.

It was estimated that investment in cultural tourism in the CCSD would lead to an additional US$51,626,278 in tourism expenditure by 2040. The investment and tourism demand scenario (COMBI), show positive impacts on GDP, unemployment, private investment and household consumption (0.02%, -0.04%, 0.04% and 0.01%, by 2030 respectively). The cost-benefit analysis of the investment in cultural tourism results in an NPV of US$29,798,077. This paper has drawn together quantitative methodologies from environmental and tourism economics to develop a framework for evaluating investments in cultural tourism. The approach enables quantification of the indirect and induced benefits that investment in cultural heritage generate, which is a gap in the literature on cultural tourism valuation. Applying this framework to

investment in the CCSD, this analysis has demonstrated the value of investing in cultural tourism and the importance of indirect and induced benefits in contributing returns on investment.

In addition, the consequences of a disinvestment in cultural tourism and declining maintenance of existing cultural tourism infrastructure were explored. This contrast highlights the fact that while there is an opportunity cost of allocating resources toward investment in cultural tourism, the short and medium-run cost of not doing so is substantial. This comparative analysis lends support to maintaining investment in cultural tourism and provides a solid business case for increasing investment as an approach to diversifying the tourism experience that is offered by a destination.

The development of the SAM and DCGE model developed in this paper was possible and due to the DR's strong national accounts data. The analysis presented here could be strengthened if disaggregated data at the provincial level were available. With the most recent household income and expenditure data dating back to 2006/2007, updated income and expenditure data would enable poverty analysis at the household level through a linked DCGE-microsimulation approach.

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Annex 1 – Economic Structure of the Dominican Republic

The major contributions to value-added are from (Manufacturing) (12%) and Other Services (36%). Transport and trade are also important (9% and 11%, respectively) and are linked to the sector tourism (8%). The most labor-intensive sectors are the aggregate agricultural and mining sectors, and the transportation and trade sectors, while the most capital-intensive sectors are the aggregate sectors Food processing industries, and Other industries. The share of labor in value added for the tourism sector is59%. Table A-1: Sectoral, labor and capital share of value added.

Table A-1: Sectoral, labor and capital share of value added.

	Share of sectoral value added in total value added	Share of Labor of VA	Share of Capital of VA
Agriculture and mining	7	82	18
Food processing	5	30	70
Other industries	12	36	64
Construction	11	57	43
Trade	11	71	29
Transportation	9	86	14
Tourism	8	59	41
Services	36	55	45

Source: Authors' own elaboration; computations from the SAM.