

**FACTORS ASSOCIATED TO ART MUSEUM VISITATION:
The Inhotim Case**

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ABSTRACT

Cultural assets present features of public or semi-public goods, which makes it difficult to determine their pricing, as well as how much people are willing to spend to enjoy them. Yet, such assets value culture and the territory wherein they are located. A technique to build information on consumer's hypothetical behavior is the Contingent Behavior Method: in this paper, art museum visitors are interviewed and their answers are conducive to evaluating factors associated to Museum Visitation and to what extent changes in pricing and in visitor's income affect the demand for such cultural assets. The main findings of our survey include the observation that museum demand is inelastic to price but not to income; furthermore, consumption habit proved to be statistically significant and positive.

O fato de bens culturais apresentarem características de bens públicos ou semi-públicos dificulta a determinação do preço que as pessoas estão dispostas a pagar para sua fruição. Entretanto, tais bens cumprem papel de valorização da cultura assim como do território onde se situam. Uma técnica para obter informações sobre o comportamento hipotético do consumidor é o Método de Comportamento Contingente. Utilizado em uma entrevista com visitantes de um museu de arte, as respostas dos entrevistados permitiram avaliar os fatores associados à visitação do museu e o quanto alterações de preço e renda afetam a demanda por tais bens. Entre os principais resultados, observou-se que a demanda pelo museu é inelástica ao preço e elástica à renda, além disso, o indicador de hábito de consumo se mostrou estatisticamente significativo e positivo.

Keywords: *Museum, Demand curve, Contingent behavior method, Elasticity.*

1 – INTRODUCTION

Cultural goods (art centers, theaters, museums and others) are hard to evaluate, as they show characteristics of public or semi-public goods, meaning that they are non-excludable and non-rival assets which people visit usually free of any charge whatsoever (Cuccia, 2011). In general, these services are offered on account of the intrinsic cultural value they express. This value can be grasped by individuals in different ways: firstly, the utility of preserving the good itself and the possibility of it being visited now and in the future; secondly, there is the value derived from knowing that a specific cultural service or good exists, even if the individual has no intention of ever visiting it; also, a patrimonial value symbolizing identity or regional / national pride; and last but not least, one's knowledge that future generations will too enjoy such cultural goods or services (Bille and Schulze, 2008).

Government is generally responsible for investing in and maintaining cultural goods. In order to avoid a zero-price policy, managers of cultural goods or services charge admission, often subsidized. Some visitors to cultural attractions are tourists who contribute very little to cover costs, yet enjoy the benefits of historic and artistic preservation. It is also known that the market is not able to capture the externalities derived from cultural asset consumption (Bille and Schulze, 2008). Charging for a visit or service is a way to obtain value from this type of good. Fees / revenue can also be used to manage the number of visitors through price discrimination - something used by entertainment businesses, such as theme parks and movie-houses.

Studies on demand for cultural goods usually emphasize economic variables (e.g., price of the good, of substitute and complementary goods, consumer's income), in order to obtain demand elasticity. However, individual

preferences and other qualitative variables - such as cultural habit formation - are also important to determine demand for these goods (Seaman, 2006). This paper seeks to estimate factors associated to museum visitation as well as how much visitors to an art museum are willing to pay in order to enjoy this cultural good. It also aims at determining changes in the number of visits whenever admission price and visitor income vary.

Towards these ends, our case study contemplated Inhotim, a private contemporary art museum in Brumadinho, in the Brazilian Southeastern state of Minas Gerais. Our procedure can serve as management practice for cultural institutions - both private and public alike - as it allows a pricing policy to be developed as an ancillary financial management tool. This paper's text is thus structured: its second section briefly describes the Museum; section three lays out the activities developed to carry out interviews with a sample of museum visitors; an econometric analysis and the outputs obtained are found in section four; and the text ends with some concluding remarks.

2 – THE MUSEUM

INHOTIM is a contemporary art museum and botanical garden complex. It houses both (museum and botanical garden) in roughly 100 hectares, in the city of Brumadinho, in Brazil's Southeastern state of Minas Gerais, some 60 kilometers (38 miles) from Belo Horizonte, the state capital. Belo's greater metropolitan region is home to over five million residents, while Brumadinho's population is currently around 34,000 inhabitants.

The Museum has over 500 works of art along outdoor trails, inside galleries and in open-air exhibits. The Botanical Garden's collection surpasses 4,000 species, especially palm-trees and native species typical of two genuinely Brazilian biomasses, namely, *Mata Atlântica* (remnants of the lush forests that long ago hugged the country's entire Atlantic seacoast) and the savannah-like *Cerrado* lands. The museum's collection displays major art works dating back from the 1960s to today, smoothly and tastefully merging the main currents of national and international contemporary art.

Created in 2002, the Inhotim Museum is dedicated to preserving, exhibiting and producing contemporary art works. Its original trailblazing pioneers (7,000 visitors in 2006) grew to 147,000 in 2009, 169,000 in 2010 and a whooping quarter of a million current annual visitors. The museum offers temporary and permanent exhibits, a wide-range of restaurants and cafeterias, commercial shops and stores, outdoor trails as well as rest and relaxation spots for visitors.

Inhotim is managed by a public-interest civil organization, under Brazil's legislation. One of its paramount goals is revenue increase, given the museum's mounting operational and maintenance costs. Revenue sources are the box office income, museum-provided services (food, souvenirs, transportation), fiscal tax-break incentives to corporations funding museum projects, volunteer contributions from companies and individuals (a.k.a. "museum friends") as well as contributions from its founder and board chairman.

Specifically as regards box-office (admission tickets) revenue, at the time of the survey the price ranged from US\$8.0 to US\$8.5¹ for adults to half this amount for youngsters (kids and teenagers) and senior citizens aged over 60. Museum guests enjoyed free-of-charge courtesy admission. This was the pricing policy at the time of the research. Expenses were the upkeep and maintenance of the entire art collection, of buildings and galleries, landscaping and gardens, plus the museum employees' payroll (wages and salaries, law-mandated benefits etc.). Hence, knowing the demand and defining a visitor-based pricing policy becomes a major sine-qua-non tool for sound museum management.

3 – VALUATION METHODOLOGIES

The literature is rich² on techniques to value non-market-traded assets. This includes environmental and cultural goods and services. For our purposes in this paper, three of them will be commented on, namely, the travel cost technique, contingent valuation, and contingent behavior.

Travel Cost is one of the techniques that use substitute market methods. It was developed to value entertainment sites (e.g., parks, ponds / lagoons), seeking to measure family spending to access such locations from the family's residence. The postulated hypothesis is that transport expenses, site admission cost and the visitors' cost of

¹ Research carried out in December 2009 and January 2010. In this timeframe, the December 2009 price (US\$8.0 or R\$15,00 Brazilian Reais) rose to US\$8.5 or R\$16,00 Brazilian Reais in January 2010.

² Vide Mitchell and Carson, 1989; Hausman 1993; Freeman III 1994; Faria, 1995; Saz et al. 2000; Motta 2006; Mueller 2007; Carson, 2011.

opportunity represent their willingness to pay for the pleasure of enjoying a certain location (Mueller, 2007). This technique has some constraints, such as preferably using similar hypothesis for visitors coming from different origins (living near or far from the site to be visited). To overcome this constraint, scholars recommend excluding non-resident visitors (tourists) from the analysis (Chase et al, 1998).

Contingent valuation is a methodology used to appraise environmental and cultural goods (Cuccia, 2011; Sanz e Herrero, 2006; Saz, 2000). Its goal is to value goods not traded in markets. Field research is used, as people are directly asked about their willingness to pay for environmental improvement / enhancement, for historic preservation or for implementation of various services (Hausman, 1993; Mitchell and Carson, 1989). The paramount objective of this technique is to estimate maximum pay for a good or service, including its use and non-use (for instance, the value of a certain good just existing). Albeit widely used, this method has the constraint of being hard to obtain the necessary data to estimate a system of demand equations, incorporating cross-price elasticity, thus making it impossible to draw up any effective price-differentiation policies (Chase et al, 1998).

The contingent behavior policy uses a stated-preference approach. A random-utility model is estimated as a direct assessment of changes in visitor demand, in response to different fees or prices charged for services. This technique was used by Chase et al. (1998) to estimate demand for ecotourism in Costa Rica parks and also by Alberini et al. (2005) to calculate the value of practicing sports in the famed Venice Lagoon. This method is deemed to be the most adequate for our objective herein, that is, to determine how much museum visitors would be willing to pay to enjoy / benefit from this cultural asset, including price and income elasticity estimates.

In the use of the Contingent Behavior technique, real and hypothetical prices are used, to know the visitation frequency to a certain good or access to a given service. Hypothetical prices, which are also applied to contingent valuation techniques, can influence the answers of visitors interviewed, given his / her credibility regarding the values (amounts) asked and confidence in the answers (Saz et al, 2000; Faria, 1995; Diamond and Hausman, 1994; Mitchell and Carson, 1989).

To avoid biased answers by the visitors, specifically regarding hypothetical prices³, the interview process must be planned with the utmost care, including question formulation, choice of values (\$ amounts) to be inquired, researcher training, answer monitoring, and the like.

Information on visitors (admission priced paid to access the museum, visitation frequency, monthly income, educational level, habit of participating in cultural events, motivation to travel and other socio-economic variables) was obtained in a survey of 393⁴ museum visitors, between October 2009 (pilot research) and January 2010 (final research). During that timeframe, the museum was open to the public from Thursdays through Sundays, most visits taking place on Sundays and holidays. A decision was made to survey visitors on Fridays (representative of week days) and on Saturdays and Sundays (the weekend).

Sampling was the survey technique used: a structured standard questionnaire was applied to a representative sample of the population. Information was collected on the admission price paid, number of visits in one year, in view of the price paid. Visitors were then asked: "If the admission charge increased to US xx, how would this change your decision to visit the museum? How many annual visits would you make?" This way, the visitor was asked about his / her visit frequency based on two prices, namely, one *actually paid* and a *hypothetical price*.

Five hypothetical prices were used (vide Table herein below). Each visitor was asked about only one randomly-chosen⁵ hypothetical admission price and visitation frequency, in view of this hypothetical admission price.

³ Whenever hypothetical prices are used, bias must be avoided, such as a tendency to favor good causes, as long as I do not have to contribute financially to them (the so-called warm glow bias); incapacity to differentiate between different projects, in terms of cost-benefit (embedding effect); and in order to avoid the so-called zero protests.

⁴ Sampling is based on a simple random sampling technique, using proportion, as no information was available for the universe of interest. A maximum 5% error was admitted in estimating a p proportion, with 95% confidence. Sample representativeness was ascertained estimating the variation coefficient vis-à-vis visitor's income. It resulted in a 0.0455 variation coefficient (that is 4.55%), ensuring a statistically representative sample as regards visitors' income.

⁵ Each form had one hypothetical price only. Forms were given to the surveyors who asked questions based on the hypothetical price in the survey form.

Hypothetical prices were based on admission charged by cultural institutions and theme parks in Brazil, always using amounts above those practiced in Inhotim. No values below those actually paid were presented, as people knew the admission price charged by the institution, and to suggest lower prices could trigger strategic behavior by those interviewed.

Table 1-Number of interviews per hypothetical price

Price (US\$)	Number of interviews	Percent (%)
10.7	74	19%
13.3	80	20%
16.0	81	21%
24.0	79	20%
32.0	79	20%

Source: Data Survey, 2010

4 – DESCRIPTIVE ANALYSIS OF VARIABLES USED AND MODEL OUTPUTS

This section presents a descriptive statistics of data, emphasizing selected variables, among them visitation frequency in view of the price actually paid and the hypothetical price. As per Sanz et al. (2006) and Bedate et al. (2009), cultural consumption markers are included and a Habit Index is constructed, measured by the frequency of cultural activities, created through PCA – Principal Components Analysis. Lastly, Counting Data Models and Ordinary Least Squares (OLS) were estimated. PCA’s goal was to identify factors associated to visitation frequency and Counting Data Models to infer a demand curve. OLS estimated the museum’s demand elasticity.

4.1 – Database description

Visitors interviewed are profiled in Table 2 below. In a total of 393 interviewed, 57% were women, 61% claimed to be ethnically Caucasian, average age 35 years old, 59% had concluded at least their Bachelor’s (only 7.9% of Brazilians hold a College degree), 57% declared themselves Catholics, 72% lived in the Belo Horizonte Metropolitan Area and 78% travelled in their own vehicles.

Furthermore, their average monthly personal income was US\$ 2,055 (while US\$ 806 is the average in Brazil’s Southeast as a whole - the most developed of its five regions). Average personal income of Friday visitors trumped that of weekenders. On average, museum visitors spent US\$ 40. A visit to the museum was the main motivation for 80% of all travelers, including groups and tourists / sightseers who came exclusively to know the museum. Given their above-par schooling and income levels, it is fair to infer that this visitor sample is a bona-fide membership of Brazil’s upper demographic strata.

Table 2 – Sample Descriptive Statistics

Interviews characteristics	Statistics
Women	57%
Caucasian	61%
Average age	35
Education (Bachelor’s degree and beyond)	59%
Catholics	57%
Average personal income	US\$2,055.69
Stand. dev. personal income	US\$1,937.37
Residents from Belo Horizonte Region	72%
<u>Average visit cost</u>	US\$40.00
Stand. dev. visit cost	US\$57.07
Inhotim as travel purpose	80%
Own vehicle	78%

Source: Survey Data, 2010

In the interviews, some 380 visitors in the sample (97% of those interviewed) commented on the admission charged. Its prices ranged from free-of-charge admission (zero-price) to lower admission for students (US\$4.0 to US\$4.3) to general admission (US\$8.0 to US\$8.5).⁶ Table 3 below shows that 38.7% paid US\$8.5, and approximately 4% enjoyed a free-of-charge courtesy admission.

Table 3 – Number of visitors by fee paid.

Price paid by visitor (US\$)	Number of people	Percent (%)
0	15	3.95
3.7	27	7.11
4.0	23	6.05
4.3	77	20.26
5.3	1	0.26
7.5	1	0.26
8.0	87	22.89
8.5	147	38.68
9.1	1	0.26
10.7	1	0.26
Total	380	100

Source: Survey Data, 2010

Table 4 informs on museum visitation frequency (measured by the average number of visits) vis-a-vis the admission price paid. Out of 380 visitors interviewed (vide Table 2 herein), 147 paid US\$8.5. At this price, visitors would be willing to visit the museum six times a year, on average. Among those who paid less than US\$8.5, annual visits would average 7.26, while those who paid more would, on average, come visiting 3.5 times a year. The price-quantity ratio shows, on average, a negative demand function.

Table 4 - Willingness to visit / Price paid comparison.

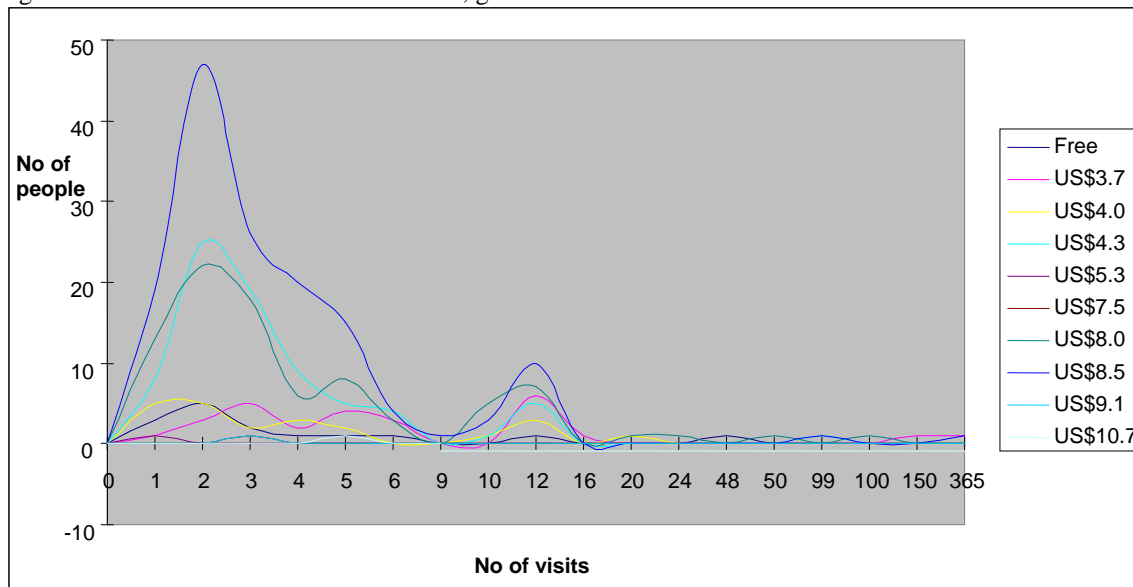
	Observations	Number of visits (average)	Number of visits (standard deviation)
Price = US\$8.5	146	6,1	30,0
Price > US\$8.5	2	4.0	1,4
Price < US\$8.5	230	7.3	26,9

Source: Survey Data, 2010

Taking into account the answers' distribution and annual visitation frequency, in view of the admission price paid, Figure 1 herein points to different configurations in the answers' distribution.

⁶ Final survey was carried out between December 2009 and January 2010. In December, students paid US\$4.0 and adults US\$8.0. In January, admission rose to US\$8.5 for adults and US\$4.3 for students.

Figure 1 – Museum demand curves *Proxies*, given fees



Source: Survey Data, 2010

At the US\$8.5, US\$8.0 and US\$4.3 admission-price levels, visitation frequency answers cluster on twice a year. On average, visitors who paid US\$8.5 would visit 12 times a year (once a month), while those who had paid US\$8.0 would come calling seven times a year and those paying US\$4.0 were willing to visit six times a year. Among those who had enjoyed free-of-charge admission, only five said they would visit twice a year. All of which allows us to conclude that the museum facilities are more highly regarded and appreciated by those who paid admission.

An analysis of the hypothetical admission prices (US\$10.7; US\$13.3; US\$16; US\$24; US\$32) demonstrates that – contrary to our expectations – the average number of annual visits is not continuously reduced as prices rise (vide Table 5). Behavior is erratic up to US\$16 admission, followed by a drop to be expected. At US\$10.7, the average visitation frequency is 5.09 yearly visits. This average drops down to 2.28 visits when the hypothetical price is US\$13.3 but bounces back up to 5.23 annual visits when the hypothetical admission price reaches US\$16. At higher prices, visitation frequency is reduced, as expected, in comparison to the hypothetical US\$16 admission. This behavior suggests other components (not just admission price) affecting interest in museum visitation.

Table 5 - Hypothetical price and museum frequency visitation

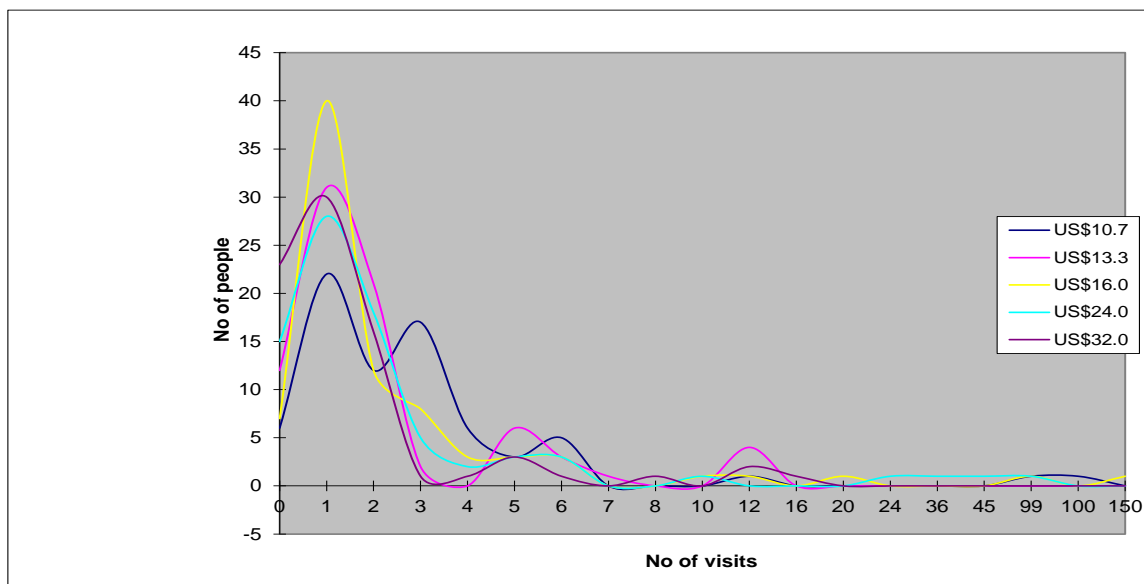
Hypothetical price (US\$)	Number of visits	Number of visits (average)	Number of visits (stand dev)
10.7	74	5.09	16.00
13.3	80	2.28	2.76
16.0	81	5.23	19.70
24.0	79	4.23	12.80
32.0	79	1.75	2.77

Source: Survey Data, 2010

Organization of data on number of visits at each hypothetical price (vide Figure 2 below) shows that many curves become unimodal, with a far lower peak of visitation frequency and a sharper negative slope vis-à-vis the admission price paid. This is to be expected, as the hypothetical prices are higher than those actually paid.

Figure 2 shows answer concentration (*moda*) by those interviewed as regards visitation frequency. In view of the hypothetical prices, this clustering of answers is at one annual visit: 40 visitors would make one yearly visit at US\$16 admission; 31 if the price were US\$13.3; 30 would visit once a year at US\$32; 28 with the price level at US\$24 and 22 visitors would come annually paying a US\$10.7 admission.

Figure 2 – Museum demand curves proxies in relation to hypothetical prices



Source: Survey Data, 2010

Once again, the distribution analysis as per hypothetical prices points to a heterogeneity not observed among the visitors interviewed, affecting their visitation frequency. On the one hand, approximately 28 % of those interviewed said they would visit Inhotim twice a year. However, in this case, more people (21) were willing to visit if admission were US\$13.3 rather than US\$16 (in which case only some 12 visitors would come). In analyzing interest in three annual visits, the *moda* slides down to the lowest hypothetical admission price: US\$10.7 (vide Figure 2 herein). This visitation contrast in the two distributions reveals a see-saw effect, namely, museum visits go down as admission prices go up.

Economic theory describes access to installations and consumption of cultural goods and services as experience goods (Marshall, 1891) or as a "positive addiction" (Stigler and Becker, 1977). Both perspectives generally discuss the importance of developing and nurturing cultural-access habits. Hence, a Habit Index was constructed, using PCA – Principal Components Analysis and the *Stata* software.

The index variable refers to questions asked on the frequency (number of annual visits) a person goes to movies, theater, museums, art exhibits, cultural centers, art galleries, circuses, outdoor cultural events, and libraries / bookstores. All these cultural-activities questions were answered by the visitors interviewed. The Cultural Habit Index was developed through the maintenance of the first component, which explains the nearly 22% variability among those interviewed (vide Table 1 in annex).

Table 6 shows the weights of the variables used in the Index, considering the first component. Visitation frequency to art galleries (52.41%) and museums (46.59%) are the heaviest-weight variables in the Index, while circus attendance ranks dead last (1.88% only). Standard index average is 0.1143 (vide Table 7), with a 0.1396 standard deviation. This indicates that, among these museum visitors interviewed, few visit / attend other cultural activities in a year.

Table 6 - Eigenvectors associated to the first component used in the creation of the cultural habit index

Variable	Comp1
Movies	0.1864
Theater	0.1742
Museum	0.4659
Art exhibits	0.4474
Cultural centers	0.3146
Art galleries	0.5241
Circus	0.0188
Outdoor events	0.2213
Library / Bookstores	0.3078

Source: own elaboration.

Table 7 - Standard habit index descriptive

Variable	Observations	Average	Stand.dev	Min	Max
Habit index	392	0.1143	0.1396	0	1

Source: own elaboration.

4.1.1 – Estimate of visitation-associated factors

Inhotim visitation illustrates the number of times an event takes place within a given timeframe. It is a random variable taking on non-negative values. In modeling this type of discrete positive data, there is no recurring to linear regression models. Therefore, several alternatives present themselves: the Poisson model, the Negative Binomial model (Greene, 1999) and log-linear functions (Cameron and Trivedi, 1986).

Albeit much used, the Poisson model assumes an equal distribution of the average and conditional variance, that is, the *equidispersion* hypothesis. It also assumes no non-observed heterogeneity, considering that all determinant factors are described in the model-specifying variables used. However, one way to include the non-observed individual heterogeneity effect is to assume a Gamma distribution, thus transforming the Poisson distribution into a Negative Binomial. Hence, two models were estimated. The first seeks to analyze factors associated to visiting Inhotim, while the second dwells on demand elasticity. The first model uses Negative Binomial distribution and specifies the following function:

$Visits = f[admission\ price; expenses\ during\ visit;^7\ habit\ indicator; gender; religion\ dummies\ (Roman\ Catholicism\ is\ the\ reference\ category)].$

Personal visitor attributes (gender, religion, cultural habits) are taken into due account, as they affect preferences. However, it is important to note that the schooling variable (key to explaining factors associated to cultural consumption in Brazil (vide Diniz and Machado 2011) was not included in the model, as the sample of interviews has a significant number of college & graduate visitors (59%).

It is worth mentioning that the number of database observations was doubled, as each person interviewed informed his/her museum visitation frequency from the standpoint of two different prices, namely, the admission actually paid and a hypothetical price. In each visitor interviewed, the first observation refers to the admission price actually paid and visitation frequency at this price level. The second observation is grounded on the hypothetical price and its corresponding number of annual visits. All the other variables and the socio-economic profile of those interviewed remained unchanged.⁸

Table 8 summarizes the estimated results in the Negative Binomial model. Given the presence of “missings”, the sample was reduced to 751 individuals. Results show higher prices associated to fewer museum visitations, a behavior consistent with expectations and with other similar studies (vide Sanz and Herrero, 2006). The visitation-expenses-cost variable (is statistically significant (12%) and, as expected, the spending/visit frequency ratio is negative. Higher spending is associated to fewer visits. The Habit Index shows that higher frequency / attendance to other cultural activities translates into a greater interest in museum visitation. This is to be expected, given the importance of positive experience and habit in explaining cultural consumption (vide Sanz and Herrero, 2006, and Bedate et al. 2009).

Religion is important in Brazil’s case (64% of its population is Catholic) and all non-Catholics are less inclined to visiting as compared to their Catholic counterparts, who are the benchmark reference and make up most of the sample (57%⁹). Gender-wise, the negative sign indicates that Brazilian women tend to visit museums more often, but this coefficient is not statistically significant.

⁷ The visitation-expenses variable includes short-haul transportation (e.g., from Belo Horizonte to Inhotim) and food.

⁸ This procedure and a discussion on its use, known as *pooled sample*, can be found in Chase et al, 1998. These authors deem that as long as visitors interviewed are randomly selected from a large population of potential visitors and inferences are made of their preferences based on sample observed behavior, the model’s random effects will be appropriate. Model random effects using double data are preferable, inasmuch as they take into account all the available information.

⁹ In Brazil’s 2010 census, 64% of the population declared themselves Catholics (vide IBGE-Brazilian Geography and Statistics Institute).

Table 8 – Model Estimate

Variables	Negative Binomial	
	Coefficient	Standard deviation
Willingness to visit		
InPrice	-0.5805***	0.1066
InCost	-0.1826	0.1184
Habit	1.2650**	0.5448
Gender	-0.0972	0.1441
Protestant	-0.2875	0.2038
Other	-0.5873***	0.1666
Agnostic	-0.4919**	0.1669
Constant	3.8197***	0.7680
Observations	751	

Source: Own elaboration

The second model aims at analyzing the elasticity of economic variables (e.g., price, income, spending). The variable of interest is the logarithm of number of visits. The correlation matrix among the variables indicates a correlation between visit number and price, with the expected sign. In the spending and income variables, the signs were contrary to expectations and the correlations were very low (respectively, 0.0007 and -0.0148, with a 0.2386 inter-variable correlation (vide Table herein below).

Table 9 - Correlation Matrix

	Visit	Price	Cost	Income
Visit	1			
Price	-0.2637	1		
Cost	0.0007	0.175	1	
Income	-0.0148	0.024	0.2386	1

Source: Own elaboration.

Thus, in order to estimate elasticity, an OLS regression was carried out, taking into due account the frequency and price logarithms¹⁰, plus habit indicator and reason for visit, in a discreet variable specification.

Table 10 – OLS Estimate

Variables	Coefficients	Stand error	t	P>t	95% Conf. Interval	
Invisit dependent						
Lnprice	-0.23	0.04	-5.81	0	-0.31	-0.15
Habit	0.31	0.23	1.33	0.183	-0.15	0.77
Inhotim	0.15	0.08	1.8	0.072	-0.13	0.30
Constant	1.44	0.14	10.37	0	1.17	1.72
Number of obs	649					
Statistics						
F (1,699)	12.56					
Prob>F	0					
R ²	0.0552					
AdjR ²	0.0508					
Root MSE	0.8182					

Source: Own elaboration

The result reveals that a 10% price increase reduces visits to nearly 2.3%. This suggests low demand sensitivity vis-a-vis prices charged (vide Table 10). Goudriaan and Van't Eind (1985) found elasticity for such values (\$

¹⁰ The sample is reduced to 649 observations, given the presence of zero-value for visits.

amounts) in Dutch museums, and Lukstich and Partridge (1997), using a specific museum survey, found a -0.17 price elasticity demand in North-American art museums. With 18% of significance, Cultural Habit is positively associated to visits. Considering Inhotim the main travel reason is also associated to the visits (with 7% of significance). Still in terms of visitation, its negative price elasticity signals the possibility of admission price rises, to help the museum increase its revenue.

5 – CONCLUDING REMARKS

In the past few decades, the number of museums has increased, as has interest in visiting them. As cultural goods, museums have features of public or semi-public assets, making it difficult to determine at which price people would willingly pay for visitation. Using a contingent behavior method and analyzing data based on econometric models, it was possible to estimate a demand curve and determine a price art museum visitors would be willing to pay to enjoy it.

A survey of Inhotim visitors showed that the highest number of annual visits was at the US\$16 price level. This was the admission price deemed feasible by museum visitors interviewed, corresponding to double the admission price then charged. Results also showed demand inelasticity, meaning that price increase would slightly reduce the number of possible annual visits, yet could also increase museum revenue.

Another relevant aspect is the income profile of those interviewed, which differs between business days and weekend visitors, plus information on the week days of greatest visitation. Such information allows price discrimination, that is, to charge a higher price on heavier-demand days (thus avoiding over-crowding) and reducing the admission price on the other days, to encourage visitation by those with more free time on less-demand days; also, determining free-admission days, in order to avoid idle capacity.

All of which means that museums can manage their visitation frequency, applying a strategic pricing policy of price reduction and revenue increase, using demand curve models as management tool.

Whether public or private, Museums need operational and maintenance funds. A sound pricing policy can help the revenue-increase process, if an adequate determination is made of how much people are willing to pay for visitation. There are many cases in which museum directors can use the results of demand studies, such as those found herein, to know the factors determining visitation and prices, as well as developing strategies pursuing a more efficient management of these cultural assets.

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Annex 1 – Table 1 - Principal Components Analysis

Component	Eigenvalue	Variance proportion
Comp1	2.0221	0.2247
Comp2	1.3407	0.149
Comp3	1.1627	0.1292
Comp4	0.9581	0.1065
Comp5	0.895	0.0994
Comp6	0.7807	0.0867
Comp7	0.7359	0.0818
Comp8	0.601	0.0668
Comp9	0.5038	0.056

Source: Own elaboration

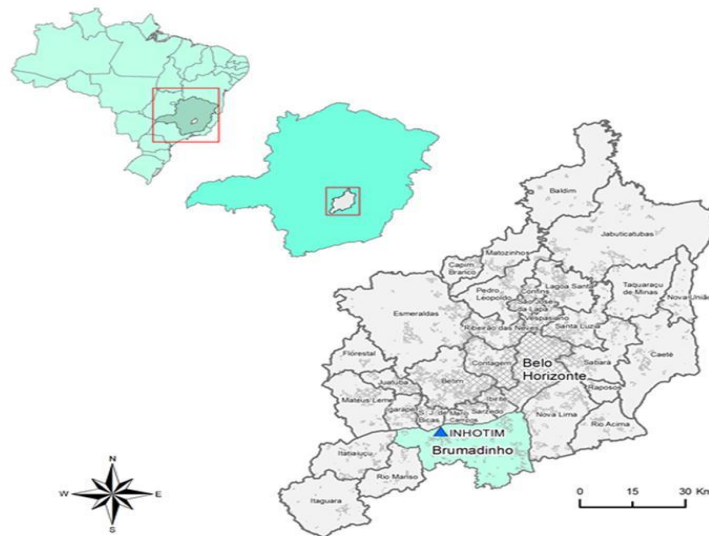
Annex 2 – Correlation Matrix

	Visit	Price	Cost	Gender	Habit	Protest	Catholic	Others	Agn
Visit	1								
Price	-0.1012	1							
Cost	-0.0721	0.1715	1						
Gender	-0.0395	0.0007	0.1486	1					
Habit	0.0530	-0.0047	0.1289	-0.0474	1				
Protest	-0.0225	-0.0045	-0.1001	-0.1107	-0.0880	1			
Catholic	0.0585	0.0210	0.0365	0.0633	-0.0284	-0.5281	1		
Others	-0.0274	-0.0238	0.0442	-0.0178	0.0223	-0.1467	-0.3701	1	
Agn	-0.0339	-0.0048	0.0189	0.0427	0.1109	-0.2015	-0.5083	-0.1412	1

Source: own elaboration

Annex 3

Geographic location: Brazil - Minas Gerais State - Greater Belo Horizonte Metropolitan Region - Brumadinho and Inhotim



Annex 4 – Inhotim Pictures



Partial view of the Museum and one of the lakes; also some art pavilion buildings, palm trees and modern art by famed Brazilian artist Hélio Oiticica (Magic Square n#5).



Art pavilion by American artist Matthew Barney