PUBLIC PROCUREMENT IN CULTURAL HERITAGE CONSERVATION: AN EXPLORATORY STUDY FOR ITALY

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ABSTRACT. This paper is aimed at investigating a specific area of public procurement, namely the capital expenditure aimed at the conservation of the Cultural Heritage (CH). The procured activities, such as, for instance, CH restoration or maintenance as well as archaeological excavations are crucial for the conservation and the enhancement of CH. The paper tries to investigate whether the peculiar features of CH conservation, e.g. the high degree of specialization of contracting authorities, "make a difference" as far as the costs and the length of interventions are concerned. To address such a question, an empirical analysis on the determinants of the performance (on costs overrun and delays) of public contracts for CH conservation is carried out. The results of the empirical analysis show that CH conservation, when compared with the general public works sector, "makes a difference" as far as the performance of public contracts is concerned, favouring costs overrun and delays; it seems that the search for quality, which is a peculiar feature of the heritage field, as well as the major role of the experts, tend to favour costs overrun and delays relatively to the overall public works contracts.

1.INTRODUCTION

This paper is aimed at investigating a specific area of public procurement, namely the capital expenditure aimed at the conservation of the Cultural Heritage (CH). The procured activities, such as, for instance, CH restoration or maintenance as well as archaeological excavations are crucial for the conservation and the enhancement of CH. Though the economic relevance of CH is increasingly recognised in the literature, so far no much attention has been paid to the economic features of the "market" of CH conservation. The paper aims at filling this gap and at analyzing the

main features of such a market, looking both at supply and demand. Attention will be focused upon the direct demand for conservation exerted by the public sector through its procurement activity.

Italy will be used as a case study: the rich CH endowment of the country, the relevant size of CH in public ownership, the extensive role of the public sector make Italy an interesting example to be analyzed. Employing a detailed data set on Italian public contracts for CH conservation in the period 2000 to 2005, the paper analyzes the features of the market for CH conservation (i.e. dimension of the contracts, length, complexity, specialization, procurement procedures, degree of competition, characteristics of suppliers, etc.). This analysis also takes into account some insights coming from the general Italian public works procurement sector – of which Ch conservation is a sub-sector-, namely the fact that delays and costs overrun occur in the execution stage. Thus, the paper tries to investigate whether the peculiar features of CH conservation, e.g. the high degree of specialization of contracting authorities, "make a difference" as far as the costs and the length of interventions are concerned.

To address such a question, an empirical analysis on the determinants of the performance (on costs overrun and delays) of public contracts for CH conservation is carried out, using a parametric approach. We firstly compare CH conservation with the more general public works sector to check whether the specificity of the CH conservation affects the performance of public spending. Secondly, we explore more in depth the CH conservation sector, to analyse the determinants of the performance within such a sector.

The results of the empirical analysis show that CH conservation, when compared with the general public works sector, "makes a difference" as far as the performance of public contracts is concerned. It seems that the search for quality, which is a peculiar feature of this field, as well as the major role of the experts, tend to favour cost overruns and delays relatively to the overall public works contracts.

When the analysis of the determinants of performance of CH contracts is carried out within the CH conservation sector, results show that, ceteris paribus, the search for quality and the expertise characterizing the CH field affect the performance of CH contracts, with specialized contracting authorities paying more attention to the completion of the contract than to the control of the final cost.

This paper is organized as follows: in Section 2, we discuss the main theoretical issues of public intervention in Cultural Heritage, with special attention to the conservation activity. Section 3 describes the main issues in the implementation of CH conservation in Italy, paying attention to its institutional features as well as to the market characteristics. The empirical analysis of the determinants of the

performance in CH conservation is developed in Section 4. Section 5 provides some concluding remarks.

2.THE ECONOMICS OF CULTURAL HERITAGE

2.1 Public intervention in Cultural Heritage

Almost everywhere public intervention in the CH field is widespread and it is implemented with monetary as well as non monetary means (Rizzo-Throsby, 2006). Leaving aside the well known normative

motivations underlying public intervention[1], in this paper a positive analysis is carried out; more precisely, attention is paid to public expenditure, i.e. to direct monetary intervention[2], aimed at the conservation[3] of built heritage.

No much attention, so far has been devoted to analyse this specific area of public intervention in the CH field, a possible explanation lying in the fact that public spending for CH conservation constitutes a very
small share of GDP[4].However, notwithstanding such a small size, the analysis of the public spending for CH offers a fruitful room for investigation. There is an increasing awareness that CH has relevant economic potentialities. Indeed, CH conservation plays an important role to foster sustainable economic development; urban policies increasingly rely on the rehabilitation of CH to support economic activities and the services related to culture and tourism.

However, at the same time, it has been stressed (Peacock and Rizzo, 2008) that to be input of economic development CH has to be the output of conservation policies and, therefore, the ways how these policies are designed and implemented crucially affects the overall economic impact of CH. In the literature, such an issue has been investigated focusing attention mainly upon the role of regulation and of the discretionary power enjoyed by regulators, stressing that the range and intensity of regulation appear to be more the endogenous product of the public decision-making process than just a policy instrument in the heritage field (Rizzo, 2010). To restrain the discretionary scope of the public decision-maker in CH field and to improve public participation in the political decision-making process some institutional means have been envisaged, such as devolution (Rizzo, 2004) and independent agencies operating at arms' length from government as an alternative to public bureaucracies (Peacock and Rizzo, 2008).

It has been outlined that in most western countries there is a tendency toward the extension of the concept of heritage and,

therefore, toward the overprovision of CH conservation; a likely consequence is that the increasing pressure on public expenditure is difficult to be met, also because of the fiscal stringency affecting public budgets. Therefore, the objective of conserving CH may not be fulfilled and the related economic and social benefits are at risk.

2.2 CH conservation: some definitions

Within the scenario described above, a further threat for CH conservation might arise if public spending is not carried out efficiently and effectively. CH conservation is a very broad concept: different meanings can be assigned to the word 'conservation' with different economic implications.

According to the definition provided by the World Bank (1994) outlines that conservation "encompasses all aspects of protecting a site or remains so as to retain its cultural significance. It includes maintenance and may, depending on the importance of the cultural artifact and related circumstances, involve preservation, restoration, reconstruction or adaptation, or any combination of these". As Lichfield (1988) outlines, the different meanings of conservation can be regarded as different ways of conserving CH to meet different demands for conservation which, in some cases, may generate also conflicts, such as, for instance, the choice between preservation vs/adaptation. The decision-maker enjoys some degrees of freedom when the choice of a specific type of conservation is made; at the same time, the economic benefits stemming from conservation, namely those related to use values, strongly depend on the chosen type of conservation. In principle, the artistic and architectural characteristics of heritage should affect such a choice, suggesting also the ways to put it in practice, e.g. techniques of diagnosis and restoration, methods for the study and conservation of different objects, materials to be used in restoration, etc. In practice, such a choice cannot be considered a 'neutral' decision, relying only objective technical grounds but it is influenced by experts knowledge, experience and professional training.

Within such a scenario, given the features of CH conservation, the outcome of decision-making process is crucially affected by experts (art historian, architect, archaeologist, urban planner); they enjoy an informative advantage and are entitled to decide which type of conservation, has to be carried out in each specific case and how. In other words, the conventional problems related to the principal-agent paradigm arise.

Elsewhere (Finocchiaro -Rizzo, 2009), analysing the public decision-making process underlying CH conservation in Sicily, it has

been pointed out that in the utility function of experts managing the heritage authorities (Soprintendenze) reputation plays a relevant role. Restored buildings or archaeological excavations offer a testimony to the expertise of the Soprintendenze's specialists. Moreover, these specialists have direct interest in any conservation activity that offers scope for new discoveries and historical interpretation in their field of expertise, which would allow them to gain professional prestige and reputation among their peers. In doing so, the specificity and the uniqueness of CH is stressed and the importance of quality is enhanced.

A good example is offered by the debate on the adoption of standards for conservation. Among experts there is wide agreement that each piece of heritage is unique and that conservation should be carried out case-by-case, since real conservation cases require a mix of approaches and principles, able to grasp the mixed values of complex sites[5]. To what extent standards in conservation should be considered compulsory or simply voluntary, as benchmark of best practices to orientate practitioners and professionals in the heritage field? There is no consensus on the mandatory nature of the standards. On the other hand, the high variability among technical standards dealing with the same objects[6] shows how difficult is to find the specialists' agreement on this topic and, therefore, stresses the highly subjective judgement underlying conservation choices. The overall implications are that the efficiency and effectiveness of CH conservation are affected by who takes the decisions and how they are implemented.

In this paper we try to address these issues taking for granted the decisions regarding the type of conservation and investigating only the implementation stage. More precisely, we focus our attention on the conservation activities carried out within the public sector, e.g. on the direct public capital expenditure[7]. In theory, there are two possible ways of implementation: either the public sector provides grants or subsidies to other (private or no profit) actors to conserve the CH in their ownership or it is directly involved in the provision of CH conservation through its departments (at any level of government). In this paper we mainly concentrate on the latter[8]; because of the features of the conservation activities, the public sector does not produce such an output directly but it contracts out the related activities. In other words, we are in the field of public procurement, though of special nature. As far as we know, in the literature no attention has been paid to public procurement for CH conservation and, therefore, it might be useful to explore some features of this specific type of procurement. Italy will

be used as a case study: the rich CH endowment of the country, the relevant size of CH in public ownership, the extensive role of the public sector as well as the availability of a somehow unique and detailed data set make Italy an interesting case study.

3. IMPLEMENTATION ISSUES IN CH CONSERVATION: THE ITALIAN CASE

3.1 Some institutional features

The CH conservation is heavily regulated in Italy; it is at the intersection of two set of rules, e.g. the Code of heritage (Codice dei beni culturali) and the Code for the award of public supply, services and works contracts (Codice dei contratti pubblici di lavori, servizi, forniture). The former defines the principles for the conservation and enhancement of heritage and the allocation of responsibilities between central and local governments, with the former plying a major role; the latter provides the rules governing the national procurement system, according with the principles set up in the EU Directive, with a specific reference to the CH conservation field. No attempt is made here of analysing the Italian legislation; only few key general features will be recalled and the peculiarities of the norms applied to CH conservation will be outlined.

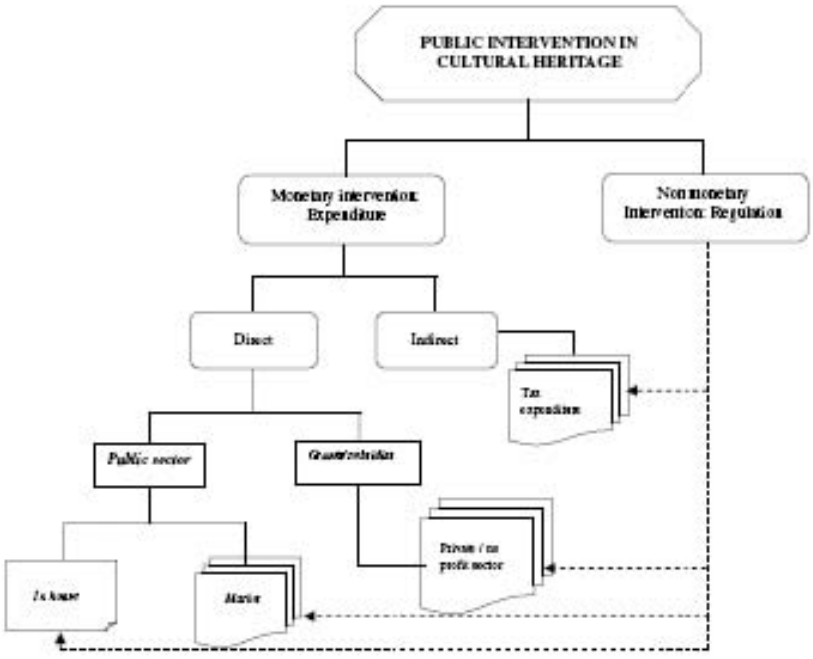

Diagram 1 *Means of public intervention in cultural heritage*

As far as public works in general are concerned, the Italian procurement rules are quite strict in specifying how decisions should be taken (for instance, "award to the lowest bidder" or "award to the most convenient") or what process has to be followed in making a decision (for instance, "do not accept late proposals", "evaluate proposals only based on the evaluation criteria in the solicitation"). The law tries to reduce bureaucratic discretion as much as possible. On these grounds, preference is given to competition: procurements should be widely advertised and evaluated strictly on the criteria announced in advance. Sealed bids are used to prevent collusion among the participants and to ensure transparency. In other words, competition is promoted as much as possible, as a tool to select the most convenient bidder. As far as the specification of the contract is concerned, to prevent opportunistic behaviour of private contractors, cost plus contract are not allowed. Moreover, to ensure the quality in the execution of works, the access to the public works market is heavily regulated: in fact, the firms need to be qualified according to a complex system referring to two criteria, type of the works carried out in the past and financial dimension. An independent Authority (Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture) supervises the functioning of the market for public works, the proper implementation of the existing regulation by the public authorities and the contractors as well as the functioning of the qualification system for the firms[9].

Broadly speaking, such a wide set of rules is applied also to the CH conservation field, though with some specific provisions. As it was said before, "quality" plays a major role in CH (aesthetic, cultural values, etc.) and, as a consequence, there is a high resistance among the experts in accepting that the rules governing general procurement are suitable for the specific conservation field. In practice, according to experts, the search for quality should imply to enlarge the scope of the discretional evaluation of the contracting authority. Indeed, the Italian legislation provides some different rules for the procurement in the CH conservation field: the qualification of firms entitled to enter the market is designed to ensure that they possess the specific expertise required by the restoration of heritage; the scope for restricted procedures to select the firm is enlarged as well as the scope for the renegotiation of the contract. Indeed, more room is left at the implementation level according with the specific requirements of each conservation/archaeological excavation intervention; in other words, the idea that each conservation case is "special" seems to be accepted by the rules and more degrees of freedom are left to the negotiation between the contracting authority and the firm at the execution stage than in the general procurement case. Whether the existing rules do lead to good results in the public contracts aimed at CH conservation is an open question: it is

addressed in this paper though it cannot be answered exhaustively.

3.2 The features of the market for CH conservation -demand

Public contracts for CH conservation in Italy have a relevant size. Table 1 shows that in the period 2000-05, 4,997 public contracts above 150,000 euros were awarded[10], (4.92 % of the total number of public works contracts awarded) amounting to about 3,545 millions of euros (3.75 % of the total amount of public works). These figures somehow represent the overall public demand for CH conservation[11] at its initial stage. On average, the size of the CH conservation contract is small (709.37 thousands of euros), lower than the average size in public Works[12], and it exhibits a high standard deviation.

Table 1. CH conservation contracts awarded in the period 2000-2005

Sector	Number of contracts	Total amount	Average amount	Dev. St.	Min	Max
CH conservation contracts	4,997.00	3,544,699.42	709.37	1,704.72	150.01	52,678.60
% of total contracts	*4.92*	*3.75*				
Total public contracts awarded	**101,589.00**	**94,651,035.43**	**931.71**	**4,238.25**	**150.00**	**857,720.36**

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*
Note: monetary values in thousands of euros at current prices

The market appears to be fragmented in terms of the size of contracts. As Table 2 shows, in the CH field 3,363 contracts (67.30% of the total number) are between 150,000 and 500,000 euros and, at the other extreme, only 61 contracts (1.22%) are between 5 millions and 15 millions and only 9 contracts (0.18%) are above 15 millions of euros. On the other hand, the contracts between 150,000 and 500,000 euros account for 25.03% of the total amount and those in the last two classes, above 5 millions, account for 20.59% of the total amount.

Table 2. Number of CH conservation contracts per classes of value in the period 2000-2005

Classes of value	Number of contracts	%	Total amount	%	Average amount
CH conservation					
>= 150.000 € < 500.000 €	*3,363.00*	*67.30*	*887,23,26*	*25.03*	*263.82*
>= 500.000 € < 1.000.000 €	*867.00*	*17.35*	*612,05.75*	*17.27*	*705.95*
>= 1.000.000 € < 5.000.000 €	*697.00*	*13.95*	*1,315,44.47*	*37.11*	*1,887.29*
>= 5.000.000 € < 15.000.000 €	*61.00*	*1.22*	*469,058.57*	*13.23*	*7,689.48*
>= 15.000.000 €	*9.00*	*0.18*	*260,907.39*	*7.36*	*28,989.71*
Total contracts	4,997.00	100.00	3,544,699.40	100.00	709.37
All public works contracts					
>= 150.000 € < 500.000 €	*69,351.00*	*68.27*	*18,810,172.98*	*19.87*	*271.23*
>= 500.000 € < 1.000.000 €	*17,020.00*	*16.75*	*11,969,584.09*	*12.65*	*703.27*
>= 1.000.000 € < 5.000.000 €	*13,271.00*	*13.06*	*27,018,120.75*	*28.54*	*2,035.88*
>= 5.000.000 € < 15.000.000 €	*1,387.00*	*1.37*	*11,244,983.36*	*11.88*	*8,107.41*
>= 15.000.000 €	*560.00*	*0.55*	*19,260,545.19*	*20.35*	*34,393.83*
Total contracts	101,589.00	100.00	94,651,035.12	100.00	931.71

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*
Note: monetary values in thousands of euros at current prices

As far as contracting authorities are concerned, also in the CH conservation field[13] municipalities play a major role in terms of the number of contracts awarded but central government shows some peculiar feature from a qualitative point of view. Table 3 shows that 54.91 % of the CH contracts are awarded by local governments (municipalities) and 30.44 % of the contacts are operated by central government, mainly through specialized heritage authorities (Soprintendenze)[14], run by experts and operating on a decentralized basis. However, as it is expected, the central government appears to be rather specialized in the field of CH conservation contracts, compared with the overall public works contracts; in fact, CH conservation contracts account for the 24.37% of the total contracts awarded by central government while at local level they account only for 5.47%. In other words, it seems that, for central government contracting authorities CH conservation can be considered a "core business" while for municipalities (as well as for the other contracting authorities) CH conservation is just one the several fields of activity.

Table 3. CH conservation contracts awarded by contracting authority in the period 2000-2005

Contracting authority	All sector		CH intervention						
	Total contracts	%	Number of CH contracts	%	% of total contracts	Total amount	%	Average amount	Dev St
Central government	6,241.00	*6.14*	1,521.00	*30.44*	24.37	789,902.74	*26.54*	630,91	1,354,39
of which Soprintendenze			*1,075.00*	*21.51*		*620,179.95*	*20.84*	*576,91*	*1,529,29*
of which Provveditorati			*57.00*	*1.14*		*169,722.80*	*5.70*	*602,59*	*2,539,34*
Regions and provinces	15,935.00	*15.69*	535.00	*10.71*	3.36	289,610.10	*9.73*	681,44	844,93
Of which Sicilian region			*83.00*	*1.66*		*121,321.46*	*4.08*	*870,74*	*2,552,34*
Municipalities	50,175.00	*49.39*	2,744.00	*54.91*	5.47	1,647,593.38	*55.36*	687,64	1,661,18
Others	29,238.00	*28.78*	197.00	*3.94*	0.67	249,291.74	*8.38*	1,392,69	4,161,66
Total	**101,589.00**	***100.00***	**4,997.00**	***100.00***	**4.92**	**2,976,397.96**	***100.00***	**699,99**	**1,749,73**

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*
Note: monetary values in thousands of euros at current prices

Another indicator of the specialization of central government contracting authorities in the CH conservation field[15] (table 4), compared with others contracting authorities, is offered by the fact that 66.53% of the CH conservation contracts awarded by central government are based on in-house projects, while such a percentage is much lower, less than half, for the other contracting authorities. The composition of demand raises some questions with some theoretical content: does the specialization of the contracting authority affect the contract performance? Is decentralization a relevant feature of the CH procurement?

A further feature of the CH conservation market is that restricted procedures are more widespread than in the overall public works contracts market: 27.64% of CH contracts are assigned through restricted procedures (accounting for the 14.73% of the total amount of the CH contracts)[16] while only 13,87% of the overall public works contract is assigned through restricted procedures, (i.e. 6,40% of the total amount). These figures reflect the fact that the existing regulation provides more scope for restricted procedures in the CH conservation, the rationale being that these contracts, because of their highly specialized features, require a closer relationship between the experts in the contracting authorities and the supplier, leading to more degrees of freedom in the selection of the supplier. What are the effects of such a closer relationship and such a greater discretion on the performance of the CH contracts is an open question which will be investigated in Section 4.

Table 4. In-house projects for CH conservation contracts awarded by contracting authority in the period 2000-2005

Contracting authority	Number of contracts	*%*	In-house project	*%*	% for each contracting authority
Central government	1,252.00	*29.60*	833.00	*45.79*	66.53
of which Soprintendenze	*1,075.00*	*25.41*	719.00	*39.53*	66.88
of which Provveditorati	*57.00*	*1.35*			
Regions and provinces	425.00	*10.05*	141.00	*7.75*	33.18
Municipalities	2,396.00	*56.64*	800.00	*43.98*	33.39
Others	157.00	*3.71*	45.00	*2.47*	28.66
Total	**4,230.00**	***100.00***	**1,819.00**	***100.00***	**43.00**

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*

Table 6 shows that the demand for CH conservation is not evenly distributed across the country, being mainly concentrated in the Centre, with 42.05% of the number of contracts awarded (36.88% of the total amount). The same pattern, though with a less marked concentration, also characterizes the overall public works contracts market.

Table 5 CH conservation contracts awarded in the period 2000-2005 by tendering procedure

Tendering procedure	**Number of contracts**	%	**Total amount**	%	**Average amount**
CH conservation					
Open	3,375.00	67.54	2,901,098.36	81.84	859.59
Restricted	1,381.00	27.64	521,962.57	14.73	377.96
n.c.	241.00	4.82	121,638.48	3.43	504.72
Total	4,997.00	100.00	3,544,699.42	100.00	709.37
All public works contracts					
Open	83,131.00	81.83	84,850,012.24	89.65	1,020.68
Restricted	14,089.00	13.87	6,054,160.74	6.40	429.71
n.c.	4,369.00	4.30	3,746,862.45	3.96	857.60
Total	101,589.00	100.00	94,651,035.43	100.00	931.71

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*
Note: monetary values in thousands of euros at current prices

Table 6. Geographical distribution of CH conservation contracts awarded in the period 2000-2005

Areas	Number of contracts	%	Value	%	Average amount
CH conservation					
North-West	953.00	19.07	781,333,26	22.04	819,867.01
North-East	539.00	10.79	481,645,64	13.59	893,591.17
Centre	2,101.00	42.05	1,307,411,84	36.88	622,280.74
South	897.00	17.95	598,381,17	16.88	667,091.61
Islands	507.00	10.15	375,927,50	10.61	741,474.36
Total	**4,997.00**	**100.00**	**3,544,699,42**	**100.00**	**709,365.50**
All public works contracts					
North-West	27,147.00	26.72	26,989,940,64	28.52	994,214.49
North-East	15,661.00	15.42	12,335,967,03	13.03	787,687.06
Centre	31,814.00	31.32	28,470,522,86	30.08	894,905.48
South	17,111.00	16.84	16,603,453,88	17.54	970,338.02
Islands	9,856.00	9.70	10,251,151,02	10.83	1,040,092.43
Totale	**101,589.00**	**100.00**	**94,651,035,43**	**100.00**	**931,705.55**

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*

Note: monetary values in thousands of euros at current prices

3.3 The features of the market for CH conservation -supply

The access to the public works market is heavily regulated. The firms must be qualified to participate to tenders above 150.000 euros and they can obtain their qualification certificate on the base of their technical, economic and organizational features.[17] Namely, the qualification is obtained according with categories (type of expertise)[18] and classes (financial dimension).[19] The categories which are relevant for the field of CH conservation are: OG2 Restoration and maintenance of built heritage; OG4 Underneath works of arts ; OS2 Decorated surfaces and mobile heritage; OS25 Archaeological excavations.

The supply in CH conservation consists of 4,449 firms. e.g. firms which are qualified for at least one of the categories OG2, 0G4, OS2 and OS25. Table 7 shows that the qualifications obtained in the CH sector represent a small share of the overall qualifications, ranging from 3.58%
(OG2) to 0.33% (OS25)[20] of the overall qualifications. As far as the classes (i.e. the financial dimensions) are concerned, the firms qualified in the conservation field show different features depending on the category: OG2 exhibits a distribution similar to the overall set of firms: 50% of the firms are concentrated in the two lowest classes and only a very small share in the two highest classes. Such a

concentration in the lowest classes is even more marked for the specialized categories (OS2 and OS25), showing that small firms prevail in these categories. Only OG4 exhibits a high share in the two highest classes (32.32%), showing that big firms tend to prevail. Whether and how this feature of the supply affects the performance of the CH contracts is an open question which is addressed in the following section.

Table 7 Composition of supply by categories and classes – 2005

Categories	**Number of qualifications**	***%***	***% of firms in the two lowest classes***	***% of firms in the two highest classes***
Category OG2	2,956	*3.58*	*50.22*	*2.06*
Category OG4	362	*0.44*	*25.41*	*32.32*
All general categories	**54,411**	***65.88***	***54.07***	***3.45***
Category OS2	494	*0.60*	*71.26*	*0.20*
Category OS25	275	*0.33*	*66.91*	*0.00*
All special categories	**28,179**	***34.12***	***63.90***	***2.75***
All firms qualified in CH	4,449	*5.39*	*47.47*	*11.37*
All qualified firms	**82,590**	***100.00***	***57.42***	***3.21***

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*

If we compare the composition of supply as illustrated by Table 7 with the composition of demand in terms of number of tenders, by classes and categories (Table 8) it appears that the decisions of firms with respect to the classifications somehow matches the compositions of demand; in other words, it seems that "demand creates supply", e.g. firms qualify according with the demand.

Table 8 Distribution of tenders by categories and classes -2005

Categories	**Absolute values**		**Weighted values**	
	% of tenders in the two lowest classes	% of tenders in the two highest classes	% of tenders in the two lowest classes	% of firms in the two highest classes
Category OG2	58.48	0.61	36.70	2.15
Category OG4	24.39	19.51	10.00	38.13
All general categories	**74.29**	**0.68**	**53.44**	**2.95**
Category OS2	70.51	5.13	46.20	18.99
Category OS25	63.77	0.00	42.25	0.00
All special categories	**71.51**	**0.66**	**50.22**	**2.80**
All qualified firms	**73.75**	**0.68**	**52.81**	**2.92**

Source: *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture (2006)*

A similar conclusion holds looking at the geographical distribution of firms operating in the CH conservation field: table 9 shows that they are mainly concentrated in the Centre and in the South in almost all categories, e.g. with a geographical distribution very similar to the demand.[21]

Table 9 Geographical distribution of qualified firms by categories -2005

Categories	North-West	North-East	Centre	South	Islands	NC	Total
Category OG2	13.43	16.61	28.86	28.76	11.87	0.47	100.00
Category OG4	28.21	19.61	25.14	19.34	8.01	2.76	100.00
All general categories	**17.38**	**15.95**	**19.78**	**33.23**	**12.96**	**0.70**	**100.00**
Category OS2	13.16	22.47	38.87	17.61	7.49	0.40	100.00
Category OS25	6.18	7.64	33.09	30.91	21.09	1.09	100.00
All special categories	**23.88**	**21.14**	**21.48**	**23.24**	**9.42**	**0.84**	**100.00**
All qualified firms	**19.60**	**17.72**	**20.36**	**29.82**	**11.75**	**0.75**	**100.00**

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*

Further features of the market for CH conservation contracts which deserve attention refer to the specialization of the contracts, to the interactions between the contracting authorities and the suppliers and to the leadership in the market.

Table 10 shows that the composition and specialization index[22] in CH conservation contracts varies across categories: OG2 contracts do not exhibit marked differences with respect to the overall public works while the contracts pertaining to the other categories are more specialized (the most specialized being OS2).

Table 10 Specialization index of CH contracts awarded

Categories	Composition index -CI	Weighted Composition Index -WCI	Specialization Index -SI
OG2	1.287	1.251	0.793
OG4	1.104	1.091	0.915
OS2	1.062	1.037	0.947
OS25	1.129	1.115	0.834
All public works	**1.231**	**1.197**	**0.825**

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*

Table 11 reports some indicators on the leadership in the market and on the degree of interaction between the contracting authority

and the supplier: the former aspect is measured by the number of contracts awarded to the leader firm and by its market share while the latter is measured by the number of contracts awarded to each firm by the same purchasing authority. Again, we find differences across categories within the CH sector: leadership is more marked in the more specialized categories. Also interaction differs across categories but it follows a pattern which is not systematically related to specialization.

Table 11 Leadership and interaction in the CH conservation market

Categories	Average n. of contracts of the leader firm	Market share of the leader firm	Interaction
OG2	21.43	0.82	2.28
OG4	26.84	7.41	7.63
OS2	20.50	4.15	1.92
OS25	10.13	3.68	2.38
All CH	21.09	2.09	2.31

Source: Our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*

3.4 Define the performance

On the grounds of the analysis developed in the previous section, we try to carry out an empirical investigation about the performance of public spending in the CH conservation field.

Following a previous works (Guccio, Pignataro and Rizzo, 2008) we define performance in terms of the time and costs required for the completion of the intervention. One indicator of public contracting authorities' performance is represented by cost overruns, i.e. the additional costs above the value of the winning bid, incurred by contracting works authorities. Another indicator is given by the time of Completion[23] of works, whether it is on time or whether delays occur. The two indicators are somehow correlated: the presence of delays in the completion of the work is likely to imply higher costs overrun, since the delay is, in fact, representative of problems connected with the implementation of the work.

Costs overrun and delay have been increasingly investigated in the literature. Flyvbjerg-Holm and Bull (2002) report that almost 9 out of 10 projects experienced some cost overruns in transport (rail and road) infrastructure projects in 20 developed and developing countries over the world and (Flyvbjerg, 2005) estimates that the cost escalation of infrastructure projects caused by the delayed construction is at 4.6 percent per year. Bajari -Houghton and Tadelis

(2006) estimate that the economic costs of ex post adaptations account for about ten percent of the winning bid for California highway contracts. Alexeeva -Padam Queiroz (2008), show that the value of a public road contract exceeds its engineering cost estimate by more than 20 percent and that the average delay in project completion reaches 10 months. Finally Iimi (2009) estimate that for road procurement in Africa about 70 percent of contracts experienced some cost overruns and adaptation cost is estimated at 93 cents per one dollar of contract adjustment.

Table 12 shows the relevance of costs overrun and delays in the execution of CH conservation contracts, also in comparison with overall public works in Italy. Namely, in the period 2000-2005, 43.45% of CH conservation contracts has experienced cost overruns above 10.00% of the original cost. The results in terms of delays are even more striking: 66.39% of CH conservation contracts involved a delay longer than 20.00% of the completion time agreed upon in the contract. No major differences seem to occur between the CH conservation sector and all public works contracts as far as delays are concerned. On the contrary, cost overruns are more marked in the CH conservation sector than in general public works sector, a possible explanation being the above mentioned differences in the regulation on the contract renegotiation.[24]

Table 12 – Distribution of public works for classes of normalized cost overruns and delays – 2000-2005

Intervals (%)	CH conservation				All public works contracts			
	Normalized cost overruns		*Normalized delays*		*Normalized cost overruns*		*Normalized delays*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
≤ 0	102	16.89%	140	23.18%	2,724	27.60%	2,767	28.03%
>0<5	103	17.05%	9	1.49%	2,120	21.48%	128	1.30%
≥ 5 <10	136	22.52%	10	1.66%	2,034	20.61%	240	2.43%
≥ 10 <20	149	24.67%	44	7.28%	1,634	16.56%	641	6.49%
≥ 20	114	18.87%	401	66.39%	1,358	13.76%	6,094	61.74%
Total	**604**	**100.00%**	**604**	**100.00%**	9,870	100.00%	9,870	100.00%

Source: our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*

Therefore, the issue seems to be relevant and worth of investigation to understand what are the major determinants of the CH conservation performance, measured by the two above

mentioned indicators.

In what follows we develop a parametric analysis. We firstly compare CH conservation with the more general public works sector to check whether the specificity of the CH conservation affects the performance of public spending. Secondly, we explore more in depth the CH conservation sector, to analyse the determinants of the performance within such a sector. Such analysis offers a partial explanation of the determinants of the performance because the two indicators – cost overruns and delays – cannot be used jointly. Two different equations are estimated, one for each performance indicator.

4. EMPIRICAL ANALYSIS

4.1 Data employed

The data used in the following analysis are those collected by Osservatorio per i lavori Pubblici" of the "Autorità di Vigilanza sui contratti pubblici di lavori, servizi e forniture" for the public works contracts in Italy, including, therefore, also CH conservation interventions. The observation unit is given by the single intervention; very detailed information are available on the various steps of the procedure – project, selection of the contractor, execution and conclusion.

The complete sample refers to 9,870 interventions, whose costs range from 150,000 euros to 5 million euros, awarded in the period 2000
2004 and completed by 2005.[25] Table 13 provides summary statistics for the total number of contracts awarded and completed per year, the total amount, the mean value of contracts.

Table 13 – Distribution and summary statistics of public works contracts for year of award

Year	Number of obs.	Total Amount	Mean	St. Dev.	Minimum amount	Maximum amount
2000	2,339	1,077,961.45	460.86	506.70	150.02	4,482.70
2001	3,110	1,236,930.22	397.73	412.80	150.05	4,815.96
2002	2,510	978,182.09	389.71	384.47	150.00	4,965.73
2003	1,482	522,485.56	352.55	314.21	150.00	4,340.00
2004	429	136,273.63	317.65	263.48	150.00	3,212.08
Total	**9,870**	**3,951,832.96**	**400.39**	**414.17**	**150.00**	**4,965.73**

Source: our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*
Note: monetary values in thousands of euros at current prices

4.2 Empirical estimation -the overall public works sector

The empirical analysis developed in this section aims at testing the hypothesis that the specific features of CH conservation affect the performance of the spending activity in terms of costs overrun and delays in the completion. This analysis is carried out in two steps: first of all, extending previous works (Guccio-Pignataro and Rizzo, 2009) and (Guccio-Pignataro and Rizzo, 2008) we analyze whether, within the overall public works sector, CH conservation interventions exhibit significant differences in terms of performance. The second step consists in analyzing, within the CH conservation sector, what are the determinants of its performance.

As it was pointed out in the previous section, performance is expressed in terms of costs overrun and delay: the ratio of the costs overrun to the value of the winning bid (EXTRACOST)[26] and the ratio of the delay to the expected length of the contract (DELAY)[27] are used as dependent variable, respectively, to represent costs overrun and delays.

As far as independent variables are concerned, we identify five different groups of variables which can affect the CH conservation contract performance: the supplier selection mode, the execution mode, the complexity of the intervention, the market characteristics and other control factors. The independent variables are expected to exhibit a different behavior with respect to EXTRACOST and DELAY.

The contractor selection mode variable refers to the impact of the different procurement procedures –whether it is an open auction or a restricted procedure-. Above, it has been pointed out that, broadly speaking, in Italy the existing procurement rules tend to favour the use of open tendering procedures with the consequence that a large portion of bidders are selected through competitive auctions, such a tendency being somehow mitigated in the CH conservation field, because of the specific role plaid by quality. Indeed, firms are more inclined to perform well whenever they can use such a record for obtaining further contracts in the future; however, such a strategy holds only if a restricted selection procedure is adopted while it does not if an auction takes place. Moreover, elsewhere (Guccio, Pignataro and Rizzo, 2008) it has been pointed out that if bidders cannot invest in a long-term relationship with the contracting authority, as it is in the case of the auction, they could find convenient to underbid, at the auction stage, so as to increase the probability of winning the auction, since the expectation of renegotiation will reduce the loss associated to this strategy. To express the role of the selection procedure, we use a dummy variable for open tendering procedures (OPEN) and we expect a positive effect on costs overrun. The effects on delays seems to be less clear cut.

As for the execution mode, the factors which potentially affect the performance are: the presence of subcontractors in the execution of the work (SUB) and the existence of legal disputes between the firm and the purchasing authority (DIS). Our hypothesis is that DIS tend to increase the duration of the intervention, because legal disputes require time, and also the final costs, though the extent of the latter effect depends on the outcome of these disputes, whether it is favourable or not to the purchasing authority. As far as the effects of SUB are concerned, it is plausible to assume that the existence of sub-contractors implies coordination problems and, transaction costs and, therefore, the duration of the work as well as the final costs are likely to increase.

As for the complexity is concerned, our hypothesis is that, contracts implementation becomes more uncertain and, therefore, cost overruns are more likely to occur the higher the degree of complexity. As proxies for complexity we use the estimated duration of the work (ED) the estimated total value of the work by the contracting authority (ETV)[28] and the weighted composition index of the work, calculated on the different subcategories involved in the work, weighted for their relative amount (WCI).[29] At the same time, complexity makes more difficult to forecast exactly the time required to execute the work and, therefore, the higher the complexity the more likely are delays. It must be pointed out, however, that with respect to delays, the above reasoning holds for the variables ETV and WCI – and, therefore, we expect for both a positive sign, while a different behaviour is expected for ED. Indeed, in such a case, this variable cannot be considered an indicator of complexity but, instead, it captures the fact that the delay can increase or decrease, simply as the result of underestimation or overestimation of the expected time of completion. Therefore, we would expect a negative sign.

The market characteristics play a role in connection with the features of the purchasing authorities and the contractors. On the demand side, it is important to point out that the demand for CH conservation is more specialized than for the overall sector. As it was pointed out before (see section 2), in this field quality is a very relevant issue and experts play a major role in the CH conservation decision-making process. A more specialized demand, aimed at pursuing quality is likely to be able to exert a stronger influence on the supplier's behavior because it suffers less asymmetrical information. If quality is relatively more important than in the overall sector we would expect that CH conservation contract might experience a comparatively worse performance in terms of costs and delays, compared with the overall sector. We use a dummy variable (CH) to represent the effects of the CH conservation field, with a positive sign on both dependent variables. As far the supply side is concerned, reputation is likely to reduce the convenience of strategic

behavior, aimed at the contract revision, when there is a probability to obtain other contracts in the future. We consider as a proxy for the value of the long-term relationship between the firm and the purchasing authority, the number of contracts awarded to each firm by the same purchasing authority (INT) . The expected sign for this variable is negative, since the interaction is likely to prevent opportunistic behavior and, therefore, the greater the interaction the lower the extra costs and delays.

Moreover, ceteris paribus, the relevance of such a variable depends on the market competition level and on the market share of the firm. To measure market competition we employ the number of potential bidders,
i.e. the number of firms qualified for the public work categories and classes (P_BID); the expected sign of this variable is positive: the higher the competition, the lower the probability of being awarded a contract in the future and, therefore, the lower the future value of reputation and the less convenient the efforts to fulfil the contracting authority's expectations in terms of costs and time. It is also important, however, to evaluate the position of the winning bidder within the market. We have, therefore, estimated the market leadership as the number of contracts awarded to each firm by the contracting authorities, included in the data set in the period under consideration (LEAD). In a market in which tendering is effective in selecting the best bidder and assuming that quality is homogeneous across firms for the works of the same category and size, the market leadership could be considered as cost leadership. In this case, the greater the market leadership, the higher the probability of being awarded contracts in the future and, therefore, the greater the value of reputation and the lower the occurrence and extent of extra costs and delays.

Finally, we take into consideration control factors. Besides the variables listed before, another factor potentially able to affect the final cost and the duration of public works is the geographical area. The geographical area variable represents the three major areas of Italy – North, Centre and South -characterized by different economic conditions[30] which are likely to impact on the efficiency of public contracting authorities. We use two dummy variables (NORTH, CENTRE) and we estimate their effects relatively to the South area, used as benchmarking. We expect a negative sign for both of them. Finally we control for the year of award.

The variables we use are listed and described in table 14 and summary statistics for these variables are reported in table 15.

Table 14 – Description of variables employed

VARIABLE	MEANING
DEPENDENT VARIABLES	
EXTRACOST	Normalized costs overrun
DELAY	Normalized adaptation time
INDEPENDENT VARIABLES	
Contractor selection mode	
OPEN	Dummy for open tendering procedures
Work execution mode	
SUB	Dummy for subcontracting
DIS	Dummy for legal dispute
Complexity and specialization	
ED	Estimated duration
ETV	Estimate total value
WCI	Weighted public work composition index
Market characteristics	
CH	Dummy for CH conservation contracts
INT	Number of contracts awarded to each firm by the same purchasing authority
P_BID	Number of firms qualified for the work categories and values
LEAD	Number of contracts awarded to each by all contracting authorities
Control factors	
NORTH	Dummy for north area of the country
CENTRE	Dummy for centre area of the country
Other control variables	Year of award

The dependent variables are the normalized costs overrun (EXTRACOST) and the normalized delays (DELAY) for project i and, therefore, the general models estimated are:

$$\boldsymbol{EXTRACOST}_i = \beta_0 + CF\,\beta + \varepsilon_i \qquad [1]$$

$$\boldsymbol{DELAY}_i = \beta_0 + + CF\,\beta + \varepsilon_i \qquad [2]$$

where CF is a matrix of the covariates previous defined and ε are disturbance terms. In the estimate of [1] and [2] it is necessary to take into account that the dependent variable assumes a zero value, which represents the minimum variable value, several times. A natural approach is to use a Tobit estimate. We estimate [1] and [2] with Tobit model. In the estimates we assumed robust standard errors. The results from the regressions described in [1] and [2], and their variants, are displayed in Table 16.

Table 15 – Descriptive statistics of the variables employed

Variable	Obs	Mean	Std. Dev.	Min	Max
Depended variables					
EXTRACOST	9870	0.09	0.14	0.00	1.80
DELAY	9870	0.77	0.88	0.00	14.22
Contractor selection mode					
OPEN	9870	0.81	0.39	0.00	1.00
Work execution mode					
SUB	9870	0.78	0.42	0.00	1.00
DIS	9870	0.02	0.14	0.00	1.00
Complexity and specialization					
ED	9870	212.27	137.83	3.00	1,327.00
ETV	9870	400.39	414.19	150.00	4,965.73
WCI	9870	1.20	0.34	1.00	4.00
Market characteristics					
CH	9870	0.06	0.24	0.00	1.00
INT	9870	2.42	3.37	1.00	60.00
P_BID	9870	2,250.01	1,397.18	1.00	5,707.00
LEAD	9870	17.87	37.92	1.00	136.00
Control factors					
NORTH	9870	0.46	0.50	0.00	1.00
CENTRE	9870	0.34	0.47	0.00	1.00

Columns 1 and 3 show the estimates for the overall public works contracts; column 2 and 4 include also the dummy variable CH to look at the marginal effects on costs overrun and delays of the specific features of the CH conservation sector. In other words, we are able to check whether CH conservation "makes a difference" as far as the performance (measured by costs overrun and delays) of public contracts is concerned.

The competitiveness of the procurement procedure is associated to an increase of the costs overrun in the implementation stage; the result is robust since the variables used in the analysis (OPEN) the dummy for open tendering procedures) is significant, with the expected sign. The interpretation of the result we provided above is that underbidding, whose extent varies with the competitive strength of the procurement procedure, is a way to reinforce the chances of being awarded the work, in the expectation of a renegotiation that can compensate the reduction in the bid. This result does not imply any conclusive judgement on the overall efficiency of the different procurement procedures, since it is not possible to conclude which procedure produces the best outcome for the contracting authority, in

terms of minimization of the total cost of construction. However, it makes clear that this outcome may not be completely guaranteed by the competitiveness of the award procedure, but it is also related to the monitoring in the works' implementation stage. Moreover, even if, in principle, there are rules, in the Italian law, that should prevent the opportunistic behaviour of firms, excluding the "too" low or "too" high bids, they seems to be not so much effective in terms of preventing renegotiations.[31] The procurement procedure does not exert significant effects on the delay.

Table 16 – Estimation results

Variable	(1)	(2)	(3)	(4)
	EXTRACOST	***EXTRACOST***	***DELAY***	***DELAY***
Constant	-0.319***	-0.332***	-440.609***	-456.517***
	(0.041)	(0.041)	(44.547)	(44.552)
Contractor selection mode				
OPEN	0.011**	0.014***	-1.966	1.014
	(0.005)	(0.005)	(5.388)	(5.398)
Work execution mode				
SUB	-0.009*	-0.009*	10.113*	9.722*
	(0.005)	(0.005)	(5.201)	(5.191)
DIS	0.031**	0.031**	60.887***	61.309***
	(0.013)	(0.013)	(14.311)	(14.286)
Complexity and specialization				
ED	0.048***	0.046***	-15.843***	-18.887***
	(0.003)	(0.003)	(3.464)	(3.492)
ETV	0.011***	0.011***	42.468***	42.919***
	(0.003)	(0.003)	(3.590)	(3.584)
WCI	0.000	-0.001	32.573***	30.272***
	(0.008)	(0.008)	(8.823)	(8.814)
Market characteristics				
CH		0.039***		53.726***
		(0.008)		(8.531)
INT	-0.008***	-0.008***	-35.917***	-35.840***
	(0.003)	(0.003)	(3.027)	(3.021)
P_BID	0.001	0.003	9.929***	12.833***
	(0.002)	(0.002)	(1.892)	(1.946)
LEAD	-0.002	-0.002	-3.045*	-3.150*
	(0.002)	(0.002)	(1.779)	(1.776)
Control factors				
NORTH	-0.018***	-0.017***	20.325***	21.553***
	(0.005)	(0.005)	(5.791)	(5.783)
CENTRE	-0.027***	-0.028***	11.146*	9.491
	(0.006)	(0.006)	(5.980)	(5.974)
Observations	9870	9870	9870	9870

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

As for the execution mode, the existence of sub contractors (SUB) seems to have significant positive effects on delays and negative effects on costs overrun. The positive effects were expected while the negative effects on costs overrun is less intuitive. A possible explanation is that, being sub-contractors directly chosen by

the contractor, the reputation factor is relevant for them in a long term perspective and, therefore, they have strong incentives to keep the costs low. The existence of legal disputes between the firm and the contracting authority (DIS), has the expected sign and exerts a positive impact on both the costs overrun and the delay, with the latter being much more marked and with a higher degree of significance than the former.

As expected, higher levels of complexity of the works, as measured by the estimated duration of the work (ED) and the estimated total value of the work by the contracting authority (ETV) affect positively the costs overrun for the plausible reason that they are associated to a higher degree of contractual incompleteness, greater uncertainty in the implementation and, consequently, wider opportunities for renegotiation. The other variable for complexity, the weighted composition index of the work, (WCI) does not affect in a significant way cost overruns.. As expected, the estimated total value of the work by the contracting authority (ETV) and the weighted composition index of the work, (WCI) are significant and exert positive effects on delays. The estimated duration of the work (ED) is significant with the expected negative sign.

Market conditions offers mixed results. Looking at the demand side, the variable for the CH conservation field (CH) has a significant and positive effect on cost overruns and delays, with the latter effect being more marked than the former, offering some support to the hypothesis that CH conservation "makes a difference" on the performance of public contracts. It seems that the search for quality, which is a peculiar feature of this field, as well as the major role of the experts tend to favour cost overruns and delays relatively to the overall public works contracts. Looking at the supply side, the variable representing the interaction between the firm and the purchasing authority, measured by the number of contracts awarded to each firm by the same purchasing authority (INT) is significant with a negative sign for both costs overrun and delays, though in the former case the size of its effect is negligible. The variables representing the number of potential bidders (P_BID) and the number of contracts awarded to the winning bidder (LEAD) do not have significant effects on costs overruns; instead, both of them are significant and with the expected sign as far as delays are concerned.

As for the control variables, results are mixed. As expected, contracting authorities operating in areas with relatively higher income per capita (NORTH and CENTRE) tend to be associated to lower costs overrun. Instead, the variable NORTH, though significant, has effects on delays of unexpected sign; the same occurs for the variable CENTRE which is not always significant.

On the grounds of the above results, since it appears that CH conservation "makes a difference" as far as the performance of public contracts is concerned, in what follows we shift our attention within this sector, to test for the determinants of the performance of CH conservation contracts.

4.3 Empiricale estimation -CH conservation sector

In this section we look only on CH public work contrcts. The sample employed in the following analysis consists of 604 CH conservation contracts, awarded and concluded in the period 2000-2005. Tables 17 shows the composition of this sample focusing upon the 4 categories included in this field and the main descriptive statistics. By far, the largest share of the CH conservation contracts falls in category OG2 Restoration and maintenance of built heritage; while the others categories (OG4 Underneath archaeology; OS2 Decorated surfaces and mobile heritage; OS25 Archaeological excavations) refer to a very small number of contracts.

Table 17 – Composition of the sample for CH conservation contracts

Sectors	Number of obs.	Total Amount	Mean	St. Dev.	Minimum amount	Maximum amount
OG2	*551.00*	*238,892.89*	*433.56*	*394.62*	*150.00*	*3,220.96*
OG4	*16.00*	*8,651.42*	*540.71*	*406.75*	*189.09*	*1,936.71*
OS2	*31.00*	*9,190.24*	*296.46*	*223.15*	*159.34*	*1,321.63*
OS25	*6.00*	*1,671.64*	*278.61*	*114.45*	*165.27*	*433.82*
Cultural heritage	**604.00**	**258,406.20**	**427.82**	**388.07**	**150.00**	**3,220.96**

Source: our elaboration on data provided by *Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture*
Note: monetary values in thousands of euros at current price

Again, the ratio of the costs overrun to the value of the winning bid (EXTRACOST) and the ratio of the delay to the expected length of the contract (DELAY) are used as dependent variable, respectively, to represent costs overrun and delays of CH conservation contracts.

As far as independent variables are concerned, all the variables are the same as before, but for CH; since the analysis is carried out within the CH conservation sector, we do not need anymore the variable CH. Instead, we add two new variables to investigate the relation between the specialization of the contracting authority and the performance of CH contracts. As it was pointed out in section 2, central government is a very specialized contracting authority. Its activity is concentrated on CH, to issue regulation and to carry out conservation; in other words, CH conservation can be considered a "core business" while for municipalities (as well as for the other contracting authorities operating in the field) CH conservation is just one the several fields of activity. Central government operates mainly through specialized heritage authorities (Soprintendenze) run by

experts, who are likely to be very much interested in the quality of the conservation since they gain prestige and reputation among their peers. We would expect, therefore, that the objective function of this highly specialized contracting authority, when compared with the others, affects the performance of the contract: costs overruns are likely to be more accepted in the light of the search for quality but, on the other hand, to maximize prestige and reputation among the peers, the completion of the contract is relatively more important. To test for the role of specialization of the contracting authority we use two variables: SOPRINTENDENZA and IN_HOUSE_PROJ. The former is a dummy variable indicating that the contracting authority is a specialized one; the latter represents the percentage of in-house projects, as an indicator of the specialization of the contracting authority. In both cases, on the grounds of the above considerations, we would expect a positive effect on costs overrun and a negative one on delays. The summary statistics for the variables are reported in table 18.

The results from the regression described are displayed in Table 19. Columns 1-3 refer to the dependent variable EXTRACOST while columns 4-6 refer to DELAY. Columns 1 and 3 report the general model, in the others the specialization variable is added; in columns 2 and 4 such a variable is expressed by SOPRINTENDENZA while in columns 3 and 6 it is expressed by IN_HOUSE_PROJ.

Table 18 – Descriptive statistics of the variables employed

Variable	Obs	Mean	Std. Dev.	Min	Max
EXTRACOST	604	0.12	0.15	0.00	1.80
DELAY	604	0.67	0.92	0.00	8.15
Contractor selection mode					
OPEN	604	0.66	0.47	0.00	1.00
Work execution mode					
SUB	604	0.77	0.42	0.00	1.00
DIS	604	0.02	0.15	0.00	1.00
Complexity and specialization					
ED	604	267.21	145.86	19.00	907.00
ETV	604	427,824.80	388,396.10	150,000.00	3,220,961.00
WCI	604	1.25	0.41	1.00	3.70
Market characteristics					
INT	604	2.41	3.39	1.00	30.00
P_BID	604	687.17	217.53	31.00	899.00
LEAD	604	21.45	52.67	1.00	136.00
SOPRINTENDENZA	604	0.18	0.38	0.00	1.00
IN_HOUSE_PROJ	604	0.48	0.50	0.00	1.00

Control factors					
NORTH	604	0.33	0.47	0.00	1.00
CENTRE	604	0.50	0.50	0.00	1.00

Table 19 – Estimation results -CH conservation contracts

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	EXTRACOST	***EXTRACOST***	***EXTRACOST***	***DELAY***	***DELAY***	***DELAY***
Constant	-0.262	-0.277	-0.274	-925.965***	-907.175***	-896.662***
	(0.174)	(0.174)	(0.173)	(206.524)	(205.961)	(203.860)
Contractor selection mode						
OPEN	0.011	0.020	0.013	8.952	-3.425	4.265
	(0.016)	(0.017)	(0.016)	(19.245)	(20.206)	(19.033)
Work execution mode						
SUB	-0.003	0.002	0.002	45.387**	38.977*	35.343*
	(0.018)	(0.018)	(0.018)	(21.459)	(21.647)	(21.302)
DIS	-0.023	-0.020	-0.023	22.376	19.564	23.597
	(0.045)	(0.045)	(0.045)	(52.151)	(52.009)	(51.424)
Complexity and specialization						
ED	0.076***	0.071***	0.075***	-10.557	-5.000	-8.933
	(0.015)	(0.015)	(0.015)	(17.625)	(17.802)	(17.417)
ETV	0.011	0.012	0.010	50.639***	49.569***	53.169***
	(0.014)	(0.014)	(0.014)	(16.018)	(15.978)	(15.824)
WCI	0.015	0.019	0.016	18.039	12.991	16.685
	(0.028)	(0.028)	(0.028)	(32.367)	(32.356)	(31.939)
Market characteristics						
INT	0.007	0.006	0.003	-37.618***	-36.263***	-29.768**
	(0.011)	(0.011)	(0.011)	(12.732)	(12.708)	(12.711)
LEAD	-0.026**	-0.025**	-0.024**	67.232***	65.678***	63.377***
	(0.012)	(0.012)	(0.012)	(14.706)	(14.653)	(14.516)
P_BID	-0.008	-0.007	-0.007	-14.902**	-15.739**	-16.577**
	(0.006)	(0.006)	(0.006)	(7.083)	(7.074)	(7.003)
SOPRINTENDENZA		0.037*			-47.756*	
		(0.021)			(24.675)	
IN_HOUSE_PROJ			0.034** (0.014)			-72.288*** (16.465)
Other control factors						
NORTH	0.010	0.015	0.014	18.746	13.428	9.791
	(0.022)	(0.022)	(0.022)	(26.223)	(26.302)	(25.959)
CENTRE	-0.010	-0.009	-0.010	44.717*	43.889*	44.132*
	(0.020)	(0.020)	(0.020)	(23.953)	(23.916)	(23.654)
Control for year of award	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	*604*	*604*	*604*	*604*	*604*	*604*

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

The determinants of performance of CH contracts are very similar to those of the more general case of public works though, not surprisingly, some independent variables loose significance because of the narrower scope of the investigation. Also in this case the independent variables behave in a different way with respect to EXTRACOST and DELAY.

The procurement procedure (OPEN) does not exert significant effects on both the dependent variables, a possible explanation being that, as it was pointed out in section 2, in the CH conservation field there is more room for restricted procedures.

As for the execution mode, only the existence of sub contractors (SUB) maintains its significance and its positive effects on delays. The complexity of the works, as measured by the estimated duration of the work (ED) maintains its significance and its positive effects on costs overrun. The other variable for complexity, the estimated total value of the work by the contracting authority (ETV) maintains its significance and its positive effects only on delays. The other variable for complexity, the weighted composition index of the work, (WCI) is not significant.

Market conditions offers mixed results. Looking at the demand side, The variables representing the specialization of the contracting authority, SOPRINTENDENZA and IN_HOUSE_PROJ are both significant and with the expected sign. The size of the coefficients would suggest that the expertise of a specialized contracting authority, compared with the others, exert a greater effect on reducing delays, coherently with the objective function described above. The attention for delays is somehow supported by the result scored by the variables representing the interaction between the firm and the purchasing authority, (INT) and the number of contracts awarded to the winning bidder (LEAD) which are significant with the expected negative sign only for delays. The results scored by the variable representing the number of potential bidders (P_BID) are mixed: it is significant, with the expected positive sign for delays while it has a counterintuitive negative sign with respect to costs overruns.

As for the control variables, results are almost always not significant or of unexpected sign.

The above analysis seems to show that, though most of the determinants of CH conservation contracts performance are very similar to the more general public works field, a relevant role is plaid by the specialization of the contracting authority. Our results seem to confirm that the search for quality and the expertise characterizing the CH field affect the performance of CH contracts paying more attention to completion of the contract than to the control of the final cost.

5. CONCLUDING REMARKS

This paper lies at the intersection of two streams of literature: on one hand, the political economy analysis of decision-making process underlying CH conservation and, on the other hand, the economic analysis of procurement. At the best of our knowledge, there are not similar studies in the literature and this paper can be considered as a first attempt to investigate the economic features of CH conservation contracts. The paper tries to address the question whether the search for quality and the major role plaid by the experts in the heritage field affects the performance of CH conservation contracts.

The results of the empirical analysis show that CH conservation, when compared with the general public works sector, "makes a difference" as far as the performance of public contracts is concerned, favouring costs overrun and delays; it seems that the search for quality, which is a peculiar feature of the heritage field, as well as the major role of the experts, tend to favour costs overrun and delays relatively to the overall public works contracts. When the analysis of the determinants of performance of CH contracts is carried out within the CH conservation sector, results show that, ceteris paribus, the search for quality and the expertise characterizing the heritage field affect the performance of CH contracts; specialized contracting authorities seem to pay more attention to the completion of the contract than to the control of the final cost.

One explanation of the results is that the specialized contracting authorities, such as Soprintendenze, tend to maximize reputation among the peers and that, coherently with this objective function, their efforts are mainly allocated toward the completion of the works, with less attention to the control of costs.

Our results, far from being conclusive, offer some insights on the main economic features of the CH contracts and on their performance. The available data do not allow for measuring the quality dimension of these contracts; however, a tentative suggestion coming from the analysis is that, to improve the performance of CH contracts, the adoption of standards of conservation should be taken into account. Indeed, our results suggest to look for some form of benchmarking of best practices to orientate practitioners and professionals in the heritage field and to reduce the asymmetrical information enjoyed by contracting authorities. Though standards are highly criticized in this field, they could offer a solution for a better control of the final cost of CH contracts which, according with our results, is called for.

NOTES

1. Use as well as non use values (such as option, bequest, and existence values) are usually put forward. It is claimed that CH produces social benefits because it strengthens social identity and promotes creativity (Frey, 2003).
2. The non monetary intervention, e.g. regulation, is explored by Rizzo (2010).
3. The concept of 'conservation' is explored below.
4. Data on the public spending for culture in general are provided by OECD (2006) and Klamer, Mignosa and Petrova (2006).
5. For instance, see the Canadian Federal Heritage Buildings Review Office (1996).
6. *Ibidem*.
7. In this paper no attention is paid to indirect public spending, namely tax expenditures, since they raise different economic problems. On this issue, see Schuster (2006).
8. The various means of public intervention in the CH field are described in Diagram 1.
9. A closer analysis of the Authority is provided by Rizzo (2008).
10. According to the estimates of the Autorità di vigilanza sui contratti pubblici di lavori, servizi e forniture, almost 64% refers to "restoration" while the others are classified as "maintenance" (24%), "new intervention" (8%) and "others" (5%).
11. Indeed, there might be an underestimation of the overall public demand for CH conservation for two reasons. On one hand, the figures refer to the final stage of the tender, e.g. when the winner is chosen, while the number of the tenders just issued might be higher (but data are not available); on the other hand, the above figures are based on the data which each contracting authority has communicated to the Authority while it is likely that some of them do not fulfill the obligation on time.
12. The average size for the public works in general is 931,705 euros.
13. The 49.39% of the overall public works contracts are awarded by municipalities and 6.14 by central government.
14. Provveditorati are central government contracting authorities operating at interregional level on behalf of other public bodies.
15. Table 4 reports a small difference in the overall number of contracts, 4.252 instead of 4.997 since the information regarding the in-house project was not available for all the observations.
16. Restricted procedures are mainly concentrated in the contracts between 150,000 and 500,000 euros.
17. Qualification is costly for the firms; a payment is due for each category and class which are obtained. The system is run by private companies (Società Organismo di Attestazione – SOA); they evaluate whether each firm is entitled or not to obtain the required qualification.

18. There are 13 general categories, so called OG (such as roads, restoration and maintenance of built heritage, dams, underneath works of arts, railways, etc.) and 34 specialized categories, so called OS (such as, decorated surfaces and mobile heritage, archaeological excavations, telecommunications infrastructures, landscape, etc.).
19. There are 8 classes ranging from 258,228 up to 15,493,708 euros.
20. These shares are higher if calculated within the general and the specialized sectors.
21. A similar pattern holds for overall set of qualified firms.
22. More formally, if S_{ij} is the i-th category and W_{ij} is the relative import W of the public work *j-th*
then: $CI_j = \sum S_{ij}$; $WCI_j = \sum S_{ij}^{ii}$; $ii \sum W_j$ $SI_j = \sum w^2_{ij} / (\sum w_{ij})^2$
23. Bajari and Lewis (2009) underline its relevance for social welfare.
24. See above, par. 3.1.
25. The sample was selected on the basis of the completeness of the records included in the data base. To limit the heterogeneity, the public works above 5 millions euros were not included in the sample because of the longer time lag required to complete complex works. Moreover, public works with a final cost lower than the contract cost were not taken into account because of the lack of adequate information.
26. More formally, if B_h is the value of the winning bid for a public work h, FC_h is the final cost and AC_h is the adaptation cost of the same public work, thus $FC_h = B_h + AC_h$. We define normalized adaptation cost as $NAC_h = {}^h AC_h / B_h$ which is clearly independent of the economic dimension of a public work.
27. We can similarly define normalized adaptation time as $NAT_h = AT_h / T_h$ where T_h is the time contractually agreed for the completion of a public work h and AT_h is the adaptation time
28. This is the engineering estimate which is used to issue the tender.
29. Public works are articulated in sub-categories, i.e. the different components of the overall work, which contribute, according with their relative relevance, to the estimated total value. It is plausible to assume that the more complex is a public work the higher is the number complexity of sub-categories involved in its implementation.
30. Per capita income is lower in the South than in the North area and in the Centre.
31. A system for evaluating the bids based on the notion of standard cost might be more effective in preventing underbidding because it might reduce the asymmetrical information of the contracting authority.

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