VISITOR ATTITUDES TO DEACCESSIONING IN ITALIAN PUBLIC MUSEUMS: AN ECONOMETRIC ANALYSIS

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Abstract

Deaccessioning is a largely controversial practice involving the sale or disposal of objects from a museum's collection. Although it has received increasing attention in the past few decades as a solution to museums' financial concerns, its implications have rarely been researched in academia which is mainly due to the 'barely legal' status of deaccessioning as a management practice. Previous research suggests that visitors' responses may vary depending on some factors, such as the destination of income generated by deaccessioning operations and the public's perception of the museum collection as a public good. We address this question by analysing visitors' responses in Italian public museums. Specifically, we hypothesize that stronger public cultural identity of the collection and the purpose of the income generated by deaccessioning strongly affect the attitudes to deaccessioning. Using structural equation modelling, we estimate several important determinants of visitors' responses. We also show that attitudes to deaccessioning do not influence the decision to visit a museum. The findings of the article have implications for museum governance and particularly for the knowledge about deaccessioning in cultural economics and museum management.

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1. Introduction

Museums are ubiquitous in the social and cultural landscape of Western societies. They are flexible and diverse institutions, varying greatly in ownership patterns, financial models, size and reputation. A cultural, historical, and geographical divide exists between museums based on the Anglo-Saxon model and those based on the Napoleonic model (Mossetto & Vecco, 2001). Museums in the Anglo-Saxon tradition are visitor-oriented, with a focus on exhibition and engagement, while those in the Napoleonic tradition are more item-oriented, with a focus on care and restoration. This difference has thinned over the past few decades as visitors' experience has become increasingly important for Napoleonic museums. Evidence of this shift is provided by the increase in 'blockbuster' exhibitions. This is partly because these institutions rely on public funding, but their growth has not been accompanied by a proportionate increase in funding received. This encouraged museum managers to compensate in some ways, from higher admission fees to ancillary commercial activities and private sponsorships (Johnson, 2003). Museums' survival thus increasingly relied on the public's satisfaction with their services. Managers devoted increasing attention the visitor experience to reduce the likelihood of failure (Crivellaro, 2011; Trione, 2012).

The inefficiencies caused by museum growth are greater in societies where cultural governance is based on the inalienability principle. Continuously accumulating objects without being allowed to discard some of them creates a clear problem of resource allocation (Weil, 1997; Chen, 2009; Dolák, 2010; Fayet, 2010; Mairesse, 2010a; Vilkuna, 2010). As a result of this "cumulative" approach, museums display only a fraction of their holdings at any given time. This is referred to as the 'Prado effect' (Peacock, 1994). It is reasonable to question whether museums accomplish their mission by collecting objects when they cannot be displayed (Johnson, 2003). The removal of objects from a museum's collection, i.e., *deaccessioning*, is one of the most debated topics in the professional and scholarly literature on museum management. In some contexts, objects cannot be deaccessioned due to legal agreements, resistance by managers, and national laws on cultural heritage. At the same time, economic urges and ethical considerations cause deaccessioning to be viewed as inevitable (Fayet, 2010). Restrictions on object disposal lead to 'ossification' in the museum field (Johnson, 2003, p. 319) by hindering the reallocation of collections over time. The legal standing of museums further complicates the issue: for institutions belonging to the private sphere, deaccessioning is more readily allowed while for public museums this practice – although some guidelines do exist – is still highly problematic. Moreover, the boundary between public and private tends to be fuzzy. Public museums are seldom entirely public, and hybrid setups are commonplace (Severini, 2003). In contexts where there is no strong tradition of donorship, and private institutions are viewed by the public as market-driven, deaccessioning represents a capitulation of culture before pragmatic demands (Acidini Luchinat, 1999; Settis, 2003, 2004, 2007). Indeed, museums are by nature opposed to market forces (Grampp, 1989); managers are generally risk-averse (Throsby, 2003b); and the protection of elitist interests is also likely to play a role (O'Hagan, 1998).

Although academic research on deaccessioning is lacking, the adoption of deaccessioning policies by public institutions represents an interesting economic issue. Most existing studies approach this problem from an ethical (Fayet, 2010), microeconomic (Di Gaetano and Mazza, 2014; Srakar, 2012; 2014) or legal perspective

(Chen, 2009). Few of these take the public into account as a primary stakeholder (Whiting-Looze, 2010). Morevoer, they tend to assume that visitors oppose deaccessioning. Recent research suggests that deaccessioning does not necessarily harm the interests of the public and may even lead to benefits (Cirigliana, 2010). For this reason, it is topical to analyze visitors' attitude towards deaccessioning. This is precisely the point we address in our study. We contest the dominant view that public trust is harmed by implementing deaccessioning in public institutions. We theorize that visitors' attitudes depend on some factors, such as the characteristics of objects to be deaccessioned, sale conditions, and proceeds allocation.

We test our predictions using a dataset of 310 randomly administered questionnaires. Responses are analyzed via structural equation modelling (SEM) to test four main hypotheses – H1: The responses to the questionnaire reveal a clear underlying construct of attitude to deaccessioning; H2: The collection driven and marketing driven approaches supported by the deaccessioning have a significant and positive effect on the attitude to deaccessioning of the public; H3: A stronger public cultural identity of the collection destination significantly influences the attitude to deaccessioning; H4: attitude to deaccessioning significantly affects the decision for visiting museums even after controlling for endogenous relationship in the model.

The present study is structured as follows. In the next section, we provide a review of relevant literature on deaccessioning and introduce Italian public museums frame as our chosen empirical context. Then, we describe our data and the methodology employed to test our hypotheses. In the fourth section, we present our results and conclude with the discussion of the findings and implications for museum governance and future research.

2. Theoretical framework

### 2.1. Deaccessioning is defined as "the permanent loss"

Deaccessioning is a practice that may be largely ignored outside the museum field. It is defined as 'the permanent removal or disposal of an object from the collection of the museum by virtue of its sale, exchange, donation, or transfer by any means to any person (McKinney, 2004). It received wide publicity in museum management literature – and public media[1] – since the ground-breaking work of Montias (1973). The term is of relatively recent origin and represents the opposite of 'accessioning', i.e. the insertion of objects into the museum register. It is used to refer to sales and disposals, but also to involuntary losses such as thefts, misplacements and destructions (Merryman et al., 2007; Vilkuna, 2010), and other repurposes (Maranda, 2010). If accessioning indicates the transfer of an item from the mundane to the collection-worthy, and thus implies a gain of status, deaccessioning represents the unceremonious revocation of such status. The choice to deaccession suggests that the item is no longer worthy of display, at least in its current context, and may move to another context or be returned to daily life values. Via deaccessioning, museums implicitly communicate that objects no longer contribute to the museum's mission, and thus undermine its identity (Harris, 2010). The word itself involves a negative prefix applied to a positive action. This generates a host of negative psychological undertones (Vecco & Piazzai, 2015). This is particularly true for museums in the 'Napoleonic' as opposed to the 'Anglo-Saxon' tradition (Mossetto

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[1] See as example the debate around the Detroit Institute of Arts in 2013 or the international discussion started on the Financial New York Times on April 4, 2015.

& Vecco, 2001) because there is greater emphasis on conservation and restoration. The two perspectives coexist in Europe due to the EU's adoption of the subsidiarity principle, which implies that heritage management is best pursued at a sub-national level by individual member-states (Barnett, 2001, Vecco & Piazzai, 2015).

As a practice, deaccessioning involves a trade-off across two relevant dimensions, as shown in Figure 1. Firstly, efficiency, which is a purely economic dimension; secondly, ethicality, concerning the generation of income and concerning cultural consumption as equity. Opponents of deaccessioning usually appeal to some ethical and legal arguments related to the role of the State and the impact of this practice on the public accessibility of cultural goods (Besterman, 1991; Acidini Luchinat, 1999). From this perspective, deaccessioning is undesirable for museums because it suggests a profit- rather than a public good-orientation (Settis, 2003; Crivellaro, 2011). The problem is usually framed through an ethics of conviction, i.e. the sense that good behavior stems from adherence to clearly defined and absolutely valid rules (Weber, 2000). In this sense, any deviation from the inalienability principle appears to be an unethical capitulation to economic and pragmatic demands (Fayet, 2010). The second line of opposition is fundamentally microeconomic. Museum managers who make decisions concerning deaccessioning operations may be drawn to misconduct because they are in a position of asymmetric information on their principals, and partly insulated from risk (Srakar, 2014). Managers may thus view their depots as a "cookie jar of assets" (Krueger, 2008, p. 11). This is particularly problematic, if incomes from deaccessioning can be used to finance daily operations, as opposed to being used only for the betterment of the collection (Stephens, 2011).

Figure 1: The Trade-Offs of Deaccessioning

Efficiency

↑

Ethicality

Income generation ⟍   ⟋ Equity in consumption
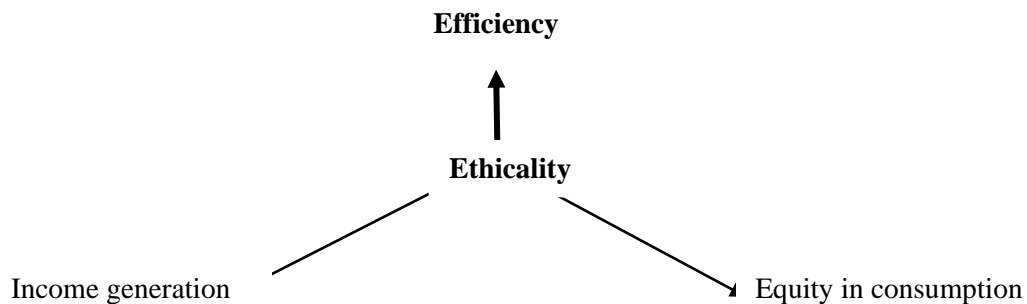
Source: Own elaboration.

By contrast, deaccessioning can be supported based on practical and financial considerations (Montias, 1973; Weil, 1990; Borg, 1991; Mairesse, 2010a). The efficiency-related argument is that the perpetual growth of museum collections is not sustainable in the long run. Museums tend to increase the size of their collections at a rate far exceeding that of disposal (Merriman, 2008). Indeed, if the material production of societies grows exponentially, so does the number of items deemed worthy of collection status. The gap between the number of objects deemed worthy of accession and the number that are accessioned will continue to increase as creative human beings continue to work (Fayet, 2010). From this perspective, deaccessioning is closely related to, and inseparable from, broader policies of collections optimization (Neves, 2005; Vilkuna, 2010).

Deaccessioning has been broadly discussed regarding policies (Di Gaetano & Mazza, 2013; Tam, 2012; Shane & Burgess, 2011; O'Hagan, 1998), as a practice that could influence the attitude of museums donors (Di Gaetano & Mazza, 2014; Lanza, 2013). However, in our best knowledge no quantitative study dealing with visitor attitudes towards museum deaccessioning has been performed yet.

Ethical considerations, instead, are based on museums' missions as keepers of cultural heritage for present and future generations. Because of this mission, museums cater to both inter- and intra-generational equity. The principle of intra-generational equity has been discussed in terms of the influence of public policy (Baer and Snickars, 2001), economic valuation of heritage (Throsby, 2002), sustainability (Cassar, 2003), needs of present and future museum users (Lindsay, 2005), guidance about expected object lifetime (Dillon et al., 2013), and, implicitly, through social discounting (Dillon et al., 2013, Ashley-Smith, 1999). Throsby (2002: 107) defines it like this: "The intra-generational equity dilemma is a classic inter-temporal allocation problem – that is, a choice between present and future consumption." Both present and future consumption entail costs on preservation and maintenance, but is it possible to define the first or second best option within this scenario? The point is to decide how far the principle of intra-generational equity and its authority should be applied, and what the impact on the present generation exactly is. With respect to the welfare of present and future visitors, it is also topical that the preservation of items of marginal importance impedes the acquisition and preservation of more relevant ones (Fayet, 2010). The preservation of heritage is hence as much a sacrifice for society as its loss (Babelon & Chastel, 1994; Vecco 2007).

2.2.   Empirical context: Italian public museums

Italy counts among the most conservative environments in Europe with respect to heritage management. Such belief is grounded in this sector's legislative immobility, bureaucratic setup and overall entrenchment onto the status quo. These characteristics have stalled not only change but academic interest as well (Solima, 2008). In such context, researching the public's perspective on museums is increasingly interesting as visitors are shifting from the role of passive receptors of cultural activities to active protagonists and shapers of their cultural experiences due to digitization, multi-layered interaction, and efforts of co-creation (Solima, 2008). Furthermore, the Italian context is highly representative of the Napoleonic model, as museum functions are strongly oriented towards conservation and restoration as opposed to displaying (Mossetto & Vecco, 2001).

The density of cultural heritage and the ancient tradition of conservation make deaccessioning particularly controversial. Keeping items in the territory where they are embedded, as Italian museums are supposed to do (Emiliani, 1994), is viewed favorably by the public. Settis (2007) notes how their enjoyment by the community contributes to civic sense and collective identity. However, the amount of objects in public museums is such that only a fraction of museum holdings are exhibited at any given time. Moreover, individual public museums have relatively little managerial and financial independence and are essential 'offices' of the Ministry of Cultural Heritage, headed by a government official (Fedeli & Santoni, 2006; Ripamonti, 2008). Recent attempts to allow private intervention into cultural heritage management and implement deaccessioning policies were largely met with resistance, including allegations that the

government was planning the systematic destruction of Italian cultural heritage (Settis, 2007; Tarantino, 2002).

3. Data and methodology

For our data, we use a dataset of responses to a questionnaire on deaccessioning in Italian public museums. The questionnaire was administered in April 2012 to randomly selected visitors to sites of archaeological and art-historical interest in the city center of Rome. The questionnaire included 22 attitudinal questions on deaccessioning. Five-point Likert scales were offered as possible responses to individual claims, to express respondents' level of agreement. Furthermore, questions on the gender, age, education, the number of children and number of yearly museum visits of the respondent were included. Some of the questions were repeated twice, with different wording, to assess the internal validity and reliability of responses. In total, there were 310 valid answers, which form the sample for our analysis. The questions – structured in three batteries (A, B and C) - are the following:

A) I believe the sale can be acceptable for items:
    1) Which originate from a different territory than that of a museum ("Provenance");
    2) Of minor art-historical interest compared to the average for the museum ("Minorinterest");
    3) Of which copies and/or close substitutes exist, e.g. sketches or archaeological fragments ("Substitutes");
    4) That are out of theme compared to other items in the museum ("Outoftheme");
    5) Of more recent origin, as opposed to more ancient ones ("Ageofitem");
    6) That have <u>not</u> been exhibited by the museum for a certain period of time ("Notexhibited");
    7) Belonging to the so-called "minor arts", e.g. ceramics or carvings ("Lesserarts");
    8) That are <u>not</u> within the theme of the museum ("Outoftheme2").

B) I believe selling is acceptable only if:
    9) The item is destined to other museums or collections open to the public ("Opentopublic");
    10) The item was <u>not</u> a gift for the museum, e.g. a testamentary legacy ("Notagift");
    11) Transparency is guaranteed through public negotiations, e.g. notices and auctions ("Transparency");
    12) There is a cap to the number of items that can be sold ("Setalimit");
    13) The museum of destination is within the same territory as the original ("Eqterritory");
    14) The museum of destination is equally relevant as the original, e.g. for the life of the artist ("Eqrelevance");
    15) Future visitability by the public is guaranteed ("Opentopublic2").

C) The proceeds from sales should be used to:
    16) Acquire new items that are more relevant to the collection ("Acquisitions");
    17) Cover building maintenance costs ("Maintenance");
    18) Finance building improvements ("Expansions");

19) Cover restoration costs for other items ("Restorations");
20) Create new services for the public, e.g. restoration areas, shuttles or areas for children ("Newservices");
21) Lower admission fees ("Entrancefees");
22) Offer new didactic activities, e.g. courses, seminars or conferences ("Neweducation").

Below are some descriptive statistics for the variables in the questionnaire. Table 1 shows the statistics for all the attitudinal variables. In Battery A, the highest average score was for the two variables "Outoftheme", while the lowest was for the age of the item and "lesser arts". This shows that respondents, in general, tend to support deaccessioning as a strategy to improve the possibly outdated collection of the museum while they do clearly not support the selling of museum artworks which are of more recent origin (artworks of recent origin can, of course, be valued highly) and of lower cultural value.

As for the Battery B, clearly the respondents value highly the public cultural identity of the collection – of main value to them is, if the item is destined to other museums or collections open to the public and if future "visitability" by the public is still guaranteed. Also, transparency appears to be crucial to respondents. They are much less sensitive if the museum of destination is within the same territory as the original or of the same relevance as the original.

In the Battery C, the respondents think that the proceeds from sales should be used for restoration of other items, they are also more inclined towards usage for education purposes. Creating new services for the public is clearly the most problematic to them which goes in line with the most basic arguments against deaccessioning summarized before.

Table 1: Descriptive statistics, attitudinal questions

	Mean	Median	Coeff. of variation	N
Provenance	2.58	3.00	0.51	310
Minorinterest	2.91	3.00	0.45	310
Substitutes	2.89	3.00	0.48	308
Outoftheme	2.99	3.00	0.45	309
Ageofitem	2.46	2.00	0.52	309
Notexhibited	2.95	3.00	0.47	306
Lesserarts	2.67	2.50	0.49	310
Outoftheme2	3.02	3.00	0.46	310
Opentopublic	4.23	5.00	0.27	310
Notagift	3.41	4.00	0.40	309
Transparency	4.15	5.00	0.30	310
Setalimit	3.55	4.00	0.40	309
Eqterritory	3.10	3.00	0.44	310
Eqrelevance	3.42	3.00	0.37	308
Opentopublic2	4.27	5.00	0.26	309
Acquisitions	3.66	4.00	0.33	308

Maintenance	3.77	4.00	0.34	310
Expansions	3.73	4.00	0.33	308
Restorations	4.16	4.00	0.25	309
Newservices	3.19	3.00	0.41	308
Entrancefees	3.64	4.00	0.37	309
Neweducation	3.80	4.00	0.32	309

Source: Own elaboration.

Table 2 shows the main descriptive statistics for our socio-demographic variables. There are more females than males in the sample, regarding age, the categories of 36-45 and 46-64 years of age are predominant, which shows that most (more than 60%) of the visitors are aged between 36 and 64. Interestingly, people with primary school are almost non-represented in the sample that confirms the importance of education for museum visiting. Interestingly, master degrees are predominant among the university graduates while also PhD degrees are not rare. Most of the people (almost 50%) of those who were interviewed have no children while approximately the same percentage visits the museum 1-3 times a year. Only about 25% of them do not usually visit museums.

Table 2: Descriptive statistics, socio-demographic variables

		%	N
gender	male	44.26	135
	female	55.74	170
age	up to 19	4.53	14
	20-26	11.33	35
	27-35	17.48	54
	36-45	25.57	79
	46-64	34.95	108
	65 and over	6.15	19
education	primary school	0.34	1
	secondary school	7.88	23
	high school	42.81	125
	bachelor	13.70	40
	master	30.14	88
	PhD/specialisation	5.14	15
number of children	0	49.68	153
	1	15.58	48
	2	28.90	89
	3 or more	5.84	18
museum visits	0	24.01	73
	1-3	49.34	150
	4-7	19.74	60
	8 or more	6.91	21

Source: Own elaboration.

Our methodology is composed of three parts. Firstly, we reduce the dimensions of the questionnaire using factor analysis. As we expect the dimensions to be correlated (this is confirmed by results of correlation analysis of the factors) we use oblique oblimin rotation with gamma coefficient set to zero.

Secondly, we use structural equation modeling (SEM) to verify most of our hypotheses. Structural equation modeling is a general, mainly linear and cross-sectional statistical modeling technique, related to multivariate statistical methodology. Part of its origins date to the early years of the 20th century with the development of what we now call exploratory factor analysis (usually credited to Charles Spearman, see Spearman, 1904) and path analysis (see Wright, 1918). The measurement (factor analysis) and structural (path analysis) approaches were integrated in the early 1970s in the work of three authors: K. Jöreskog, J. Keesling, and D. Wiley (see e.g. Bentler, 1980). The 1980s and 1990s witnessed the development and rapid expansion of the use of SEM techniques in many different areas of the behavioral sciences (Kline, 2010). There have been many recent developments which represent the extension of models about continuous latent variables to other kinds of analyses (see Kline, 2010), e.g. estimation of growth and change over time on latent variables (e.g. Duncan et al., 1999); estimation of curvilinear and interactive effects of latent variables (e.g. Schumacker & Marcoulides, 1998); estimation methods for non-normal data, such as when the indicators are dichotomous or ordered-categorical (ordinal) variables (e.g. Muthén, 1984); convergence of SEM and techniques for multilevel analysis, which are applied in data sets where scores (cases) are grouped into higher-order units, such as siblings within families (e.g. Muthén, 1994). Interest in SEM has also expanded to other disciplines, beside the "traditional users" in psychology, education, business and economics, including wildlife management (e.g. Grace, 2006; 2008), communication sciences (e.g. Holbert & Stephenson, 2002), medical research (e.g. DiLalla, 2008), administrative pharmacy (e.g. Schreiber, 2008), and pediatric psychology (e.g. Nelson, Aylward, & Steele, 2008).

SEM is mainly related to confirmatory, rather than exploratory techniques. The interest in the applications of this method is largely on latent constructs (abstract variables like intelligence or brand attitude), rather than on observed variables. By explicitly modeling measurement error, SEM can derive, if done properly, unbiased estimates for the relations among the latent constructs. Compared to regression, factor analysis and other commonly used multivariate techniques, frequent usage of SEM is relatively novel, having its beginnings in articles, appearing in the late 1960s. The methodology is, therefore, still in the process of development, and its fundamental concepts subject to testing and revision. In our analysis, we use second-order SEM models (including exogenous sociodemographic predictors), modified according to modification indices and compare the fit to the first-order models.

In the final part of the analysis, we use principal components analysis to construct an index of attitudes of deaccessioning and, - using regression models (OLS, Poisson, Probit) and taking into account the endogeneity in the model-, we test also the hypothesis 4.

4. Results
a. Factor analysis

Tables 3 and 4 show the results of oblique oblimin rotated factor analysis. As can be clearly seen (also from the scree plot in Figure 2), number of factors to be selected is suggested to be five.

Table 3: Proportion of explained variance, oblique oblimin rotated factor analysis

| Component | Rotated Eigenvalues | |
	Eigenvalue	Proportion of explained variance
1	4.4365	0.2017
2	3.2204	0.1464
3	2.9684	0.1349
4	2.5739	0.1170
5	2.0590	0.0936

Note: Extraction Method: Principal Component Factors, Oblimin Oblique Rotation with Kaiser normalisation, Gamma=0
Source: Own calculations.

Figure 2: Scree-plot of eigenvalues after factor analysis
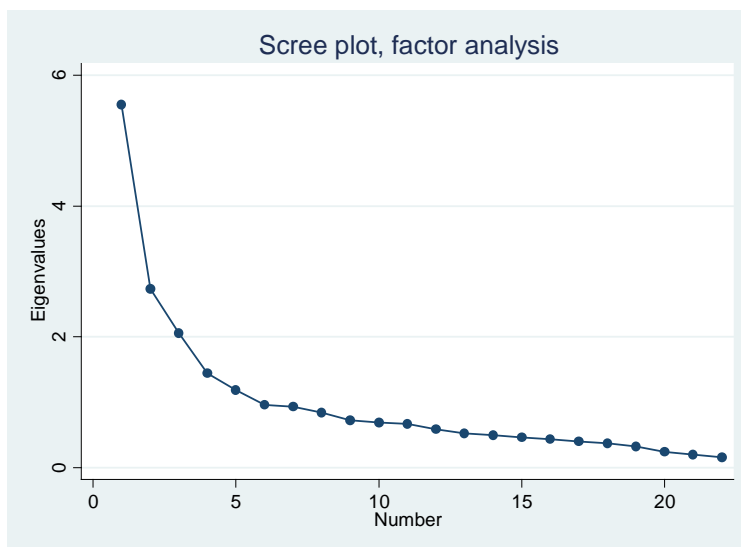
Source: Own calculations.

Table 4 shows how to interpret the five factors. As can be clearly seen, the first factor includes all eight items from the Battery A and we, therefore, label it "Items". It can be interpreted as attitudes towards the nature of the items to be deaccessioned. Battery B is separated into two factors, namely factor 2 and factor 5. Factor 2 includes items openness to public, transparency of the transaction and public nature of the donation and we, therefore, label it as "Public Identity of the Collection". Factor 5 includes the restrictions on sales and relevance of the location of the museum of destination and we, therefore, label it as "Limits to the Sales and Museum of Destination".

Finally, Battery C groups into factor 3 and factor 4. As Factor 3 includes all items related to the infrastructure and collection of the museum we, therefore, label it as

"Collection Driven Approach of Using the Sales from Deaccessioning". Factor 4, on the other hand, includes all items related to marketing, education and sales and we, therefore, label it as "Marketing Driven Approach of Using the Sales from Deaccessioning".

We summarize this below as follows:
Factor 1 – "Items";
Factor 2 – "Public Identity of the Collection" (shortened: PubIdColl);
Factor 3 – "Collection Driven Approach of Using the Sales from Deaccessioning" (shortened: CollApp);
Factor 4 – "Marketing Driven Approach of Using the Sales from Deaccessioning" (shortened: MarkApp);
Factor 5 – "Limits to the Sales and Museum of Destination" (shortened: SellDest).

Table 4: Results of direct oblimin rotated factor analysis

	Component				
	1	2	3	4	5
Provenance	0.655				
Art-historical interest	0.707				
Scarcity	0.550				
Thematic relevance	0.759				
Age of the item	0.697				
Not exhibited	0.677				
Lesser arts	0.670				
Thematic relevance (control)	0.788				
Public visitability		0.842			
Not a gift		0.442			
Public negotiations		0.723			
Limit to the sales					0.496
Same territory as seller					0.823
Same relevance as seller					0.757
Public visitability (control)		0.845			
New acquisitions			0.619		
Building maintenance			0.811		
Building improvements			0.760		
Restoration costs			0.708		
New services				0.707	
Admission fees				0.744	
Education activities				0.725	

Note: Extraction Method: Principal Component Factors; Rotation Method: Oblimin (gamma=0) with Kaiser Normalization; all loadings lower than 0.35 are intentionally left blank
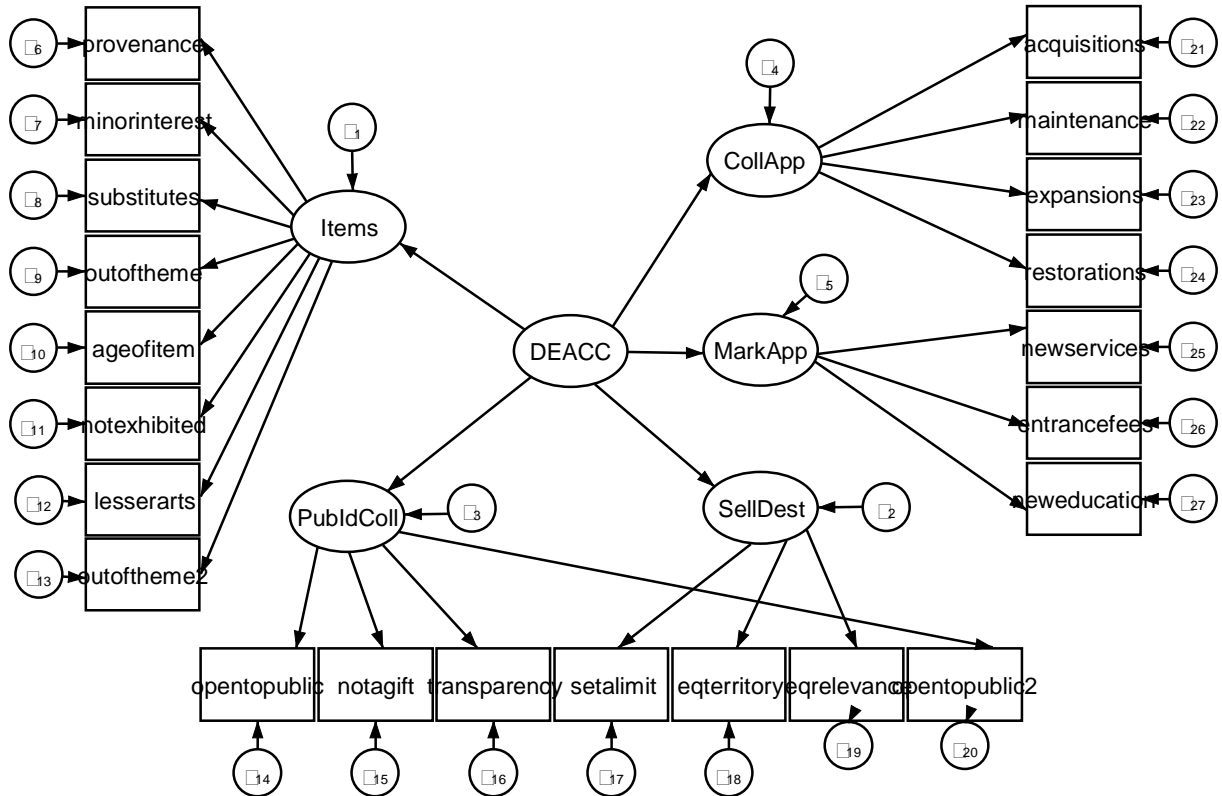Source: Own calculations.

b. Structural equation model (SEM) analysis

In the second stage, we estimate three different SEM models. We firstly estimate a second-order model, including all our estimated factor variables' relationships from the

previous section, and hypothesized relationships between all five factors and the underlying construct of attitudes to deaccessioning. Figure 3 shows the construction of the model and all the hypothesized relationships.

Figure 3: Basic second-order structural equation model

Source: Own calculations.

Table 5 serves us as a first test of our first three hypotheses, namely H1: The responses to the questionnaire reveal a clear underlying construct of attitude to deaccessioning; H2: The collection-driven and marketing-driven approaches supported by the deaccessioning have a significant and positive effect on the attitude to deaccessioning of the public; H3: A stronger public cultural identity of the collection destination significantly influences the attitude to deaccessioning.

From Table 5, we can observe that all relationships are confirmed[2], the strongest relationship to the attitude to deaccessioning appears to be related to factors of Public Identity of the Collection (by H3) and Marketing-Driven Approach (by H2). It is interesting that Collection-Driven Approach appears to be less (but, nevertheless, positively) related to the attitude to deaccessioning which could be interpreted in the manner that respondent see much fewer problems in assigning the funds from deaccessioning to the marketing purposes than to the improvements in infrastructure, which appears in accordance with the theory, presented in the second section.

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[2] We constrained the first relationship (Items) to 1 in accordance with literature, see e.g. Chen, Sousa and West (2005).

Table 5: Regression coefficient estimates, second-order model, no modifications

Variable effect	Variable cause	Estimate	S.E.	P
Items	DEACC	1	/	/
PubIdCol	DEACC	1.075	0.227	0.000
MarkApp	DEACC	1.398	0.285	0.000
SellDest	DEACC	0.516	0.165	0.002
CollApp	DEACC	0.459	0.131	0.000

Source: Own calculations.

From Table 9, we can see that the fit of the second-order model is not acceptable. The normed chi-square is higher than 2 (which could still be acceptable by some authors, see Schumacker and Lomax, 2004), the CFI and TLI indexes are lower or equal to 0.90 and RMSEA and RMSR are higher than 0.05. We, therefore, use modification indices, depicted in Table 6, and choose several covariances, related to the most significant and largest change in chi-square statistic, and set them equal between the respective two variables.

The estimates of the modified model are shown in Table 7, and the improved fit of the model is visible from Table 9. From Table 7, we see that all the relationships remain of more or less the same sign and significance, but the size of the coefficient on Public Identity of the Collection is significantly raised, while the coefficients on Marketing Driven Approach of Using the Sales from Deaccessioning drops. Still, the coefficient on Marketing Driven Approach is the largest in size.

Table 6: Modification indices

Variable 1	Variable 2	Modification index (MI)	P>MI
e.SellDest	e.PubIdColl	28.651	0
e.PubIdColl	e.MarkApp	17.339	0
e.CollApp	e.MarkApp	14.444	0
e.minorinterest	e.substitutes	16.394	0
e.ageofitem	e.lesserarts	18.726	0
e.setalimit	e.transparency	21.546	0
e.eqterritory	e.eqrelevance	16.646	0
e.maintenance	e.expansions	15.418	0

Source: Own calculations.

The fit of the model is significantly improved, as seen from Table 9. The normed chi-square statistic is significantly lower than 2 (also satisfying the more stringent restrictions of Ullman, 2001), the CFI and TLI indexes are significantly above 0.90 and RMSEA and RSMR are lower than 0.05. The fit of the model is, therefore, appropriate.

Table 7: Regression coefficient estimates, second-order model, with modifications

Variable effect	Variable cause	Estimate	S.E.	P
Items	DEACC	1	/	/

PubIdCol	DEACC	1.132	0.268	0.000
MarkApp	DEACC	1.206	0.332	0.000
SellDest	DEACC	0.648	0.227	0.004
CollApp	DEACC	0.441	0.124	0.000

Source: Own calculations.

For comparison purposes, we estimate also a first-order model where all the factor variables are related to each other. As shown in Table 9, the fit of the model is better than the respective second-order model that could be interpreted as attitudes of deaccessioning being a heterogeneous concept, which shows significant differences particularly in the relationship of factors we have named Collection Driven and Marketing Driven Approach. The formerfirst seems much more adversely related to the attitudes to deaccessioning than the latter.

Finally, we estimate also the model, including the exogenous variables, captured by our questionnaire: age of the respondent, his/her gender, level of education (binary variables, having value of 1 for those with higher education, and 0 otherwise), children (binary variable, having the value of 1 for those with children, and 0 otherwise) and museum visits (binary variable, having the value of 1 for those who visited any museum in past year, and 0 otherwise).

The results show that among exogenous predictors, only age is significant - older respondents tend to have more stringent attitudes to deaccessioning. Furthermore, there is a change in the importance of the factors: Public Identity of the Collection becomes the most important, followed by the Marketing Driven Approach; Limits to the Sales also become significantly more important, while the Collection Driven Approach is by far the lowest in size. In our model, we include the modification on the basis of covariances with the largest change in chi-square statistic.

Table 8: Regression coefficient estimates, "exogenous variables" model, with

modifications

Variable effect	Variable cause	Estimate	S.E.	P
Items	DEACC	1	/	/
PubIdCol	DEACC	1.623	0.447	0.000
MarkApp	DEACC	1.555	0.452	0.001
SellDest	DEACC	0.901	0.318	0.005
CollApp	DEACC	0.384	0.122	0.002
DEACC	Age	3.688	2.040	0.071
DEACC	Gender	-0.016	0.074	0.824
DEACC	Education	-0.068	0.075	0.367
DEACC	Children	0.029	0.074	0.696
DEACC	Museum visiting	0.098	0.065	0.129

Source: Own calculations.

Finally, we again look at Table 9 for the results of the goodness of fit. The models with modifications in all criteria significantly overpass the basic models. The preferred model seems to be the one including exogenous variables. In basic model with no modifications, the first-order model slightly dominates the second-order one, which we explained above. In this manner, although we can verify our hypothesis 1, we cannot estimate a clear difference between first and second order model in terms of the goodness of fit and, in this manner, perhaps in some future studies deaccessioning could be conceptualized in different manner (including different questions or batteries and/or excluding parts of the present questionnaire).

Table 9: Goodness-of-fit statistics, all models

	Chi Sq. [p value]	Normed Chi-Sq.	CFI	TLI	RMSEA	RMSR
Second-order model	347.86 [0.000]	2.1082	0.900	0.885	0.061	0.070
Second-order model with modifications	231.14 [0.000]	1.4722	0.960	0.951	0.040	0.049
First-order model	305.39 [0.000]	2.0359	0.915	0.893	0.059	0.057
Exogenous variables model	347.56 [0.000]	1.3368	0.952	0.944	0.035	0.057

Source: Own elaboration.

c. Index of attitudes to deaccessioning

In the third and final methodological part, we construct an index of attitudes to deaccessioning for the final testing of hypothesis 4. To this end, we use and modify the method applied in Fernando, Samita & Abeynayake (2012). The method defines a specific weight to each factor from our five dimensions of the attitudes of deaccessioning, and the index assigns a specific numerical value to the final construct. The weight corresponding to a particular factor variable is a function of the correlation coefficient between the factor and the first principle component in the Principle Component Analysis (PCA) of the five factors[3].

To calculate the final weights in the index of attitudes to deaccessioning, we, therefore, calculated the correlations between each of the five factors and the first principle component. The final equation of calculating the index is in (1).

$$IndDea = 0.5736 * Items + 0.6770 * PubIdColl + 0.6104 * CollApp + 0.5509 * MarkApp + 0.4331 * SellDest \qquad (1)$$

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[3] It has to be stated that decisions on weighting in the constructions of the indexes are always in large part arbitrary - as stated in the most referenced OECD Handbook on this topic: "Regardless of which method is used, weights are essentially value judgements. While some analysts might choose weights based only on statistical methods, others might reward (or punish) components that are deemed more (or less) influential, depending on expert opinion, to reflect better the policy priorities or theoretical factors." (Nardo et al. 2008: 31).

Finally, we use the constructed index to explore the relationship of attitudes to deaccessioning and the museum visiting. We use two different dependent variables: number of museum visits (which is, of course, a count variable) and the probability of museum visiting (a binary variable having the value of 1 if the respondent has a positive number of yearly museum visits and 0 otherwise). We use several different regression models: linear regression (OLS), corrected for heteroscedasticity; Poisson regression; Instrumental Variables Poisson (correcting for the reverse causal relationship between index of deaccessioning attitudes and number of museum visits[4]); and, finally, Probit and Instrumental Variables Probit when the dependent variable is probability of visiting museums. We use six predictors[5]: index of attitudes to deaccessioning; gender (binary variable, 0-male, 1-female); age; age squared; education (binary variable, 0-respondent does not have a tertiary education; 1-respondent has a tertiary education); and a number of children. We expect that all or most of our socio-demographic variables will be significantly related to the museum visiting, particularly that better educated and older people will be more likely to visit museums. We also expect that people with stronger deaccessioning attitude will be more frequent museum visitors.

Table 10 shows the results of our testing. In Poisson model, gender, age, education and number of children are indeed significantly related to the level of museum visits, in accordance with expectations: women tend to visit museums more frequently. People aged 28 years or younger tend to visit museums less frequently, while when they turn 29 and after they tend to visit museums more frequently. Tertiary educated visit museums more frequently than those with lower education; and, finally, respondents will fewer children tend to visit museums more frequently[6]. However, our prediction on the influence of the index of attitudes to deaccessioning is not supported by the results: there clearly appears to be no correlation between the index and museum visits, the finding is robust to a number of different specifications of the variables (even after including a full set of five factors in the model, only one is of acceptable statistical significance) and the model itself – it is present in both OLS (even 2SLS) and Poisson and IV Poisson regression. We instrument for possible reverse causality between the index of attitudes to deaccessioning and museum visits by one of the factors/dimensions of the index.

Table 10: Regression coefficient estimates, number of museum visits

Dep.var.: Number of museum visits	OLS (het. robust std.err.)			Poisson			Poisson			IV Poisson		
	Coefficient	Std. Error	Sig.	Coefficient	Std. Error	Sig.	Coefficient	Std. Error	Sig.	Coefficient	Std. Error	Si
Constant	2.784	2.234		1.040	0.311	***	1.195	0.320	***	1.295	0.693	*
Index of attitudes to deaccessioning	-0.041	0.207		-0.013	0.029					-0.030	0.097	

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[4] We use as instrument factor 3, although most factors satisfy both instrumental variable restrictions.

[5] The questionnaire, unfortunately, allows us only a very limited number of covariates.

[6] This finding is explained by looking into the age structure of respondents. The respondents in the age group 50-64 years (the ones, probably having children of age, more suitable for the interest in visiting museums), tend to have a reverse relationship: the ones with more children tend to visit museums significantly more often. The relationship, found in our model, therefore, strongly holds only for the younger respondents (of age lower than 50) and those in the age group 65+.

	Coefficient	Std. Error	Sig.	Coefficient	Std. Error	Sig.	Coefficient	Std. Error	Sig.	Coefficient	Std. Error	Sig.
Items							-0.115	0.039	***			
PubIdColl							0.003	0.038				
CollApp							-0.018	0.039				
MarkApp							0.046	0.040				
SellDest							0.067	0.038	*			
Gender	0.415	0.395		0.141	0.074	*	0.105	0.076		0.083	0.133	
Age	-0.059	0.104		-0.023	0.014		-0.028	0.014	*	-0.035	0.031	
Age squared	0.001	0.001		0.000	0.000	***	0.000	0.000	***	0.001	0.000	
Tertiary educated	0.900	0.387	**	0.320	0.074	***	0.318	0.076	***	0.393	0.136	**
Nr of children	-0.770	0.226	***	-0.308	0.050	***	-0.294	0.051	***	-0.319	0.074	**
Observations	268			268			268			268		
Log Likelihood				-686.4			-679.8					
(Pseudo-) R Squared	0.0642			0.0454			0.0547					
F / LR Chi2 Stat.	3.95***			65.31***			78.61***					

Note: The number of asterisks denote the level of significance (*** - 1%; ** - 5%; * - 10%).
Source: Own calculations.

We, finally, verify our claim also for the probability of museum visiting. Interestingly, most of the variables lose their significance, although they remain of the same sign. The only variable that remains a highly significant and important predictor is education that is by expectations: education is one of the main predictors of participation in cultural events as shown in numerous studies (see e.g. recent studies of Falk and Katz-Gerro (2015) and O'Hagan (2014)).

Table 11: Regression coefficient estimates, probability of visiting museums

Dep.var.: Probability of visiting museums	Probit			IV Probit		
	Coefficient	Std. Error	Sig.	Coefficient	Std. Error	Sig.
Constant	0.6054	0.7746		0.5883	0.7701	
Index of attitudes to deaccessioning	0.1042	0.0673		-0.0248	0.1125	
Gender	0.2655	0.1738		0.2611	0.1727	
Age	-0.0197	0.0348		-0.0207	0.0345	
Age squared	0.0002	0.0004		0.0002	0.0004	
Tertiary educated	0.5691	0.1770	***	0.5417	0.1777	***
Nr of children	-0.0721	0.1025		-0.0865	0.1026	
Observations	268			268		
Log Likelihood	-139.318			-518.685		
(Pseudo-) R Squared	0.0543					
Wald Chi2 Stat.	16.00**			13.22**		

| Wald test of exog. | 2.00 |

Note: The number of asterisks denote the level of significance (*** - 1%; ** - 5%; * - 10%).
Source: Own calculations.

5. Conclusion

In our article, we used structural equation models to study the attitudes of museum visitors in Italian public museums to deaccessioning practice. It was our initial proposition that our constructed factors in the factor analysis of the responses to the questionnaire would all be related and caused by the underlying construct. Our first assumption was proven correct – all factors are strongly related to the underlying construct, although we weren't able to find solid evidence that models with underlying construct are better in explaining relationships among the variables in the model than the models without it. We, furthermore, confirmed several hypotheses, related to relationships among the factors, namely, the collection driven and marketing driven approaches supported by the deaccessioning have a significant and positive effect on the attitude to deaccessioning of the public; and, a stronger public cultural identity of the collection destination significantly influences the attitude to deaccessioning.

Finally, when we included the attitudes to deaccessioning in the regression model of predicting frequency of museum visits (taking into account the endogenous character of the model, using one of the factors as an instrument), there is no visible evidence whatsoever that attitudes to deaccessioning would have an influence on museum visits, which is important for policy purposes and future measures in the field. The only strong and persistent predictor of the museum visits is education, while age, gender and, particularly, the number of children are either insignificant or even of adverse sign.

The finding that attitudes to deaccessioning are not related to museum visits is important. It shows that although visitors reflect on the usage of funds from collection management, the ethical issues (at least those related to deaccessioning as we identified in the existing literature) are not related to their decisions of visiting museums. As estimated by the cultural economic literature, the main determinants, influencing the likelihood and frequency of cultural participation, in general, are the socio-economic and demographic characteristics of individuals (see e.g. Zieba 2015; Wen and Cheng 2013, Falk and Katz-Gerro 2015, Borgonovi 2004). In this manner, our finding is in line with the findings, already established in the literature and indicates that "higher", ethical values play a minor role in the decision to visit museums.

To our best knowledge, the article is the first empirical study on deaccessioning providing evidence on some claims, so far heard mostly as speculations or theoretical predictions. There are some drawbacks of the article, not least being a limited sample - geographically based - and limitations of attitudes to deaccessioning as being a relevant concept in explaining deaccessioning - there are at least two other important adverse aspects of deaccessioning practices in economic light, the first one being the perspective of the donors (as analyzed in Di Gaetano and Mazza, 2014) and the other being the managerial practices (as analyzed in Srakar, 2014). As the interest and research on deaccessioning are ~~slowly~~ growing, we sincerely hope our article will provide improved knowledge and some ground for measures regarding cultural policy and management practices, including the necessary verification and validation of our findings in different contexts and research designs.

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