

**REPUTATION-BASED GOVERNANCE OF PUBLIC  
WORKS**

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**ABSTRACT**

*I propose a governance model of public works that relies on an Internet-based “reputation system”. Reputation-based governance of public works is an application of a broader reputation-based governance model, and it inherits its general implications. In particular, it allows for the routine production of statistics that are useful for monitoring purposes, and it provides a coherent framework to limit rent-seeking and corruption. [JEL Classification: H430, H830, C800, H540]*

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## 1. INTRODUCTION

Between 1995 and 2000, 43.3% of the construction projects carried out by the private sector in Northern California were awarded through private negotiations, and the rest using some form of bidding. In the same period, public administrations in Northern California used private negotiations only in 1% of the cases. Even when the private sector used bidding, a remarkable difference occurred: public administrations almost always chose open bidding, while the private sector more often opted for bidding upon the invitation of participants<sup>2</sup>.

Such a striking difference is easily explained: while the private sector is free to choose the award system of choice, public procurement is typically constrained by a panoply of rules whose main purpose is to avoid abuses by public officials or, more to the point, corruption (see Kelman, 2002; Rose-Ackerman, 1999, pp. 59-68). The public sector, with few exceptions, is forced to choose (open) bidding. In the United States, for example, the Federal Acquisition Rules strongly limit the use of awarding methods not characterized by “full and open competition”<sup>3</sup>. Full and open competition has much to commend it, because it places the buyer in the best position to exploit the competitive forces of the market in order to obtain the best deal. Limiting competition, by using invited bidding, where the buyer identifies the participating firms or, even more so, private negotiations, would seem to be illogical, because it would weed out of the selection process firms that are potentially more efficient than the chosen ones.

The construction data example here provided, however, by showing that the private sector only rarely uses auctions to solve its procurement needs, suggests that open bidding has its downsides. The benefits of competition may be less important when the object of procurement is complex, so that it is impossible to fully specify within a contract all the possible contingencies. In those cases, contractual flexibility allows both the buyer, and the seller, to better deal with unforeseen occurrences. Moreover, and most importantly,

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<sup>2</sup> See Bajari et al, 2003. The source of the data that they consider, consisting of about 25600 projects, is the Construction Market Data Group.

<sup>3</sup> U.S. Government, 2005; see also Wilson, 1989, pp. 120-122, citing Kelman, 1990, and describing the situation before the reform of the 1990's, on which I'll return.

when the good to be delivered is not a commodity, the buyer benefits from the seller's reputation, signaling his ability to deliver high quality goods, and committing him to do so.

Current legislature on public procurement, certainly motivated by commendable reasons, constrains bureaucrats and distorts their choices of procurement methods. Such a distortion has a series of negative consequences, whose seriousness is directly related to the degree of complexity of the procurement needs. First, in situations where the outcome of their work presents a substantial degree of uncertainty, firms facing a completely predetermined contract may ask a higher price as a way to insure themselves against the risk of cost overruns. Secondly, the products delivered may be worse. A fixed contract may force the firm to take actions that could have been optimal ex-ante, before production started, but that would be optimally revised once the production process reveals information previously unknown. True, changes within an open bid setup are possible, as with the so-called "change orders" in the US construction industry. However, changes require a renegotiation of the original stipulations, they are costly to obtain and often are the source of acrimony between the parties involved.

Thirdly, in most private negotiations, reputation considerations play a prominent role, the more important, the greater the difference between the object of procurement with respect to the idealtypical commodity. In open bidding, the reputation of the participating firms matters at best indirectly (for example, through their ability to find the necessary financial guarantees, whenever these are a preconditions for participating to an open bid). Excluding bidders from a selection procedure because they have a bad performance record, even when possible, typically happens infrequently.

Such a lack of concern with respect to reputation considerations has a series of negative effects. It provides the firm with weaker incentives to behave virtuously, because opportunistic behaviours are less likely to be punished by a vindictive administration. Moreover, it weakens market discipline, because contract awards may be given to firms that produce low quality products, but that have successfully specialized in the writing of impeccable tender proposals. On the administration's side, besides provoking an over-regulation of procurement, it puts an emphasis on the drawing of overdetailed "technical specifications" – see the "cookie specs" example offered in Kelman S. (2002), referring to how the U.S. military had gone to great lengths to specify the cookies that it deemed fit for its troops. The emphasis on the

minute description of the goods and services to be procured has organizational implications for the administration, whose focus on the writing of specs is at the expense of the resources, and skills, that are needed for the management of the contract following its adjudication.

In this paper I propose a novel “reputation-based governance” of public works that not only represents a radical departure from traditional reputation-free procurement, but that also significantly innovates with respect to the experience of the United States where, as I will discuss, in the 1990s reputation considerations were introduced within open bidding procedures. Reputation-based governance is based on a full-fledged Internet-based reputation system, akin to other information systems that have already been experimented in different contexts, and it represents a comprehensive approach to governance problems, having a series of important system-wide consequences. Among these, reputation-based governance has an impact on the production of statistical information related to public works, and it represents a coherent framework to fight rent-seeking activities and corruption<sup>4</sup>.

The paper is structured as follows. The next section defines an Internet-based reputation system. Section 3 and 4 describe and discuss the proposed method of governance of public works. Section 5 briefly illustrates the U.S. public procurement reform of the 1990s, in order to compare it with the present proposal. Section 6 and 7 treat two important implications of reputation-based governance. The conclusions follow.

## **2. INTERNET-BASED REPUTATION SYSTEMS**

Word of mouth has always been an essential instrument for spreading information (and often rumors) about the quality and reputation of a supplier, or the trustworthiness of a prospective buyer. We tend to go to restaurants that our friends suggested, and we’d rather entertain business relations with people that have a reputation for being honest. Since such an attitude is fairly

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<sup>4</sup> The interested reader can find more information on the general concept of reputation-based governance, and on its implications, in Picci (2006).

generalized, economic actors benefit from having a good reputation, and this provides a strong incentive for virtuous behavior<sup>5</sup>.

With respect to this simple story, the Internet innovates in two ways. First, it allows exchanges to be completely impersonal. Unlike in a town where shops have their clientele, in a globalized electronic market the probability that a seller meets twice the same buyer is low. Where contracts are either incomplete, or hard to enforce, such an inherent impersonality would seem to preclude the possibility of repeated exchanges and the emergence of trust. In a world where everyone has a short term incentive to cheat, everyone expects cheating and, as a result, there occur very few business interactions. In extreme cases, the market is simply not viable.

However, the Internet is a powerful tool to spread traditional “word of mouth” to unprecedented levels, so that, even if repeated interactions are rare, prospective buyers and sellers can learn about their business partners from other people who already interacted with them. At least in principle, this allows for the development of the beneficial effects of reputation at a much larger scale than in a traditional context. Recently there has been interest towards “Internet-based reputation systems” (IBRS) that, as Dellarocas (2003) notes, amount to the “digitalization of word of mouth”. An Internet-based reputation system is defined by a set of characteristics, that I describe while reporting how they map into what probably is their best known example, the eBay auction electronic market<sup>6</sup>.

First, an IBRS provides an information infrastructure that allows for a set of transactions to take place. In eBay, sellers can post information on their products. Prospective buyers access the information and place their bids on the products that they desire. The system records the bids and manages the needed interactions between sellers and buyers. A noteworthy characteristic of eBay is

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<sup>5</sup> The concept of reputation (and of trust) can be considered using two alternative sets of game theoretic tools. Reputation can be seen as emerging according to the Folk Theorem: in an infinitely repeated game, players may prefer the long-run benefit of not cheating, to the short-run advantage of cheating. Also, reputation can be considered within a bayesian game context, where the quality of a player is not immediately evident to others. See Cabral, 2005, for details and for a formal definition of concepts.

<sup>6</sup> eBay is also the most widely studied example of a reputation system. Reisnick et al. (2002) cite 14 empirical studies on eBay. See also Cabral and Hortaçsu (2006).

that the transactions that it allows are not backed up by formal contractual guarantees, so that in principle there is ample space for cheating, in the form of not paying for a delivered good, of paying late, of delivering merchandise that does not correspond to the published specifications, etc.. Second, an IBRS allows the interested parties to record in a highly structured manner their assessments of the transaction. On eBay, both sellers and buyers can voluntarily rate each other, with marks that can be “positive”, “negative”, or “neutral”, while other existing IBRSs allow for greater granularity of ratings. Third, some function(s) of the opinions expressed are made public. On eBay, it is the sum of negative, positive and neutral ratings received by each buyer/seller during the past six months. Such a filtering of information is provided by the “feedback mediator”, and the resulting publicly available data is descriptive of the reputation of each agent.

Last, an incentive system is in place prizing a good reputation and punishing a bad one. On eBay, people are wary of conducting business with agents who performed badly in the past. The desired outcome of such a system is one where players have an incentive to behave well in order to build and to maintain a good reputation. When such an outcome is obtained, we expect people to be well behaved: the most effective punishments are the ones that are feared, and that as such are rarely needed and, hence, observed<sup>7</sup>.

To summarize, the availability of the Internet offers the potential to drastically renovate the time honored institution of word of mouth. First, it brings it to a huge scale: reported opinions spread vastly and instantaneously. Secondly, it democratizes it, because the assessments are accessible to everyone, and not just to the people who are well placed within an organization or an informal social network. Thirdly, Internet-based reputation systems are not simply the result of social interaction as they manifest themselves, but they can be suitably engineered. Ongoing research is trying to better understand how various characteristics of reputation-systems – their general rules, the way feedback mediators are designed, the required costs to participate or to change one’s identity, etc. – influence the equilibrium outcome.

Reputation systems also have shortcomings. The information that they collect is decontextualized. Unlike in a traditional setting, it is not possible to extrapolate information from the non-verbal aspects of communication: for example, if a

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<sup>7</sup> This is the observed outcome on eBay, where less than 1% of the reported comments are negative. See Dellarocas (2003)

prospective business partner is maligned by someone who's dressed like Napoleon, such an opinion may as well be discounted. On the other hand, all non-verbal information is lost on the Internet. The availability and truthfulness of reported opinions also represents a thorny issue. Ratings are a public good and, as such, we'd expect their underprovision. Also, there could be manipulation of personal assessments, following strategic behaviors and, possibly, collusive practices, for example in situations where actors exchange good ratings, either in-kind or for money. In the context of the proposed application, I address some of these issues below.

### **3. REPUTATION-BASED GOVERNANCE OF PUBLIC WORKS**

I here discuss how the concept of IBRS can be used to shape a comprehensive governance model of public works. The purpose of public works is to add to the stock of infrastructure available to an economy, or to provide for its maintenance. Most infrastructure are public, but we are witnessing a shift towards their private provision. Moreover, private financing and management of pieces of infrastructure have become more popular, the English Channel Tunnel being a representative example of such a trend. While such a shift is an interesting (and well studied) topic of research, it is on the *public* provision of public works that I focus.

At the basis of the proposed governance model there is a taxonomy of possible projects. For example, and limiting our attention to the construction of new pieces of infrastructure, public works can be "roads", "bridges", "buildings", etc. Within each type of good, there are further sub-classes: Buildings may be schools, police headquarters, and so forth. All projects are included in a database, that can be accessed (via a Web-based application) by public administrators, by firms, and by the public. Upon approval, the public administration inserts each project into the database. Preliminary information about a project would include its general description according to the codified taxonomy (type of good, location, expected cost, etc.), technical drawings, and a set of data pertaining to any documentation that may accompany the early stages of the project (such as an environmental impact and a cost-benefit analysis). As the project evolves, more information is provided, eventually to include details on costs and information on the final outcome, comprising, for instance, pictures of the completed works. Each project is associated with the administration

and with the contracting firms that are responsible for its execution. In particular, the responsibilities of the contracting firms are recorded, and the information system keeps track of all the projects that each administration and each firm have done. Summary views of the past record of individual administrations and firms should be easily accessible.

To summarize, reputation-based governance of public works rests on the availability of an information system that allows for a careful definition of the types of goods and of their characteristics, and that, through a set of suitable procedures, permits the storing and the publication, via the Web, of data on projects, on administrations and on firms.

Projects outcomes are assessed by a set of relevant actors, who are allowed to express their opinions on given characteristics of the finished works. Public administrators in charge of a project express their opinion on the quality of the work carried out by the contracting firms. Firms assess how the public administration managed a given project, and the public judges the public works that affect them. For example, a school would be assessed by the local community where it is built, by its personell, and possibly by its students. A local road would be judged by the people who live in its proximity, while a freeway could be assessed by residents of a vaster area. Such opinions, that we call “voice activities”, would be highly structured, and would refer to a small set of well defined characteristics. For example, the public could judge “aesthetic qualities”, “usefulness” and “accessibility” of public works. Such assessments would be posted through a Web application where, after identification, the relevant actors are presented with a menu of possibile actions.

These digitalized information would allow for the provision of a series of automatically generated summary statistics. Such method of producing statistics in itself represents a novelty with respect to current practices, a topic on which I will return. When all the relevant information on public works are contained in a digital repository, computing summary statistics of interest does not require any *ad hoc* data gathering and processing, because it can be done in an “integrated” fashion by producing a “view” of the available data. The statistics produced in this fashion would include a comprehensive set of summary information on the public works: their general characteristics, the unit costs of projects of the same type (for example, of a km of road of a given category) and their completion time. They would moreover express the overall assessment by the public. Also, the availability of information on

many projects would allow for the computation of rankings of individual projects on several dimensions. Summary statistics would be available also for various subsets of the data, providing views by geographic unit, by type of administration, and by contracting firm. The assessments on the quality of completed public works would reverberate to administrations, administrators, and firms. The reputation of all these actors would be a function of the assessments that their past projects received.

The system could supply information at two levels. First of all, it would provide highly usable and easy-to-read summaries, using only very simple descriptive statistical concepts. A further level would include more detailed information and would use more sophisticated tools of analysis. The interested person, depending on her time and needs, in order to examine a single project could choose a quick tour, or could opt for a more in-depth analysis. One particular designing issue has to do with the “feedback mediator”. Some existing systems limit the visibility of past assessments to the more recent ones: on eBay, only the last six months of past transactions are visible, while in the United States, a case study that I’ll discuss in Section 5, it is the contracts that are less than 3 years old that are made to matter. In general, the design of the feedback mediator is a critical aspect of reputation-based governance, and as such it should be carefully crafted, possibly allowing for a trial-and-error approach.

Reputation-based governance of public works would establish a number of incentives and of disincentives. Through the feedback mediator, the general public could access various rankings of completed public works, of the administrations who carried them out, of the administrators involved, and of the contracting firms. By itself, this would put a premium on honest and efficient behaviour, considering that such information would influence electoral choices. Also, public administrators would be pressured not to be looked down by their peers. To the extent that reputation matters within the source selection process, firms would also be obviously interested in having good ratings. Moreover, if a firm is active in both the public and in the private sector, a good reputation in the former would be expendable in the latter. Such effects could then be made more cogent by deliberate publicity initiatives, such as the publishing in newspapers of the “ten best (worst) projects” of the year. The media also would play a role in providing incentives, since journalists could access a very powerful tool to obtain information on public works, to be used to expose both worst and best practices.

Moreover, and most importantly, reputation considerations could be employed within source selection procedures, as it happens today in the United States (see Section 5). Note however that reputation-based governance of public works, thanks to its strong incentives, would make more attractive an allocation mechanism based on off-the-shelf purchases, instead than on competitive biddings, an evolution of procurement systems already hinted at in Rose-Ackerman (2004).

#### 4. DISCUSSION

Voice activities carried out by the general public raise the problem of who should be allowed to participate. In principle, private citizens and organized private entities could be entitled to assess projects' outcomes. Private citizens could register on a Web site, and then voice their opinions on all works carried out in their proximity. On the other hand, everyone could be entitled to express an opinion on a piece of a major network infrastructures. Participation to voice activities by citizens' organizations presents some problems. It is not immediately clear how the assessments of organized entities should be weighted – possibly according to the size of their membership, but this would establish an incentive to artificially inflate them. Also, compared to individuals, organizations would be more prone to engage in colluding behaviors.

Collusion and the presence of political scheming, in fact, is a general concern for the working of the voice system. Political parties could encourage their activists to express positive opinions on projects that they sponsor, and to smear projects within the jurisdiction of political adversaries. They could encourage the formation of *ad hoc* organizations for this purpose, possibly leveraging on fake membership by party activists. Enterprises, also, could encourage the formation of organizations to support their projects and to discredit their competitors.

Several answers to these objections are possible. First, the capability of creating some form of consensus on a given public work would somehow reflect its worth. In a context where barriers for entering the voice system are very low, whoever is able to organize consensus on a given project, no matter how that is done, is implicitly showing that, at least to some extent, that consensus is warranted. More importantly, a set of cautionary measures could be

taken to limit scheming and collusion. For example, citizens' organizations could be required to post their budget sheets and to declare the origin of any contributions that they receive. Their members could be required to register within the system, and to declare any link that they may have with firms or administrations.

An altogether different route would be to allow only individual participation to voice activities. The proposed information system is also a tool to reduce transaction costs of various kinds, and to the extent that organizations are instruments to counter transaction costs, they would be less needed than before. True, the proposed system would also lower the costs of carrying out watchdog activities, and this would instead put an incentive favoring the formation of citizens' organizations. Again, the fine tuning of the system would require flexibility and experimentation.

I have already mentioned the possibility of collusion among public administrators and firms. The public also could collude both with administrations and with firms. Public works are localized goods and sometimes are supplied as part of a patronage relation between politicians and their clients or, more crudely, they are a manifestation of "pork barrel". Up to a point, people benefit from local public works regardless of their quality. For example, an expensive and poorly built school may be a failure from the point of view of a "social planner", but it may still be preferable, both to parents of students and to the home owners who benefit from any increase in real estate valuations, than a good school located in a different neighborhood. For these reasons, administrations, firms and local constituencies could team up to support policies that provide themselves a common benefit, regardless of its social cost.

The possibility of collusion among inefficient and possibly dishonest administrations, firms, and local constituencies who, in exchange for political support to their patrons, cynically appreciate any "pork" that they may get, should be an obvious motive of concern. However, countermeasures can be adopted. First, the information systems would routinely produce statistics on standardized costs. They should be computed and read with care, because the costs of comparable tracts of roads, for example, are influenced, among other factors, by the local cost of labor and by the nature of the terrain. However, the more information accrue into the system, the higher is the sophistication that can be achieved. For example, standadized costs could be computed adopting a conditional expectation model, where several variables affecting production costs are controlled for (for an application, see Golden and Picci, 2005).

The availability of standardized costs could allow for a smart targeting of auditing activities by a dedicated agency. A rule could determine that the probability for an administration of being audited depends both on the cost of the project, relative to what standardized costs would dictate, and on the ratings that it received. Such a “probabilistic auditing rule” would temperate the incentives that local actors may have to team up in order to facilitate the grabbing for themselves of a disproportionate amount of resources. Other characteristics of reputation-based governance would play favorably in this respect. The information systems allows for the computation of very detailed geographic statistics showing the effects of distributive decisions. In such a highly transparent context, it would be relatively difficult to sustain pork barrel expenditures, that to some extent are grounded in secrecy – both of the outcomes, whenever detailed and timely geographic information on the allocation of resources are scarce, and of the political process, given that resources are often distributed by parliamentary committees, where log-rolling practices favor the creation of vast majorities<sup>8</sup>.

Last, local projects could be audited from the outside. Besides formal auditing by a central authority, possibly following a probabilistic auditing rule, the public also could be involved in the assessments of public works that are located in different communities.

## **5. CONTRACTOR PERFORMANCE IN THE UNITED STATES**

In the 1990’s the United States embarked in a sweeping reform of federal public procurement, a part of the then Vice-President Al Gore “reinventing government” initiative. The most relevant changes occurred under the guidance of Steven Kelman, Professor at the Kennedy School of Government who, from 1993 until 1997, served as the Administrator of the Office of Federal Procurement Policy (OFPP). That reform mostly affected what Steven Kelman refers to as “the first two legs of contracting management”, namely, business strategy management and source selection, and “largely

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<sup>8</sup> This is the case in the United States, where pork barrel is often wrapped in *omnibus legislation* that attracts support from both sides of the aisle. See Golden and Picci, 2006b for more details and for references to the literature.

ignored the “third leg”, or contract administration (Kelman, 2002). The purpose of the brief account that follows is to allow for a comparison of that experience with the present proposal.

While the collection and use of past performance information had been around for a long time in the United States, such use has been strongly increased by a series of decisions, started by the OFPP Policy Letter No. 92-5 (30 December 1992), requiring all agencies to prepare past performance evaluations for new contracts and to use past performance information as an evaluation factor in awarding contracts. The whole process of reform was marked by two pieces of legislation, the Federal Acquisition Streamlining Act (FASA) in 1994 and the Federal Acquisition Reform Act in 1995. The changes that have occurred during the 90’s have brought about a situation where reputation considerations have entered the computation of the relative merits of an offer, and contribute to the final decision, together with quality and price, for all contracts exceeding US\$ 100,000.

The Federal Acquisition Streamlining Act (FASA), dated October 13, 1994, “codified the requirements to consider past performance in making awards. It required the Administrator to provide guidance for using past performance. Federal Acquisition Circular 90-26 (dated April 4, 1995) implemented the OFPP and FASA requirements into the FAR” (Office for Government-wide Policy, 1997). Currently, the Federal Acquisition Rules treats with reputation issues in Part 9.104, Part 15.608 and Part 42.1501. In particular, the 1998 rewrite of Part 15 of FAR, dealing with source selection procedures for large buys, requires past performance to be one of two mandatory evaluation factors, where cost/price is the other, for all competitively negotiated acquisitions exceeding established thresholds. The extent and quality of an offeror’s past performance is assessed by the source selection authority, using reviews of past projects carried out by a given firm, eventually complemented by other indicators of past performance that may also originate from the private sector.

Of paramount importance are the opinions expressed by public administrators on the quality of work carried out by their contractors. Such opinions are kept on file for three years and form the bulk of evidence on the reputation of firms. Of key relevance, considering also the legal implications that a negative assessment may have, is the procedure that dictates how a public administration is to judge a contractor. The assessment is on four separate dimensions:

- Quality of performance – as defined in contract standards.
- Cost performance – how close to estimates.
- Schedule performance – timeliness of completion of interim and final milestones.
- Business relations – history of professional behavior and overall business-like concern for the interests of the customer, including timely completion of all the administrative requirements and customer satisfaction.

(Office of Federal Procurement Policy, 2000).

Evaluations on this four dimensions are in terms of numeric scores from 0 to 5. Within a codified process, the firm has ample space for voicing its rebuttals to the administration. The relevant official documentation places much emphasis on the right that the firm has to know beforehand how its performance is to be evaluated, and on the continuous communication between the administration and the firm. The shortening of the traditional arm's length distance between the administration and the contractor was in fact one of the goals of the reform, that aimed to transform a relation that was often acrimonious, into one among "partners". Such result has been sought for in part by emphasizing the responsibilities of the contracting official, and correspondingly by giving her more freedom of movement, as is evident, for example, from the concomitant introduction of credit cards for all purchases below the US\$ 2500 mark (Kelman, 2002).

A relevant role in assuring that evaluations are not a mere formality is played by the existence of the Federal Torts Claims Act, protecting the evaluating official "from personal liability for common law torts. In those instances, if an agency official were sued, upon certification by the Attorney General, the official would be dismissed from the lawsuit and the United States would be substituted as the defendant" (Office of Federal Procurement Policy, 2000). Another important characteristic of the evaluations is that they are not made public, being accessible only to those public officials who, for the purpose of source selection, need to assess a firm's reputation.

The relatively long experience with the system shows that firms take their reputation scores very seriously, knowing that a bad reputation would damage their future prospects of being awarded new contracts. This constitutes basic evidence that the system works, in the sense that reputation considerations represent relevant incentives. However, past experience has also raised concerns on

the possibility of strategically manipulating the system. For a list of critical issues, see Petrillo (2005).

There are obvious similarities between the U.S. experience and the present model of reputation-based governance of public works. Both provide an institutional framework for the reputation of the contracting firm to arise and to be used within the source selection process. Also, the U.S. experience makes ample use of the Internet. Several administrations have developed their Internet-based information systems to record firms' assessments, and the most popular of them, the Contractor Performance System run by the National Institute of Health (<http://cps.od.nih.gov>), is adopted by several administrations. This system, together with the ones that are run by the National Aeronautics and Space Administration and by the Department of Defense, have teamed up within the "Past Performance Information Retrieval System" (PPIRS) program to exchange reputation information. The resulting integrated system has been available since 2002. Such an emerging integrated information system, in fact, represents a portion of the IBRS that would serve as the technical infrastructure for the proposed model of reputation-based governance.

However, the differences between the U.S. experience and full-fledged reputation-based governance of public works are as important as their similarities. First, in the U.S. only the opinions of the administration with respect to the contractor's job are recorded. Firms are not allowed to produce their assessments on the administrations that they interact with and, most importantly, the people who are affected by the projects are not allowed to voice their opinions<sup>9</sup>. Also, the opinions expressed by the administration on the contracting firms are kept private. In this sense, public procurement in the United States, after the reform of the 1990's, represents an interesting, but only partial, adoption of a reputation-based governance model.

With respect to its full adoption, the partial adoption of the model determines a difference that is not just of degree, but also of kind. Only a full-fledged reputation-based governance model would have a series of important implications, two of which I discuss next.

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<sup>9</sup> In the official documentation lip service is payed to the need to listen to final users' opinions (see, among others, Office of Federal Procurement Policy, 2000). However, final users are taken to be the users within the administration, and not the public at large.

## 6. A SHIFT IN THE PRODUCTION OF STATISTICAL INFORMATION

The broad implications of reputation-based governance are discussed in Picci (2006c). Here I focus on two consequences that are particularly relevant, the first one having to do with methods of producing statistical information. Traditionally, the production of statistics starts with the gathering of data, often through questionnaires. Survey-based data present shortcomings of various types, such as lack of response and, possibly, attrition. Running surveys is an expensive and lengthy process, so that there is a considerable delay between the reference time of the statistical information and the date of its availability.

Within reputation-based governance, most relevant information on public works would be digitally recorded. Useful statistics could be generated simply by means of “views” of data that are already available within the overall information system. There would be a fixed cost to create statistical information for the first time, but the marginal cost for further production would then be negligible. Also, official statistics would reflect real-time data.

To better grasp some the main implications of this new situation, I introduce a simple taxonomy of statistical information. I define *ad hoc* those statistics that, in order to be produced, need statistical information to be gathered and processed. I call *integrated* those statistics that are produced as a view of the digital information already present within a computerized information system. An example of the latter is provided by the statistics on accesses to a Web site, routinely produced by a dedicated software without the need of any outside interventions, apart from the initial effort to install and configure the program. At present, most statistics are of the *ad hoc* type. Reputation-based governance, on the other hand, allows for the production of integrated statistics.

Another important dimension in which statistics differ is their *degree of institutionalization*, that I define as the prospect for their continuing provision. *Ad hoc* statistics representing the core activities of National Statistical Offices, such as the Census Bureau, are highly insititutionalized: We may expect National Accounts to be produced indefinitely in the future. On the other hand, *ad hoc* statistics that are produced for the first time, or one-shot surveys for which future funding and political support is not secure, are weakly institutionalized.

While the degree of institutionalization of *ad hoc* statistics greatly varies, all integrated statistics tend to be highly institutionalized: Once they have been produced for the first time, their future provision only depends on the continuing existence of the information system, and on the maintenance of the software producing the necessary views of the data. In order to discontinue the production of integrated statistics a clear opposition is needed, and not just a lack of support. To put it differently, *ad hoc* statistics requiring funding need an explicit decision to be continued. On the other hand, integrated statistics, once the continued functioning of the underlying information system is guaranteed, need an explicit decision in order to be interrupted.

Reputation-based governance would naturally lead to the production of statistics that are *integrated* and *highly institutionalized*. Each piece of public infrastructure would be recorded in the information system, together with the flow of payments to the contractor(s). As a project is completed, a comparison between its actual and predicted costs would immediately become public. A simple view of the data would provide aggregate information on these variables divided by type of public good and by geographic or administrative area. The information system would generate a wealth of data on the geographic localization of the recipients of the benefits, information that policy makers could use to inform their decisions, and that electors would consider when making their choices. The comparison between physical and monetary measures of infrastructure would provide very useful geographic information about the presence of rent-seeking activities, a topic that I will consider next.

Overall, the establishment of a full-fledged model of reputation-based governance would be accompanied by the timely provision of a wealth of easily accessible data, determining what may amount to a revolution in the realm of the production of statistical information.

## **7. RENTS AND CORRUPTION**

The second important consequence of reputation-based governance rests on its ability to limit rent-seeking activities and corruption. Rent-seeking often plagues public governance, by subtracting valuable resources from productive ends and by tilting private choices towards the pursue of unproductive activities. It often takes

the form of corruption, whose damages are widely documented, deriving in part from the immediate drain of public resources and, more importantly, from its distortionary effects on both private and public choices<sup>10</sup>. Among the latter, the preoccupations with corruption triggers reactions from the public administration that have unintended negative effects, such as the over-regulation of public procurement (see Kelman, 2002, for a discussion).

In the debate on corruption there is a broad agreement on what measures could contribute to its cure. These involve increased accountability, to be obtained through a higher degree of transparency, regular monitoring of the activities that could lead to corruption, and a proper set of incentives, such as the perception that dishonesty is punished with a high probability. However, policy suggestions so far have had a piecemeal character, failing to find a common thread effectively allowing for the packaging of the different proposed measures into a single plan. Reputation-based governance represents a unified framework to address the problem, overcoming the limitations of less comprehensive approaches. In particular, as I have argued, it allows for the computation of “integrated” statistics that provide long sought-for objective measures that are related to the governance of public works, and that are an indispensable prerequisite for the necessary monitoring activities.

In this respect, the integrated statistics that are computed within a reputation-based governance would considerably improve the current situation. Corruption indexes available today are mostly based on *perceptions* of corruption. This is the case of the Transparency International Corruption Perception Index, the result of the aggregation of several other indexes (see Lambsdorff, 2003). The characters that are the object of measurement may be aspects of corruption proper, or they may represent occurrences that are understood to be correlated with corruption, such as “public integrity” or various measures of the quality of governance. Sometimes, they describe broad aspects of governance, and as such are more tenuously linked with the corruption phenomenon, as in Kaufmann et al. (1999).

Corruption indexes may be only weakly related to the character object of observation. For example, an intense exposure of the public opinion to corruption scandals may cause a spurious increase of perception-based indexes. Italy’s ranking in the 1995

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<sup>10</sup> For a recent survey on the current debate on corruption, from an economist’s point of view, see Svensson, 2005.

Transparency International Corruption Perception Index announced more corruption than in Mexico and Colombia, and marginally less than in Thailand, India and The Philippines. Such an unrealistic ranking is presumably explained in part by the spate of attention that serious (grand) corruption episodes had received in Italy in the early 1990's, following the so called "Tangentopoli" judicial inquiries<sup>11</sup>. Perception-based corruption indexes could also influence the perception of corruption, given the popularity that they enjoy and their visibility on the media, raising the possibilities that they influence the very same perceptions on which they are based.

While most corruption indexes are subjective, being based on perceptions of the character that is the object of measurement, recently an *objective* measure of corruption has been proposed. Golden and Picci (2005) compute for the Italian regions a corruption measure that is based on the contrast between two alternative measures of the public capital stock. The first one represents the total amount of moneys allocated over the years to endow Italy of infrastructure, and is computed using the permanent inventory technique<sup>12</sup>. The second is a physical inventory of the infrastructure that have actually been built – km of roads and railroads, number and dimensions of public buildings, etc.. The two measures offer a striking contrast, with Southern Italy having received a disproportionately high amount of financing that only partially was put to good use. Such contrast is the base for the computation of a "corruption index"<sup>13</sup>.

All corruption indexes currently available are of the *ad hoc* type, with varying degrees of institutionalization. The Corruption Perception Index, computed under the sponsorship of Transparency International since 1995, presents a rather high degree of

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<sup>11</sup> Italy moved up significantly on the TI-CPI ranking over the years. For a qualitative assessment of corruption (in public works) in Italy, see Golden and Picci (2006a).

<sup>12</sup> The permanent inventory techniques computes an estimate of the stock of capital by summing current and past flows of investments. Investments on given types of goods that are older of their relevant "service life" are not included in the computation. For details see Golden and Picci, 2005.

<sup>13</sup> Geographic differences in the effectiveness of public investments in generating infrastructure could also be explained by other factors, such as disparities in the efficiency of the construction industry, in costs, or in the efficiency of public administrations. Golden - Picci (2005) consider these issues explicitly.

institutionalization. On the other hand, indexes that depend on the effort of academic researchers, such as the one in Golden and Picci (2005), have a “one shot” character and are weakly institutionalized. Reputation-based governance of public works would allow for the routine production of statistics on corruption related phenomena that would be *objective, integrated* and *highly institutionalized*, and that would be central in establishing appropriate incentives and in informing auditing activities.

## 8. CONCLUDING COMMENTS

Reputation-based governance is prone to further developments and extensions with respects to the description here provided. For example, if candidate public works are recorded within the information system before they are selected, then room is created for participatory forms of decision making. The public could be entitled not just to assess completed works, but also to express opinions on alternative plans, or even to propose novel projects. In this way, reputation-based governance could support far reaching e-democracy practices, where the word “democracy” would be taken to mean both participation *and* accountability.

The range of action of the monitoring system could be increased. Public works shape the territory where they are constructed, and suitably organized information on infrastructure that are either desired, planned, under construction or, finally, available, would help planning and analytic activities of various types.

The present proposal, with its emphasis on the establishment of automatic procedures for the gathering and processing of data, should be seen within an ongoing process that is gradually changing our appreciation of the quantitative aspects of public administrations and, more generally, of governance. The study of corruption provides a good exemplification of the issue. In the 1990’s several organizations made available perception-based corruption and governance indexes. Golden - Picci (2005) provide a measure of corruption that is based not on perceptions, but on hard data. Moving from measuring perceptions, to constructing indexes that are based on objective data, is a process that deserves encouragement. However, such a process is difficult to realize, because objective data are difficult to find and are time consuming to process.

The methodology proposed in Golden - Picci (2005) could certainly be carried out, and indeed has been carried out, for countries other than Italy, but at a high cost. The availability of an information system of the type here proposed, however, would allow for an integrated monitoring system that would routinely compute a vast array of useful indexes and measures. This, in turn, would be helpful in addressing a more general problem that besets current studies on public administrations: the difficulty to collect suitable quantitative information.

These considerations help casting the proposed governance model under a different light. The stated issue is about improving governance of public works. However, it is also about the creation of a conceptual and technological model for the systematic organization and collection of quantitative information about the working of a governance system. The two issues, in fact, are closely related.

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