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TESI FINALE

"L'INDUSTRIA AEROPORTUALE ITALIANA TRA INCERTEZZE DEL PASSATO E SFIDE DEL FUTURO"

"LAW AND ECONOMICS OF BUNDLING BY NON-DOMINANT FIRMS"

"AWARDING PROVISION THROUGH COMPETITIVE TENDERING: LESSONS FOR AND FROM THE ITALIAN EXPERIENCE WITH LOCAL PUBLIC SERVICES"

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Introduzione Alla Lettura Della Tesi

Ai fini del completamento del percorso di studi e ricerca, il Consiglio di Dottorato ha concesso ai dottorandi del Ciclo XXII, sin dal primo anno di attività, la possibilità di scelta tra un unico lavoro monografico e tre *working paper*.

Avendo optato per quest'ultima possibilità, seguono i tre lavori presentati per la discussione, dei quali i primi due già pubblicati su riviste specializzate in tematiche di Diritto ed Economia.

Coerentemente, il testo che segue è diviso in tre sezioni, ciascuna corrispondente ad un paper distinto. L'organizzazione delle sezioni/articoli segue l'ordine cronologico di predisposizione: primo anno (Sezione I), secondo anno (Sezione II) e terzo anno di dottorato (Sezione III).

In particolare, di seguito si descrive in estrema sintesi il contenuto e le finalità principali di ciascuna paper:

1. Sezione I: "L'industria Aeroportuale Italiana tra Incertezze del Passato e Sfide del Futuro"

    Il contributo analizza gli assetti strutturali e regolamentari dell'industria aeroportuale italiana, evidenziandone le principali linee di tendenza, *in primis* la crescita progressiva del grado di concorrenza e la difficile ricerca di regole certe, presidiate da istituzioni forti e credibili. Si suggeriscono poi coerenti indirizzi di riforma.

    Il testo è stato pubblicato nel primo anno di dottorato come Formica G. (2007), "L'industria aeroportuale italiana tra incertezze del passato e sfide del futuro", in *Mercato, Concorrenza, Regole*, n. 2, agosto 2007

2. SEZIONE II: "LAW AND ECONOMICS OF BUNDLING BY NON-DOMINANT FIRMS"

Il lavoro contrasta l'approccio dominante nella letteratura gius-economica, secondo il quale le vendite gemellate (*bundling*) sono idonee ad inibire la concorrenza ed il mercato solo ove praticate da imprese (quasi) monopolistiche. Le principali conclusioni teoriche (entro specifiche circostanze il *bundling* potrebbe danneggiare il consumatore, anche in contesti maggiormente concorrenziali) sono *indirettamente* supportate da una ricca casistica antitrust su ambedue le sponde dell'Atlantico.

L'articolo, premiato come miglior tesi del percorso di studi all'estero previsto per il secondo anno di dottorato, è stato pubblicato in rivista collegata come Formica G. (2008), "Law and Economics of Bundling by Non-Dominant Firms", in *German Working Papers in Law and Economics*, volume 2008, paper n. 16, Berkeley University Press.

3. SEZIONE III: "AWARDING PROVISION THROUGH COMPETITIVE TENDERING: LESSON FOR AND FROM THE ITALIAN EXPERIENCE WITH LOCAL PUBLIC SERVICES"

Il contributo, di taglio monografico, prende le mosse dalla recente riforma italiana dei servizi pubblici locali (art. 23bis L. n. 133/08, come modificato dall' art. 15 D.L. n. 135/09, "Decreto Ronchi"), ispirata al principio generale della concorrenza (per il mercato), anche in coerenza con scelte analoghe operate all'estero. Il lavoro ha però vocazione generale: si dimostrano i benefici attesi, ma anche i possibili rischi implementativi del meccanismo della gara ad evidenza pubblica. Le predizioni teoriche sono poi confermate dall'esperienza italiana più recente, in alcuni tra i principali settori interessati dalle proposte di riforma. Segue una coerente formulazione di *guidelines* per l'ottimo design delle gare per servizi pubblici locali.

INDICE GENERALE

Sezione III

"Awarding Provision Through Competitive Tendering: Lessons For and From The Italian Experience With Local Public Services"

Awarding Provision Through Competitive Tendering: Lessons For and From The Italian Experience With Local Public Services

GIOVANNI FORMICA

I. INTRODUCTION

In most countries, local authorities have historically supplied public services - as urban transportation, water, refuse collection, power and gas distribution - either directly or through publicly-owned companies, on the premise that there exist relevant socio-economic reasons for making them fully affordable. However, the acknowledgement of growing inefficiencies and increasing pressure on taxpayers, both interpreted as the outcome of the combination of public ownership, soft budget constraints and lack of competition, has spurred heated discussions and reform proposals. Following the political and academic debate, the option for competitive tendering (hereinafter, CT) has become a basic tenet in the policy agenda of most countries since the middle of 80s, with UK as forerunner. The underlying idea is to award a monopoly franchise through a public auction in which any bidder names the price and/or the subsidy at which she accepts to run the activity and the related "universal service obligation". Any bid reflects the remuneration the would-be operator requires to supply a given package and minimum quality levels, provided that full affordability is guaranteed. Bidding competition is expected to select the most efficient provider, assure consistent subsidy savings and incentivize efficiency gains (Demsetz, 1968; Riordan and Sappington, 1987; Laffont and Tirole, 1994). Sector analyses and general investigations confirm theoretical predictions on a factual viewpoint (Szymanski, 1996; Hensher and Wallis, 2005).

However, all these arguments should be taken cautiously. One should avoid that criticisable tendency to invoke auctions as a solution per se. *Inter alia*, poor design, contract incompleteness and lack of credibility in the enforcement of tendered schemes may invalidate the theoretical appeal of CT (Williamson, 1976): a result with large empirical confirmation as well (Zupan, 1989). Moreover, its admittedly positive effects should be confronted with potential social concerns (administrative costs, lower labour standards, deteriorated quality), while also assessing expected benefits in their persistency over time.

Needless to say, if such a cost-benefit balance is found to be negative, other solutions should be explored, mainly based on direct selection and individual negotiation.

This paper originates from the debate around the last reform of local public services in Italy (article 23bis of the Law 133/2008, as modified by article 15 of the Legislative Decree 135/2009), apparently inspired by unreserved faith in the "miraculous" virtues of tender-type competition. The economic theory - in particular, insights from auction, public choice and contract theory - and past experiences with tendering - in Italy and abroad - confirm the contention that auctions are not a *panacea*, at least when improperly designed. Based on theoretical and empirical arguments, we suggest when and under what (institutional and implementation) conditions a CT is a good idea. This indirectly identifies some shortcomings in the Italian current discipline, as well as the distortions which may descend from eventual unwise regulation.

The work is organized as follows. In Section II, we summarize the historical evolution of the Italian law, from first interventions of "formal privatization" to recent measures of market opening. A special focus is reserved to the last reform, in particular to the choice of the "tender rule", to highlight strengths, weaknesses and incompleteness in actual legislative choices. Section III presents the economics of CT: through a revised version of the Armstrong and Sappington's (2005) model, we show all expected benefits from auctioning service provision, *i.e.* larger probability to select the most efficient operator, higher extraction of its monopolistic rents, subsidy and tariff reductions. In Section IV, we identify the ideal conditions for an optimal auction, *à la* Demsetz. In this vein, several potential sources of failure (*e.g.*, favouritism, collusion, incumbency advantage, contract incompleteness, quality shading) are analysed in abstraction and confirmed empirically. In Section V, we use data from Italian tenders for water, transportation and gas distribution services to confirm that certain risks can be systematic, at least if implementation issues are disregarded and/or liberalization enjoys poor political support. Consistently, Section VI stresses the issue of optimal auction design (object, franchise length, transparency, discretion, post-award discipline), in order to draw some practical guidelines. Finally, Section VII compares the Italian current discipline with insights from the economic theory and past experiences with tenders, in order to outline consistent conclusions and policy suggestions.

II.   THE LEGAL FRAME FOR LOCAL SERVICE PROVISION IN ITALY

Article 23bis of the Law 133/2008 has written the umpteenth, yet presumably not the last episode of an endless saga. In Italy, since the 1990s the discipline of local public services has been characterized by ups and downs, sonorous proclamations and last-minute backflows. The main concern has always been the identification of suitable selection mechanisms and organizational formulas, on the premise that proper awarding rules would have been enough to achieve the relevant socio-economic objectives underlying local service regulation (efficiency, quality of services, accessibility, equity). Proposals for pro-competitive reforms have entered systematically in the electoral program of any political party in the last two decades, but unfortunately none of the projects in which electoral promises were actually transfused (*e.g.*, Vigneri project, Lanzillotta project) could reach the last stage of the legislative procedure. Indeed, the promise of "better local services" sounds unquestionably appealing for citizens, in their double identity of users and taxpayers (most of these activities, for instance transportation services, are systematically subsidized), but contrasts strong interests at local level and the political ambition (mainly, of local administrators) to use public firms as a repository for electoral consensus (most locally-owned operators are heavily overstaffed). This should explain a certain resistance against a serious pro-competitive reform (based on principles which are nevertheless largely shared among academicians and politicians) and also a certain tendency to proceed by emphatic statements, mini-reforms and standstills. More in detail, the discipline has evolved over time through confused legislative interventions, buried among the paragraphs of laws with different purposes - as the annual Financial Acts or "multi-postponement" decrees -, in the lack of a clear strategic plan, unavoidable prerequisite for temporal consistency. The result is that a context of regulatory uncertainty still represents the most serious source of exogenous risk for operators. Moreover, at least waiting for implementation decrees, also the most recent reform may be hardly considered a final say.

To draw a rapid history of past episodes, one can distinguish two main phases of intervention. A first phase - rawly corresponding to 90s – has been characterized by a lengthy evolution of the organization system towards greater separation of institutional roles (regulatory, proprietary and managerial), at least formally. This has occurred by a gradual transformation of municipally-owned firms firstly into *special enterprises*, having their own legal status, and successively into autonomous companies, subjected to ordinary business law ("formal privatization"). Then, in a second phase - not surprisingly characterized by larger inconsistency and uncertainty -, the legislator's efforts have been

addressed towards the objectives of liberalization and efficiency promotion, solicited in this sense by growing burdens on municipal budgets and by the pitiless comparison with analogous experiences abroad. The awarding mechanism for services with natural monopoly features has represented an area of major political concern, even more than privatization and ex-post incentive regulation. As a matter of synthesis, the Italian legislator has manifested wavering positions with respect to an elementary, yet crucial question: "to tender or not to tender?"

To give just the essentials of the saga, a first systematization dates back to 1990 (Law 142/1990): the legislator identified alternative organization modes for service provision, as internal running, *special enterprises*, totally public corporations and institutions[133]. Starting from 1992 also corporations with public authorities' minority shareholding have been allowed, while the transformation of *special enterprises* in joint-stock companies has been highly facilitated by the so called "Bassanini reforms" and, in particular, by the Law 127/1997.

The frame defined in such first, yet partial interventions converged in the TUEL ("Consolidation Act on Local Authorities"), passed with Legislative Decree 267 of 2000. The Act, as successively modified by Law 448/2001 (Financial Act for 2002), distinguished between services "with" and "without economic significance", for the former only ruling CT as the general selection criterion, yet eventually subjected to sector exceptions (for instance, in the water industry the law admitted Public-Private-Partnerships, PPP). The new legislation also affirmed the principle of separation between ownership of infrastructures (necessarily public) and service provision (to be tendered), in the view of promoting downstream (bidding) competition on equal foot. However, before that local markets could be really opened to competition, the Financial Act for 2004 (Law 350/2003) made a significant step back. By modifying article 113 TUEL, three different organization and awarding modes (for services "with economic significance") were allowed, with no hierarchical order among them: stock companies selected through CT; private-public companies (PPP) with competitive selection (auction) of private partners and direct award to totally public corporations (in-house providing). However, the law admitted the last solution only under the restrictive conditions ruled by the European Court of Justice since the *Teckal* judgement (1999), that is: a) fully public capital; b) "analogous control" by local authorities on awarded operators, similar to that exercised on internal offices; and c) prevailing activity in favour of the awarding local administration.

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[133] Institutions were allowed only to run "social services", *i.e*, services lacking any economic or commercial content.

The way of proceeding - small modifications hurriedly inserted in the annual Financial Acts - denoted incompleteness, lack of a strategic vision and unclear political will. Moreover, to make matters even more complicated, sector legislations have sometimes identified solutions inconsistent with the general frame depicted so far and contributed significantly to regulatory uncertainty. In this context, not surprisingly the absence of competition and the provision trough publicly-owned companies have become the rule, more than the exception. Most local authorities have largely opted for the in-house[134] and, even when actually organized, auctions have simply perpetuated public incumbents' provisions, with embarrassing performances in terms of subsidy and cost savings. In effect, a far-reaching legislative project presented in July 2006 (*i.e.*, the "Lanzillotta project") had more clearly opted for the liberalization, also going beyond the principle of equal dignity among alternative provision formulas (franchise, in-house, PPP). Unfortunately, this project lost validity for the end in advance of the proponent Parliament, but most of its principles - including the hierarchy in awarding options - have been transfused in a recent intervention.

In particular, the article 23bis of the Law 133/2008 disciplines a pro-competitive reorganization of local public services. The original, basic ambition was making uniform an excessively jagged discipline by a reasonable transitory period. To this end, the first paragraph rules the effectiveness of new regulations over incompatible sector legislations. The real novelty – in effect, a return to a past hurriedly renounced and a heritage of the "Lanzillotta project" – is the choice of auctions as the ordinary rule; direct awarding and in-house are just framed as a departure for special reasons, to be rigorously motivated before the antitrust authority.

Besides, although the legislative procedure is still in progress (we are waiting for the implementation decrees), article 23bis has been significantly modified by the Legislative Decree 135/2009 (so called *Ronchi Decree*) in the last days. Three main novelties need to be quoted. Firstly, the new discipline reintroduces PPP as an alternative (of equal worth) to CT: municipalities can avoid direct tendering by partially privatizing local companies, on condition that private partners - with at least 40 percent of capital - are selected competitively, to perform specific operative tasks (so called "double object tender"). Moreover, although with some ambiguities, to be (hopefully) solved through future guidelines, the *Ronchi Decree* explicitly regulates the transitory period, as differentiated between listed and non-listed companies. Finally, it introduces an explicit regime of sector

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[134] At least in the legislator's intentions this solution should have been residual and adopted under very restrictive conditions.

exemptions, *i.e.*, for regional transportation, municipal pharmacies, gas and power distribution.

The whole reform seems guided by the optimistic belief that tenders are *per se* the right answer to the growing call for more efficiency and investments. In this logic, the confirmed option for public ownership of networks aims at guaranteeing equal chances at the bidding stage. Other aspects are perceived as a minor and dangerously neglected, at least while waiting for the implementation decrees. Just to quote some, the notion of "economic significance" remains vague: the legislator confirms neither the choice of giving a conceptual definition nor a list of activities (Massarutto, 2009). Secondly, the article 23bis does not specify the object of tenders (an incentive contract or the sole provision?) and the awarding rule (auctions or beauty contests?), hence the possible role for ex post regulation. Neither it's clear if will all nor some of these questions be tackled in future guidelines. Finally, the institutional design remains a challenge: absent a relevant independent authority, local administrations are competent for organizing and deciding on tenders which are also opened to operators totally or partially owned by themselves. The same conflict of interest may emerge in their role of ex post regulators, as in case of successive renegotiation of tendered obligations.

In effect, a clear move to CT is indubitably an appreciable step, but it's not a *panacea*. The effectiveness of auctions depends crucially on the quality of the implementation and institutional frame, first of all on the capacity of overcoming the risk of merely legitimating the incumbent with the appearance, but not the substance of competition. In next paragraphs, we will tackle such questions with the help of the economic theory. The aim is to assess critically the last reform in a policy-oriented perspective, yet with a solid theoretical background.

III.   THE ECONOMICS OF COMPETITIVE TENDERING

At least since Harold Demsetz's (1968) pioneering contribution, the economic literature has suggested the case for CT ("competition for the market") when the ordinary market discipline ("competition within the market") is irremediably compromised, as in the hypothesis of increasing returns to scale and "cost sub-additivity" (natural monopolies). By awarding a monopoly franchise through a public auction, governments can exploit some of the main benefits of competition, although this latter is just confined at the bidding stage. In particular, the risk of not being selected and the threat of substitution induces firms to a truth-revealing attitude, which results in consistent benefits for consumers and public pockets ("rent-extraction benefit"). In some sense, bidding competition induces awarded monopolists to commit themselves to behave as if subject to ordinary market pressure. Moreover, a monopoly franchise works as a sort of Darwinian process, that increases the chance to select the most capable provider, while driving bad firms out of the market ("selection benefit"). Finally, in sectors traditionally dominated by consistent public stakes, as local services, CT may also represent a first step toward privatization. In any case, tenders allow for a balanced compromise between the advantages of competition (and delegation) and the need to preserve some forms of public control on market failures (Baldwin and Cave, 1999; Engel *et al.,* 2002). In the remainder of this section we try to prove formally these intuitive arguments and similar, to show that most benefits rest upon a proper auction design and some environmental conditions. We aim at revealing true merits and potential limits of bidding competition.

Before starting, we need a clarification on terminology. We use the terms franchise bidding and competitive tendering (CT) indifferently, to mean any competitive mechanism whereby service provision is allocated to the best bidder in a competitive auction.

To show how competitive bidding can work as a valuable substitute for direct market discipline we use a simple, two-type model, based on Armstrong and Sappington (2005). Imagine a local authority wishing to outsource the provision of a municipal service with natural monopoly features, such as urban transportation or refuse collection. The awarding of the legitimizing title to an independent company - whether public, private or mixed - can be either negotiated individually or determined as the outcome of a competitive bidding process. In a legal perspective, the preference for CT is typically phrased in terms of transparency, guarantee of equal opportunities and/or protection against corruption and fraudulent behaviours by self-interested bureaucrats. Instead, the economic literature tends

to focus on the merits of competition "for the market", as a disciplining force against market power that needs to be protected also beyond previously quoted legal or ethical concerns.

But what are these economic benefits? And under what conditions can consumers and social welfare actually benefit from CT? Although variously declined, answers to the first question are somewhat a common patrimony in the economic literature, at least since Demsetz's (1968) influential work. Instead, the consciousness of potential limits of bidding competition appears much less widespread, even more at political level.

In particular, one could start the analysis of suitability conditions for CT with a basic, maybe unnecessary, consideration: in case of perfect information (*i.e.*, when operators' costs are perfectly verifiable and contractible), there would no point in organizing a complex and costly auction. A benevolent regulator could save a lot of money by selecting directly the most efficient firm and implementing a first-best (regulatory) contract to induce its optimal effort[135]. Unfortunately, since costs are private information in most real-life contexts, auctioning procurement can be proved to perform relatively well in a logic of second-best. The underlying intuition is relatively simple: when costs and efforts are ex ante unverifiable, the risk of losing the tender and being excluded from the market (there are several ready suppliers) works as a powerful constraint against opportunistic behaviours, cost misrepresentation and the request for large information rents[136], as compared to individual or direct negotiation.

To see how, consider a tendering authority (*e.g.*, a local administration) facing n would-be suppliers[137] and, for sake of simplicity, imagine just two types of firms - *i.e.*, low-cost (c_l) and high-cost (c_h) ones -. At the bidding date, individual types are firms' private information and the regulator just knows the proportion π of low-type firms (*i.e.*, $\pi = pr[c_i = c_l]$). The regulatory challenge consists in exploiting bidding competition to select the most efficient operator (in our case, to select a low-cost firm), extract large part of its information rents and assure sufficient incentives for post-award cost reduction efforts. At the end of the day, franchising is just a special form of competitive auction whose object is no longer an indivisible good, but an incentive contract for the provision of a natural monopoly service. As such, the awarded contract tries to solve the usual regulatory trade-off between cost reduction efforts and rent extraction, while guaranteeing

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[135] For a discussion on optimal regulation under perfect information see Laffont and Tirole (1993).

[136] If prizes and auction rules are well-designed, exaggerating own costs - as to obtain better terms - would be unwise, since success probability would be proportionally reduced.

[137] In effect, the number of bidders is not exogenous, as we assumed here for simplicity, since participation decisions are not immune to auction rules and other environmental features (see *infra*).

sufficient quality standards (Laffont and Tirole, 1994). For the moment, we abstract from "moral hazard" concerns by assuming verifiable post-award effort and we just focus on the issue of (adverse) selection. Nevertheless, we will come back on this issue afterward.

To make matters simple, yet generally valid, imagine an auctioneer (the competent local or national agency) wishing to procure a local public service. In particular, she auctions a menu of contracts, where each arrangement sets a common part (the universal service obligation, the basic package to be provided, minimum quality standards, etc.) and a contract-specific section (economic conditions). This last section represents the true object of bidding competition, in the sense that specifies allowed tariffs (affordability is a crucial concern) and net subsidies (from local governments) as a function of claimed marginal costs $\hat{c}_i$ (formally $\{p(\hat{c}_i); S(\hat{c}_i)\}$). In a way, firms bid "cost promises". Contracts are rank ordered: those associated with lower "cost promises" are highly ranked, since involve lower tariffs for citizens, higher political consensus for politicians and better performances for benevolent auctioneers. More in detail, we imagine a tender which proceeds as follows. Potential suppliers simultaneously announce the production costs at which they "promise" the universal service obligation and the other contract specifications, including some quality standards. The monopoly franchise is awarded to the firm that "bids" the lowest cost. In case of parity, the winner is selected randomly among the best, equal bids.

Winner's rents will depend on both actual type c_i and claimed costs $\hat{c}_i$:

$$U(\hat{c}_i / c_i) = Q(p(\hat{c}_i))[p(\hat{c}_i) - c_i] - k + S(\hat{c}_i) = \Pi_{\hat{i},i} + S(\hat{c}_i) \qquad (1)$$

Based on classical arguments in auction theory and, in particular, on the so called "revelation principle" (Myerson, 1979), this simple scheme – a "direct mechanism", in technical jargon[138] – allows for conclusions of general validity. As a normative implication, these game theoretical findings suggest to restrict attention only to direct mechanisms for which truthful revelation of individual types is a Bayesian Nash equilibrium strategy for all players (Gibbons, 1992). In other words, as a condition for optimality, auction rules need to be designed as to induce each bidder to reveal honestly her type. More formally, payments $\{p(\hat{c}_i); S(\hat{c}_i)\}$ and the success probability function $\phi(\hat{c}_i)$ have to be set in a such a way that, at equilibrium, each player bids exactly her cost figures (*i.e.*, $\hat{c}_i = c_i$; $\forall i$)[139].

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[138] A "direct mechanism" can be devised as a simple game where each player announces her type (*i.e.*, her cost) and wins the prize with a probability that depends on its own and other participants' claims.
[139] Direct mechanisms designed as to induce truth-telling equilibrium strategies are said "incentive compatible".

In particular, as a condition for a low-cost firm to be honest, it must be the case that:

$$\phi_l[Q(p(c_l))][p(c_l) - c_l] - k + S(c_l)] \geq \phi_h[Q(p(c_h))][p(c_h) - c_l] - k + S(c_h) \quad (2)$$

where:

$$\phi_h = \frac{(1-\pi)^{n-1}}{n} \ [140]; \qquad\qquad \phi_l = \frac{1-(1-\pi)^n}{n\pi} \ [141] \qquad (3)$$

and ϕ_l and ϕ_h denote the ex ante beliefs respectively for a low-cost and a high-cost bidder to be selected, under the expectation of truth-telling bidding behaviour by all players, with $\phi_l > \phi_h$. These beliefs are realized at equilibrium.

Then, by defining $\lambda = \phi_h / \phi_l$, condition (2) is satisfied if:

$$U(c_l / c_l) \geq \lambda[U(c_h / c_h) + (c_h - c_l)Q(p(c_h))] \qquad (4)$$

or

$$U_l \geq \lambda[U_h + (c_h - c_l)Q(p(c_h))] \qquad (5)$$

Instead, a high-cost type always prefers her own contract $\{p(c_h); S(c_h)\}$ to the one designed for low-types $\{p(c_l); S(c_l)\}$: it would be meaningless for her to pretend to be low-type and accept lower tariffs, thus eventually incurring in losses. This implies that condition (5) is the sole to be verified for honest bidding to be incentive-compatible for all players.

In the class of direct mechanisms with truth-telling equilibria (*i.e.*, those satisfying (5)), we need to identify the contract menu that maximises the tendering agency's interests. This requires a preliminary specification of the authority's objective function and, in particular, of the political justification for its mandate, that in turn may differ significantly depending on the prevailing institutional frame. In particular, an independent authority would have a stronger preference for the maximisation of social welfare. However, in most countries, including Italy, there is no independent agency in charge for awarding and regulating local public services, so that local governments typically tender, own and, at the same time, benefit - at least indirectly - from service provision. Under similar circumstances, as suggested by an extensive literature on the "private interest of regulation" (Stigler, 1971; Pelzman, 1976; Becker, 1983) and confirmed in empirical investigations (Gagnepain and

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[140] A certain high-cost firm wins the auction when all other (n-1) firms bid high costs and, in that case, with probability 1/n (for random selection)

[141] A specific low-cost firm wins the contract in all cases where all bidders are of high-type and, in that case, with probability $1/n\pi$.

Ivaldi, 2009), political considerations – mainly, the search for electoral consensus - may play a substantial role in actual choices. The use of publicly-owned firms as a receipt against local unemployment and for the consolidation of electoral power is a widespread phenomenon, with no need for further explanations. It's a fact that the international move towards CT - eventually with the privatization of awarded providers – is frequently justified exactly with the consciousness of widespread inefficiency and intolerable political pressure. However, one may convincingly argue that the efficiency paradigm would not contrast, but instead fits with the search for electoral success, since lower costs, tariffs and subsidies turn out to be advantageous for citizens, as both taxpayers and users[142]. At most, the point is how much wise and far-seeing are awarding local municipalities.

These considerations have important implications for our formal analysis. In particular, there is no excessive lack of realism in the hypothesis of a "benevolent auctioneer", who aims at the maximisation of social welfare (the sum of consumer surplus and firms' rents, net of public subsidies), even when awarding authorities are by no way independent from politicians. If any, one could guess a certain political preference for consumer surplus over firms' profits, on the ground of a greater concern for the well-being of the most numerous category of voters. To take into account such considerations we specify the following objective function:

$$W = CS(p_i) - S_i + \alpha U_i = CS(p_i) - S_i + \alpha(\Pi(p_i) + S_i) = TS(p_i) - (1-\alpha)U_i \qquad (6)$$

where

$$TS(p_i) = CS(p_i) + \Pi(p_i)$$

and, as in Baron and Myerson (1982) and Armstrong and Sappington (2005), we assume zero distortion from taxation and higher weight for consumers' well-being than for firms' rents (*i.e.*, $0 < \alpha < 1$)[143] [144].

Then, the optimal contract menu (to be tendered) solves the following maximisation programme, where the outside option for all bidders is staying out of the market (*i.e.*, $\overline{U}_i = 0; \forall i$):

$$Max_{\{p_h;U_h\};\{p_l;U_L\}} \left\{ (1 - (1-\pi)^n)[TS(p_l) - (1-\alpha)U_l] + (1-\pi)^n[TS(p_h) - (1-\alpha)U_h] \right\}$$

$$(7)^{[145]}$$

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subject to

$$U_l \geq \lambda[U_h + (c_h - c_l)Q(p_h)] \qquad (8)$$

$$U_h \geq 0 \qquad (9)$$

$$U_l \geq 0 \qquad (10)$$

Lemma 1. *At equilibrium, constraints (9) implies (10), and expressions (9) and (8) hold as equalities, hence low-types' rents are positive.*

Proof. See Appendix

Lemma 1 implies that:

$$U_h^* = 0 \qquad\qquad U_l^* = \lambda[(c_h - c_l)Q(p_h)] \qquad (11)$$

by substitution of (11) in (7), the constrained welfare function to be maximised becomes:

$$1 - (1-\pi)^n[CS(p_l) + \Pi(p_l) - (1-\alpha)\lambda[(c_h - c_l)Q(p_h)]] + (1-\pi)^n(CS(p_h) + \Pi(p_h))$$

$$(12)$$

By maximising expression (12) with respect to both prices, one gets optimal tariffs in the ideal contract menu (to be tendered):

$$p_l^* = c_l; \qquad\qquad p_h^* = c_h + \frac{\pi}{1-\pi}(1-\alpha)(c_h - c_l) \qquad (13)$$

Proof. See Appendix

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[145] Note that our maximisation programme gives solutions in terms of optimal tariffs and rents. Clearly, efficient subsidies can be easily obtained by subtraction, *i.e.* $S_i^* = U_i^* - (p_i^* - c_i)Q(p_i^*) - f$.

> **Proposition 1.** *Under the optimal tender with independent costs:*
>
> 1. *the probability to choose a low-cost operator is higher than under individual negotiation; everything being equal - including cost distribution -, this probability is increasing in the number of bidders ("selection" or "sampling benefit");*
>
> 2. *a winning high-cost firm would get zero rents; a low-cost winner would get the minimum payoff to ensure it does not exaggerate its costs; low-types' rents are decreasing in the number of bidders; expected rents are decreasing in the number of contending operators ("rent-extraction benefit");*
>
> 3. *tariffs are driven down to marginal costs when a low-cost firm is selected; expected tariffs are decreasing in the number of bidders and in the proportion of low-cost bidders ("tariff reduction benefit");*
>
> 4. *A low-cost new bidder increases the chance to choose an efficient operator; the entry of a high-cost new bidder has an ambiguous impact on such a probability.*

Point 1 follows from (7): the probability to select a low-cost provider passes from π (under private negotiation)[146] to $1-(1-\pi)^n$ (under optimal tenders). This distance is increasing in n. *Point 2* is straightforwardly based on (11), while also observing that U_l decreases as the ratio $\lambda = \phi_h/\phi_l$ decreases, hence as the number of bidders increases. *Point 3* is more subtle: to guarantee allocative efficiency, low-types are priced at marginal costs. Then, since from (11) efficient firms' rents (U^*_l) are negatively related to tariffs charged by high-cost operators (p^*_h), the latter are raised above marginal costs (c_h), in order to efficiently reduce low-types' rents. The "optimal distortion" ($p^*_h - c_h$) balances efficiently associated social costs (from charging high-types above marginal costs) and benefits (from reducing low-types' rents). Consistently, the distortion size is increasing in the proportion of good types π and decreasing in the weight attached to (low-types') rents α (see expression (13)). Finally, *point 4* follows from (7): a new bidder with low costs increases the chance to choose an efficient operator for the combined effect of an increasing n and a higher π; viceversa, a new bidder with high costs would increase the number of bidder, while decreasing the proportion π, thus having ambiguous impact on total welfare.

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[146] Under private negotiation, the awarded firm is selected randomly in the population of would-be providers; therefore, the agency has a probability π to run into a low-cost operator.

Notice also that, under the optimal tender, the selected operator is awarded a *fixed-price contract*: government transfers and prices are set in advance, on the basis of expected costs; no post-award adjustments for actual performances are allowed.

In Graph 1, we present the price setting process summarized in *Proposition 1*. In particular, Graph 1(a) traces the way by which prices (and subsidies) for high-cost operators are optimally set. Outcomes are depicted in the space $[U_l ; p_h]$; other choice variables are held fixed at their optimal values (*i.e.*, $p_l^* = c_l$ and $U_h^* = 0$). A map of welfare contour sets is drawn: once fixing $p_l^* = c_l$ and $U_h^* = 0$, lower sets are associated with higher welfare, since involve lower U_l for any given level of p_h. In particular, from (12), welfare contour sets in the space $[U_l ; p_h]$ take the form:

$$U_l = \frac{(1-\pi)^n}{1-(1-\pi)^n} \frac{1}{1-\alpha} [CS(p_h) + \Pi(p_h)] + \frac{1}{1-\alpha} [CS(c_l) + \Pi(c_l)] =$$
$$= \frac{(1-\pi)^n}{1-(1-\pi)^n} \frac{1}{1-\alpha} [CS(p_h)\Pi(p_h)] + k.$$

A benevolent regulator aims at maximising social welfare, subject to the condition that the optimal contract for high-cost types has to be always inconvenient for low-cost types. Therefore, the best contract for a high-type firm $\{p_h^*; U_h^* = 0\}$ lies on the shaded area above the incentive-compatible constraint ($U_l \geq \lambda[(c_h - c_l)Q(p_h)]$), as a condition for being chosen only by high-types. This constraint is binding at equilibrium (*Lemma 1*), thus $U_l^* = \lambda[(c_h - c_l)Q(p_h)]$. Optimality requires the contract $\{p_h^*; U_h^* = 0\}$ to lie at the tangency point between the lowest possible welfare contour set and the incentive compatible line. This necessarily involves p_h^* larger than c_h.

Graph 1(b) presents contract selection for low-cost firms in the space $[U_l ; p_l]$ (other choice variables are held fixed at their optimal values p_h^* and $U_h^* = 0$). Again, incentive-compatibility requires this contract to lie in the area above the horizontal constraint (observe that the constraint in (11) does not depend on p_l). The optimal contract $\{p_l^*; U_l^*\}$ is given by the tangency condition between the incentive-compatible line and the lowest possible welfare contour set, as described by previous expression:

$$U_l = \frac{(1-\pi)^n}{1-(1-\pi)^n} \frac{1}{1-\alpha} [CS(p_h) + \Pi(p_h)] + \frac{1}{1-\alpha} [CS(c_l) + \Pi(c_l)] =$$
$$k + \frac{1}{1-\alpha} [CS(c_l) + \Pi(c_l)].$$

It involves $U_l^* = \lambda[(c_h - c_l)Q(p_h)]$, and $p_l^* = c_l$.

Graph 2 presents the effect on p_h^* of a change in π. A decreasing proportion of low-cost firms involves less price distortions (right-hand side), while an increasing π enlarges the difference $p_h^* - c_h$ (left-hand side). Graphically, this effect occurs because the incentive-compatible constraint in Graph 1(a) becomes flatter in the first case and steeper in the second case (observe that λ is decreasing in π), so that the maximum is achieved respectively on a lower (right-hand side) or a higher social welfare curve (left-hand side), as suggested by previous expressions for welfare contour sets (recall that lower curves are more highly ranked). The intuition behind this result is relatively simple: p_h^* is chosen as to balance efficiently social costs (welfare losses from excessively pricing high-cost firms) and benefits (extraction of low-types' rents) stemming from raising p_h^* above c_h. Obviously, gains are increasing in the proportion of low-cost firms π. This explains why price distortions tend to drain away with a decrease in π and to become larger with an increase of this proportion. Incidentally note that, for similar reasons, a decrease in α has exactly the same effect of an increase in π and viceversa. The more weight the tendering authority attaches to firms' rents (higher α) in its objective function (equation (6)), the lower the optimal price distortion for high-types, hence the higher the efficient types' rents.

Graph 1. Price setting by a benevolent regulator

(a) $[U_l^*; p_h^*]$ (b) $[U_l^*; p_l^*]$
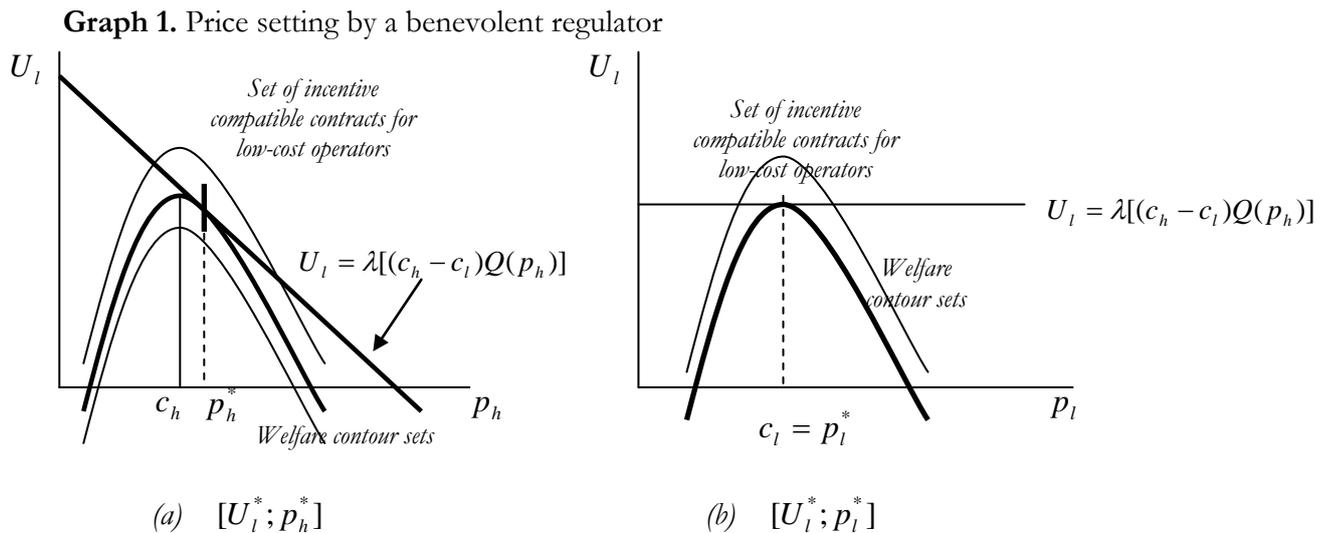
Graph 2. Effect on price distortions of a change in π

(a) Effect of an increase (decrease) in π (in a)   *(b) Effect of a decrease (an increase) in π (in a)*
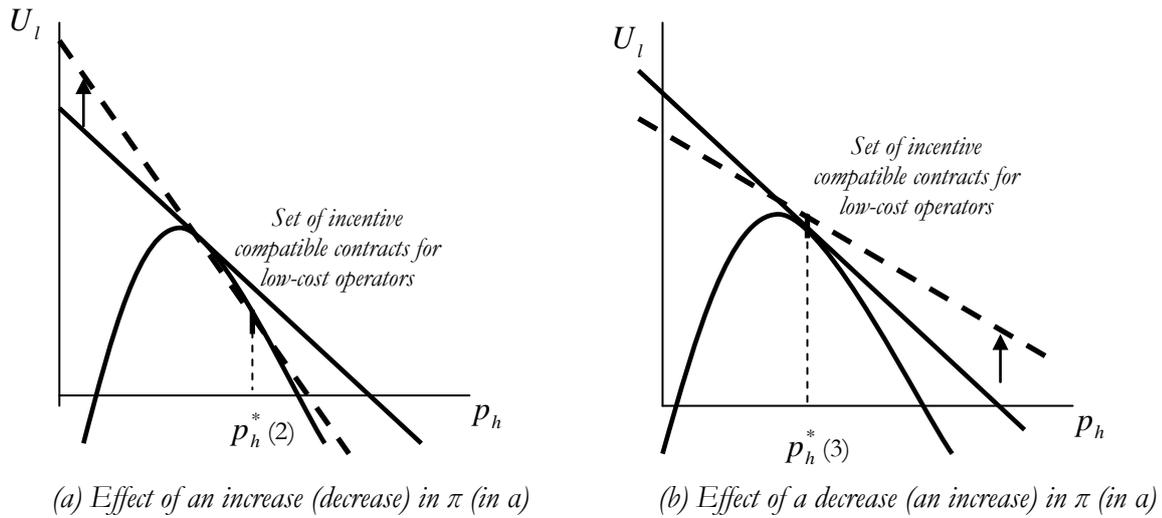
A standard conclusion among theorists and practitioners suggests that more competitiveness (*i.e.*, higher number of bidders) is a desirable thing (Bulow and Klemperer, 1996; Gomez-Lobo and Szymanski, 1998). As the number of bidders increases, related price distortions (on high-types) would be perfectly balanced by benefits in terms of better rent extraction (from low-types), as showed before. Instead, an increase in *n* involves higher likelihood to select the most capable provider and lower expected rents (see *Proposition 1*). Hence, the final impact on social welfare is surely desirable.

An interesting finding is that, when bidding markets are perfectly competitive (*i.e.*, as *n* becomes arbitrarily large), the optimal auction achieves the most efficient outcome: the lowest cost operator is selected with probability close to one; the awarded contract entails marginal-cost tariffs and zero rents (subsidies just cover sunk entry costs, $S_l = f$). Under the assumption of zero distortion from taxation (that we maintain through the whole work), perfectly competitive tenders achieve the first-best and resemble perfect competition "within the market", as in the Walrasian analogy of competitive markets as auctions.

Proposition 2. The optimal tender achieves the efficient outcome asymptotically, i.e. as the number of bidders becomes arbitrarily large: a low-cost operator is chosen with probability close to one, marginal-cost pricing prevails, social welfare is maximised, the winning firm gets zero profits and public subsidies just cover the fixed cost of entry.

Proof. These results can be straightforwardly obtained by observing the asymptotic behaviour (n going to infinite) of expressions (11) and (13).

Conclusions in *Proposition 2* are depicted graphically. In particular, Graph 3 draws the problem of contract choice for low-types, which are surely selected (observe in the graph that as $n \to \infty$, then $\lambda \to 0$ and $U_l^* \to 0$). Graph 4 depicts the related industry outcomes.

Graph 3. Contract choice with infinite number of bidders

Set of incentive compatible contracts for low-cost operators
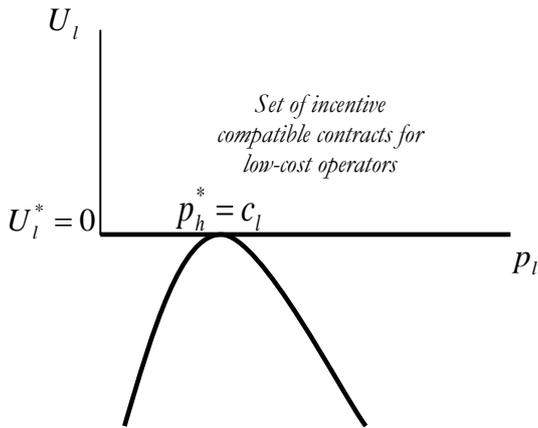
Graph 4. The asymptotic (industry) outcome of competitive bidding
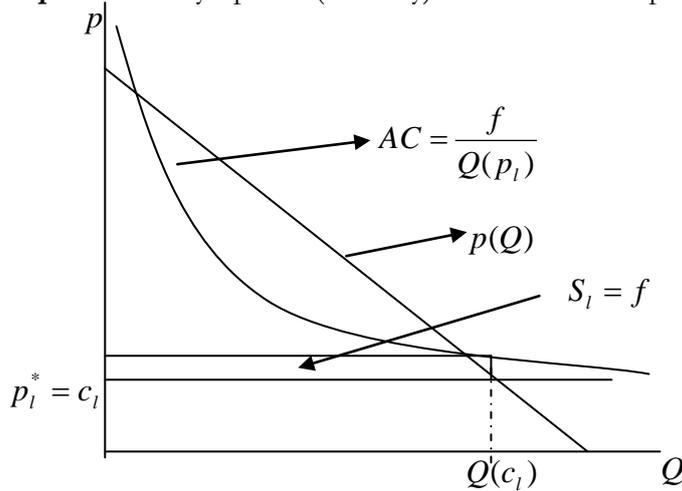
Needless to say, the asymptotic paradigm does not fit with more realistic circumstances and just amounts to a benchmark case, as for perfect competition in standard industrial organization theory. One may criticize a certain diffuse confusion between the asymptotic

benchmark (*Proposition 2*) and the outcome under more concrete hypotheses (*Proposition 1*); nevertheless, in theory, the final judgement on social desirability of CT remains always largely robust, at least in a logic of second-best. Theoretical appeal is then increasing in the degree of potential competitiveness.

However, on a practical viewpoint, serious doubts may be raised on real advisability for bidding competition. In effect, the above analysis implicitly underpins some basic conditions for success, such as the absence of collusion and corruption, bidding equality, contract completeness and perfect enforcement of the awarded regulatory mechanism (Williamson, 1976). To assess possible sources of failure and (practical) problems with franchise bidding, we need to complicate somewhat the theoretical analysis made so far and its main assumptions. The next section is devoted to these crucial issues.

IV. REASONS FOR FAILURE: THEORY AND EVIDENCE

As (hurriedly) argued in the above, tender desirability is not granted for sure, yet depends crucially on auction rules and on some other setting conditions. In effect, at this stage of the analysis, such a statement may still sound too vague for the reader: we try to make the point clearer in a while.

Let start from a common-sense consideration: real-life circumstances are mostly foreign to the stylized world depicted so far. Recall that, in previous models, most implementation issues were consciously left out of the picture, as to highlight just the most basic economic relationships. Therefore, based on the above, it would be at least premature to unreservedly sing praises for franchise bidding, as a proper substitute of perfect competition. If any, some qualifications and a bit of caution seem advisable. In fact, most recent stories of action failure have been explained exactly as the outcome of excessive confidence and/or of poor consideration for actual success preconditions (bidding parity, no collusion, contract design, adequate enforcement). In this respect, the international experience with franchising of local services appears very instructive, and it will be extensively relied upon through the whole section. We aim at completing theoretical findings with a bit of pragmatism, that suggested by real-life experiences or by an implementation-based viewpoint.

To go step by step, theoretical conjectures in *Proposition 1* and *2* were formulated under two main assumptions, namely *(i)* firms' independent and private information about the prospective production technology and *(ii)* absence of any sort of discrimination in awarding. In others terms, bidders were assumed to contend services on equal foot, and tendering authorities to provide all firms with the same information (demand features, growth rates, description of production technologies, legal obligations, etc.) and to rely on selection criteria by no way discriminatory.

Unfortunately, in practice, these conditions may be severely flawed in case of corruption (subsection IV.1) and incumbency advantage (subsection IV.2): the ambition of significant cost reductions or subsidy savings proves illusory when the rules of the game are somewhat "biased" in favour of "special" competitors. Collusion may also be an issue, as it invalidates the truth-telling mechanism through which tenders achieve their desirable outcomes (subsection IV.6). Then, contract incompleteness and improper enforcement of tendered schemes make awarding agencies subjected to risks of renegotiation and opportunism (hold-up): initial gains may prove only apparent, once taking into account ex post generous

(for operators) adjustments (subsection IV.3). Finally, tenders may also be prone to quality deterioration (subsection IV.4) and under-investment (subsection IV.5), at least when auction rules do not provide for suitable controlling devices.

IV.1 Corruption and Favouritism

A striking finding in the analysis of public sector outsourcing, even in developed countries, is a certain vulnerability to fraudulent discrimination. In effect, in spite of large disparities, also among different regions in the same country (in Italy, for instance, it's much more widespread in the South), corruption is basically everywhere an important challenge of civilization and legality, with relevant impact on public sector efficiency, hence on the economic growth. Franchise bidding and local services are not immune to this threat. However, before seeing why and in what proportion, we urge a clarification on terminology. Through the entire work we term corruption any form of favouritism or self-interested abuse of discretion by tendering authorities in exchange for material (*e.g.*, bribes) or immaterial (*e.g.*, electoral support) rents. In a sense, corruption consists in any sort of mutually advantageous collusive agreement between the auctioneer and special bidders. The impact on tender performances should be easy to guess. The abuse of discretion may harm allocative efficiency and potentially obstruct the inherent engine of franchise bidding, namely the working of genuine competition.

A French case is very instructive in this respect. In 1989 a long-term concession (25 years) for water provision in the city of Grenoble was awarded to a private operator (*Lyonnaise des eaux*). After long disputes before administrative and criminal courts, in 2000 the concession was revoked for corruption and bribery, and the service re-municipalized, with significant improvements in terms of tariffs, quality and investment efforts[147]. Similarly, in Italy, in the area of Agrigento (Sicily), a dozen of persons were led under investigation for collusive tendering (*turbativa d'asta*, in the Italian legal jargon)[148], again in the water industry.

One can counter-argue that tenders are by themselves less prone to malfeasant behaviours and discriminatory selection than individual negotiation. Besides, in the economic literature (and in policy-making based on it) compulsory tenders are typically justified with protection against corruption, in particular by invoking risks associated with misalignment between principals' (local communities) and agents' (competent bureaucrats) interests in the public

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[147] See Avrillier R., « Le retour aux sources » ; Italian translation : Avrillier R., « Il ritorno alle origini », 2004.
[148] The case is quoted in Druisiani (2006).

administration[149]. However, such unquestionable considerations do not exclude a certain vulnerability to unfair behaviour, at least when auctions rules allow for some degree of opacity and discretion (Klitgaard, 1995).

To describe the effect of favouritism, we assume only one "advantaged", yet inefficient bidder, with marginal costs $c_F > c_l$. The probability for her to be selected is η, that can be interpreted as the likelihood to reach a collusive agreement with the auctioneer for being awarded the service in exchange for a bribe B or electoral support of the same value. The proportion of low-cost firms is still π; high-cost types are about $(1-\pi)$ of the population of potential suppliers[150]. Auction rules involve some degree of discretion, with respect for instance to the assessment of firms' experience, financial viability, etc. The awarding agency can turn such a freedom to her own advantage, for hiding collusive agreements and favouritism. We also assume that corruption refers both to selection probability and contractual conditions: a bribing operator is selected preferentially and provided with economic conditions $\{p^F; S^F\}$ of special favour, not disposable for "non-advantaged" competitors. These economic terms are particularly appealing and result from pre-award private negotiations with the auctioneer. Therefore $\{p^F; S^F\}$ and B are treated as given in the authority's maximisation programme:

$$Max_{\{p_h; U_h\}; \{p_l; U_L\}} \eta[TS(p_F) - (1-\alpha)U_F + B] +$$
$$(1-\eta)\{(1-(1-\pi)^n)[TS(p_l) - (1-\alpha)U_l] + [(1-\pi)^n[TS(p_h) - (1-\alpha)U_h]\} \tag{14}$$

subject to:

$$U_l \geq \lambda[U_h + (c_h - c_l)Q(p_h)] \tag{15}$$

$$U_h \geq 0 \tag{16}$$

$$U_l \geq 0 \tag{17}$$

where:

$$\lambda = \frac{\phi_h}{\phi_l} \qquad \phi_h = (1-\eta)\frac{(1-\pi)^{n-1}}{n}; \qquad \phi_l = (1-\eta)\frac{1-(1-\pi)^n}{n\pi} \tag{18}$$

(observe incidentally that the specification presented in Section III just amounts to a special case of the model presented here, for $\eta = 0$).

The solutions of the constrained maximization programme through (14) to (18) are:

$$U^*_{h(N.F.)} = 0 \qquad\qquad U^*_{l(N.F.)} = \lambda[(c_h - c_l)Q(p_h)] \tag{19}$$

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[149] In France, the Sapin Act justifies compulsory CT for local services exactly on anti-corruption grounds.
[150] Given that we assume just one "favored" bidder, the proportions assumed in the previous section are infinitesimally modified when the number of participants is sufficiently large.

$$p^*_{l(N.F.)} = c_l; \qquad\qquad p^*_{h(N.F.)} = c_h + \frac{\pi}{1-\pi}(1-\alpha)(c_h - c_l) \qquad\qquad (20)$$

Proof. See Appendix.

Proposition 3. *Favouritism has the sole effect to reduce the probability of selecting a low-cost provider. The optimal contract menu for non-favoured firms remain unchanged*

From (14), the main effect of favouritism is to reduce the probability to select the most efficient firm. Moreover, observe that the first-best allocation is prevented also asymptotically: with a number of bidders extremely large, the probability to select a very efficient operator is still $(1-\eta) \leq 1$.

Now combine *Proposition 1* and *2* with *Proposition 3*. The probability to select the lowest-cost provider (allocative efficiency) is increasing in the number of bidders (n) and in the proportion of efficient operators (π), but decreasing in the probability of favouritism (η). The following table summarizes our main findings.

Table 1. Probability to select an efficient provider

Selection mechanism	Favouritism	Probability to select an efficient operator
Private negotiation	No	π
Private negotiation	Yes	$(1-\eta)\pi$
CT	No	$[1-(1-\pi)^n]$
CT	Yes	$(1-\eta)[1-(1-\pi)^n]$

Proposition 4. *The probability to select the lowest-cost provider (allocative efficiency) is increasing in the number of bidders and in the proportion of efficient operators, but decreasing in the probability of favouritism and corruption.*

Unfortunately, it's not easy to test empirically the real magnitude of suggested effects, if any because of the lack of suitable data. Favouritism is secret by its own nature, while detection rates may be a misleading information, as they can be interpreted as a signal for both corruption and the adequacy of the deterrence system. Most empirical works rely on

subjective indices[151] provided by international institutions (World Bank, Transparency International, etc.), which are typically general - *i.e.*, referring to the whole economy -, as the nature of the underlying research questions. These contributions, which analyse corruption in wider settings (than tenders for local public services), are nevertheless very useful to the aims of this work.

In effect, the topic of prime causes of corruption has been widely studied both theoretically and empirically, but final conclusions are sometimes contrasting. On one hand, the classical economic thinking - in particular the "rent-seeking literature" and the "theory of capture"[152] - suggests that the higher the potential rents, the more likely the room for malfeasant behaviours. This means that η is not exogenous, as we supposed for simplicity in the above analysis, but depends negatively on the degree of market competitiveness, hence on the numbers of competitors (*i.e.*, we can reasonably assume a function $\eta(n,..)$, with $\partial \eta(n,..)/\partial n \leq 0$). In this vein, a protected position, as the monopoly franchise of local service providers, appears an appealing prize to bribe bureaucrats in charge with awarding licences. Consistently, it has been suggested that any reform that increases competitiveness can reduce corruption incentives, since bribes are less profitable and harder to sustain when approaching the conditions for perfect competition (Rose-Ackerman, 1978). These policy arguments are confirmed in a recent empirical contribution by Ades and Di Tella (1999): the authors observe an inverse relation between corruption levels and the degree of exposure to foreign imports and competition.

However, in opposite perspective, it is has been recently suggested that the impact of competition on corruption is everything but clear cut (Celentani and Ganuza, 2002). For instance, higher rents may also make public agencies more concerned with controlling competent bureaucrats (for instance, through direct monitoring or incentive contracts), so that the net impact of more competition may be either positive or negative (Bliss and Di Tella, 1997; Laffont and N'Guessant, 1999).

To our eyes, such a debate appears too concerned with finding a one-way relation between corruption and competition, and it's somewhat misleading. Indeed, the level of competitiveness is in itself not exogenous to the corruption level and to the transparency of procurement procedures. A large number of bidders may be refrained from bidding when a diffuse sense of illegality and favouritism frustrates their expected probability of success. To get the point, let abandon the ingenuous assumption of zero participation costs. Entry

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[151] As suggested by Ades and Di Tella "some problems stem from the possibility that the persons generating the subjective reports do not share the same cardinal rankings or that the rankings are not uniform".
[152] Classical references are Tullock (1967) and Krueger (1974).

expenditures may be prohibitively high as compared to expected rents, even more in case of favouritism. Indeed, corruption reduces perceived chances of success and make participation intimately undesired in most cases. One can guess that the higher the corruption risks, the weaker the participation rates.

Formally, a potential bidder would be driven out of the contest unless:

$$(1-\eta)\phi_i U_i \geq k \qquad\qquad (21)$$

where k represents the participation cost (*e.g.*, entry fees). Observe that the right-hand side of expression (21) - hence participation incentives - is decreasing in the probability of favouritism.

In principle, the "participation problem" could be solved contractually, *i.e.* by providing all bidders with expected rents larger than initial entry costs. However, this would come at a social cost, in terms of lower rent-extraction. In particular, under corruption and costly bidding, the optimal menu contract would involve:

$$U_h^{C,C} = \frac{k}{(1-\eta)\phi_l}\,; \qquad\qquad U_l^{C,C} = \frac{k}{(1-\eta)\phi_l} + \lambda[U_h + (c_h - c_l)Q(p(c_h))] \qquad (22)$$

Rents for both types are higher than corresponding ones under the hypothesis of no corruption (and costly entry):

$$U_h^{NC,C} = \frac{k}{\phi_l}\,; \qquad\qquad U_l^{NC,C} = \frac{k}{\phi_l} + \lambda[U_h + (c_h - c_l)Q(p(c_h))] \qquad (23)$$

By comparing (22) and (23), equilibrium rents with corruption - (22) - are always higher than in case of genuine competition – (23) -, for any $\eta > 0$. This distance is increasing in the probability of favouritism η, for both types.

Proposition 5. *Under costly participation, the "rent-extraction benefit" of optimal tenders is decreasing in the level of favouritism.*

Practically, tenders are rarely designed in this way (*i.e.* as to satisfy conditions in (22)) and fail to incentivize costly bidding. Stakes are in general too low for many bidders, as compared to real chances of success. Thus, since decreases individual (expected) rents by $(1-\eta)$, favouritism tends to severely condition aggressive participation.

Finally, economic agents often fail to act rationally and their participation may be influenced also by psychological frustration when confronting with tenders whose final

outcome – they think – is already written. In the case of local services, this occurs frequently when there is special candidate for easy success: the incumbent.

IV.2 THE INCUMBENCY ADVANTAGE

The "incumbency advantage" represents an alternative explanation for the lack of bidding competitiveness. Sometimes it amounts to the best example of favouritism. Indeed, the parameter η in the previous subsection IV.1 could also be interpreted with the political pressure to perpetuate public control[153] or with the desire to avoid electorally costly changeovers, at least where tendering authorities coincide with local governments. For myopic local administrations, municipally-owned incumbents are powerful tools for electoral purposes, they wish to protect against harsh competition.

Another interpretation relates to "path dependency" and ideological contentions: there could simply be a certain resistance against novelties, in general, and against eventual involvement of private interests in the provision of services with relevant social impact, in particular.

Finally, an alternative, yet more widespread, explanation for the incumbent's perpetuation relies on her information advantage (*e.g.*, superior knowledge on demand and cost conditions). To understand the point, one should adopt a change in perspective, and replace the *independent, private value assumption* with the *common value assumption* (*i.e.*, cost uncertainty at the time the monopoly franchise is tendered)[154]. For instance, as in Riordan and Sappington (1987), one could imagine that, before bidding, each player observes a private signal about unobservable prospective costs c and formulates accordingly her bid. In this context, the incumbent's advantage means that her signal is much more informative and, eventually, predicts perfectly future costs of provision. Instead, less informed competitors can hope to succeed only if they overbid. This phenomenon, referred to as "winner's curse" in auction theory, consists in the danger that the winner is likely to be the party that has most greatly overestimated the awarded prize (Milgrom and Weber, 1982). New entrants may be discouraged from bidding aggressively or even from stepping in, as they perceive that success at profitable conditions is quite remote for them. Consequently, the competitive pressure on incumbents is relaxed and poor savings can be predicted. The

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[153] For instance, in most countries, as in Italy, the large majority of incumbents are publicly owned companies.
[154] For a discussion, see Milgrom (1989).

auction mechanism is deprived of its inherent merit: selecting the best operator and extracting most of its rents. A famous auction theorist, Paul Klemperer, addresses the point with the usual incomparable clearness (2002):

> "knowing about winner's curse will cause everyone to bid cautiously. But weaker firms must be especially cautious, since they must recognize that they are only likely to win when they have overestimated the value by even more than usual […] Because the winner's curse affects weak firms much more than strong ones, and because the effect is self-reinforcing, the advantaged bidder wins most of the time. And because its rivals bid extremely cautiously, it also generally pay a low price when it does win".

To sum up, due to asymmetric information and exposure to the "winner's curse", the incumbent succeeds most of the time and, because of overtly cautious bidding by rivals, she also pays less than otherwise would be the case (Menezes *et al.*, 2003). In the same vein, Prager (1989) observes:

> "the incumbent will possess a significant advantage over potential competitors at franchise renewal time, thereby transforming the renewal process into a small numbers bargaining situation, in which the franchisee is likely to possess the greater share of bargaining power".

In other words, regardless of its motivations (information advantage, political resistance against changeovers, favour toward loyal existing providers, etc.), the incumbency advantage results in poorly desirable outcomes, as for any form of favouritism and protection against competition (see *infra*, previous subsection). As we will show in Section V, the Italian experience with local tenders offers a good test for these arguments.

Proposition 6. *The incumbency advantage in franchise bidding typically results in relaxed competition, hence in allocative inefficiencies (lower probability to select the best provided) and poor economic performances (higher tariffs, lower rent-extraction).*

Needless to say, the incumbency success is not a bad news in itself (as a difference from bribery or ingenuous favouritism), since it's quite common that existing operators are also better equipped for running tendered activities, in terms of experience, know-how, knowledge of the business, reliability, etc. These differential competences and resources imply an inherent, non-transferable advantage over rivals, which should be nevertheless protected only to the extent it translates in lower costs (and tariffs for citizens). In other worlds, the incumbent's success should result from a really competitive procedure, where

bidders share equal opportunities and information, and the existing operators are not advantaged by the sole fact of being owned by awarding administrations or by their unshared, privileged information.

The incumbency advantage is expected to be more robust at the time the license is first tendered (this is the condition of most Italian municipalities), as competition is more limited in first phases of market opening (Heimler, 2007). Others counter-argue that the effect on competition is even worst in successive awards, because *inter alia* potential bidders anticipate more pessimistically the advantage or simply because the relevance of suggested asymmetries increases with the cumulative level of the incumbent's relation-specific investments. In effect, although theoretical conclusions are somewhat ambiguous, the international evidence - for instance in the water and transportation industry – is more uniform: competition tends to be relaxed when the same license is retendered several times.

IV.3 CONTRACT INCOMPLETENESS AND IMPERFECT ENFORCEMENT

Franchise awards are long-term agreements, within which in principle all terms of provision are specified in detail. However, in practice, auctioning complete contracts, regulating any possible contingency and defining all dimensions of performance, is just a little more than an illusion. Contracts are inherently incomplete, even more when referring to complex activities, lasting for long time (Williamson, 1976). This may depend on unforeseeable events, contingencies which are prohibitively costly to regulate ex ante (rational gaps) and measurement ambiguity with respect to certain contract specifications, as quality standards (see *infra*, subsection IV.4)[155].

When such contingencies actually occur (and this is more likely in case of long franchise periods), parties need to agree ex post on their regulation. Firms may take this chance to extort better conditions (Schmalensee, 1979). Post-award renegotiation modifies the terms of provision, often radically, and in general in a way that favours awarded operators. Improper enforcement of existing clauses may also lead to similar adjustments[156] (Pranger, 1989). This phenomenon of ex post rent-extraction, referred to as "hold-up" in the economic literature[157], is quite common in local service provision. To make a suitable example, in 1993 the French Parliament opted for compulsory auctions to award water

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[155] See Cooter and Ulen (2007).

[156] Even a complete, well-designed contract is of a little value if the awarded operator fails to fulfil its explicit obligations.

[157] See Klein *et al.* (1978) and Tirole (1988).

provision (and not only) with the "Sapin Act". After the new legislation, most licences were competitively awarded at better conditions (for consumers and municipalities) as compared to the recent past, but almost always winning firms benefited immediately from generous renegotiations.

It's a fact that most adjustments are requested by licence-holders quite immediately after winning the contest and signing the original contract, typically to extort more favourable terms, such as tariff increase, higher subsidies, delay or reduction in investment obligations (Guash, 2004). The explanation lies on respective bargaining positions: re-awarding the licence would be too costly for the auctioneer (the municipality or other local governments); the licensed firm may find convenient to hold-up her counterparty in order to obtain better terms of provision ("retendering" or "switching costs" amounts to a sort of fixed relation-specific investment for local administrations). In effect, also the incumbent often engages in specific stakes, which are not transferable in the event that the licence is retendered in advance to a new operator (see *infra*, subsection IV.5). Both these relation-specific involvements create a situation of bilateral dependency, whereby each contractual party has an interest to renegotiate ex post omitted terms in order to avoid expensive, advance tender renewal[158].

But, exactly for this reason, ex post accommodation may give room to opportunistic behaviours, that in turn harm social welfare to an extent which depends on the degree of individual lock-in. The working mechanism is relatively simple. Imagine a local administration wishing to auction the service of refuse collection. The original contract specifies most terms but neglects the regulation of a contingency, unforeseeable at the time of award, *i.e.* the injunction to shut down a neighbouring dump for environmental damages. The injunction involves additional costs of provision, due to the need to identify an alternative, yet more distant location, to higher transportation costs, etc. Let assume that, all things being equal, the incumbent would incur in losses for 100€ if it continues running the activity at unchanged contractual conditions. Moreover, imagine that for the awarding municipality the (sunk) cost of retendering the same service would be 1000€, because of penalties, administrative expenditure, discomforts for citizens, etc. Then, in case of substitution, the incumbent would incur in losses for 300€, because of not completely recovered specific investments, which are also non-transferable to new providers (for instance, investments in human capital). The incumbent predicts a 50 percent probability of substitution in the event of tender renewal in advance. Therefore, efficiency would require

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[158] For a discussion, see Hart (1995).

to renegotiate terms and avoid re-awarding, because a new auction would cost too much (1000€+0.5*300€=1150€), compared to expected saving (100€ [159]).

Since the causing contingency was unregulated, the operator can threat to rescind the contract for *impossibility of performance*, unless it's "fairly" compensated for new costs. Suppose that it makes a "take-it-or-leave-it" offer to the awarding authority against the threat of rescission. If the threat is credible, the incumbent can ask up to 999€ as a compensation for additional costs of 100€. However, such an offer will be presumably not accepted, since based on a non-credible threat, as shown by the solution of game tree 1. The timing of the game is the following. In period 1, the awarding authority decides whether to accept or refuse the request of 999€, as a compensation to be paid in order to avoid contract rescission. If it accepts, in period 2 the operator bears costs for 100€, but receives a generous compensation for 999€. If it refuses, the incumbent can either withdraw its threat and continue running the service (it would suffer costs for 100€, without any compensation) or rescind the contract (it would bear expected losses on sunk specific investments for 150€). Clearly, the latter will prefer the first option. But, by anticipating such a behaviour, the original offer will not be accepted by the awarding municipality in the first place, since based on a non-credible threat. The backward induction solution of the game is highlighted in red in the following graph.

Game tree 1
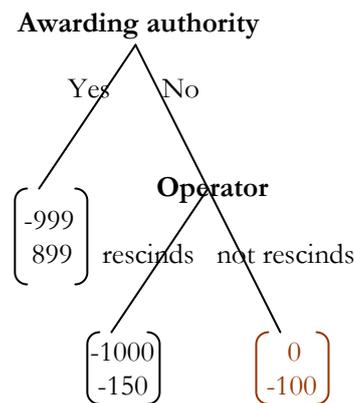
The game and its underlying logic imply that, as long as expected losses on specific investments overweight unanticipated cost increase, the operator cannot hold-up completely on the authority's switching costs and appropriate all *quasi-rents*.

Needless to say, for symmetric reasons, also the awarding municipality cannot extract the entire renegotiation surplus, unless retendering costs are zero. To prove this, imagine that

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[159] Since service provision would be interrupted, the operator would avoid unexpected losses for 100€.

the local authority proposes a very small transfer of ε (with a small $\varepsilon > 0$) as a compensation for not rescinding the contract. At period 1, the operator can either accept or formulate a counter-offer (let say it asks for 800€); then, at period 2, the authority can either accept the counter-offer or bear the cost of a new tender. Stakes are summarized in the following game tree. By backward induction, the operator will not accept the authority's proposal and will make a counter-proposal (see the solution of next game).

Game tree 2

Operator

Yes   Counter-offers

$$\begin{pmatrix} -100+\varepsilon \\ -\varepsilon \end{pmatrix}$$

Authority

accepts   refuses

$$\begin{pmatrix} 700 \\ -800 \end{pmatrix}$$ $$\begin{pmatrix} -150 \\ -1000 \end{pmatrix}$$
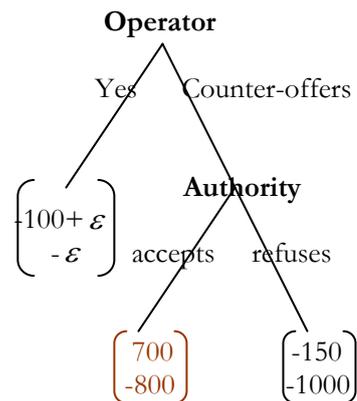
Game tree 2 and its backward-induction equilibrium need to be interpreted carefully. Our contention is not that a compensation of 800€ is an equilibrium, but simply that accepting a poor offer would be a dominated strategy for the incumbent. A rational firm can always make a wealth-improving counter-offer. The same qualitative conclusions hold for any improving proposal, *i.e.* for any counter-proposal involving a compensation larger than ε.

All together game trees 1 and 2 prove that extreme solutions, whether in a sense (a compensation of ε€) or in another (transfers for (1000-ε)€) are unlikely to represent an equilibrium. Bilateral involvements in the contractual relationship create a position of double monopoly, whereby none of parties is able to extract all *quasi-rents*. Yet, the analysis so far does not allow for any prediction on actual equilibrium compensation. In effect, negotiation rarely involves just one proposal and, eventually, a counter-proposal, as in our simplified game-theoretical presentation. Typically, it goes through several steps before that a mutually advantageous accommodation can be agreed upon. Final outcome will depend on respective negotiation capacity, risk attitude and bargaining power, that in turn one can reasonably suppose to be negatively related to the size of parties' specific investments and outside options (in our case, the incumbent operator would be advantaged). In particular, if stakes are common knowledge, parties will agree on a fair compensation in the range $[0€,1000€]$, where 1000€ is the maximum compensation the authority is willing to offer

and 0€ is the minimum that the operator is willing to accept[160]. In the easiest case of Nash bargaining, the refuse collector obtains a very generous compensation of 500€, five times the additional unpredicted costs which originally called for a renegotiation. This should explain the above conjectures: the incumbent tends to exploit unregulated contingencies to extract radically better terms of provision.

Notice that if expected losses on specific investments are zero or, at least, lower than unanticipated costs, the operator may extract the entire renegotiation surplus. If, for instance, non-transferable specific investments worth 100€ (instead of 300€) and the expected probability to be rewarded the licence is still 50 percent, a "take-it-or-leave-it" offer of 999€ would be based on a credible threat of contract rescission, hence accepted in the first place. The next sequential game, a variant of game tree 1 (with different incumbent's sunk investments), straightforwardly proves such a result. This implies that, depending on the likelihood of future renegotiations, hence on the degree of contract incompleteness, the incumbent may have a rational interest to reduce as much as possible non-transferable specific investments (under-investment problem). In fact, this gives an unshared position of bargaining power *vis-à-vis* awarding municipalities.

Game tree 3
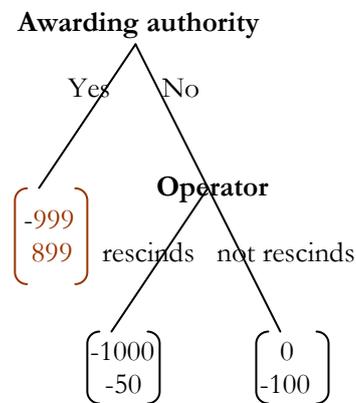
To generalize this frame, let I be the level of the incumbent's non-transferable specific investments, X the authority's cost of retendering the activity and γ the incumbent's perceived probability to be re-awarded the license, in case of tender renewal in advance. Let assume that, when an unregulated event (involving unanticipated losses for x) occurs, the incumbent can choose to rescind the contract for *impossibility of performances* (the service will be retendered), unless parties agree on a mutually beneficial renegotiation. In particular,

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[160] Under the circumstances at hand (expected losses on specific investment higher than additional unpredicted costs), the operator is willing to accept any positive compensation. Therefore, the lower bound of the interval is 0€. Instead, the upper bound is 1000€, *i.e.*, the authority's gains from not retendering.

when successful, ex post accommodation involves a transfer c (from the municipality to the operator) as a compensation for losses x on unforeseen contingencies. Renegotiation avoids a social loss of $S = \gamma \cdot I + X - x$, since it prevents retendering costs (X) and expected losses on the incumbent's sunk investments ($\gamma \cdot I$), but imposes the additional expenditure x for running the activity in a less favourable environment.

Therefore, renegotiation is socially desirable when:

$$S = \gamma \cdot I + X - x \geq 0 \qquad (24)$$

If condition (24) holds and transaction costs are zero or sufficiently low, renegotiation will succeed (Coase Theorem): parties will agree on a fair compensation c, which corresponds to a mutually advantageous sharing of ex post surplus in (24). In particular, for renegotiation to be accepted by the incumbent, it must be the case that:

$$c > \max\{(x - \gamma \cdot I); 0\} \qquad (25)$$

Analogously, the awarding municipality will accept to compensate the operator only if:

$$c < X \qquad (26)$$

Therefore, two cases need to be analysed:

1) $x - \gamma \cdot I < 0$: the operator is better off with any positive compensation ($c > 0$), since it always prefers running the activity and bearing losses for x, instead of risking $\gamma \cdot I$ in a new tender.

2) $x - \gamma \cdot I > 0$: the operator has the whole bargaining power since, differently from the awarding authority, it finds a new tender convenient as compared to continue running the activity (with no compensation). Therefore, since it can credibly commit itself to the threat of contract rescission, the incumbent can make a very high "take-it-or leave-it" request for compensation.

In case 1), conditions (25) and (26) imply that agreed compensation can assume any value in the interval $c \in [0; X]$. Under Nash bargaining, equilibrium compensation will be:

$$c_1{}^* = \frac{X}{2} \qquad (27)$$

Therefore, if X is very high relative to x (*i.e.,* more than twice) - as it seems the case in most real-life circumstances - the operator gets a very generous renegotiation of initial subsidies[161].

Under case 2) (*i.e.,* $x - \gamma \cdot I > 0$) the incumbent has the whole bargaining power. It will make the following "take-it-or leave-it" offer: a compensation of $c^{**} = X - \varepsilon$ (with $\varepsilon > 0$ sufficiently small) to avoid contract rescission. The proposal is mutually advantageous and based on a credible threat, as rescission would be an ex-post dominant strategy for the incumbent in case of refusal (recall that $x - \gamma \cdot I > 0$). Therefore:

$$c_2^* \cong X \qquad\qquad (28)$$

In this case, the probability and the generosity of post-award adjustments are defiantly higher than under (27), since $X > 2x$ implies $X > x$. In this hypothesis, it's quite likely that renegotiation is very appealing for the incumbent: the latter could be willing to reduce non-transferable investments efforts, as to increase the probability to comply with conditions for case 2).

One may also assume that the bargaining power is not uniform (Nash solution), but distributed according to respective contract-specific involvements. In particular, let define with $\alpha(I, X)$ the incumbent's bargaining power as a function of both I and X, where $\alpha(I, X)$ satisfies the following properties:

$$0 \le \alpha(I, X) \le 1;$$

$$\alpha(I, 0) = 0; \qquad \alpha(0, X) = 1;$$

$$\frac{\partial \alpha(I, X)}{\partial I} < 0; \qquad \frac{\partial \alpha(I, X)}{\partial X} > 0$$

$$\begin{cases} \alpha(I, X) = 1 & \text{if } I < \dfrac{x}{\gamma} \\ \alpha(I, X) > 0{,}5 & \text{if } I < X \\ \alpha(I, X) < 0{,}5 & \text{if } I > X \end{cases}$$

The equilibrium compensation will be:

$$c^{**} = \alpha(I, X)X \qquad\qquad (29)$$

that is straightforwardly increasing in X and decreasing in I. This implies that, for any given level of retendering costs X, the incumbent has a strong incentive to reduce non-transferable specific investments.

Notice that, from (29), renegotiation may also condition participation choice, when retendering costs are low and awarding authorities choose to exploit contract incompleteness at their own advantage. Formally, if a firm anticipates that $\alpha(I,X)X < x$, it will prefer not to bid at all, since knows it will incur in losses ex post.

Finally, observe that Case 2) of previous specification can be modelled as a sub-case of this more general frame by assuming $\alpha(I,X)=1$ when $I < x/\gamma$. Then, not surprisingly, equation (29) allows for analogous predictions of equation (28).

Proposition 7(1) *Awarded contracts are inherently incomplete or imperfectly enforced, hence prone to ex post renegotiation. Firms exploit unregulated contingencies - and eventually call pretentiously for a change in conditions - to holdup awarding authorities. The degree of exposure to opportunistic behaviour by the incumbent is increasing in the level of retendering costs and decreasing in the amount of the incumbent's specific, yet non-transferable investments. Initial benefits from tenders may prove illusory, when tender performances are assessed along the whole length of monopoly franchise.*

Proposition 7(2). *However, when retendering costs X are relatively low compared to unforeseen losses x, the opposite effect can occur: awarding authorities can exploit contract incompleteness to their own advantage and discourage bidding participation.*

In theory, the frequency of renegotiations is contingent to the nature of tendered services (in particular to the degree of underlying complexity) as well as to the length of monopoly franchises. For instance, urban lighting involves much less complexity and risks than public transportation or water provision. Typically, the operator just attends to maintenance, without bearing investment obligations or other risks. This – in turn - reduces significantly the mass of unanticipated events that may call for an ex post accommodation. Moreover, the issue of contract incompleteness is more severe the longer is the franchise period, for the consideration - maybe unnecessary - that the same (unforeseen) contingency is more likely to occur in a longer period: a straightforward implication of the "law of large numbers".

> **Proposition 8.** *The frequency of renegotiations is increasing in the degree of complexity and in the length of franchise periods*

One may think that post-award opportunism just results in wealth redistribution from local governments to service providers (whether public or private operators), at least in the large majority of cases. At the end of the day, renegotiations are a good deal for the society, since avoid waste of money (and social well-being) from organizing a new tender. Ideally, allocative efficiency would require that saved money could be canalized toward those parties having the chance and the ability to make the most fruitful use of it, but one may question the belief that local governments are always better placed to do so. For instance, incumbents may use additional cash flows to finance investments for quality improvement or environmental-friendly technologies.

In effect, these defensive arguments are poorly founded on a twofold viewpoint. Firstly, the Chicagoans' approach, according to which regulation should be foreign to distribution concerns (to be addressed only through the fiscal system), is unrealistic and criticisable when regulators (and tendering agencies) coincide with municipalities, as in most countries. Secondly, and maybe more significantly, generous ex post renegotiations can also raise welfare concerns in a more subtle, dynamic perspective. In particular, the perceived possibility of renegotiation and the chance for ex post opportunism may distort bidding strategies, thus potentially altering the outcome – and, if any, the desirability - of franchise bidding. Indeed, in the hope of future renegotiation at more favourable terms, would-be operators may be induced to bid strategically. Truthful revelation of individual type could be no longer incentive-compatible when bidders play for high stakes - as in the logic of "winner-takes-all" contests – and anticipate the possibility to review initial bids afterward. To increase their chance of success and confident of post-award adjustments, parties may "bid promises" which are too difficult to satisfy, by using strategically the existing uncertainty on cost and demand functions (Spulber, 1990). For instance, contending firms may be induced to exaggerate their efficiency levels and ask for lower tariffs or subsidies, thus increasing their winning chances. Consistently, Athias and Nuñez (2008) have found a positive relationship between perceived probabilities of renegotiation and strategic behaviour (*i.e.*, aggressive bidding) in toll road concession auctions.

Apparently, consumers should benefit from aggressive bidding. Practically, this is just an illusion, as ex post renegotiation has the potential to invalidate initial gains. The latter can prove only an apparent effect, to enlarge electoral consensus. As put forth by the Nobel Prize Paul Krugman (2002):

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"it's common for private contractors to bid low to get the business, then push their prices up once the government work force has been disbanded. Projections of a 20 or 30 percent cost savings across the board are silly – and one suspects that the officials making those projections know that[162]".

Zupan (1989) offers another emblematic example of illusory gains from strategic over-optimism. Three years after having got the licence and cabled New Orleans, the winning firm (Cox Cable) of the local cable-TV franchise obtained a 36 percent basic rate increase and significant scale backs in community programme obligations.

Needless to say, the expectation of adjustments of similar size could frustrate the ambition to prize the best offer overall. Indeed, there is no ex ante awarding criterion that allows to select always the best bid ex post. When bidders have dissimilar attitude toward risk and strategic behaviour, choosing the best offer among similar initial economic bids is mainly a gamble. Since optimism, hazard, bargaining capacity and correctness are not uniformly distributed (they depend *inter alia* on individual risk-aversion rates), the expected outcome from CT may be severely altered by perspective renegotiation and opportunism, in terms of both "selection" and "rent-extraction benefit".

This can also occur when certain bidders feel confident of larger ex post bargaining power, for instance because of special links with awarding administrations (*e.g.*, municipality-owned firms may confide in future financial rescue). As Williamson (1976) put forth:

> "Such awards are apt to be arbitrary and/or pose the hazards that adventurous
> bids will be tendered by those who are best suited or most inclined to assume
> political risks".

Finally, post-award adjustments are a way to hide favouritism, while giving the appearance of auction success (see *infra*, subsection IV.1). Most of these practices are frequently observed in the building industry (Bajari and Tadelis, 2001).

Proposition 9. *In case of contract incompleteness or weak institutional environments, would-be operators have an incentive to bid strategically, anticipating future renegotiations at more favourable terms. This may alter social desirability of tenders, as a powerful selection and rent-extraction mechanism, and eventually help favouritism.*

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[162] Krugman P. (2002), Victors and spoils, *New York Times*, 19th November 2002, Section A, p. 31.

In effect, there exists a powerful self-enforcing device against strategic exploitation of contract incompleteness in long-term relationships, *i.e.,* reputation[163]. The fear that opportunism will invite some form of retaliation in next awarding has in itself the potential to sustain more efficient outcomes. Disposable evidence proves that the risk of losing future business is a serious concern for economic agents (Zupan, 1989b). However, for reputation to work properly, as for any other informal device, some basic conditions need to be guaranteed. For instance, if the awarding rule is automatic (*e.g.*., the lowest-cost provider, the best price, the highest score, etc.), the record of past behaviours does not influence re-awarding, so that future retaliation is not a credible threat.

This also means that, although helping favouritism and contrasting with transparency purposes, some discretion may be worthwhile, at least when confined at a pre-bidding, qualification stage. The point is to find a balanced compromise in the trade-off among alternative objectives. We will come back on this issue in next sections, within a more general discussion on proper auction design.

IV.4 QUALITY SHADING

At the outset, two main types of contracts are typically awarded in local service industries, namely cost-plus and fixed-price schemes. Each type can be implemented with various degrees of complexity, but, in a nutshell, public subsidies can be either related to expected costs and sales (fixed-price contracts) or to ex post deficits (cost-plus contracts), with asymmetric impact on quality levels. Indeed, the latter are expected to lead to quality over-provision, while the former to performance deterioration (Vickers and Yarrow, 1988).

Our model in Section III predicts that, under the optimal tender, a fixed-price contract is awarded to the winning bidder. This finding fits with dominant practices in many local services and countries. Therefore, in coherence with theoretical conjectures and actual regulatory experiences, we will mainly focus on high-powered incentive schemes and, in particular, on their link with quality performances. Besides, under cost-plus contracts, quality deterioration, although not totally excludable (some quality dimensions involve nonmonetary, hence non-reimbursable costs), is at least less alarming.

A well-settled conclusion in the economics of regulation suggests that fixed subsidies make firms sacrificing quality of service (Laffont and Tirole, 1994). This risk is even more serious when dealing with tenders. Indeed, it has been argued that, once accounting for quality

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[163] Kreps (1983).

choices, fixed-price contracts, awarded on the basis of a "lowest-claimed-cost" (as in our formal analysis) or "lowest-price" auctions, may lead to unintended, yet counterproductive results. Armstrong and Sappington (2005) limpidly observe that:

> "standard procedures such as competitive bidding that work well to select least-cost providers may not secure high levels of service quality. A competitive bidding procedure may award a monopoly franchise to a producer not because the producer is more able to serve customers at low cost, but because the producer's low costs reflect the limited service quality it delivers to customers".

When quality is verifiable, the authors suggest to award the service to the party submitting the "best offer" overall: contending firms should bid a bundle price-quality, while knowing in advance the rule according to which both bundle components (quality and price) translate into a unique score (scoring function). Unfortunately, this solution is theoretically appealing, but practically complex, costly and unfeasible, as most quality dimensions are subjective and difficult to verify. What's more, a multi-dimensional score would imply too arbitrary choices[164]. Admittedly, Armstrong and Sappington (2005) conclude pessimistically:

> "when quality is not verifiable, consumers may be better served when the regulator engages in individual negotiations with a randomly chosen firm than when he implements a competitive bidding process"

Armstrong and Sappington's intuition maybe goes too far in its pessimism. In effect, it's undisputable that the level of quality delivered to customers cannot be measured and verified perfectly (Jensen and Stonecash, 2004; Sappington, 2005). Data collecting is not enough for complete assessment, since quality also requires subjective judgements, which are often non-contractible[165]. Take the case of transportation services. Some performance dimensions can be measured objectively (percentage of delays, average delay, ageing of busses, etc.); for other, actual evaluation may vary significantly among users (standard of cleanliness, staff courtesy, comfort, etc.).

It's also indisputable that quality non-verifiability and imperfect measurability may represent a serious concern. To stick with the urban transportation example, Yvrand-Billon (2005) observes a decreasing trend in average commercial speed and service frequency after

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[164]For instance, weights attached to price and quality dimensions in the scoring rule may simply reflect the authority's preferences or those of the most powerful pressure group, thus being misaligned from social welfare.

[165] Personal valuations of the same performance may be very sensitive to individual consumers' preferences.

tenders in France and explains this effect with poor monitoring and non-credible incentives.

However, imperfect verifiability does not exclude that some quality signals or proxies could be fruitfully relied upon, in order to avoid "biased" selection and post-award quality deterioration. In particular, we suggest that calls for tenders should provide with a minimum quality standard (hereafter, MQS) obligation, complemented by a linear compensation for performances above basic thresholds. By the first device one prevents the risk to transform auctions in a sort of *race to the bottom*. Instead, the latter tool aims at avoiding effort distortions, once that minimum targets have been surely guaranteed[166].

Obviously, first-best (*i.e.*, full information) outcomes will not be achieved. Firms will fall short of immeasurable or poorly rewarded performance dimensions, while applying themselves too much into the most rewarded ones. Yet, these corrective devices allow to protect bidding competition and its distinctive merit (namely, increasing the likelihood to select the least-cost provider) against the risk of quality shading. Clear enough, the effectiveness of suggested devices (*i.e.*, the degree of distortion in effort allocation among different quality performances) will depend on the way proxies are actually designed, hence on the industry knowledge of designers.

To put these arguments more formally, let Y be the true level of overall performance. If Y is perfectly verifiable, the contract can make quality rewards/penalties contingent on ex post verification of its level. Unfortunately, this is never possible, by definition of quality non-verifiability. Yet, even if incentive schemes based on Y are practically unfeasible, other contract solutions can be auctioned and enforced before courts. In particular, penalties and rewards may be based on some proxies P (instead of Y), namely a sort of weighted sum of only measurable and contractible quality features. This proxy is inherently imperfect and incomplete: some dimensions of performance are not verifiable; others can be only imperfectly measured.

As in Section III, we imagine that firms "bid" cost promises. In particular, each bidder names the cost at which she commits to a minimum score $\overline{P}$ of a specified quality index P [167]. Non-fulfilment of basic thresholds would be severely punished. In particular, the

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[166] Standard agency theory teaches that when agents' efforts are rewarded (or not punished) through non-linear target-based contracts, they will stop devoting themselves once reaching minimum targets.

[167] Minimum targets need to be carefully specified. Ideally, all targets should be set at levels corresponding to the marginal principle (marginal cost equal to marginal benefit of supplying additional quality). In practice, it seems reasonable to bias downward such computations, avoid risks of over-specification (by misinformed authorities) and exploit delegation. The underlying idea is to leave actual quality choices to the party that is in the best information position (the operator). For a discussion on MQS, see also Sappington (2005).

winning bidder would pay D in the event of performances falling short of $\overline{P}$. We assume penalties high enough to assure deterrence, that is:

$$C(\overline{P}) < \theta \cdot D \qquad (30)$$

where $C(\overline{P})$ is the costly effort to achieve $\overline{P}$ and θ is the probability of detection.

The call for tender also provides with a linear compensation w for performances above the minimum threshold $\overline{P}$, that is:

$$w = bP + t \qquad \text{for } P > \overline{P} \qquad (31)$$

Who "bids" the lowest cost gets the right to serve the market at given economic conditions (tariffs and subsidies). She also commits herself to the MQS obligation ($\overline{P}$) and to the quality incentive scheme in (31), both ex ante specified and advertised[168] [169].

To assess the effect of auctioning proxy-based schemes on post-award quality levels, we use a simple principal-agent model, an extension to a different context of a contract theory application by Gibbons (2005). In particular, we start by a benchmark case of perfect information (*i.e.*, quality level Y is perfectly verifiable and contractible). Both the principal (the tendering authority) and the agent (the winning firm) are risk-neutral. In particular, let Y be a known function $f : R^n \to R$ of the n-vector $a' = [a_1, a_2, ..., a_i ..., a_n]$ of quality dimensions (or visible actions) under the agent's control, plus a zero-mean noise term (ε, with $E[\varepsilon] = 0$), *i.e.*:

$$Y = f(a) + \varepsilon \qquad (32)$$

A noise term in the production technology implies that the agent's quality performance is partially uncertain. Notice that $a_i, i = 1,2...n$ is a generic quality dimension on which the agent can take performance-improving actions. For instance, bus delays can be reduced by increasing the number of daily runs; the regularity of water provision can be improved by organizing more effectively precautionary maintenance, etc.

The awarded contract specifies the following payoff function for the winning bidder:

$$\begin{cases} w = bY + t & \text{if } Y > \overline{Y} \\ w = -D & \text{if } Y \leq \overline{Y} \end{cases} \qquad (33)$$

To make matters simple, we assume just three quality dimensions ($a' = [a_1, a_2, a_3]$) and a linear production technology:

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[168] Note that firms do not bid neither on the MQS nor on the reward scheme, which are both pre-specified in the call for tenders.

[169] By simultaneously exploiting both MQS and a linear (quality) incentive scheme, the auctioneer avoids "biased" awarding, while delegating actual choices to the most informed party.

$$Y = f(a) = q_1 a_1 + q_2 a_2 + q_3 a_3 + \varepsilon \qquad (34)$$

The agent's cost function, which defines expenditure or effort to get $a' = [a_1, a_2, a_3]$, is assumed to be additive (*i.e.*, actions are not substitute to the agent's choice)

$$C(a) = C_1(a_1) + C_2(a_2) + C_3(a_3) \qquad (35)$$

and convex in all dimensions:

$$\frac{\partial C(a)}{\partial a_i} = C'_i(a_i) \geq 0; \frac{\partial^2 C(a)}{\partial a_i} = d^2 C_i(a_i) \geq 0; \forall i = 1,2,3 \qquad (36)$$

Moreover, for sake of simplicity, we assume that if either a_1 or a_2 or a_3 fall short of respective (minimum) threshold $\overline{a}_1$, $\overline{a}_2$ and $\overline{a}_3$, the incumbent incurs in money penalties for D. Under these conditions, the payoff function in (33) becomes:

$$\begin{cases} w = bY + t = b(a_1 q_1 + a_2 q_2 + a_3 q_3 + \varepsilon) + t & \text{if } a_i \geq \overline{a}_i \quad \forall i = 1,2,3 \\ w = -D & \text{otherwise} \end{cases}$$

Again we assume that penalties are large enough to assure deterrence, *i.e.*:

$$C_1(\overline{a}_1) + C_2(\overline{a}_2) + C_3(\overline{a}_3) < \theta \cdot D \qquad (37)$$

so that falling short of minimum thresholds is never in the agent's interest. Therefore, the condition $a_i \geq \overline{a}_i, \forall i = 1,2,3$ will represent a constraint in the agent's post-award maximisation problem[170].

Under the above circumstances, the franchisee chooses performances a_1, a_2 and a_3 as to maximise her expected payoff:

$$Max_{a_1;a_2} E[b(q_1 a_1 + q_2 a_2 + q_3 a_3 + \varepsilon) + t - C_1(a_1) - C_2(a_2) - C_3(a_3)] =$$
$$= b(q_1 a_1 + q_2 a_2 + q_3 a_3) + t - C_1(a_1) - C_2(a_2) - C_3(a_3)$$

subject to: $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad (38)$

$$a_i \geq \overline{a}_i \qquad \forall i = 1,2,3$$

At optimum, the operator chooses the quality levels $\hat{a}_1$, $\hat{a}_2$ and $\hat{a}_3$ corresponding to the marginal principle (marginal costs equal to marginal benefits). More formally, solutions are:

$$\hat{a}_i \qquad \text{satisfying} \qquad b \cdot q_i = C'_i(\hat{a}_i) \qquad \forall i = 1,2,3. \qquad (39)$$

If the bonus component b is efficiently chosen (*i.e.*, as to align private and socially desirable benefits), this compensation scheme assure optimality. Under risk-neutrality assumption, it's not difficult to prove that efficiency may be achieved through the most powerful

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[170] In effect, another implicit assumption is that the penalty D is affordable for the incumbent. Otherwise, the incumbent could find convenient to fall short of MQS, and exploit limited liability. This is a standard conclusion in Law and Economics literature. See Shavell, 2004.

incentive scheme (*i.e.*, $b = 1$). This would make agents residual claimants for performance improvements, hence inducing them to supply welfare-maximising quality levels, *i.e.*, the levels at which marginal benefits equate marginal costs of supplying additional units.

Unfortunately, first-best outcomes are practically unfeasible, since total quality is largely unobservable. The awarding authority cannot measure perfectly overall performance Y, but at most an imperfect proxy P for it, and make compensation contingent on the ex post verification of its score. Proxies are incomplete by definition or attach sub-optimal weights to single dimensions. At most, one can try to approach as much as possible the true quality-production technology, but the result will still remain an approximation.

Consider the following index, where action a_3 is assumed unverifiable, hence does not enter in the score (η is a mean-zero disturbance):

$$P = h_1 a_1 + h_2 a_2 + \eta \qquad (40)$$

We preserve the assumption of additive, convex (in a_i; $\forall i = 1,2,3$) cost function as in (35). The awarded contract enforces penalties D for performances below some minimum levels ($\overline{a}_1$ and $\overline{a}_2$) and a linear incentive scheme for performances above such thresholds, as related to ex post verification of the score P. Therefore, the agent's payoff function will be:

$$\begin{cases} w = bP + t = b(h_1 a_1 + h_2 a_2 + \eta) + t & \text{if } a_i \geq \overline{a}_i \quad \forall i = 1,2 \\ w = -D & \text{otherwise} \end{cases}$$

where penalties still achieve deterrence by assumption:

$$C_1(\overline{a}_1) + C_2(\overline{a}_2) < \theta \cdot D \qquad (41)$$

The agent solves the following maximisation program:

$$Max_{a_1; a_2} E[b(h_1 a_1 + h_2 a_2 + \eta) + t - C_1(a_1) - C_2(a_2)] = b(h_1 a_1 + h_2 a_2) + t - C_1(a_1) - C_2(a_2)$$

subject to: $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad (42)$

$$a_i \geq \overline{a}_i \qquad \forall i = 1,2$$

whose solutions (*i.e.*, post-award quality choices) are:

$$\breve{a}_i \qquad \text{satisfying} \qquad b \cdot h_i = C_i'(\breve{a}_i) \qquad \forall i = 1,2 \qquad (43)$$

$$\breve{a}_3 = 0 \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad (44)$$

where $\breve{a}_i$ satisfies $b \cdot h_i = C_i'(\breve{a}_i)$ and $h_3 = 0$. Notice that, because of convexity (marginal costs are increasing in $a_i, \forall i = 1,2$):

$$\breve{a}_i \geq \hat{a}_i \qquad \text{if} \quad h_i \geq q_i \qquad (45)$$

$$\breve{a}_i \leq \hat{a}_i \qquad \text{if} \quad h_i \leq q_i \qquad\qquad (46)$$

Paying the agent's quality efforts based on P will create stronger incentives on those activities whose weights in P are larger than corresponding weights in Y. For instance, if $h_1 > q_1$ and $h_2 < q_2$, the contract will create stronger incentives for dimension a_1 (than those desired by the principal) and weaker for a_2, as in Figure 4.

Notice also that from (44) our incomplete proxy-based scheme induces no effort as regards those dimensions which are not rewarded at all (*i.e.*, those not included in P, but relevant in Y). For instance, dimension a_3 may be any quality dimension which can only be assessed subjectively, but not enforced in an incentive scheme.

Graph 5. Post-award distortions in quality supply under proxy-based reward schemes
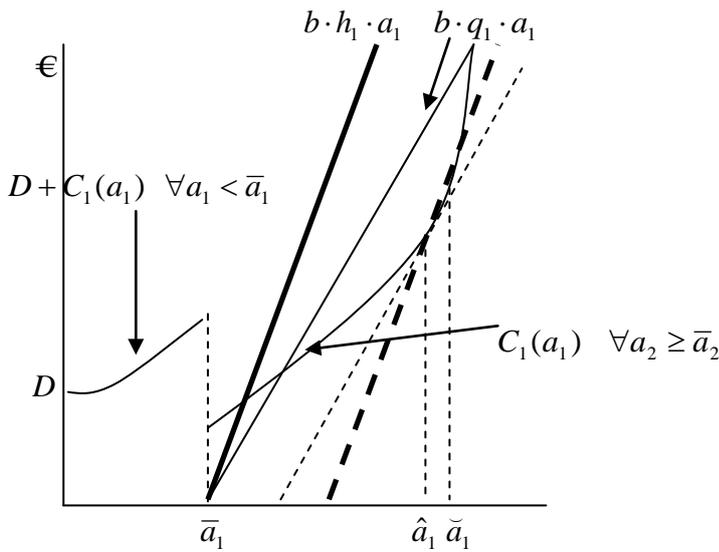
(a) $h_1 > q_1$
If P over-weights quality dimension a_1, the agent will take more effort than what is desirable. Graphically, condition (a) involves a steeper benefit-curve $(b \cdot h_1 \cdot a_1)$ as compared to that associated with the first-best compensation scheme $(b \cdot q_1 \cdot a_1)$.
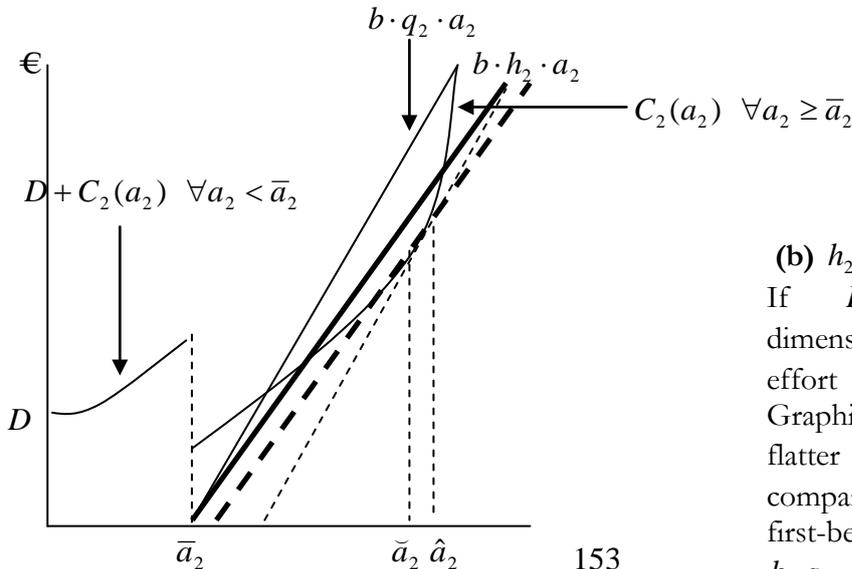
(b) $h_2 < q_2$
If P under-weights quality dimension a_2, the agent will take less effort than what is desirable. Graphically, condition (b) involves a flatter benefit-curve $(b \cdot h_2 \cdot a_2)$ as compared to that associated with the first-best compensation scheme ($b \cdot q_2 \cdot a_2$)

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To improve firms' incentives, the bonus component b under proxy-based schemes should differ from the optimal one under the perfect information benchmark ($b = 1$). For instance, if one guesses that both $h_1 > q_1$ and $h_2 > q_2$, optimality would require b to be consistently reduced, as P creates too strong incentives on both a_1 and a_2. Clearly, these arguments are purely theoretical, as they contrast with the starting point of this analysis, namely quality non-verifiability. If the principal could know in advance about similar distortions, she would directly change weights in the proxy formula, at the time incentive schemes are set. However, the digression appears interesting in another perspective, since it allows to understand true causes of potential distortions, namely size and alignment of weights in P and Y. To prove this, we assume an additive, quadratic cost function:

$$C(a_1, a_2, a_3) = k_1 \cdot a_1^2 + k_2 \cdot a_2^2 + k_3 \cdot a_3^2 \qquad (47)$$

Then, the optimal incentive component b^* (*i.e.*, the one maximising welfare) would be:

$$b^* = \frac{q_1 h_1 k_2 + q_2 h_2 k_1}{h_1^2 k_2 + h_2^2 k_1} \qquad (48)$$

Proof. See Appendix

Therefore, the optimal bonus b^* differs from the efficient one under the benchmark case ($b = 1$) by an amount that depends on both size and alignment of weights in P and Y. The normative implication of (48) should be clear. A performance measure P is as much valuable as it provides incentives more equally sized and aligned with those based on Y.

Solutions through (43) to (46) confirm classical conclusions in agency theory. When confronted with multi-task activities, economic agents tend to allocate their efforts to those tasks that are most easily measured and better monitored (Holmstrom and Milgrom, 1991). This straightforward principle, summarized in the idea of "getting what you pay for", is a milestone in agency theory (Kerr, 1975; Gibbons, 2005). In particular, awarded firms will allocate efforts to those quality dimensions which are best rewarded or most accurately detected, falling short of those for which penalties/rewards are inadequate. Some dimensions do not even enter in the reward mechanism (for instance, courtesy toward customers, comfort), maybe because difficult to observe, quantify, verify. One can predict poor or zero commitment on them. More in general, depending on their weights in P, the

firm will oversupply or undersupply (as compared to welfare-maximising levels) single quality dimensions.

On a normative side, this suggests that the choice of the aggregate index P is crucial. Weights attached to single dimensions should be as much as possible aligned with those based on Y.

Proposition 10. *To control for quality-shading, tenders should entail minimum quality requirements and money incentives for performances above minimum thresholds. Even when overall quality is unverifiable, one can make quality rewards contingent on a synthetic measure of performance. This amounts to a second-best solution. The magnitude of efficiency losses (compared to ideal, full-information devices) will depend on the adequacy and completeness of performance indices*

IV.5 PROTECTION OF NON-TRANSFERABLE, SPECIFIC INVESTMENTS BY THE INCUMBENT

When concessions are tendered[171], they may result in under-investment. The point was originally made in Williamson (1976) and confirmed empirically, at least indirectly, in Joskow (1987). If franchise periods are not sufficiently long, firms may fail to recoup their financial efforts, with negative impact on their incentive to invest in the first place.

Even when contracts provide for a "fair" compensation to the outgoing provider, the uncertainty surrounding the measurement of depreciation rates (these depends on several factors, such as technological evolution, maintenance services, etc.) and the expected future benefits of investments (for instance, buying new equipments often involves future savings in maintenance costs, which are too difficult to quantify ex ante) tends to lead to under-compensation. For instance, the perspective impact of current expenditure is rarely assessed and indemnified, if any because uncertain and largely unquantifiable; investments in human capital are even more difficult to transfer, etc. Consequently, as part of its effort is systematically non-contractible and non-transferable at "fair" terms, the incumbent could be refrained from engaging in (sunk) investments, which would have nevertheless improved performances and production technologies, in the interest of the whole society (Baldwin and Cave, 1999).

Under-investment concerns are expected to be increasing in the incumbent's perceived probability to be replaced at the renewal stage and concentrated temporally at the end of

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[171] Recall that the basic distinction between "concessions" and "operative franchising" pertains to the circumstance that, only in the former case, awarded operators bear all investment obligations.

contract periods, when the expire date is approaching and the recoupment time is shorter. Moreover, as observed in subsection IV.3, firms may have an incentive to reduce non-contractible investments also to limit their lock-in and benefit from higher bargaining and, eventually, more generous renegotiations. The magnitude of the latter effect largely depends on the degree of contract incompleteness.

Empirical studies provide with non-uniform evidence. Affuso and Newbery (2001) analyse the relation between franchise length, uncertainty and investment rates over a panel of 25 franchisees (passenger Train Operating Companies, TOC) in the British railway industry. They find that firms tend to delay strategically their investment efforts up to the end of contract periods, as to improve their probability of being re-awarded the same service. Indeed, by investing more, incumbents build up a strong "first mover's advantage" for themselves, while raising rivals' costs. Moreover, the authors observe a counter-intuitive inverse relation between investment efforts and franchise length.

Instead, Chong and Huet (2005) find opposite evidence in the French water industry. In particular, the longer the awarded contract, the larger the investments undertaken by public authorities, to compensate for insufficient incumbents' efforts. Moreover, the probability for these substituting investments to be undertaken by public authorities tends to increase as the contract approaches its expire date.

Proposition 11. Tenders may lead to under-investment, since part of the incumbent's financial efforts is systematically non-contractible or non-transferrable at "fair" terms when the licence is retendered to a new operator. Under-investment is increasing in the expected probability of replacement by new comers and in the degree of contract incompleteness, and temporally concentrated at the end of franchise periods. Nevertheless, empirical evidence is not uniform.

IV.6 COLLUSION

A primary requirement for tender effectiveness is healthy competition at the bidding stage. This condition is flawed when prizes are awarded somewhat in advance, as in case of favouritism, unmatchable competitive advantage (typically, for the incumbent) and collusive bidding. We discussed extensively the first two points, respectively in subsection IV.1 and IV.2. Here we deal with bidding coordination.

Collusion substitutes the harshness of competition with agreements for profit-sharing (or market-sharing) and easier life, with non-trivial, yet negative impact on tariffs, subsidies or

quality levels. If competitors agree, tacitly or explicitly, on the "share-out of the loot", there is no way to convincingly argue on the superiority of franchising bidding. In particular, coordination may be a serious concern especially with multiple-object auctions (for instance, transportation services may be tendered route by route as in London, refuse collection auctioned by single urban areas, etc.) and/or in case of multi-market contacts (firms simultaneously compete to serve several municipalities), since competitors may sustain more effectively prize-sharing at low prices under these circumstances.

Although most of these anti-competitive practices are admittedly hard to challenge legally, particularly when coordination is tacitly sustained, nevertheless competent authorities have often fined firms for collusion in procurement. For instance, the French Competition Authority denounced a cartel among the three leading providers of local bus services, namely Keolis, Transdev and Connex. These companies were condemned to pay almost 12 millions of euro (respectively, 3.9, 3 and 5 millions of euro) for having *inter alia* coordinated their participation strategies and bids (the Commission observed that, also when all the defendants participated simultaneously to competitive auctions, there was only one serious bid), while threatening potential, disturbing new comers.

Needless to say, the exposure to anti-competitive dangers depends on several aspects of auction design as well as on the existence of a credible threat of harsh penalties by competent authorities (Klemperer, 2002). For instance, the economic profession convincingly argues in favour of sealed-bid auctions, *i.e.*, the format typically exploited in the procurement of local public services. Indeed, lower transparency (among bidders) makes harder to promptly identify and punish defective firms, and deprives partners of the chance to use initial bidding stages to signal intentions on how to "share the pie"[172]. Other implementation aspects may also play a role (see Table 2).

In this respect, it has been argued that "bidding rings [..] are driven by forces very similar to those governing cartel formation in oligopolistic markets" (Albano *et al.*, 2006). Consistently, the same structural factors, as entry barriers, frequency of interactions, market transparency or multi-market contacts, which are expected to help sustaining collusion in oligopolies (Motta, 2004), may also facilitate bidding coordination in procurement markets. To understand the point, one should consider the procurement market as a whole, where bidders meet repeatedly for getting the right to serve the same

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[172] See Cramton and Shwartz (2001) and Klemperer (2002). In both studies the authors observe a wide number of signal practices to achieve and sustain bidding coordination, in the specific context of spectrum auctions.

municipality (*i.e.*, at any franchise renewal) and eventually compete among themselves in different geographical areas and/or for different services (*e.g.*, multi-service providers).

More formally, bidding coordination can be achieved if the cost of reaching an agreement is not prohibitively high (participation condition) and future deviations can be severely punished, hence ex ante discouraged (stability condition). This is a typical finding in all studies on collusion. In particular, collusion occurs if the following two relations hold for any bidder, at any time:

$$\pi_{i0}^{BC} + \delta \cdot V_{i1}^{BC} - \psi \cdot P_i - \omega_i \geq \pi_{i0}^c + \delta \cdot V_{i1}^c \qquad \forall i \qquad \text{(participation condition)}$$

$$\pi_{i,t}^{BC} + \delta \cdot V_{i,t+1}^{BC} \geq \pi_{i,t}^D + \delta \cdot V_{i,t+1}^P \qquad \forall t \quad \forall i \quad \text{(stability condition)}$$

where:

$\pi_{i,t}^c$ = profits under free competition at time t;

$V_{i,t+1}^c$ = present value of future profits under free competition at time t;

$\pi_{i,T}^{BC}$ = profits under bidding coordination at time t;

$V_{i,T+1}^{BC}$ = present value of future profits under bidding coordination at time t;

$\pi_{i,T}^D$ = one-period profits from deviation at time t;

$V_{i,T+1}^P$ = present value (at time $t+1$) of future profits for a defective firm i (deviating at time t) in a successive punishment phase;

$\delta = 1/1 + r$ = discount factor;

ω_i = cost of reaching a collusive agreement;

ψ = probability that the cartel is punished;

P_i = firm-specific fine.

Participation and stability constraints allow to identify structural factors, eventually related to auction format, which may facilitate or discourage collusion in franchise bidding. In particular, the following table summarizes the most important factors, their actual impact on collusion (increasing/decreasing probability for anti-competitive agreements to be sustained) and the variables in the participation and stability conditions which are more likely to be influenced. Tabled relations are self-evident and do not ask for further explanations.

Table 2. Factors and auction rules facilitating/discouraging collusion

Structural factor	Effect on the probability to collude	Main influenced variables (sign of the relation)
Transparency of bids (dynamic vs. sealed-bid auctions)	Increasing	$\omega_i(-)$; $V_{i,t+1}^P(-)$
Number of bidders	Decreasing	$\omega_i(+)$; $\pi_{i,t}^{BC}(-)$; $V_{i,t}^{BC}(-)$
Franchise length	Decreasing	$V_{i,t+1}^P(+)$
Multi-market contacts (*e.g.*, multi-object auctions)	Ambiguous	$\omega_i(+)$; $V_{i,t+1}^P(-)$; $\pi_{i,t}^{BC}(+)$; $V_{i,t}^{BC}(+)$
Entry barriers (*e.g.*, entry fees, procedural simplicity)	Increasing	$\pi_{i,t}^{BC}(+)$; $V_{i,t}^{BC}(+)$
Cost asymmetries	Decreasing	$\omega_i(+)$; $\pi_{i,t}^D(+)$

Proposition 12. *Collusion may invalidate the inherent merit of franchise bidding. The degree of exposure to anti-competitive agreements depends on several aspects of auction design, as summarized in Table 2, as well as on the existence of a credible threat of harsh penalties by competent authorities*

V. Lessons from Past Tenders for Local Public Services in Italy

The Italian past experience with CT is instructive on the extent to which franchise bidding may be prone to failures when auctions are poorly designed and/or there is a lack of effective political support. In this section, we explore evidentiary lessons from tenders in single local industries. Each sector is taken as emblematic of possible implementation issues, like limited number of competitors and renegotiation problems (water), incumbency advantage (transportation), quality deterioration and under-investment (gas distribution). Finally, risks associated with collusive bidding are described through some recent cases discussed before the Italian antitrust authority.

Notice that this way of treating subjects, sector by sector, corresponds to a conscious viewpoint, according to which industry-specific differences are informative on the unavoidable link between theoretical conjectures and specificities of the institutional and industrial environment. That's also why, through the whole section, the analysis of tendering experiences is always conducted within the frame of sector-specific regulations.

V.1 A Few Bidders for Integrated Water Services: A Tentative Explanation

The reorganization of the Italian water industry has been proceeding since almost fifteen years, but unfortunately the process is still incomplete. A first systematization dates back to 1994 (Law 36/94 or *Galli Law*), by which the legislator tried to invert a dangerous trend, no longer sustainable, in terms of quality deterioration, environmental damages and municipal deficits. Indeed, for years the industrial organization of water services in Italy had been characterized by extreme fragmentation (more than 9000 operators involved in small areas and unbundled services), direct or indirect running by municipalities, tariffs below costs and high frequency of service interruption[173]. The 1994 reform was inspired by the ambitious project to get:

- the concentration of related activities (*i.e.*, waterworks, sewerage and purification services) in a single, integrated provider, in order to allow for the exploitation of scope economies;

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[173] ISTAT (1991), *Approvvigionamento idrico, fognature e depurazione in Italia. Anno 1987*, Roma, Collana d'informazione, n.20.

- the geographical integration of provision within "optimal basins" (ATO) beyond municipal boundaries and under the control of basin authorities (AATO), in order to allow for the exploitation of scale economies;

- tariffs aligned with both operative and investment costs, in the view of improving quality, safety and environmental impact.

Although with some delay, 92 basins (or ATOs) have been identified over time. In each of them, service has been (or is going to be) awarded to one or more integrated operators, on the basis of well-defined financial plans and investment programmes. These service conditions are pre-specified in an ATO plan and in a long-lasting (20-30 years) contract based on it. As regards selection rules and organization criteria, the *Galli Law* referred to the variety of options ruled under the Law 142/90, then transfused with minor changes in the TUEL (or "Consolidation Act on Local Authorities") in 2000 (Legislative Decree 267/2000). However, also to accomplish European stimulus, the TUEL has been modified and integrated several times (Law 448/2001, Law 350/2003), often with temporally inconsistent provisions, as extensively discussed in Section II. In particular, at least until the recent approval of article 23bis of the Law 133/2008 (see *supra*), the TUEL ruled CT as a mere faculty, of equal dignity with alternative modes (direct award to publicly-owned companies or mixed ventures, with competitive selection of private partners).

In effect, up to now water services have been rarely tendered. Regulatory weakness and freedom of choice have been exploited as an opportunity to protect municipally-owned companies against competition and replacement risks. Besides, local authorities (municipalities and provinces) have only apparently disappeared from the institutional setting, as they are associated within basin authorities or AATOs[174], hence ultimately competent for selecting providers and defining the ATO plan as well as the awarding conventions. In other words, it's up to them to choose their counterparties and draw the main content of relative contractual (regulatory) relationship, although some national and regional constraints (*e.g.*, on tariff setting, quality regulation, awarding rules, etc.) have to be satisfied. More recently, the Legislative Decree 152/2006 - which reorganizes the whole environmental sector - has confirmed the frame described so far and the original structure of the *Galli Law*. However, its implementation at regional level has been neither uniform nor always consistent with national provisions, in particular, as regards some organization choices (COVIRI, 2009). Finally, observe that the new general discipline of local public

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[174] An AATO can be established either in the form of a consortium or as a convention among local governments.

services (*i.e.*, article 23bis of the Law 133/2008) defiantly opts for tender as the general awarding criterion[175]; thus, in the future, tenders will no longer be a choice (hopefully!).

As regards implementation of past reforms, after 15 years of slow progresses, 91 over 92 basins have taken office, among which about 85 have approved their ATO plan, corresponding to 96 percent of the Italian population (almost 56 millions of persons). Then, 69 of these ATOs have already awarded service provision to 114 local operators (some ATOOs allow for multiple contractors), with different legal status and capital structure. The following table summarizes these findings.

Table 2. The organization of water services in Italy

ATO (92)				
ATO established (91)				ATO-Lemene
ATO with basin plans already approved (85)			ATO without plan (6)	
ATO having already awarded services (69) to 113 operators		ATO having to award services (16)		

Source: COVIRI, *Annual report on water service provision in Italy*, July 2009

Up to now, AATOs have opted for all the awarding rules in the normative range. Competitive mechanisms, whether in a form (franchise bidding) or another (competitive selection of private partners in mixed ventures or PPP tenders), have been exploited in a limited number of cases (7 integrated providers selected though CT and 22 mixed companies), as shown in the following graph.

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[175] In effect, both direct and PPP tenders are now allowed under the new article 23bis, as modified by Legislative Decree 135/09 or *Ronchi Decree*.

Table 3 - Awarding mechanisms in Italy
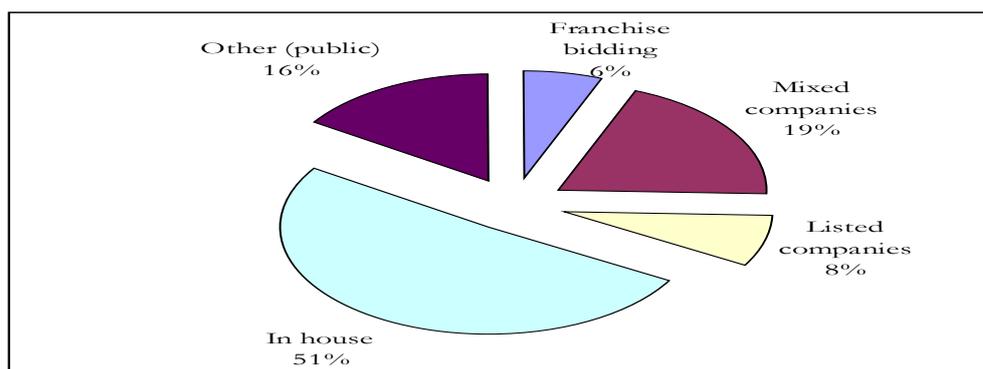
Source: COVIRI, *Annual report on water service provision in Italy*, July 2009

To restrict attention to the sole hypotheses of strict interest for this work, observe that tender discipline for water services essentially consists of two national acts (Legislative Decree 158/95 and D.M. 22/11/01) and the concurrent regional disciplines (Constitutional Court, judgement n. 272/2000), with overlapping and inconsistencies.

As regards contents, these legislations identify some participation prerequisites (*e.g.*, financial guarantees, specific experience and competence in the sector, etc.) in order to check for bidders' credibility. Then, competitive procedures typically go as follows. Basins authorities advertise a well-settled financial plan, containing a detailed investment programme (basically, the ATO plan and some declinations) and firms "bid" improving proposals over this plan. The legislation requires to prize the "economically more advantageous bid", as assessed on the basis of pre-specified criteria, as environment protection, preservation of employment levels, technical and organizational competences, anticipation of performance improvements, better economic and financial terms. The technical discipline (D.M. 22/11/01) makes explicit that the last criterion (*e.g.*, tariff and subsidy levels, tariff articulation, etc.) has to weight for at least 50 percent in the scoring rule. After selection, the winner signs an awarding contract based on its (improving) bid, which typically last for 20-30 years.

Not surprisingly, the few tenders which took place within this legal frame resulted in poor savings and technical improvements. Indeed, but for a basin (6 bidders in the ATO-Frosinone), almost in all tenders just one firm showed up, with poor improvements over base or reservation conditions. In other cases, tender procedures were declared void because of no bidders at all (*e.g.*, ATO-Sarnese Vesuviano, ATO-Reggio Calabria, ATO-

Messina) or just one offer[176] (ATO-Vibo Valentia, ATO-Trapani). In any case, almost all initiated procedures - whether or not successfully concluded - pertained Southern regions. The following table provides the number of bidders for tenders actually awarded.

Table 4. Degree of competitiveness in tenders for water services in Italy

ATO	Population (ISTAT 2008)	Number of bidders
ATO-Cuneo	573.613	n.a.
ATO-Frosinone	478.463	6
ATO-Palermo	1.241.241	1
ATO-Enna	173.676	2
ATO-Caltanissetta	272.918	1*
ATO-Siracusa	398.948	1
ATO-Agrigento	455.227	1

 * A second bidder (IBI) was excluded for irregularities in bank guarantees

Five tenders over seven took place in a specific geographical area, namely Sicily, and resulted in just one bid, but for the ATO-Enna (two bids). As predictable (see *infra*, Section III), consumers did not benefit so much from franchise bidding with a few competitors. In Table 5, the comparison with average tariffs in similar areas, where competent authorities did not resort to CT (for instance, other Sicilian ATOs, as Catania, Messina, Ragusa and Trapani), offers pitiless confirmations of theoretical predictions on the negative correlation between number of bidders and tender performances.

Table 5. Tariff comparisons between tendered and non-tendered ATO in Sicily

ATO	Awarding choice	Tariff (2008) euro/m³
ATO-Palermo	CT	1,36*
ATO-Catania	Not defiantly awarded yet	0,69*
ATO-Messina	Not defiantly awarded yet	1,09*
ATO-Ragusa	Not defiantly awarded yet	1,1*
ATO-Enna	CT	1,44*
ATO-Caltanissetta	CT	1,25*
ATO-Trapani	Not defiantly awarded yet	1,27*
ATO-Siracusa	CT	0,85*
ATO-Agrigento	CT	1,65*
Average Sicilian tendered ATO		**1,04**
Average Sicilian non-tendered ATO		**1,31**

 Source: Il Sole24Ore, 30th July 2008 (tariffs in the first year of provision)

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[176] Observe that, in some cases, tenders with one bidder were annulled on the basis of an explicit provision of D.M. 22/11/01. However, a more recent intervention (D.M. 2/5/06) establishes opposite rules, which have risen opposition by the Environmental Ministry.

Moreover, in spite of reliance on CT in five over nine provinces, the Sicily is paradoxically the Southern region with the highest water expenditure per family (Table 6). Besides, in Sicily, rates of service interruption still remains at the highest levels in Italy and quality in general has experienced a declining trend in the most recent years. This means that, at best, tenders did not contribute to improve standards of performances.

Table 6. Water expenditure per family in the South of Italy (2007)

Region	Expenditure per family
Calabria	189
Basilicata	224
Apulia	190
Abruzzo	207
Molise	190
Campania	190
Sardinia	190
Sicily	251
Average (South of Italy)	**216**
Average (Italy)	**229**

Source: Nomisma-Cittadinanzattiva

A number of reasons concurs to explain so manifest lack of competitiveness, not only in Sicily. First of all, entry barriers, in the form of disproportionate participation prerequisites, have largely conditioned bidding participation. Second, periods left to assess base plans and send bids have been typically too short - in average, just a bit more than a month and half - (Drusiani, 2006). Third and more important, most basin plans (and calls for tenders based on them) were excessively ambitious, hence economically unappealing for potential providers, since based on too optimistic sale forecasts and too rigid methodologies of tariff setting (*i.e.*, the so called "normalized method"). The IRR (Internal Rate of Return) of most plans (not more than 3 or 4 percent) was largely below a reasonable WACC (Weighted Average Cost of Capital), when also considering the high level of exogenous risks, due to regulatory uncertainty, local governments' financial delays and breaches, contract incompleteness and AATOs' inconsistent attitudes (COVIRI, 2009). Finally, other factors, as lack of transparency, favouritism, ideological opposition against the privatization of "the most public of public goods" and the lack of clear political support have sometimes contributed to poor competitiveness and embarrassing performances.

No bidders at auction in the basin Sarnese Vesuviano is emblematic for the discouraging effect of ideological positions against privatization. Immediately after that the option for CT had been exercised, the development of an opposition movement (ecologists, water warriors, etc.), together with limited profitability of the auctioned plan, strongly discouraged bidding participation and induced local politicians to assess the case for a return to public provision (in house providing). This proves that wavering political positions, humouring electoral majorities, may severely obstruct efficiency and competition.

However, recall from previous section that efficiency may also be obstructed in case of favouritism and corruption. In this respect, some doubts have been raised on the way most Sicilian tenders have been actually managed and awarded, and most local commentators have even denounced the criminal appropriation of the whole Sicilian water business. Even, interrogations have been presented before the Italian Parliament in this sense. The same competition authority has shared doubts on the appropriateness of auction management, with specific reference to the area of Palermo.

A further important aspect, only partially stressed in the above, pertains renegotiation issues. The Italian legislator requires competent ATOOs to award the "integrated water service" (hereafter, IWS), namely the combination of horizontally related activities (*i.e.*, waterworks, sewerage and purification services) and the integration of the whole chain of value creation (investments and service provision).

However, tendering the IWS exposes to frequent risks of renegotiation, as the degree of contract incompleteness is increasing in the level of complexity of awarded activities (Proposition 8). In effect, the Italian law implicitly recognizes the case for regularly updating initial conditions, as to fit with changing circumstances, and even encourages periodical reviews of the ATO plan and of the awarded contract (every three years or even before).

Based on the analysis of foreign choices, it has been suggested that the IWS is somewhat ineligible for rigid tender formats. Indeed, the international experience ranges from *beauty contests* in the French water industry (the auction object is poorly specified, municipalities have large discretion and renegotiations are consciously frequent) and the perpetual monopoly for the IWS of British companies, associated with competition by comparison (*yardstick competition*). There is no country as Italy where rigid and pretentiously complete contracts for the IWS are tendered for a long, yet non-perpetual period of time.

The Italian discipline seems focussing too much on ex ante rigid devices (calls for tenders, ATO plans, awarded conventions). Possible adjustments (*e.g.*, regular reviews of the ATO plans), which are nevertheless allowed, are not supported by sufficient guarantee of impartiality (for instance, there is no competent independent authority in charge with ex post regulation of contract gaps). This should suggest the case for poorly specified arrangements (between the AATO and the winning bidder) and frequent updating of initial conditions by parties, but within a "fairer" frame (IEFE, 2009).

We think that this solution (in the substance, resorting to *beauty contests*) could prove inadequate, as too much discretion can dangerously harm tender outcomes and invalidate the inherent merit of franchise bidding. In effect, it's indisputably true that water auctions, at least in the way they are imagined and implemented in Italy, are highly prone to successive renegotiations and that this, if left to parties, has the potential - depending on size of respective bargaining powers – to either discourage participation (Proposition 7(2)) or induce post-award pejorative terms (for users and/or consumers) and strategic bidding (Proposition 7(1) and 9). However, as we will observe more extensively in the next section, we do not need to coexist necessarily with similar risks, at least if an effective and impartial system of ex post regulation is in place. In other words, effective solutions could be devised on the institutional size, for instance by empowering an independent and equidistant authority with establishing "fair" successive accommodation of unforeseen contingencies and contractual gaps. This would avoid risks with *beauty contests* and too much discretion, while guaranteeing against distortions from ex post opportunism.

V.2 THE INCUMBENCY ADVANTAGE IN TENDERS FOR LOCAL TRANSPORTATION

Urban transportation services have been traditionally operated through municipally-owned companies, awarded directly, without any form of competitive selection of local providers (in house). However, starting from 90s, a gradual process of liberalization and privatization has taken place, in line with analogous experiences of other countries[177]. In particular, in the view of increasing efficiency and reducing public subsidization, in 1997 the Italian Parliament passed a bill (Legislative Decree 422/97 or *Burlando Decree*, as modified by the Legislative Decree 400/99), stating that non-tendered concessions were to be banned as of January 2004 and that CT had to become a condition for local providers to receive public funds. However, a diffuse normative instability, made of heterogeneous rules and

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[177] For an international review, see Hensher and Wallis (2005).

continuous postponements of transitory periods, has repeatedly altered such a frame, in the sense of an increasing uncertainty and a larger discretion for local administrations. In most cases, discretion and uncertainty have been exploited to preserve pre-existing forms of provision (*i.e.*, in house providers and non-tendered concessions). Only a few municipalities, mostly in the North of Italy, resolutely opted for a market-oriented reorganization of public transportation, based on franchise bidding.

Coming rapidly to the current discipline, after the definitive expire of the transitory period for the application of the *Burlando Decree* (December 2008, after several postponements) and the approval of article 23bis of the Law 133/2008, tenders are no longer an option for local politicians. Moreover, also for public transportation, the most recent modifications to article 23bis (article 15 of the Legislative Decree 135/09) tend to confirm this choice, with the sole PPP alternative. There is an explicit exception just for regional transportation services, which are left outside of scope of the new discipline.

When drawing a balance of the state of the reform, one concludes that the original ambitious project of liberalization is largely far from the arrival, after more than ten years. Tenders have been rare and market revenues typically cover less than 35 percent of operative costs (the *Burlando Decree* set this percentage as a minimum threshold). Moreover, the ratio market revenues/operative costs has shown a declining trend in the last years (Table 7), due to cost increases overweighting growth in core revenues[178]. This trend documents an increasing dependency from public subsidization, which in turn is an alarming indicator of the entrepreneurial inadequateness of most local providers. If it's unquestionable that making these services fully affordable necessarily involves the need for public contribution, nevertheless the ratio between internal sources (traffic revenues) and public subsidies should be at least stable and, preferably, improving over time. Otherwise, local administrations would risk to shift on taxpayers the effect of large inefficiencies as well as the political choice to protect too much users.

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[178] ASSTRA (2009) estimates that operative costs per passenger increased by 14 percent in the period 2002-2007, against an increase of unit revenues by only 9,6 percent in the same period.

Table 7. Annual evolution in the ratio market revenues/operative costs (2002-2007)
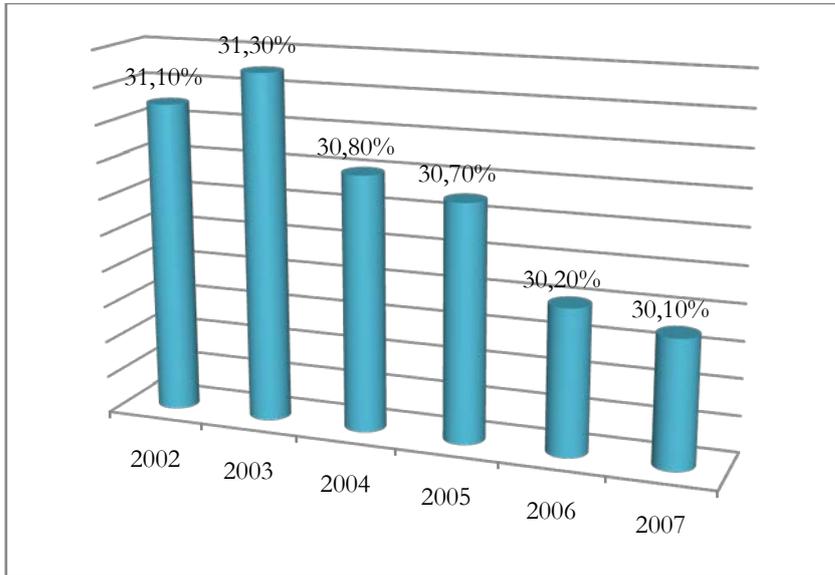
Source: ISFORT-Hermes-ASSTRA, 2009

In the logic of the reform, tendering transport services would have solved all involved efficiency and distributive concerns. Unfortunately, this ambition has proved illusory for many reasons. Tender obligation has been systematically bypassed, by exploiting normative inconsistencies and repeated postponements, with the result that, at the present, very few local provisions have been auctioned off.

In particular, their geographical distribution is by no way uniform. From Table 8, most tenders were organized in Northern regions, with the largest concentration in Lombardy (26 at 2008) and Emilia Romagna (10 at 2008). In some areas, such as Sicily, Sardinia and Abruzzi, no tender at all has taken place yet. More in general, CT is only slowly spreading in most Southern and Central regions.

Table 8. Tenders for local transportation in Italy: evolution and distribution
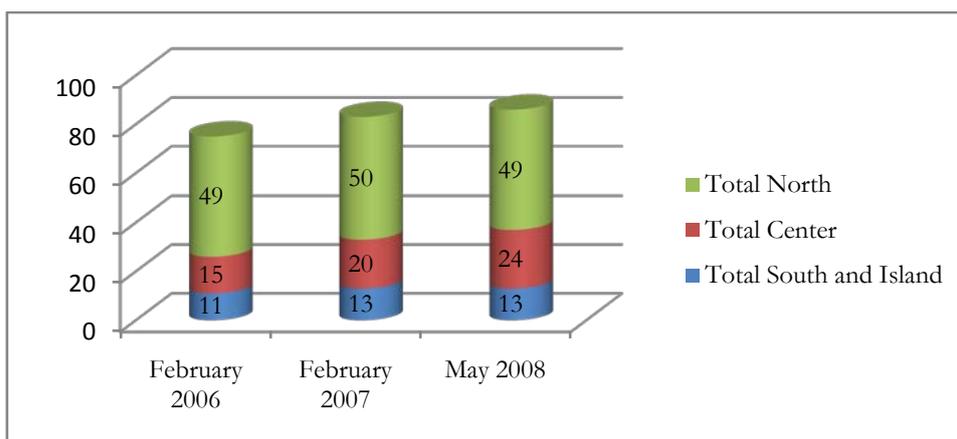
Source: ISFORT-Hermes-ASSTRA, 2009

As regards tender formats, there was (and there is) no specific constraint, but for those established at regional level. For instance, in Lombardy auctions have been organized within a well-settled frame, requiring to award a seven-years *net-cost contract*[179] to the firm proposing "the most economically advantageous bid".

For the rest, auctioneers (regions, provinces, municipalities and public authorities for mobility) have enjoyed wide freedom of choice. In particular, the length of awarded contracts ranges between 2 and 10 years, contracts can either reward (penalize) for extraordinary (poor) quality performances or not, and, finally, they can entail either separation or integration between service provision and patrimony (buses, networks, etc.) ownership. In most hypotheses, local authorities have preferred *net-cost contracts*, in order to incentivize adequate effort in both production and sale management (Alderighi and Sparacino, 2008). Finally, except for some cases (*e.g.,* additional lines in Rome, see *infra*), in Italy competitive procedures have generally regarded networks, instead of single lines or bundles of them (as in the London bus market): this notoriously plays against competition, at least in terms of number of bidders (Amaral *et al.*, 2009).

There is a further reason - other than scarce diffusion – that could explain why "tender revolution" proved insufficient, namely conflicts of interest in auction management. In effect, even when actions were actually organized, the final outcome was largely disappointing (in terms of subsidy savings), as it would come with no surprise to any person minimally familiar with some auction theory or simply with a bit of common sense.

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[179] Under a *net-cost contract*, the awarded operator bears both production and commercial risks, since it receives an amount of subsidies equal to the difference between expected costs and expected market revenues. Viceversa, with a *gross-cost contract*, revenues from tariffs accrue directly to the tendering authority and the operator receives just a fixed total subsidy related to costs, thus bearing only production risks.

The anticipated success of existing operators is the main candidate explanation. In Section IV, we emphatically named this practical flaw as the "incumbency advantage".

The following table compares rates of incumbents' success and tender performances, in terms of improvements over reservation conditions. The proportion of incumbency renewals is by itself an imperfect indicator of competitive pressure. The latter is better measured by the capacity of tenders to drive down prices and subsidies, up to cost levels for the most efficient provider, and in a declining fashion over time, that reflects constant pressure to reduce inefficiencies and save on useless costs. From Table 9, this seems not have been the case in Italy.

Table 9. The incumbency advantage in tenders for local transportation services

Region	Awarded tenders	Average reduction over reserve price	Percentage incumbents' success
Valle d'Aosta	6	4%	100%
Friuli V.G.	4	3%	100%
Liguria	4	n.a.	75%
Lombardy	10 (urban)	1%	90%
	22 (suburban)		95,5%
Emilia Romagna	6	0,50%	100%
Tuscany	11	0,01%	100%

Souce: Boitani and Cambini (2007)

Almost everywhere tenders perpetuated the incumbent's control (sometimes in joint venture with other firms), with the result that awarded subsidies were largely aligned to past costs, instead of being driven down by competitive forces. Many explanations have been suggested for this failure ("social clauses[180]", uncertainty about the auction object, procedures "tailor-made" for the incumbent, collusion), all someway ascribable to poor design, political disfavour and institutional flaws. Indubitably, unshared information advantage on the state of the network and of the fleet, together with lower "political risks" (publicly-owned incumbents can be more confident on eventual rescue by shareholders) have significantly contributed to high rates of incumbents' success (Boitani and Cambini, 2007) More in general, the coincidence between auctioneers and (main) shareholders of winning bidders has been heavily criticized, as contrasting with non-discrimination

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[180] In case of substitution, "social clauses" require new providers to employ all workers of the incumbent at the same terms and conditions. These clauses harm competition by their own nature.

principles. Finally, other explanations relate to suspects of collusion: in 2007, the Italian antitrust authorities condemned most transport providers for anti-competitive agreements (see *infra*, sub-section V.4).

Clear enough, regardless of actual causes, where auctions have a predefined winner (the incumbent), none or a few firms will be willing to lose money and time in franchise bidding: consistently, rates of bidding participation have been decreasing over time. Then, if the incumbent is crowned before starting, she can obtain her prize with no need to bid aggressively (*i.e.*, to propose ambitious strategic plans): this further explains poor performances.

Tenders as such are just a good way to hide the perpetuation of public control behind the appearance of competition (and, if any, to circumvent formal obligations), not an effective efficiency-promoting device for local administrations. It's often forgotten that tenders are means, not the end.

However, this does not mean that all Italian tenders in public transportation resulted in a sonorous failure. Instead, some stories of undisputable success are an indirect confirmation of our main contention: tenders are in itself a powerful mechanism to reduce subsidies and promote efficiency, at the condition that auctions are not flawed in implementation. As an example, take auctions organized in Rome in the period 1999-2000 to award additional and jubilee lines for a total value of 22,5 bus-km (Table 10).

Table 10. Franchise bidding in Rome (period 1999-2000)

Tender	Bus-km	Compensation per bus-km	Type of contract	Reduction	Tendering rules	Winning operator
Jubilee lines (1999)	7	2,14	Gross-cost	8,00%	Incumbent (Trambus) not allowed	Joint venture (Sita,Atm, CIPAR)
Additional services 1 (2000)	8	2,13	Gross-cost	8,23%	Incumbent (Trambus) not allowed	Joint venture (Sita,Apm, Arpa,Trasdev, Star, Cotri)
Additional services 2 (2000)	7,5	1,74	Gross-cost	25,00%	Incumbent (Trambus) allowed	Joint venture (Sita, Apm, Arpa, Trasdev, Star, Cotri)

Source: Cambini and Galleano (2005); Boitani and Cambini (2004)

All three auctions were won by a consortium, led by SITA (controlled by Ferrovie dello Stato, the Italian railway monopolist) and including some Italian local operators and (at least, in the last two cases) also an international partner (the French company Trasdev). Depending on game rules, successive auctions resulted in diversified reductions over reservation conditions. In the first two tenders, the consortium could win easily, by bidding less aggressively (almost minus 8 percent in average), as the incumbent, the municipally-owned company Trambus (in house provider for the remaining 80 percent of services) was not allowed to participate. Instead, Trambus was permitted to bid for the third set of services in 2000: although it did not win the contest, the simultaneous participation of two strong competitors, with some experience in the sector and in Rome, could lead to an extraordinary reduction over reservation conditions (almost 25 percent). In effect, the success of the this last tender can also be explained with a change in the scoring rule, in the sense of an increasing weight for economic conditions relative to quality proposals (Boitani and Cambini, 2007)[181]. Yet, changes in the scoring function tell just part of the story. A further, indirect confirmation comes from poor outcomes (reduction of 0,42 percent) in the successive retendering of same services in 2005, this time without allowing for the participation of Trambus (in effect, also collusion is suspected to have played a role on this result, as we will extensively comment on in Section V.4).

As a conclusion, one can say that Roman tenders in the period 1999-2000:

- resulted in differently desirable outcomes, depending on auction rules (in particular, on the possibility of competition between equally strong and informed providers);

- were all largely successful, as confirmed by a comparison of average compensation per bus-km between tendered and non-tendered lines in the same city (Table 11);

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[181] In the 2001 tender, economic conditions mattered for 65 percent, while in 2000 the weight was only 55 percent and economic conditions were assessed in a penalizing fashion.

Table 11. Public compensation per bus-km: tendered versus non-tendered service
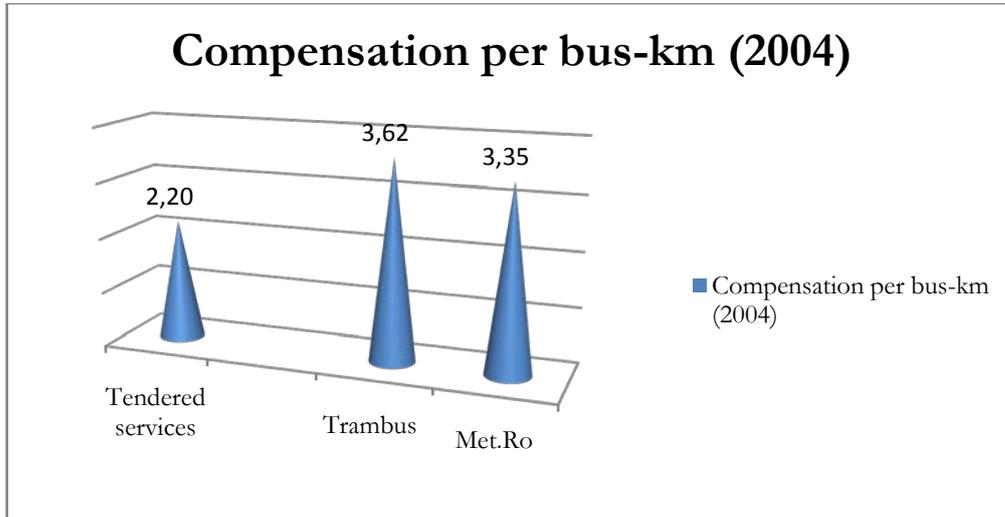
A general message can be easily drawn. The incumbency advantage is a widespread phenomenon, with relevant impact on welfare-improving outcomes from tenders if the auction design does not control for or even bias bidding parity in favor of existing providers. This conclusion is implicitly suggested by the observation of the most successful Italian auctions, which are - not surprisingly – those designed as to overcome such risks.

V.3 CT FOR GAS DISTRIBUTION: SUCCESSFUL OR NOT?

Distribution consists in gas transportation through local low-pressure or medium-pressure networks to final users. Together with sale activities, it represents the downstream phase in the value-chain of natural gas. But, differently from sale, which has been progressively liberalized on both demand- and supply-side, distribution is a local natural monopoly slowly opened to competition "for the field" only in the most recent years.

In Italy, the starting point of this liberalization process dates back to May 2000, in particular to the Legislative Decree 164/2000 (so called *Letta Decree*), in application of the European Directive 98/30/CE. The reform introduced *inter alia* the unbundling of sale (to be opened to competition "within the market") and distribution, the obligation for local administrations to award the latter through franchise bidding, a limited franchise period

(maximum 12 years) and specific regulatory competences for the sector authority (AEEG), as regards tariffs, non-discriminatory access and minimum quality standards (MQS).

Before liberalization, as for other local services, gas distribution was mostly operated through internal running, publicly-owned companies or *special enterprises*. Sometimes, the service was granted in concession to third-parties, for a very long period of time and with no competitive selection of providers. The past regulatory frame had led to extreme fragmentation of supply, in an industry characterized by significant scale economies[182] (Bernardini and Di Marzio, 2001).

However, since 2000 liberalization initiatives have induced a gradual process of aggregation. To get an idea of on-going trends, in 2007 only 275 distributors operated in the market, almost 63 percent less than seven years before (AEEG, 2008). Nevertheless, most of them (about 78 percent) continue to manage small-size networks, serving less than 100.000 final users. Just a few distributors operate on large scale, with the two strong players, Italgas (owned by the former integrated monopolist for gas, ENI) and Enel Rete Gas (owned by the former integrated monopolist for electricity, ENEL) managing respectively 18 and 17 percent of all municipal networks (Giacomelli, 2008). More in general, the suggested process of supply concentration has resulted from aggressive acquisitions by ENEL, large-scale aggregations among former municipal companies, mostly in Northern regions (*e.g.*, Hera, AEM, Iride, Enia), and massive entry of international groups (*e.g.*, E.On, Thuga and Gaz de France). In the future, the enlargement of tender basins, based on last legislative novelties (Law 222/2007), should further strengthen these trends.

Before analysing diffusion and performances of franchise bidding to now, it seems worth starting from a clarification on which socio-economic interests are at hand in gas distribution. In the chain-value of natural gas, distribution services influence not more than 10 percent of final prices, as shown in Table 13. This means that a 20 percent discount on distribution tariffs would correspond to a modest 2 percent decrease on final prices paid by consumers. Consequently, the most relevant contribution of distribution activities to final users' interests pertains to safety and quality of service, which should coherently receive a

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[182] The sector authority (AEEG) has recently estimated the chance to exploit scale economies up to 300.000 users served. See AEEG, consultation document 20/08.

very high weight in awarding criteria[183]. This point should be cautiously taken in mind when assessing tender past performances.

Table 12. Composition of average final price for gas in Italy (1ST April 2008)
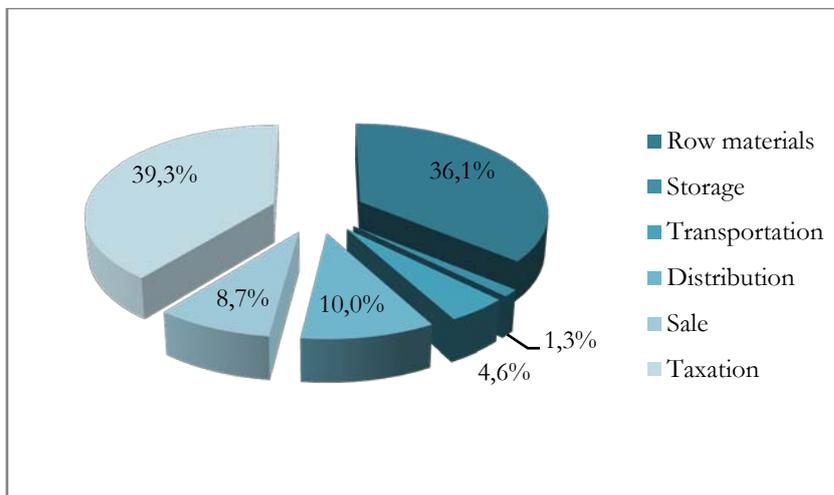
Source: AEEG, Annual Report

As in other public services, for years local administrations have exploited uncertainty and wavering judiciary positions to postpone strategically tendering procedures. Repeated postponements of the transitory period in the *Letta Decree*, up to 31 December 2007 (with possibility of further delays under specific circumstances), have largely obstructed wide-scale opening of markets. Moreover, before the final term of 2008, a new intervention has enlarged again the transitory period (up to 2009 or 2011, depending on previous expire dates). This term is still in place, as new article 23bis explicitly excludes gas and power distribution from its scope.

Not surprisingly, in a similar context of ambiguity, where local administrations could rely on the concrete hope of last-minute backflows, just a few tenders have actually taken place, basically in one of the following events:

- natural expire of concessions before the end of the transitory period;
- anticipated expire of concessions and re-awarding through CT, as allowed by Law 239/2004 (so called *Marzano Law*);
- CT of services internally run by municipalities;
- concessions to realize new networks.

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[183] Safety and quality pertain to adequate management of fire risks, to calls for rapid intervention, to frequency and length of service interruption, etc.

According to the AEEG, in 2007 just 4 percent of local provisions had been tendered (AEEG, 2008). As a confirmation that uncertainty explains most of these modest figures, Giacomelli (2008) quotes a recent inquiry conducted by the Bank of Italy in September-November 2007 on 85 large-size Italian municipalities. It's observed that almost 20 percent of interviewed municipalities indicated a final term for the transitory period largely far from the most optimistic date that could have been defined on the basis of existing, often contradicting, disciplines. Most of these respondents considered the natural expire of existing concessions as the final date to comply with tender obligations.

As regards objects, most of the time the sole network management has been auctioned off; in other cases, municipalities have tendered network extensions and, finally, in rare circumstances, also bundles of network building and its future management.

Table 13. Types of tenders
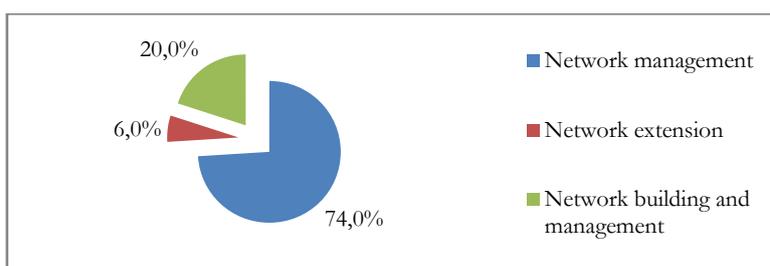
Source: CISPEL Confservizi Toscana (2006)

Tender average outcomes are described in the next table, which summarizes the main content of the annual inquiry of UTILITATIS on gas distribution and sale (Yellow Book 2009). These statistics are based on a sample of 150 tenders for which UTILITATIS could find complete information about both calls for tenders and final outcomes. In effect, in Italy the disposability of complete datasets on local tenders is very flawing (the reasoning applies not only to gas distribution), also because of the lack of local monitoring or regulatory authorities, and/or other bodies with sufficiently credible power to ask information. Anyway, the database UTILITATIS offers a reliable, effective picture of the industry, as there is no defendable argument to suggest selection bias in that sample. Moreover, this database represents the most updated description of the market for gas distribution.

Table 14. Tenders for gas distribution

Region area	Number of bids	Fee (% on allowed revenues)	Winning score (max 100)
North-West	5,5	53,2%	91,8
North-East	9	64,9%	89,6
Center	4,8	52,0%	94,5
South	5,8	44,7%	82,8
Islands	2	48,5%	34,9
Italy	**5,8**	**53,8%**	**88,5**

Source: UTILITATIS, 2009

As suggested by Table 14, auctions have been successful both in terms of average number of bidders and winning franchise fees (which in turn have been set - depending on the case - as a percentage on sale revenues, as a fixed sum or a mixture of both).

Referring the first point, the average number of bids (5,8) is extremely high when compared to tenders in other local sectors, as water (sub-section V.1) and local transportation (sub-section V.2). One can argue that this high figure is partially due to numerous "explorative bids" (presented to get information, not to win prizes), since in any tender there are several offers basically coincident with reservation conditions, on almost all parameters. Yet, one can hardly say that gas distribution tenders were in general not competitive, as proved by the following factual evidence:

- small differences in the score attached to the two or three best bids (CISPEL Confservizi Toscana, 2006);

- winning score always very high;

- winning score positively correlated with average number of bidders (compare second and forth column of Table 15).

There is another important consequence of the 2000 reform. Franchise bidding has opened gas distribution to consistent private capitals (see Table 16, on both winning newcomers and incumbents), at a progressively faster pace (see Table 16, on winning new comers). These figures make gas distribution the local market most opened to "substantial privatization".

Even if one does not share unreserved conviction on the higher efficiency of private firms, the interest of non-public capitals for this market (and the political favour for privatization)

is a good news in itself, as increases the range of potential bidders, hence expected tender competitiveness.

Table 15. Capital structure of winning new comers and winning incumbents

Winning new comers

- 16,4%
- 11,5%
- 12,3%
- 59,8%

- ■ Publicly-owned companies
- ■ Local mixed companies
- ■ National mixed companies
- ■ Private companies

Winning incumbents

- 22,7%
- 6,4%
- 8,7%
- 25,0%
- 37,2%

- ■ Municipal running
- ■ Publicly-owned companies
- ■ Local mixed companies
- ■ National mixed companies
- ■ Private companies
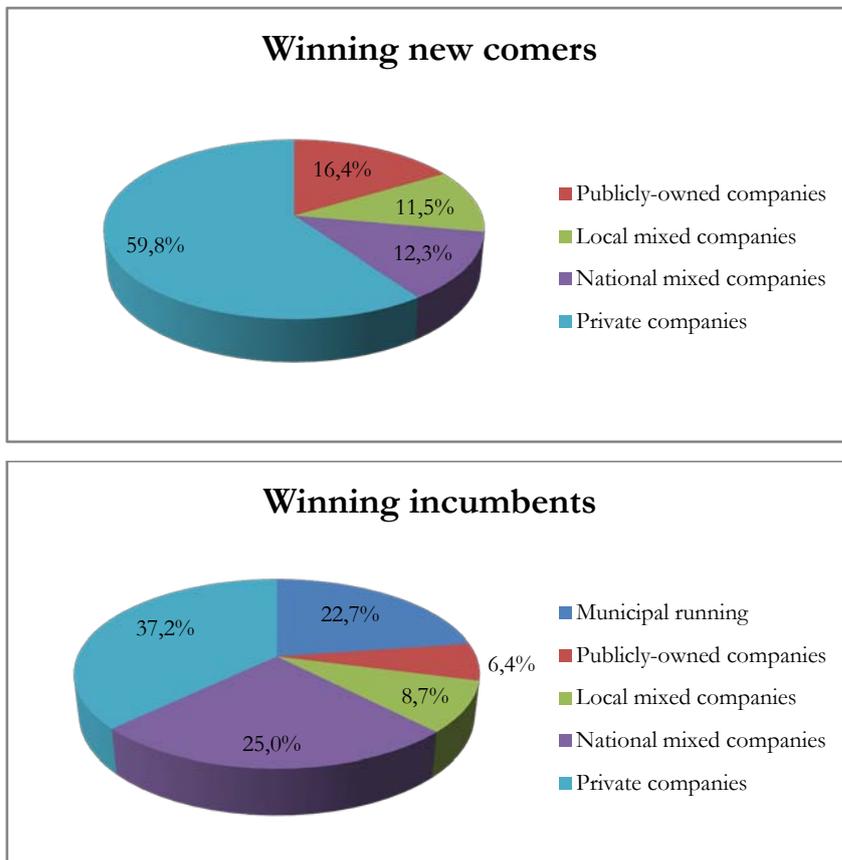
Source: UTILITATIS (2009)

However, one should avoid too hurried conclusions on tender success. Unquestionably, municipal pockets have largely profited from very competitive auctions, mainly in terms of high franchise fees. Yet, academicians and market players have repeatedly denounced:

1. small weight attached to safety and quality dimensions in awarding criteria;
2. too short franchise periods;
3. frequent absence of contractual obligations asking new comers to reimburse the residual value of the incumbent's specific investments;
4. too small served areas.

As regards the first point, in effect safety and quality improvements have been often conditioned by too disproportioned scoring functions, attaching too much weights to economic conditions compared to technical components. To give some numbers, in

average, economic bid dimensions have mattered for almost 63 percent overall, against 37 percent for technical components. The largest relevance has been attached by far to size of franchise fees (46,7 percent): this should explain most of previous findings. However, quality and safety bids have been appreciated defiantly too small (10,5 percent).

At best, this way of weighting economic and technical components is highly criticisable, as it does not take into account previous considerations on the critical relevance of safety and quality concerns in gas distribution. Besides, MQS set by the regulator are typically too low, hence insufficient to assure adequate levels of performances, absent further incentives based on competition.

Table 16. Weights in the scoring function
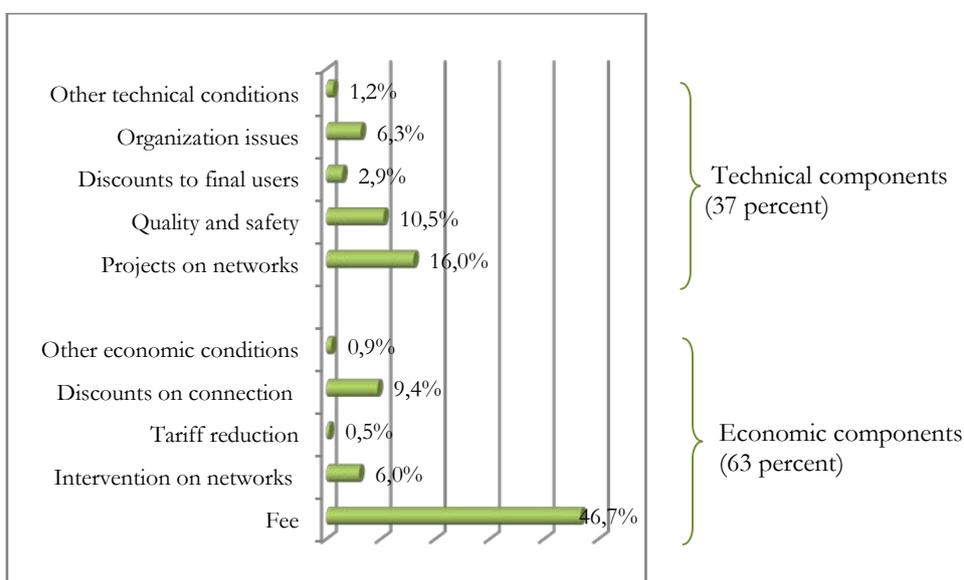
Source: UTILITATIS (2009)

One can say that tenders designed as such (*i.e.*, prizing bids with very high fees) are extraordinary lucrative for local administrations. Yet, it would be hard to convincingly argue that they are sufficiently aligned with social welfare. In effect, the same national regulatory authority (AEEG) has recently raised concerns on quality and safety shading, and denounced the risk to sacrifice consumers' protection in the name of municipal finances.

The second issue has been raised by market players (Federutility, 2009). They argue that too small franchise periods may represent a severe constraint on the incumbent's dynamic incentives. In particular, the *Letta Decree* rules a maximum of 12 years, too small as compared to similar contexts, both in Italy (30 year for power distribution) and abroad.

These under-investment concerns are even more serious, when considering that most of the time awarded contracts do not even ask for a "fair" compensation of the residual value of the incumbent's relation-specific involvements (recall that substitution by new comers is appreciably not infrequent in the context at hand). Indeed, although this practice has been judged illegitimate (TAR Lombardia, judgement n. 3793, 14 October 2005), more than a half of the time, contracts do not provide for residual reimbursement. This, in turn, could discourage long-run investments (for instance, those aimed at improving quality or safety and at reducing environmental impact), again in the name of larger ex ante competition and better local finances.

Finally, the size of tendered areas has been often irrespective of minimum efficient dimensions (MED). Table 17 compares the average size of actual reference basins (in terms of served population) with the MED, as calculated by the sector authority (AEEG). The gap is embarrassing: actual size has been in average 30 times less than what it would have been efficient. Tenders have been awarded individually by small municipalities, *de facto* frustrating the possibility to exploit scale economies.

Table 17. Average basins versus MED
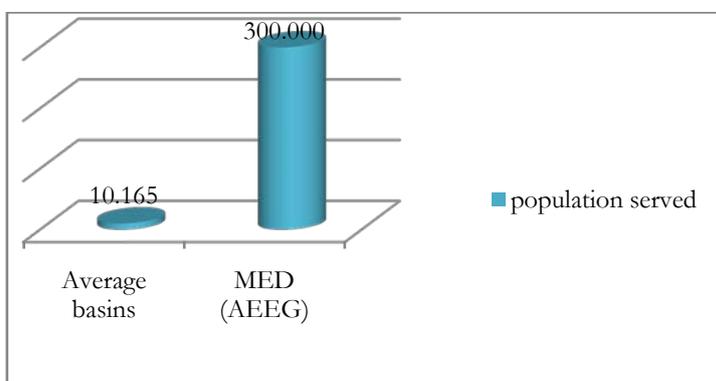
To solve inefficiencies from fragmentation, the legislator has recently intervened (Law 222/2007) to introduce *inter alia* minimum tender basins. Exact identification of "optimal areas" or "basins" is reserved to the competent Ministry (Ministry of Industry and Regional Affairs) and to the AEEG. On this basis, in 2008 the latter has initiated a consultation procedure with the publication of a dedicated study[184]. In particular, the authority calculates a MED ranging between 250.000 and 350.000 users and identifies over-municipal basins, mostly coincident with Regions or with the largest Italian provinces. Therefore, these

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[184] AEEG, Consultation Paper n. 15/08.

transformations should determine further decisive progresses in market concentration, as already occurred in the water industry.

To sum up, the experience with franchise bidding in gas distribution is by far the most successful in terms of competitiveness and municipal cash-ins. This does not mean that past tenders were not immune from design flaws and efficiency losses, as sub-optimal quality, under-investment problems, limited exploitation of scale economies. When acknowledging that in gas distribution quality should matter at least as much as economic conditions, the final judgement on these tenders could be defiantly more severe.

V.4 COLLUSIVELY BIDDING FOR LOCAL SERVICES: ITALIAN CASE-LAW

In some circumstances, the Italian antitrust authority (AGCM) has intervened to punish collusive behaviours in tenders for local public services. In this sub-section we investigate two recent leading cases, respectively in the local transportation and water market, as a confirmation of the potential effect of bidding coordination on tender outcomes.

Tenders for local transport services. In subsection V.2, we observed that most tenders for local transportation services resulted in poor performances and high percentages of incumbents' success (mostly within bidding consortia). The Italian antitrust authority has explained this evidence as the result of unlawful agreements for market-sharing between macro-partnerships of local providers (ATI)[185]. Bidding coordination and tender-sharing would have been based on the criterion of prominence of specific partners in their respective areas of main interest or incumbency.

The inquiry was started after the tender held in Rome in 2004 for additional transport services, (re)awarded (with only 0,42 percentage decrease on reservation price) to a bidding consortium (SITA, APM, COTRI), sole bidder at the auction (see *supra*). Then, the objective and subjective scope of the inquiry was progressively enlarged. In particular, the authority denounced the existence of "defensive agreements" to protect the incumbents against outside competition (mainly from potential foreign competitors) and "attacking agreements", interesting only those areas in which the incumbent was part of none of coordinated consortia. In the authority's view, these agreements would have *de facto* frustrated liberalization. On this basis, 15 local transportation providers were condemned

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[185] AGCM, decision n. 1657, 8th November 2007.

for infringement of article 81 TCE. Recently, the condemnation for anti-competitive practices has also been confirmed in successive judgements, before the TAR Lazio (judgement n. 6215, 26th June 2008) and Consiglio di Stato (judgement n. 2203, 9th April 2009).

The case ACEA/Suez. In 2007, the antitrust authority condemned ACEA (the Italian biggest water provider) and Suez Environment (the largest foreign operator in Italy) to pay respectively 8,3 and 3 ml/€ for having coordinated their bidding strategies in a number of water auctions[186]. The AGCM concluded that the two competitors had conditioned the final outcome of most PPP tenders (*i.e.*, tenders aimed at selecting private partners of mixed companies) in Tuscany and also influenced awarding in other regional areas (for instance, parties would have agreed on exclusive dealing of ACEA in Lazio), in a seed phase of market opening.

In particular, the reiterated reliance on temporary bidding consortia (or ATIs) between ACEA and Suez was judged as supportive of a "complex" sharing agreement, realized within a "unique" coordination strategy since 2001. According to the decision, bidding partnerships among some of the largest competitors in the market (where each partner is also individually qualified for bidding participation) were aimed at or, at the best, structurally prone to lead to more far-reaching forms of unlawful cooperation. Indeed, the authority reasoned that these forms of collaboration with competitors should be inherently temporary and occasional, thus incompatible with reiteration over time, unless they are aimed at limiting individual business freedom and pursuing anti-competitive purposes.

Formal and informal contacts held between defendants since 2001 were also presented as pieces of evidence for long-lasting collusive planning. Moreover, increasing shareholding of Suez in ACEA was suggested to have strengthened the agreement over time. At the date of decision, Suez could choose two over nine components in the management board of ACEA; for the authority, this confirmed relevant cross-interests and large information transparency between defendants. In this respect, the authority also observed, with reference to the PPP tender in the ATO-Medio Valdarno, that a specific provision, asking winning buyers (among which, ACEA and Suez) to share with Publiacqua (the incumbent) all relevant information on future bidding strategies, represented a relevant facilitating device for future collusion.

In effect, recently the administrative judge (TAR Lazio) has reversed this decision (and revoked penalties), by challenging conjectural errors and probative faultiness in the

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[186] AGCM, decision n. 17623, 22nd November 2007.

authority's reasoning[187]. In particular, the TAR has challenged the authority's definition of relevant market, as coincident with the boundaries of pretended collusive agreements. The judge has counter-argued that two competitive fields should be identified: on the demand side, the market would correspond to single tender basins or ATO; on the supply side, to the whole European market for local water services (there would be no structural or regulatory barriers for international operators to bid in Italy). On this ground, the anti-competitive relevance of the supposed agreement has been consistently challenged, by observing low aggregate market shares of ACEA and Suez in a market defined as such, hence small combined market power.

Moreover, documented contacts between defendants' managers have been judged insufficient as "serious, clear and concordant evidence" of an unlawful coordination plan. Besides, according to the Court, anti-competitive conjectures would be denied implicitly by the fact that the two defendants also participated separately to five other tenders. Finally, the administrative judge has suggested that repeated reliance on bidding consortia is in principle allowed within the Italian legal system, on the ground of cost synergies and risk sharing: anti-competitive potentialities should be supported with clearer factual evidence.

In effect, the definition of the relevant market by the Court is partially flawed and the distinction between supply-side and demand-side perspective meaningless. We think that, once looking at real substitution opportunities on both sides, the reference geographical market - as the smallest competitive contest is worth monopolizing – should coincide with tenders for single basins or ATOs. Therefore, the relevant market is a highly concentrated oligopolistic field, made of only those firms potentially opting for bidding participation. Market shares are given by the outcome of past auctions; thus, aggregate shares of ACEA and Suez are significantly high, and the pretended collusion relevant. Clear enough, as in any oligopolistic contest, simultaneous participation to other (geographical) markets (*i.e.*, to other tenders) influences collusive forms and sustainability, as for any form of multi-market interaction (see *infra*, Section IV). For instance, parties can collude by coordinating their bidding strategies, as to share in some way auction prizes, current or future.

Instead, the reasoning of the TAR Lazio is shareable with reference to both insufficient probative evidence and pro-competitive considerations in assessing bidding consortia. But this does not imply that collusion was surely not an issue, while only that the authority failed in providing with unquestionable evidence of unlawful coordination.

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[187] TAR Lazio, judgment n. 1071, 1139 Reg.Ric., 2008

In effect, even if a conscious cooperative plan can hardly be proved rigorously - at least, on the documentary and conjectural basis relied upon in the decision -, a manifest, unquestionable effect of bidding consortia in the case at hand should be observed: a reduced number of bids and a discouraging effect on smaller potential competitors. It's not a case that in two over the three discussed tenders, only the consortium led by ACEA and Suez stepped in, hence winning easily the right to serve markets (only two bids were presented in the remaining tender, for the ATO-Basso Valdarno).

In a nutshell, this case should suggest that, although probative requirements are typically hard to meet (thus, antitrust control very problematic), coordination and partnerships for tenders may represent a serious risk for franchise bidding success. Powerful partnerships could discourage participation and frustrate benefits from aggressive bidding. Consistently, ex post monitoring by competition authorities is in itself insufficient, as collusion is inherently secret and difficult to condemn. Anti-competitive behaviors should be contrasted with the support of ex ante devices, *i.e.*, with a better auction design.

VI.   GUIDELINES FOR TENDER DESIGN

At this stage of the analysis, two points should be clear to the reader. First, there are compelling theoretical reasons to award local public services through CT. Second, there could be several potential problems associated with practical implementation of franchise bidding. In spite of appearance, these two sentences do not contradict themselves. Instead, they just prove a straightforward principle in applied economics: theoretical propositions, formulated on the ground of simplifying, idealized assumptions need to be carefully implemented, *i.e.*, to be adapted to the reference institutional and industrial environment. Indeed, absent a proper implementation, even good devices could result in sonorous failures. Then, one should avoid the impulsive temptation to blame the device, instead of its users.

In the light of these considerations and similar, the evidence presented up to now should suggest to shrink from extreme advices, more far-reaching than the invitation to a cautious trust in the merits of CT. For instance, failure stories quoted in Section IV suffer from the unavoidable partiality of case-studies: they confirm the exposure to risks not only theoretical, but do not pretend to be representative of general outcomes. The Italian experience presented in Section V is also partial and aims at merely recalling that certain practical flaws could become systematic, when implementation issues are largely disregarded. In a way, both need to be interpreted as "warnings" by auction designers.

In effect, there is plenty of systematic empirical contributions providing with more optimistic findings, consistent with theoretical arguments in favour of franchise bidding. Overall, this literature suggests that auctions perform relatively well, when designed as to control for potential flaws. For instance, Hensher and Wallis (2005) survey the international success of tenders in local public transportation as a powerful subsidy-reduction mechanism. Similar results have been found in other industries, as prison (Edwards, 1996) and road management services (Blom and Hansen, 2003). Szymanski (1996) observes a strong fall in public expenditure, following the introduction of compulsory tenders for refuse collection services in UK, with non-significant impact on quality standards and specifications. Finally, Zupan (1989) and Prager (1989) conclude that bidding competition worked much better than what was expected, in the US cable TV market, *i.e.*, in the same industry context within which Williamson's critiques had been originally framed.

At the outset, these contributions are encouraging, but need to be assessed with two qualifications in mind. First, the magnitude of most potential drawbacks is very sensitive to

the nature of services and to the features of the industrial and institutional environment (Jensen and Stonecash, 2004). Therefore, country-based sector investigations are informative and instructive only to a limited extent. For instance, risks with renegotiation and quality shading are strongly related to the complexity of awarded activities, while the exposure to collusive behaviours depends *inter alia* on monitoring efforts, on the harshness of penalties and on some other industrial features (multi-market interaction, concentration, etc.). Second, even when the industrial and institutional setting is, in principle, perfectly eligible for bidding competition, auctions may be poorly designed and result in embarrassing performances. Obviously, the two issues are strongly interrelated, as the optimal auction cannot be devised as a "one size fits all", regardless of the activity to award and the reference context (Klemperer, 2002; Menezes *et al.*, 2003).

All together, empirical studies and qualifying remarks suggest a common message: franchise bidding performs relatively well in restraining prices, reducing public involvement and promoting efficiency when the underlying allocation mechanism (the auction) is designed as to shield itself against implementation risks. Admittedly, the optimal format is a little more than an abstraction. Nevertheless, some general lessons can be fruitfully drawn. This section provides with a tentative answer to practical questions as "what should be tendered?", "which additional tools should be devised to overcome risks of quality deterioration?", "which institutions should be in charge with organizing auctions and regulating ex post unforeseen contingencies?" and similar. In a way, it aims at drawing a simple set of guidelines, mainly useful for applied economists and practitioners. Since the purpose of this section is eminently practical, the treatment will not be purely conjectural, while aiming at combining theoretical predictions and practical solutions. The basic ambition is to put at work some auction and contract theory.

VI.1 FRAMING CONDITIONS

There are basic conditions, not necessarily under tender designers' control, which are crucial for auction success. High-quality rules of the game are not enough in the absence of an impartial referee, since tenders always involve some degree of discretion and freedom of choice. In the same vein, for competition to be fierce, firms have to bid on equal foot, and this requires *inter alia* that none of bidders can exploit the unmatchable competitive advantage from monopolistic ownership of essential infrastructures.

In a nutshell, optimal tenders require a basic frame, namely a "fair" institutional setting and vertical separation of infrastructures.

I.   THE INSTITUTIONAL SETTING

As repeatedly argued, a fair institutional frame is a *condicio sine qua non* for tenders to be fruitful. In Section III we assumed a benevolent awarding administration, whose objectives are mostly aligned with socially desirable ones. Yet, in the lack of institutional independence, one may argue that the objective function in the social welfare maximisation programme (7) is a little more than an aspiration. The Italian case is very informative in this respect. In effect, in Italy, the absence of sector agencies, functionally independent from local politicians, has been often blamed as the main determinant for failures and excessive conservatism. Actual selection may be biased someway by the fact that municipally-owned incumbents are allowed to participate to local tenders. Besides, awarding municipalities are often influenced by a special interest only for public finances (*i.e.*, only for taxpayers), instead of social welfare (*i.e.*, the weighted well-being of both taxpayers and users), and tend to weight too much economic conditions, such as the size of franchise fees[188].

Observe that an independent authority would be worthwhile not only at the selection stage, but also in the successive execution phase (see *infra*, sub-section VI.2, point XI). As suggested, incompleteness or inadequate enforcement of awarded contracts imply the need for regularly updating initial conditions. Instead of being renegotiated among parties (the awarded operator and the interested municipality), with notorious risks (Propositions 7 through 9), the updating process could be delegated to a third-party agency, in charge with establishing a "fair" compensation to unforeseen contingencies. The authority would play the same interpreting and quantifying role of a judge, when invoked by one or both parties, but with higher specific knowledge, competence and rapidity of judgement. In a way, the independent agency would perform an ex post regulatory function, as to avoid risks associated with holdup (too generous renegotiations, disincentive to tender participation, strategic bidding). Anyway, the issue will be further stressed in the following.

An interesting question pertains to the choice between general-purpose and sector-specific authorities or that between local and national agencies. Solving these issues would drive too far from the specific purposes of this paper. Suffice it to say that economically-founded answers to these questions lie on the trade-off between advantages from local or sector-specific industry knowledge and benefits from exploiting scale economies. Other

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[188] An explanation for this lies on progressively more stringent financial constraints on local finance (for instance, in Italy, the "internal stability pact").

considerations, mainly based on the geographical extension of optimal basins in single sectors, should also play a role in final balances.

Coming rapidly to actual implementation, in Italy, the most advocated political option seems that of national agencies in the water and transportation sector. As regards other local industries, where competent agencies are already at work - as for gas distribution – it has been proposed to empower existing authorities with stronger monitoring and ex post regulatory functions, even at local level. Anyway, we do not want to stress these issues now and their comparative soundness. Any option would come with strengths and weaknesses and actual choices should be a matter of balance. As such, they require a case by case approach, from which we expect different answers for different sectors, because of dissimilar degree of complexity, basin boundaries and other relevant factors.

Instead, the general message we want to draw here is that an independent authority is a minimum prerequisite for tender success, regardless of its geographical (national or local) and industrial (general or sector-specific) competence.

II.   VERTICAL SEPARATION OF INFRASTRUCTURES

A second framing condition for tender success relates to the industrial organization of markets for local public services. In particular, separation between ownership of infrastructures and service operation is vital for fierce downstream (bidding) competition. Monopoly resources, which are essential to operate downstream and difficult to replicate in a short period of time, should be owned by a separate public or private entity, with no linkage with bidders (of any kind). Otherwise, a vertically integrated firm would have an incentive to block (or discriminatory charge) downstream competitors' access to infrastructures they own monopolistically. To be concrete, the incumbent's ownership of deposits and garages is a consistent entry barrier that could prevent a new bus operator from bidding participation. In a similar fashion, water networks are essential to operate the integrated water service; therefore, all bidders should be allowed to ask for access at non-discriminatory conditions.

These are standard arguments in the literature on essential facilities, whereby the sphere of natural monopoly has to be isolated from markets already opened to competition ("for the market" or "within the market"), in the view to avoid abuses of dominant position (for exclusionary and/or discriminatory conducts). As regards actual implementation, infrastructures could be owned by public entities, provided that these are not involved in CT (*e.g.*, through shareholding in bidding firms). Therefore, local administrations could be not well placed in this respect, for instance when they indirectly take part to tenders

through the incumbents. In this last case, other public entities, formally independent from them, should be entitled with ownership of monopoly infrastructures. In alternative, essential resources could be sold (via public auctions) to private firms or managed through real estate funds.

In any case, competent awarding agencies (see *infra*, point I) would be required to determine access tariffs to be paid by future franchisees. These tariffs have to be aligned, as much as possible, with costs.

Other alternatives, such as the transfer of infrastructure ownership (and not only of its use) from the incumbent to new operators at any renewal, would be extremely complicated on an implementation viewpoint, as involving relevant assessment difficulties, due to information asymmetries. Anyway, we will come back on these points afterward, when dealing with another important issue, namely investment obligations.

VI.2 A Toolbox for Auction Designers

At this point of the analysis, we hope that readers could be sufficiently persuaded that auction rules are just a part of the explanation for good or bad performances. In the previous subsection, we saw that the legislative and institutional frame plays also a crucial role (point I), as well as the industrial organization of local markets (point II). Unfortunately, these latter aspects are often beyond the control of those in charge with choosing auction formats. However, even so, a good tender design is better than a poor one, also when framing conditions are far from optimality: if any, it allows to maximise the inherent tender merit, in terms of commitment to efficient selection rules and enhanced transparency. Consistently, this section provides with a simple toolbox for designers, through separate analysis of any single implementation aspect in tender formats (pre-selection stage, object, awarding mechanism, etc.).

We start by framing the whole discussion. Recall that the allocative mechanism underlying franchise bidding is an auction procedure. From the economic literature, the optimal competitive procurement should proceed through the following steps:

1. the auctioneer advertises a call for tenders to allocate service provision among a number of potential bidders;
2. most terms of the future awarded contract (*e.g.*, MQS, universal service obligation, reserve price) are set unilaterally by the auctioneer;

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3. calls for tenders define *inter alia* temporal (*i.e.*, bidding time and forms) and admissibility conditions (*e.g.*, reputation, financial and managerial viability) for bids (and bidders) to be accepted;

4. rules and terms under *point 2.* and *3.* are:

   - explicit (in technical jargon, they are common knowledge among potential participants), and

   - set in advance;

5. competitors choose a bid in the set of allowed possibilities (based on *point 2.*, *3.* and *4.*): in fact, a bid is a proposal on how to fill contract blanks left in call for tenders, while also satisfying temporal and admissibility conditions for bids (and bidders);

6. the service is awarded to the best bid overall, as assessed on the basis of a specific scoring function; this function objectively ranks any offer and is also explicitly defined in advance, as for all other auction rules (see *point 4.*).

Notice that, according to the economic theory, *point 4.* is a crucial feature of optimal procedures. As in any strategic interaction, parties need to know in advance the rules of the game and rely on the credible expectation that these rules will be effectively observed by all counter-parties. Otherwise, interaction would be dangerously discouraged. This is a standard conclusion in non-cooperative game theory, on which auction models are mostly based (Gibbons, 1992): the auctioneer has to commit herself to a predefined set of rules, tying her hand into a specific procedure, which leads to some forms of automatism in selection and awarded contractual terms. The main advantage of auctions is exactly in this commitment to make choices according to pre-specified criteria (Menezes *et al.*, 2003). Discretion should be confined as much as possible at a pre-tender stage, that is at the time the auctioneer chooses the rules governing the procedure. Yet, once that these rules have been set and made public, the selection should follow almost automatically (Mori, 2001). Auctions designed as such differ from mere "beauty contests", where rules are more vague and informal and the auctioneer preserves some freedom to select the bid (and the bidder) she considers "most appealing". Beauty contests would be dangerous because, at worst, make tenders highly prone to favouritism and corruption and, at the best, expose final selection to subjective (and arbitrary) judgements by awarding authorities, no matter their nature (independent authorities, local administrations, etc.) and their objective function.

This point is crucial and should be carefully taken in mind through the whole section. Admittedly, the principle of "minimum discretion" can be challenged by some counter-arguments (*e.g.*, risks with collusion) and apparently contrasts with the unavoidable

multidimensionality of interests (prices, subsidies, quality, organization formulas, etc.) involved in local service awarding. However, our main contention is that these implementation concerns (*e.g.*, non-economic performances, risk of collusion) could be solved on the domain of tender design, without abdicating a crucial principle for statistical success: the auctioneer's full commitment to pre-specified rules of the game.

From now, we deal with the issue of how to optimally set terms and rules in *point 2.* and *3.* - including the scoring function to rank bids -, in the logic suggested by *point 4.* and by the principle of "minimum discretion". To this end, we rely on some well-settled principles in the bidding theory, while also taking the viewpoint of the practitioner, as most insights in auction literature are framed within a context which fits only partially with local markets and public services. The objective is to come out with practical guidelines, *i.e.* with intermediate-level advices between general principles ("minimum discretion", "full commitment") and operative rules (these vary with local specificities, hence need to be fully left to auction designers).

I.   PRE-BIDDING INFORMATION

I suppose a few persons would be willing to bid for unknown objects. More in general, poor knowledge of auction prizes tends to induce a more cautious bidding attitude, as bidders cannot appreciate completely what benefits and which risks they are competing for. In technical jargon, they fear a "winner's curse". When happens that calls for tender miss basic elements, as the dimension of basins, the expected volume of sales, some specific risks, MQS and all other crucial information to assess prizes, one can reasonably suspect a small number of bidders, competing not aggressively. Indeed, uncertainty has a large discouraging effect, since risk-aversion and fear for the "winner's curse" are widespread phenomena.

Our main contention is that all information which are *relevant* for bidders to form their expectations and evaluations has to be shared with all interested participants, as a condition for tender competitiveness. This corresponds to a well-settled normative implication in auction theory, under affiliated bidders' valuations (the most reliable hypothesis with local service tenders), namely the "linkage principle" (Milgrom and Weber, 1982).

The nature of the information to be revealed - *i.e.*, what can be specifically qualified as *relevant* - varies with services and countries. To stick with the Italian example, for instance, the knowledge of historical trends in tariff evasion is very important to bid for transportation services. Instead, the network length, expected volumes, a list of bad

creditors are all relevant information that gas distributors need to know in advance, in order to formulate really informed bids.

Apart from these elementary considerations, there is another important reason why optimal pre-bidding information is crucial to auction success. In section IV, we argued that the more equal bidding positions are, the more successful tenders are expected to be. Typically, the incumbency advantage rests upon a preferential knowledge of auctioned services, that existing operators hold private in order to increase their chances to succeed at lucrative conditions. Viceversa, new comers are less informed on both demand- and supply-side features of markets, also when they possess some experience or competence in outside geographical areas. Even if a firm provides transportation services in Milan, it does not know exactly the cost for the same service in Rome, as there are city-specific cost differences (local trade-union disputes, different features of the network, different labour productivity, etc.). Neither it can have the same capacity of predicting expected sales and programming improving initiatives, since habits of Roman users differ largely from those of Milanese citizens, as regards for instance hazard (tariff evasion), quality perception, demand elasticity, etc. As a matter of consequences, the incumbent's private information has the potential to discourage aggressive bidding by new comers or even their participation. Indeed, the less informed it is, the more concerned a firm will be with the "winner's curse" (Klemperer, 2002).

In this respect, we think that an independent authority could be in the institutional position to have more accurate knowledge of the business, compared to non-incumbent participants, at least if empowered with the possibility to ask information against the threat of penalties for reticence or misrepresentation. Obviously, we are not ingenuously arguing that an authority can extract all the incumbent's private information. Yet, some sensitive data could be nevertheless obtained, where the degree of completeness and reliability is a function of the authority's credibility (in punishment) and of the specific competence of its officers.

This information should be shared with all bidders, at least with those demonstrating to be seriously interested in tender participation. Neither, the authority would have an incentive to be reticent, by its own institutional mandate. Differently from a tendering municipality, which is typically conditioned by a strong conflict of interest (local administrations are often the majority shareholders of the incumbent), independent agencies would be willing to share all documents and data which are expected to improve the bidders' knowledge.

Clearly, although information sharing does not pretend to overcome completely risks associated with the incumbency advantage, nevertheless it appears surely beneficial for

"bidding parity", thus contributing to tender competitiveness, in particular to the competition-like benefits of franchise bidding.

Parties should compete on equal foot. When this occurs, auction success is not to be measured on the fact of selecting a new provider at any renewal, but on the capacity to identify the best monopolist and incentivize her to behave as if subject to competitive pressure. In most cases, the best provider is exactly the incumbent, for an inherent, non-transferable cost advantage. However, a credible threat of displacement is sufficient to keep her in line, as it would not occur otherwise (Zupan, 1987, Prager, 1989). This threat is really effective only if information positions are as much uniform as possible.

II.   TYPE OF AUCTION

The type choice attains to transparency and dynamics of auction mechanisms. In theory, awarding authorities can opt either for simultaneous sealed-bid auctions, for sequential open procedures (*e.g.*, ascending or English auctions, descending or Dutch auctions) or, finally, for a combination of both (*e.g.*, Anglo-Dutch or Klemperer auction). In standard bidding theory, these solutions are compared in terms of allocation efficiency, auctioneer's revenues, transaction costs, exposure to corruption and collusion. We briefly summarize the main insights, while sending interested readers to specific works for more details[189]. As regards efficient allocation and auctioneer's revenues, under *independent private values*, sealed-bid auctions dominates English or ascending auctions if bidders are risk-averse; viceversa, the former solution is dominated under risk-neutrality. However, with *common values*, open formats are systematically better, because of powerful learning effects from sequential bidding (Milgrom, 1989). This latter effect is also the explanation for higher vulnerability to "bidding rings", as early stages can be used to signal sharing proposals to colluding participants.

On a practical viewpoint, one can hardly argue, on reasonable terms, that an English or ascending auction format is eligible for local public services, because of underlying complexity, (eventual) bid multidimensionality and the disadvantage (and cost) to require bidders' actual presence. Protection against collusion further confirms this preference, as simultaneity and secrecy allow for less transparency among bidders, hence for reduced chances of signalling and retaliation (Albano *et al.*, 2008). Moreover, this format tends to attract more bidders compared to ascending auctions: the higher uncertainty about tender outcomes incentivizes weaker bidders' participation (Klemperer, 2002). This result,

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[189] See McAfee and McMillan (1987), Milgrom (1989) and Klemperer (2004)

including a comparative advantage in terms of profitability for the auctioneer, is also documented in empirical works (Mead and Schneipp, 1989).

In effect, one can say that simultaneous sealed-bid auctions are not a choice, while a matter of facts, and the desirable properties listed so far confirms that preference. At most, authorities can decide the final term by which bids has to be (secretly) presented (bidding time).

III. BIDDING TIME AND ADVERTISEMENT FORMS

Periods left to send bids (after advertisement date) should be sufficiently long. Once again, optimal length depends on the nature of services and on other features of auction design, as the toughness of participation prerequisites. Needless to say, a too short period would implicitly prevent bidders from going through all pre-bidding disposable documents, hence from formulating really informed evaluations and bids. Moreover, a sufficient time is requested also to accomplish bidding prerequisites, as obtaining bank guarantees, eventually within a bidding partnership. For instance, consortia need to be agreed upon and formalized, and this could take long time, in particular, when partners are not sufficiently homogeneous.

Obviously, quality, diffusion and geographical coverage of advertisement forms[190] (calls for tender) also matters for tender competitiveness, for the - maybe obvious - consideration that *ceteris paribus* the sooner (and the better) one gets informed on tenders, the longer the period left to her for formulating well-considered bids.

On a more sophisticated viewpoint, in models with endogenous entry, any bidder decides whether participating or not on the basis of a comparison between expected gains and bidding costs, which in turn consist in search and bid preparation expenditure. Preparation costs are decreasing in the time length left to formulate bids, as a longer period makes bid preparation less complicated. One could also say that a longer bidding time increases the perception of individual chances of profitable success. Therefore, a more informed bidder tends to be less concerned about the "winner's curse", thus being a more aggressive player. In a way or another, bidding time increases the participation rates, hence enlarges the expected pool of competitors.

Finally, as regards quality, diffusion and geographical coverage of advertisement, all decrease firms' search costs and are beneficial to tender competitiveness as well.

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[190] Calls for tenders should be advertised at national level, as to enlarge as much as possible the pool of potential bidders. Coviello and Mariniello (2008) observe that both competition (*i.e.*, the number of bidders) and tender outcomes (winning rebates, private capitals) profit a lot from a wider-range publicity coverage.

IV. PARTICIPATION PREREQUISITES

Recall from *Proposition 1* and *2* that enlarging the pool of potential participants is always a good thing in terms of expected benefits from tenders. The point is largely shared among both theoreticians and empirical scholars (Bulow and Klemperer, 1996; Gomez-Lobo and Szymanski, 1998). In this respect, the setting of participation prerequisites - insofar influences expected competitiveness - is a non-trivial issue, in spite of modest interest in the economic literature. Optimal choices undermine a basic trade-off between initial tender performances and successive contract execution, that cannot be solved in abstraction. On one hand, soft thresholds would enlarge the pool of potential participants, thus improving bidding (initial) outcomes. On the other hand, too soft constraints may give room to a more delicate and uncertain post-award phase, since allowing also for unreliable bids and bidders. Besides, tenders would be opened to "explorative" bids, having the sole effect to increase assessing costs for tendering authorities (and decreasing social welfare by related useless costs).

Therefore, only "reliable" offers should be allowed, and this in turn requires to set objective, yet stringent standards of financial and managerial viability. Besides, as anticipated in Section III, a pre-selection qualification stage can work as a powerful retaliation device, to discourage franchisees' opportunism in the ex post contractual relationship with franchisors. We will see how in a moment.

Finding a balanced synthesis between the contrasting objectives described in the above entails neither easy nor general answers. The correct choice is a matter of level, as often for implementation issues. Yet, some general insights may be worthwhile, at least to make easier a non-trivial task. First of all, prerequisites should be aligned with just two main factors, *i.e.*, *professional viability* - in terms of staff, competences, available resources and technologies - and *financial sustainability*. Other eligibility requirements, for instance exclusive participation by locally-established firms, appear unreasonable, in the view of promoting large, yet sustainable competition. They would just amount to unsound constraints, which harm social welfare and consumers' protection, in the name of other objectives, not necessarily noble (*e.g.*, promotion of local economy, electoral considerations). Notice also, from the Italian experience analysed in the previous section, that another regrettable risk is tailoring actual requirements on the incumbent's features. This is a non-remote case, when municipalities are both referees and players.

As regards the operative definition of access thresholds, they should conform to three basic principles: *proportionality, non-discrimination* and *objective measurability*. "Proportionality" means that requirements have to be not excessive, while proportionate to underlying objectives

(assessing creditworthiness and managerial feasibility of single bids and bidders), hence not unreasonably penalizing. For instance, denying participation to firms lacking past experience in exactly the same sector may be (sometimes) excessive, since it would represent a legal constraint on legitimate and fruitful diversification strategies by large industrial groups, already acting with success in affine sectors.

Of course, a note of caution is necessary, also to avoid too far-reaching interpretations of the last statement. A local transportation provider cannot qualify "stand alone" (*i.e.*, without a partnership with a specialized firm) for gas distribution tenders, but - presumably - different conclusions should apply to a power distributor. The screening criterion should be based on a well-known principle in competition law and economics and, in particular, in the rules governing the definition of antitrust "relevant markets", namely the "supply-side substitutability"[191]. "Stand alone" bidding participation should be opened also to non-specialized firms, supplying different, yet affine services/products, under the condition they possess all skills and assets that make it possible and economically convenient to switch production in a short period of time (say, by the final date to present bids). Obviously, these conditions need to be proved before the awarding authority. Social welfare would benefit from extending participation to firms acting in affine, supply-side substitute sectors, in terms of higher expected competitiveness, exploitation of scope economies, provision of innovative bundling of services (*e.g.*, aggregate discounts, lower transaction cost from one-stop shopping, etc.).

"Non-discrimination" is self-evident and represents the very basis of any form of competition. As in a car race, there is no fair competition if umpires apply differently the same participation rules to racing teams, such as Ferrari and McLaren. Under a discriminatory application of the rules of the game, there is no certainty that the best car (and driver) will succeed.

Finally, "objective measurability" relates to the choice of quantifiable standards to assess financial and managerial viability of single bids, with full automatism or minimum discretion. In some sense, relying upon objectively measurable standards is an automatic way to implement "non-discrimination". Moreover, it can provide potential bidders with a less uncertain frame, within which they can take more conscious participation decisions. If a firm or a bidding consortium can prove to comply with objective requirements in call for tenders, participation becomes a right, potentially enforceable before administrative judges. Instead, if bids are submitted to the subjective assessment by the awarding authorities,

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[191] See Motta M. (2004).

participation could become less appealing, as bid formulation risks to amount to mere losing of time and money for potential bidders.

Finally, we suggest that this pre-selection stage can perform another important function, namely deterrence against future holdup at the post-award, execution phase. An interesting possibility consists in using past information on bidders' reliability and contract execution as a pre-auction screening device, on the premise that how much the firm was fair and smart in the past is an important information for choosing on the future. Zupan (1989) finds this as a powerful mechanism of deterrence against franchisees' opportunism in eventual ex post renegotiation. In most cases, this solution is informally relied upon, typically through unofficial information-sharing among municipalities. Needless to say, under the institutional setting described in Section VI.1, the whole mechanism could be made better working. The idea is to collect a database of information on past records of long disputes between franchisees and franchisors. Besides, an independent awarding function would allow for a non-biased exploitation of structural margins of subjectivity implicit in this solution. One can reasonably suppose that independence is associated with a less distorted use of discretion.

V.   BIDDING CONSORTIA

Other delicate questions for tender designers relates to whether and to what extent bidding consortia have to be allowed. On one side, partnerships are beneficial for competition, since consortia extend participation to firms that would be individually excluded, based on eligibility prerequisites in point IV. For instance, strong firms, acting in different, non "supply-side substitute" markets, could be allowed to bid in partnership with operators having specific competence and experience in the reference sector. Besides, observe that grouping is *per se* a legitimate, yet efficiency-grounded strategy also for individually eligible firms, as it allows for a better sharing of risks or know-how with competent partners. In theory, it also encourages more aggressive individual bidding.

On the other side, partnerships increase market concentration - in particular, when involving firms with large aggregate market power –, thus reducing potential competition. Moreover, they facilitate collusion, in two respects:

- a direct way: by themselves, partnerships are nothing other than a cartel, as they implement distribution of profits that would be otherwise unfeasible;
- an indirect way: they reduce the number of individually eligible competitors (but recall that bidding consortia may also increase the number of bidders, by

stimulating participation of those firms, unwilling or unqualified for bidding "stand alone").

In effect, consortia involve a crucial trade-off between efficiency and market power creation, that unfortunately is not easy to solve ex ante and for any sector. The design challenge consists in devising admissibility rules that limit anti-competitive utilization, while preserving their adoption for pro-competitive purposes (Albano *et al.*, 2006)

We suggest that, in principle, bidding consortia have to be allowed, safe the need for controlling devices. In particular, *nulla questio* for partnerships among firms that would not be in the position to take part individually, as their inherent motivation is pro-competitive. For the rest, an anti-competitive screening, based on initial market power of partners, should be in place, in line with the general treatment of joint ventures in competition law. More in detail, above "alarming thresholds" a more stringent inquiry is required, eventually leading to prohibition, in particular when aggregate market shares are so high to presume anti-competitive purposes. Moreover, partnerships participated by the incumbent should be completely prohibited or, at least, treated comparatively more toughly (*e.g.*, less weight for efficiency defences).

Finally, we suggest that a strict collaboration between tendering and competition authorities is always welcome, also in an ex ante perspective[192]. The sharing of respective competences represents the best way to tailor the most suitable solutions.

VI.   TENDER BASIN

Another basic choice attains to the boundaries of tendered areas or "basins". The cost-benefit assessment of alternative sizes requires a detailed analysis on benefits from scale economies, planning delegation and expected competitiveness. The former two points call for larger basins, the latter for more fragmentation. Clear enough, the definition of "optimal basins" needs to be tailored to sector specificities as well as to other aspects of the environmental setting.

Take transportation services. At the outset, urban supply could be tendered route by route, by entire networks or by subsets of lines. Optimal choice depends *inter alia* on housing density and spatial extension of tendering local administrations. Indeed, one could hardly deny there are significant provision differences between large cities - such as Rome or Paris - and a small Greek or Belgian municipality, in particular as regards served volumes and organization complexity (*e.g.*, possibility to program improvements in line planning). As a

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[192] Of course, antitrust authorities can always assess tender outcomes ex post, for instance by punishing bidding coordination within consortia or similar forms of collaboration.

matter of choice, only large cities would be – at least, in theory - economically eligible for the first and the third option (route-type or sub-network-type tenders) or for a combination of both (multi-unit auctions, for bundles of routes). Exploitation of scale economies is a relevant starting point in the exercise of basin definition. Consistently, tender objects, whatever they are (routes, networks or subsets of networks), have to be designed as to allow for volumes above the MED (Minimum Economic Dimension)[193]. Then, beyond this floor, optimal size involves a choice in the trade-off between the advantages from delegation of route organization (which would call for line grouping) and those from fostering competition and bidding participation (which would call for more fragmentation). The bus industry London model, whereby firms are allowed to bid for single routes or for route packages (a combinatorial auction), represents a good compromise between delegation and competition: the unbundling of the network encourages participation, while the possibility to bid for packages make it possible to profit from decreasing average costs and organization savings[194] (Amaral *et al.*, 2009). We think that this approach should represent a model for all the European largest cities, eventually coupled with some forms of competition by comparison (yardstick competition). Instead, for smaller municipalities there is often no alternative to a network-type tender, as aggregate volumes are too small for the coexistence of several operators.

Similar arguments also apply to refuse collection services[195]. Again, the optimal level of integration (the entire municipality or specific suburban areas) entails a trade-off between exploitation of scale economies and tender competitiveness. Moreover, some specific supply-side features of refuse collection services suggest that volume savings could be of a certain value only for small dimensions, corresponding to the population of medium- and small-sized municipalities. Instead, in large cities, decreasing average costs have a inherent limit in both house and traffic congestion. The difficulty to get rapidly distant places in the same city, make it convenient for providers to bear the fixed cost of several collection points (corresponding to small reference areas in the same city), where refuses are accumulated before being sent to final phases (waste disposal). This suggests that, in the industry of refuse collection, the size of scale economies is largely conditioned by specific

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[193] The industrial economics teaches that the MED corresponds to the minimum level of fragmentation that is economically sustainable.

[194] This model allows for the exploitation of volume economies, in spite of apparent fragmentation. Amaral *et al.* (2009) find that the average number of vehicle-kilometers per operator in London (30.851,7) is almost two times the average one for the largest French cities, those with more than 250.000 inhabitants (15.643,4). This, in spite of the fact that French local authorities organize larger-size auctions, by entire networks.

[195] Refuse collection, differently from other phases of the integrated urban cleanliness (cleaning, waste disposal), is indubitably characterized by cost sub-additivity, hence cannot be opened to competition "within the market" (Perra, 2000).

environmental aspects (*e.g.*, morphological and urban features). Therefore, it could be convenient to auction off the service by single urban areas (roughly corresponding to one or a few collection points), also in the view to fasten collection and enhance participation. In this case, some forms of yardstick competition among suburban providers could also prove effective and welcome.

As regards water services, by the very nature of these activities, optimal basins typically transcend municipal boundaries, yet consisting in geographical areas within which hydro-geological conditions are highly homogeneous. In Italy, the *Galli Law* introduced a similar idea, although admittedly the implementation phase has been largely unsatisfactory: at the end of the day, current basins coincide with administrative boundaries (and powers), instead of being based on hydro-geological homogeneity. Notice also that these considerations (and similar) should suggest relevant implications on the institutional side: for instance, the independent regulation and monitoring of the water industry should transcend the local level. A national agency is better placed to optimally design extra-municipal service areas and tenders.

Analogous arguments, in particular on the opportunity of extra-urban basins, industrially homogenous and corresponding to a sufficiently large population (see *supra*, sub-section V.3), can be easily applied to other local services, as gas distribution. As before, this also confirms the case for a national agency in this sector as well.

To sum up, the definition of "optimal basins" cannot be devised in abstraction, since it involves delicate context- and sector-specific trade-offs. What's more, final answers have relevant implications for the institutional setting, in particular as regards sector agencies' geographical field of action (see infra, subsection VI.1, point I).

VII.   THE AWARDING MECHANISM

The awarding mechanism - *i.e.* the rule by which single bids are rank-ordered and the best "proposal" is selected - is a crucial choice, for the principle – maybe too obvious – that *ceteribus paribus* different rules determine different bidding strategies and outcomes. Local services are complex activities, involving a multiplicity of relevant variables for social welfare, not all quantifiable in nature. Take quality of services. No matter how tendering authorities want to deal with quality issues, this would always involve some degree of subjectivity and discretion. We think that the selected devise to contrast (eventual) quality deterioration should be the one minimizing risks with arbitraries and temporal inconsistency (uncertainty, favouritism, etc.).

We don't want to repeat ourselves on arguments already stressed in subsection IV.4. In a nutshell, in the logic of the "minimum discretion" and "full commitment" principles, the awarding mechanism (and the underlying scoring function) should be *mono-dimensional* and just based on economic offers (tariffs, subsidies, franchise fees). Instead, quality issues should be dealt with complementary devices (*e.g.*, MQS, performance-based reward schemes, reputation), other than the competitive awarding procedure. Indeed, a *multi-dimensional* format, as the "optimal scoring auction" devised in the Che's (1993) and Asker and Cantillon's (2004) models, would be hard to implement and inappropriate for local public services, mainly because of risks associated with excessive discretion in the choice of the scoring function. Other solutions, as a *multi-stage awarding procedure* (Branco, 1997) or a single-bid auction with secret quality scores (Doni, 2006), are flawing as well. We look at the most relevant drawbacks of all these dominated solutions, in order to come out with a concrete *mono-dimensional* proposal.

In particular, a *multi-dimensional* auction suffers from two main deficiencies, namely tendering authorities' asymmetric information and excessive discretion. Both frustrate the ambition of social welfare maximisation. As regards the first point, bidders' preferential, yet private information on feasible quality-enhancing initiatives would be hardly revealed to the auctioneer before bidding, given uncertainty on final outcomes and monopoly franchise allocation (Pratt and Valletti, 2000). Bids cannot convey information either, as scoring formulas have to be set in advance, when the only reliable evidence relates to the past (which is often poorly informative about the future). Therefore, scoring functions are never fully efficient on an information viewpoint.

As regards the second aspect, there is always some degree of approximation and arbitrary freedom in the choice of an index-based awarding mechanism, which converts price-quality bids into a unique score. No one can guarantee that the selected formula is perfectly aligned with maximisation of social welfare. In a sense or another, the formula will be criticized by would-be operators, either because excessively penalizing or excessively rewarding for this or that dimension. What weights would you give to quality, compared to price? And, what functional form should this index have? For instance, a linear formula would fail to take into account complementarities between relevant dimensions; anyway, also more complicated forms would still represent an approximation. To sum up, in a way or another, final selection would depend too much on the arbitrary attempt to rank what cannot be ordered, through subjective weighting of the various performance parameters, such as economic conditions, quality, organization proposals, etc. (Armstrong and Sappington, 2005).

An alternative to *multi-dimensional* auctions suggested in the economic literature is based on a *two-stage selection procedure*. At the outset, two alternative forms could be devised. In a case (*model I*), the provider is selected through a price auction in the first stage, while quality levels are contracted ex post between the franchisor and the winning franchisee, when the former can use partial information conveyed by previous bidding (Branco, 1997). Another possibility (*model II*), suggested by Doni (2006), reverts the order of the Branco's proposal: in a first stage, bidders submit technical proposals (with or without knowing in advance the auctioneer's assessment criteria) and, in a final stage, only selected bidders are allowed to compete in price[196]. In effect, *multi-stage procedures* do not overcome discretion risks associated with multidimensionality and eventually the information problem either. In particular, *Model I* solves partially the information issue (as price bids convey some reliable, yet incomplete information on quality), but undermines the relevance of minimum discretion and ex post commitment. There is no guarantee that provision terms will not be made overall more favourable for the operator in the second stage of the game, while also considering the winner's ex post bargaining power. To borrow some enlightening words (author's additions in italic) "*successes* place winners of the original competition [...] *transforming* what was once a large numbers bidding situation, at the time the original franchise was awarded, [...] in a tantamount to a small numbers bargaining situation, once the franchise relationship is initiated" (Zupan, 1989).

Instead, *Model II* leaves even more discretion in assessing technical bids (and eventually rejecting some of them). In particular, two implementation alternatives can be imagined for *Model II*: first-stage technical assessment can be based either on explicitly set parameters or on discretionary decisions by the awarding authority. Both solutions are criticisable. The first is nothing more than a MQS obligation, and resembles, only in part (!!!), our proposal in point VIII (see *infra*). The second is unadvisable, because it's too arbitrary, hence prone to favouritism and excessive uncertainty for potential bidders (recall from previous analysis that uncertainty distorts bidding strategies away from the optimality).

We conclude that the awarding mechanism should be *mono-dimensional*, and based on the sole parameters which are objectively quantifiable, namely the economic ones (tariffs, subsidies, franchise fees).

In particular, the formal model discussed in section III suggests a relatively simple proposal: awarding the monopoly franchise to the bidder who "promises" the lowest cost

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[196] In effect, the Doni's (2006) contribution aims at studying the best auctioneer's information policy (secret, private or public assessment of technical proposals). He shows that secrecy always dominates private information (*i.e.*, quality scores are individually revealed), but both are dominated by public revelation of scores, at least under some sufficient conditions.

to engage in all pre-specified contractual obligations, including MQS. Then, once that the "least-cost-provider" is selected, the authority converts the winning "cost bid" into specific economic terms (allowed tariffs and/or transfers from/to local administrations), based on an explicit "reimbursement rule", which is set ex ante and made public in call for tenders. We call this proposal as "cost-only auction".

Clearly, two aspects are crucial for final success of the suggested format: proper selection of the "reimbursement rule" and full commitment by franchisors to such a rule, *i.e.*, to not ex post renegotiate economic conditions that have been originally promised and advertised. The second point stems from hand-tying arguments discussed through the whole work, with no need for further qualification. One should never forget that rational players tend to anticipate the auctioneer's temporal inconsistency in their bidding strategies, thus potentially frustrating the inherent truth-telling merit of franchise bidding.

Instead, the first point involves some technical complications. From Section III, the optimal rule consists in a "contract menu", designed so as to induce honest bidding. This is consistent with the most recent advances in the economic literature on optimal regulation, according to which the perfect regulatory contract is not unique, but depends on individual features of counterparties (Laffont and Tirole, 1994; Sappington and Weisman, 1996). In particular, recall from *Proposition 1* that, under a two-type case, the efficient awarding rule entails:

- for a low-cost bidder, a price equal to her "cost bid" and a positive rent, corresponding to the minimum utility she requires for not pretending to be a high-type;

- for a high-cost bidder, zero rents and a price exceeding marginal costs by an amount that optimally balance rent-extraction from low-cost bidders and allocative inefficiencies from pricing high-cost players above their marginal costs.

We send the reader back for derivations and explanations, while just observing here that the underlying reasoning can be easily extended to continuum-of-type circumstances, which are most realistically faced by franchisors.

The idea is the following: given a infinite number of bidders, uniformly distributed in a certain cost interval $[c^{min}; c^{max}]$, the optimal "menu contract" or optimal "reimbursement rule" $\{p(\hat{c}_i); S(\hat{c}_i)\}$ is designed as to induce any would-be franchisee to truthfully reveal her type (*i.e.*, $\hat{c}_i = c_i$; $\forall i$, where $\hat{c}_i$ denotes the "cost bid" of the type $c_i \in [c^{min}; c^{max}]$).This extension is computationally more complicated, yet not dissimilar in final conclusions from previous formalizations (*Proposition 1*). In fact, in a frame very

close to that of Section III, Laffont and Tirole (1994) find the optimal contract menu with a continuum-of-type. Under fixed tariffs, set at affordable levels, the efficient "reimbursement rule" involves a system of public transfers that is such that rents are decreasing in "cost bids", and zero for the most inefficient potential bidder. Therefore, the optimal subsidy system is decreasing and convex in true cost levels within the interval $[c^{min}; c^{max}]$ [197].

One may think that these findings are theoretically appealing, but of a little value for implementation purposes. Tendering authorities could be scared by complicated computations as those in Section III or in related contributions. Moreover, implementation would require crucial information on demand and cost features, one can suppose are - totally or partially - unknown to auction designers. In effect, most of these practical concerns are very serious. Yet, this (needed) note of caution should not induce pessimistic conclusions, as past industry information for instance could be of same help.

The following is a very simple proposal, both consistent with theoretical findings and easy to apply. The idea is to look at past data to find a reasonable interval $[c^{min}; c^{max}]$ for marginal cost figures. Once that the expected interval has been made discrete (*i.e.*, only discrete "cost bids" are allowed), an efficient reimbursement rule induces any firm to bid exactly its cost (*i.e.* induces a truth-telling equilibrium). This rule can be devised in this way:

    a. firms bids marginal cost promises;

    b. tariffs are set equal to declared marginal costs;

    c. subsidies are designed as to induce truth-revealing bidding, that is they are decreasing and convex in declared costs (the less you declare, the more you are subsidized, but subsidy increases are less than proportional compared to increases in "cost bids");

    d. (automatically following from *point b.* and *c.*): rents increase as "cost bids" decrease, and are equal to zero for the most inefficient firm ($c_i = c^{max}$).

The monopoly franchise is awarded to the firm bidding the lowest marginal cost, at the economic conditions defined ex ante in the reimbursement rule $\{\hat{c}; S(\hat{c})\}$. Only in case of parity, a new "cost-only auction" is devised, where first-stage best bids are taken as reservation conditions.

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[197] Notice that this is just a straightforward extension of our two-type model.

To avoid the impression of excessive complexity, we make a very easy example, whose explicit assumptions are without any loss of generality. Let assume that the tendering authority can estimate, from past information, a confidence interval $[11; 15]$, as a reasonable marginal cost range, and an approximate fixed cost of 500. Moreover, by performing a time series analysis, the authority finds that demand is fitted by the following functional form: $Q(p) = Q(\hat{c}) = 100 - 2 * p = 100 - 2 * \hat{c}$.

For sake of simplicity, the expected cost interval is divided in five levels, so that firms are allowed to bid only five discrete amounts of marginal costs, namely 11, 12, 13, 14 and 15. Anyway, the choice is made just for scientific purposes, but one can easily extend conclusions to situations with more and more levels. We further assume that bidders cannot know rivals' costs in advance, so that they are not able to form any success belief associated with different "cost bids". In practical terms, this means they choose by just looking at absolute rents, not at expected numbers.

In next table, we present a reimbursement rule $\{\hat{c}; S(\hat{c})\}$ resembling the efficient theoretical one.

Table 18. An example of efficient cost reimbursement rule

Cost bid ($\hat{c}$)	Price($p = \hat{c}$)	Demand ($q(\hat{c})$)	Total sales ($q(\hat{c}) * \hat{c}$)	Subsidy ($S(\hat{c})$)
11	11	78	858	796
12	12	76	912	719
13	13	74	962	644
14	14	72	1008	571
15	15	70	1050	500

Table 19 proves that the optimal rule devised in Table 18 induces a truth-revealing behaviour. Notice that if a player bids honestly, she gets the minimum amount of rents for not exaggerating her cost figures. In technical jargon, the incentive-compatibility constraint for any potential bidder is satisfied as equality; this, in turn, allows for social welfare maximisation. Any firm is rent-indifferent between offering its true costs and the level just below, but she will prefer to declare her actual type, in order to increase expected probability to win the contest.

Table 19. The truth-revealing properties of franchise bidding based on Table 18

Cost bid	Subsidy	Rents for a 15-type	Rents for a 14-type	Rents for a 13 type	Rents for a 12 type	Rents for a 11 type	Equilibrium bid
11	792	-20	58	136	214	*292*	*11*

12	716	-12	64	140	***216***	292	*12*
13	642	-6	68	***142***	216	290	*13*
14	570	-2	***70***	142	214	286	*14*
15	500	***0***	70	140	210	280	*15*

Notice that, based on our proposal, the winning franchisee is awarded a *fixed-price contract* (subsidies and tariffs are aligned to expected costs, instead of ex post figures), which incentivizes her efforts for both production savings and commercial promotion initiatives[198]. Indeed, less costs (column 1, Table 18) and more sales than those expected at the bidding stage (third column, Table 18) would all accrue to the winning franchisee, in terms of higher rents.

Moreover, recall that the monopoly franchise is awarded for a certain, discrete period, and not just for one year. Over time, efficiency could be enhanced by a system of *subsidy* and *price cap*, whereby the initial subsidies and tariffs in the reimbursement rule are increased by the inflation rate minus a factor X for expected increases in productivity.

In technical terms:

$$S(\hat{c})_t = S(\hat{c})_0 * (1 + \Pi - X)^t; \qquad p_t = (\hat{c})_0 * (1 + \Pi - X)^t \qquad \forall t = 1, 2, \dots T$$

where T represents the length of the franchise period, as defined in point IX, while $S(\hat{c})_0$ and $(\hat{c})_0$ the awarded economic conditions of provision.

These devices, in particular the setting of the productivity factor X, may be implemented either in an ex post negotiation between the franchisor and the winning franchisee or made part of bidders' offers. As observed before, the first solution would involve usual risks with absence of full commitment (*e.g.*, risks of ex post favourable renegotiations); the second may be more appealing, yet requiring further specific research.

Anyway, regardless of full implementation of *subsidy* and *price cap*, economic conditions need to be updated annually, as to allow at least for the recovery of inflated costs.

VIII.   QUALITY ISSUES

A practical proposal to deal with quality-shading in *mono-dimensional* tenders has already been presented in sub-section IV.4. The "cost-only auction" described in the previous section may determine a sort of *race to the bottom* as regards standards of performance, while also considering that the tendered final contract is of the type *fixed-price*. In effect, empirical

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[198] The economic literature has recognized some efficiency reasons for not tendering *cost-plus contracts* (McAfee and McMillan, 1986). These arguments are also confirmed in empirical works (Bajari and Tadelis, 2001).

works have suggested some informal controls to prevent such risks. In a inquiry on franchise bidding in the US cable TV market, Zupan (1989) finds five powerful mechanisms to restraint awarded operators from exploiting opportunistically contractual gaps, including non-contracted quality obligations. In particular, the author suggests the following constraints: penalty clauses (a sort of hostage in the hands of tendering authorities), the threat of vertical integration into the awarded activity, the authority's monopsony power (for instance, as regards the reimbursement quantification for non-recovered specific investments), cross-city and within-contract reputation concerns. More in detail, one of them strongly depends on the legal environment (for instance, article 23bis could prevent Italian municipalities from threatening vertical integration), other (*e.g.*, the exercise of the authority's monopsony power) would come at the cost of too much discretion. Finally, reputation concerns and penalty systems need to be implemented and actually enforced, at least to make these devices more effective in constraining opportunism and distorted incentives.

As regards implementation, in sub-section IV.4 we made a simple proposal that we repeat here for practical convenience: calls for tenders should provide with a minimum quality standard (MQS) obligation, complemented by a compensation scheme for performances above basic floors. In other words, instead of making quality a part of bidding competition (with the undesirable consequences observed in the previous point), would-be franchisees should internalize, in their bidding strategies, the credible threat of penalties for standards below the minimum. Moreover, a performance-enhancing index-based reward scheme is expected to induce efficient quality supply, by leaving final choices to the most informed party. Therefore, this system is expected to solve - at least partially - the previously quoted information gap, through delegation.

Of course, since quality quantification always entails some approximation, the proposed contrivances do not pretend to overcome all problems with subjective assessment and contractual gaps about quality. The reason is straightforward: the inability to come out with a totally informed index, perfectly aligned with social welfare. To repeat previous conclusions (see *infra*, subsection IV.4), mainly borrowed from multi-task agency theory, firms will fall short of immeasurable or poorly weighted performance dimensions, while committing themselves too much into the most rewarded ones. Yet, in a logic of second-best, our proposal avoids further arbitraries and discretion with using the same competitive mechanism (the auction) to achieve multiple objectives, as occurs in a *multi-stage procedure* or when trying to weight economic and non-economic bid components into a unique score (see *infra,* point VIII). In coherence with the "minimum discretion" principle, the proposal

limits as much as possible the authority's arbitrary choice. Discretion is merely confined to the selection of MQS and of specific weighting in the quality index. Besides, efficiency losses (*i.e.*, the degree of distortion in the allocation of effort among performance dimensions) could be reduced by empowering really competent independent agencies: a further argument for sector-specific authorities.

Finally, we think that control via reputation should be strengthened and, in a sense, made a more "formal" part of the selection procedure. This idea has been partially stressed in point IV. Control for quality - as for any form of opportunism from contract incompleteness - can be achieved by excluding dubious bidders, as assessed in a pre-selection or qualification stage, on the basis of records of past behaviours. However, these exclusions have to be objectively motivated. For instance, competent authorities should rely upon inter-municipality databases on past MQS infringements and/or upon similar evidence (*e.g.*, the number of filed complaints in the same market or in different sectors). Needless to say, the working of these reputation-based devices would be more effective under recurrent short-term tenders (see *infra*, next point).

IX.   LENGTH OF FRANCHISE PERIODS AND THE INVESTMENT ISSUE

There is no chance to give a general answer to the question of optimal length of monopoly franchises. Efficient solutions will depend on the specific features of single sectors and on other special environmental aspects, such as the dimension of sunk costs, the relevance of investment programmes and the size of tendering expenditure. To help awarding authorities, one can simply underline the basic trade-off involved in actual design. In particular, renegotiation concerns (sub-section IV.3), collusion (sub-section IV.5), incentives to long-run specific investments (sub-section IV.6), the size of bidders' sunk costs to participate (and exit) markets (*e.g.*, the cost to formulate bids) and the dimension of tendering costs would all call for longer periods. Instead, the lack of bidding parity among participants (as in Laffont and Tirole (1988), the incumbency information advantage is increasing in franchise length), the virtues of constant competition (recurrent contract renewals allow for continuous contestability) and the effectiveness of reputation-based devices call for shorter franchise periods. Therefore, optimal choices will vary with cases at hand. For instance, reasonably, cleaning services have to be procured more frequently than water services, as recovery of specific investments is comparatively a minor concern.

In effect, the argument whereby franchise periods should be enlarged in order to overcome short-termism in investment behaviour has to be taken cautiously. Firstly, one should preliminary recall that this issue is of a certain practical interest only when the incumbent

bears investment obligations (*concessions*), not when she just use third-parties' equipments and infrastructures - eventually public -, with no improving duties (*operating franchises*). Secondly, the under-investment conjecture is not supported by sufficient empirical evidence, which instead tends to present with ambiguous findings (Section IV.5). Thirdly, the vertical separation of infrastructures, recommended in Section VI.1, does not imply that the separate facility-owner has to bear the whole burden of investments. Some obligations are still delegated to downstream franchisees[199], but separation implies anyway a proportional scaling down of eventual under-investment concerns.

While bearing in mind these qualifications, we think that prolonging franchise length is unlikely to be effective, as investments represent a continuous commitment by their own nature. Longer monopolies would eventually allow for full recovery of financial efforts made at the beginning, while not solving the cyclical issue of decreasing incentives as the expire date is approaching. Moreover, delaying over time the end of contracts reduces the frequency of competition "for the market" and the periodic contestability of services, thus resulting in higher disconnection between prices and costs (Affuso and Newbery, 2001).

Instead, since the real issue is the inadequate recovery of past financial efforts (particularly, for investments in intangibles), the solution should be formulated in terms of better reimbursement computations. The Posner's proposal (1972) to repay the residual book value of relation-specific assets, not completely depreciated, is flawing, as prone to accounting manipulations and based on costs, instead of asset productivity, as requested to incentivize economically reasonable investment policies. Consistently, the frequent practice of accounting-based reimbursements has to be criticized. Non-recovered specific investments should be repaid at their "fair value", *i.e.* the net current value of future cash flows generated by the investment itself. In case of incumbents' substitution, an independent tendering authority could be in the position to make such an expert assessment, eventually relying upon external certifications by qualified professionals.

Two alternative solutions have been proposed in the economic theory, both unappealing on an implementation viewpoint. First of all, Laffont and Tirole (1988) have proposed to *bias* bidding parity in favour of the incumbent, on the premise that potential under-investment issues are decreasing in the probability of incumbents' renewals (see *Proposition 11*). However, this solution may be ineffective and eventually counter-productive as:

1. in some sense, coincides with extending the incumbent's expected franchise period: a solution we have already criticized;

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[199] For instance, in public transportation, all networks, garages and deposits should be vertically separated, but the awarded service provider would still have to finance bus replacement.

2. inevitably introduces a certain degree of discretion in the choice of the efficient bias;

3. gives a further competitive advantage to the strongest party, with additional disincentives for new comers (in participating and aggressively bidding).

In alternative, competent authorities could let indemnification emerging from a competitive contest (the CT), in the view that an auction is the better way to reveal the true productivity-based evaluation of assets (Harstad and Crew, 1999). This solution, theoretically appealing, is hard to implement in practice, as suggested by the circumstance that:

1. bidders are not in the information position to assess assets and make informed offers, hence they could be refrained from aggressively bidding in a context of uncertainty ("winner's curse" argument);

2. bidding positions would be automatically biased in favour of the incumbent (*i.e.*, the most informed bidder) and tender competitiveness softened as a direct consequence.

To sum up, franchise length should be optimally chosen within the trade-off underlined before. Expected recoupment time for relation-specific investments should play poor role in this choice, as relative financial efforts can be otherwise reimbursed, on the basis of a certified assessment by independent agencies.

X.   PROTECTION AGAINST ANTI-COMPETITIVE BEHAVIOURS

Standard auction theory provides with poor help on how to deal with collusive behaviors, as most of this literature – implicitly or explicitly – assumes a fixed number of non-cooperative bidders. Predation and entry deterrence are also dangerously neglected in most reference works. However, in practice, anti-competitive risks are not a minor topic (Klemperer, 2002).

At the outset, one could argue that the more automatic the mechanism, the higher its subjection to bidding coordination, since the auctioneer risks to be trapped by its own rigid rules. Even if she smells a rat, the agency has to award the tender anyway. Therefore, tendering authorities face an inescapable dilemma in the choice of the degree of discretion, namely the trade-off between favoritism and collusion (Amaral *et al.*, 2009).

However, this should not lead to repudiate principles, such as "minimum discretion" and "full commitment", repeatedly defended in the above, in the name of objectives that can be otherwise achieved, *i.e.* through other mechanisms than discretion. A way could consist in

preserving a high degree of automatism in selection criteria, while reporting to antitrust agencies all suspected bidding behaviors (Albano *et al.*, 2006). Other partial contrivances in auction format could be also of some help. To make some examples, it's advisable *inter alia*:

- opting for sealed-bid auctions (as argued in point II);

- authorizing bidding consortia only when strictly reasonable on efficiency grounds (as argued in point V);

- taking into account collusion in the definition of franchise length, in the view that the more frequent the tender renewals, the higher the coordination chances (as argued in point IX);

- increasing uncertainty on single bidders' identity (viceversa, formal invitations facilitate collusion);

- avoiding entry fees, as a lower number of bidders increases the likelihood of anti-competitive outcomes (as argued in subsection IV.6);

- limiting bid withdrawals or making them more costly (Albano *et al.,* 2006).

In any case, these and other tools suggested by simple tender economics need to be carefully tailored to the specificities of the context at hand. For instance, a special focus should be reserved to service characteristics and to the analysis of industry factors, such as entry barriers, symmetry and market concentration. As regards the last point, in the limit, with an infinite number of potential providers and/or perfect contestability, auction design does not matter at all.

Finally observe that effective antitrust is the best device to fight collusion and other anti-competitive practices. Yet, past enforcement by competition authorities has been very limited, with lower detection rates than in more "ordinary" markets. The overlapping of institutional roles and the difficulty to find reliable evidence on bidding coordination (this is typically tacit and self-enforcing) are the best candidate explanations.

We think procurers could play a non-trivial role in ex post antitrust detection, by reporting to competition agencies all suspected bidding behaviors. Notice that, by this form of collaboration, tendering authorities can achieve the efficient compromise in the discretion trade-off, *i.e.* preserving awarding automatism, without the risk to be trapped by rigid rules.

XI.   CONTRACT EXECUTION PHASE

Adequate monitoring of contract execution is a crucial task. Indeed, incompleteness is a structural part of any long-term contractual relationship, even more when complex activities, such as local services, are contracted through CT. This could be a serious risk for

allocative efficiency. To quote some words, "franchise bidding may lead to choose the bidder who is the most aware of the contractual blanks he could exploit" (Yvrand-Billon, 2006), where blanks also consist in non-contractible quality dimensions.

However, these opportunistic behaviours would be discouraged, if the awarded operator cannot be fully confident about the chance of favourable ex post renegotiations. To go step by step, two hypotheses may lead to modify contract terms initially awarded. On one hand, reneging operators could distort the information available to them, in order to pretentiously claim changing circumstances. On the other hand, renegotiation could stem from real acknowledgement of less optimistic figures (on demand, costs, etc.) than those incorporated in their original bids. The former is a guileful, opportunistic exploitation of ex post bargaining. The latter is a wise - in terms of both parties' interests - incorporation into the franchise contract of a new information, not available at the bidding stage (Zupan, 1989). However, although renegotiation is economically sounder in this second hypothesis, it can become nevertheless a pretext to extort radically better conditions, involving welfare losses on both an ex ante and an ex post perspective (see sub-section VI.3).

The economic literature has advanced two possible solutions to problems of unconstraint ex post bargaining, namely "arbitration" and "authority". The latter means that one of the contractual parties is provided with the authority to fill ex post unspecified contingencies, within a set of feasible solutions. For any given contingency, the awarded contract specifies a power-sharing rule, which assigns decisions to the most informed and/or the best incentivized counterparty (Tirole, 1988). Needless to say, such a solution is practically flawing, as it involves a biased distribution of ex post rents (in favour of the residual decision-maker) and requires a complete ex ante specification of the available set of alternatives for empowered decision-makers, which is unfeasible by the same definition of contract incompleteness.

Although imperfect, the other solution (arbitration) is more interesting, and *de facto* coincides with the proposal of a competent institutional authority (sub-section VI.1). In order to minimize opportunistic costs from contract incompleteness, it could be wise to rely upon a fair, independent mechanism of dispute solution, turning around a third-party, having sufficient sector-specific competences and rapidity of judgment. This third-party is supposed to take efficient decisions, *i.e.* those choices that most closely resemble an hypothetical ex ante specification in a complete contract. One may criticize arbitration on the ground that an external authority structurally suffers from informational asymmetry *vis-à-vis* involved parties.

However, this sincere acknowledgement merely suggests that the institutional solution is imperfect, yet not unadvisable. Besides, the same critique would be absorbent for the whole regulatory activity, as this always involves an external - possibly independent – third-party (between consumers and firms), in charge with deciding in a context of imperfect information.

In effect, from the above, one should recognize that, to be as effective as possible in preventing opportunism, authorities need:

1) to have sector-specific technical competences, in order to limit, on one side, information gaps (and guarantee more knowledgeable decisions) and, on the other side, to allow for less costly and more rapid learning about all situations at hand;

2) to take effective decisions in short term and at a relatively low cost;

3) to be independent, as to assure the maximization of aggregate interests, while building for itself a strong reputation of "credibility" (in the enforcement of its decisions) and "fairness" .

Point 1) and 2) draw the difference between a dedicated authority and the ordinary judicial proceedings, which are nevertheless allowed against the authority's decisions. The institutional setting devised in sub-section VI.1 is indubitably less expensive and more rapid, yet suitable in assuring more informed decisions. The judiciary system should represent a mechanism of *last resort*, a guarantee of full fairness.

Notice that other informal mechanisms, based on reputation-based concerns, could also play a role in contrasting opportunism at the execution phase. A firm that cheats, at same date, risks to lose a lot of money in the future. The game may not be worth the candle. To increase the probability that cheating will not be convenient for the incumbent (hence to make reputation-based concerns more powerful), we suggested a very simple device: at the pre-selection stage, the tendering agency has to rely on single bidders' information about past bad quality performances and/or about highly disputed renegotiations. The independent third-party should be in charge with organizing databases and collecting all information on past tenders, while sharing these data with all interested agencies. Reputation constraints are increasing in the expected level of *ex post* competition (Chong *et al.*, 2005) and in the frequency of renewals (degree of contestability).

These and similar arguments should make clear that, even when opting for franchise bidding, some forms of regulation still play a crucial role, to discipline market power or ex post bargaining. Once awarded, providers remain legal monopolies, no matter the way they

get their power and for how long. As such, they need to be subjected to some form of external control, that is to some form of authority.

VII. CONCLUDING REMARKS

This paper investigates theoretical advantages and practical flaws politicians should be aware of, when opting for tendering procedures. The size of the latter depends on many environmental and implementation features, partially controlled by the legislator, partially by tender designers. Therefore, the final cost-benefit balance is by no way clear-cut, at least if liberalization (through CT) lacks real political support and sound implementation. Hopefully, the most general message the reader can draw is a judgement of appropriateness, yet assisted by some degree of caution. Let say, a judgement of *tepid optimism*.

The work starts from the most recent Italian reform for local public services, which will make tenders no longer facultative by 2012 (by 2015 for listed companies). The legislative novelty is just an opportunity to address more general issues about franchise bidding, having no national specificities. Besides, through all pages, Italy is merely taken as emblematic of more general findings.

The first issue addressed in the paper concerns expected benefits from CT. Before everything else, franchise bidding is a wind of (worthwhile) change for sectors historically dominated by public patronage and widespread inefficiencies. In most countries, including Italy, some forms of competition are a categorical imperative to radically reorganize service provision on more efficient grounds, through the attraction of private capitals, ideas and competences, better managerial incentives, organization refreshments, etc. In other words, it seems wise giving back to market forces what has been left for years to politics and its unhealthy logics of power exploitation and search for electoral consensus.

Then, by itself, competition - whatever its form ("for the market" or "within the market") - is an effective device to discipline the economic power (which only partially coincides with the political one), to local communities' (users' and taxpayers') full advantage. Nothing more than the threat to lose money can induce firms to behave efficiently, in line with the interest of a benevolent social planner. When she has plenty of alternatives, a customer can always change her counterparty, for instance if she feels the seller is cheating on price requests (too high, as compared to actual costs) and/or finds its offer comparatively inconvenient. This, in turn, induces fair pricing and inefficiencies reduction.

Tenders are driven by exactly the same working force, namely the client's (the awarding local administration) faculty to chose among alternative sources. The outcome is also similar: fair price (and subsidy) requests and a continuous commitment to improve oneself.

Under both forms of competition ("for the field" or "within the field"), a basic condition for successfully disciplining market power is an high number of sellers, acting non-collusively. At the limit, as the number of independent bidders becomes sufficiently high, tenders achieves exactly the first-best, as for perfect competition (in non-natural monopolies) in classical industrial organization literature.

Obviously, another basic requirement for tenders to be effective is "bidding parity", *i.e.* all parties, including the incumbent, are allowed to bid on equal foot. Otherwise, auctions achieve just the appearance of competitive selection, without the substance and its inherent merits. Other implementation issues - such as quality-shading, opportunistic exploitation of contract incompleteness, investment disincentives, etc. - can also invalidate the ambition of fruitful competition. Through the whole work, the Italian (and not only) past experience with CT, although limited by a certain political disfavour towards liberalization, is taken as representative of most of these risks. To quote some examples, tenders for water services have been conditioned by limited participation, due to flaws in auction design (too ambitious and poorly remunerative ATO plans). Awarding of urban transportation has been led by the desire to perpetuate the incumbency, also through generous allowance for bidding consortia. In gas distribution, franchise fees and local finances have been the main concerns, with dangerous (*e.g.*, for safety) neglecting of qualitative aspects and dynamic incentives to invest.

In effect, appreciable successes are also not infrequent, as the tender for additional transportation services held in Rome in 2000 or that for the integrated water service in the ATO-Frosinone. Both are indirect confirmations that franchise bidding is *per se* a powerful disciplining device, yet that an improper use could be flawing and counter-productive. Overall, the work should suggest that proper design is crucial to tender success, but also that implementation is a non-trivial challenge, firstly because optimal choices vary with the context and the service nature. Anyway, the paper tries to provide with a toolbox and general guidelines, hopefully useful to both practitioners and theoreticians interested in efficient ways to organize local services.

Finally, coming back to Italy - our starting point and reference perspective - we appreciate the umpteenth (hopefully, the last) legislative try to move to compulsory tenders, endorsed by article 23bis of the Law 133/08, including the most recent novelties introduced by article 15 of the Legislative Decree 135/09. This last intervention (D.L. 135/09) provides local administrations with another relevant alternative to franchise bidding, of equal hierarchical dignity, namely the competitive selection of private and operative shareholders,

owning at least 40 percent of the capital. Notice that the analysis of PPP tenders is outside of the scope of this work. Suffice it to say that an adequate implementation of this further faculty would also allow for desirable outcomes, such as efficiency-enhancing incentives (for instance, to maximise awarded prices of auctioned stocks), opening to private competences, organization refreshments, etc.

Although we have strong reasons to fear the contrary, we hope this reform could represent a final say. The historical evolution of the Italian discipline teaches that a continuous overlapping of mini-reforms, postponements and standstills has led local administrations to repeatedly exploit consequent uncertainty and legislative gaps to their own advantage, in the sense of avoiding or delaying over time needed changeovers. It's also to say that this regulatory uncertainty has been *per se* a strong constraint on efficient outcomes: the changing frame has always represented the most serious source of exogenous risks (and alibis) for local providers.

Then, while also relying on the disputable premise of no about-turns, we think that competitive selections risk to amount just to a *petitio principi* if franchise bidding will not be institutionally supported. This seems the most important challenge for the Italian legislator, to address in the next future, without alibis. Indeed, there is no chance to expect really competitive tenders, absent an independent monitoring of auction design and contract execution. In this respect, several proposals have been advanced, even in the most recent years, for instance to institute a water agency (maybe just a department of the power and gas agency) and a separate transportation authority. For other local services, as refuse collection and waste disposal, there is no project either, but for generic proposals of conflation with similar services (*e.g.*, water).

Even without addressing the issue of appropriateness referring to legislative preference for national authorities (for instance, transportation and refuse collection have a prominent local configuration), these projects are still locked in the "box of wishful thinking" and, with them, also the ambition of more efficient local public services.

To sum up, substantial rules having "the potential" to promote competition (and efficiency) are not enough. Initiated projects need to be completed with the courage of a radical institutional reform.

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Proof 1. **Optimal menu contract in a two-type case -** *Lemma 1 -*

Consider the tendering authority's maximisation problem defined in expressions through (7) to (10). Based on underlying assumptions, if both types were allowed to charge equal tariffs, profits for low-cost bidders would be higher than for high-cost ones, *i.e.*:

$$\Pi_l(p) > \Pi_h(p); \quad \forall p \tag{1.1}$$

This implies that only the participation constraint for a high-cost firm is relevant, since - under equal economic terms of provision – this constraint automatically implies that for low-cost firms:

$$U_h \geq 0 \qquad \rightarrow \qquad U_l > 0 \tag{2.1}$$

Provided that rents are socially costly, this participation constraint is binding at equilibrium, *i.e.* a high-cost firm will be optimally provided with no rents:

$$U_h^* = 0 \tag{3.1}$$

By substitution of (3.1) in the incentive-compatible constraint (8), and observing that rents are costly also when afforded to efficient types (*i.e.* the incentive-compatibility constraint in (8) is solved as equality), one gets:

$$U_l^* = \lambda[(c_h - c_l)Q(p_h)] \tag{4.1} \qquad \bullet$$

Proof 2. **Optimal menu contract in two-type cases -** *Proposition 1 -*

Given *Lemma 1* and expressions (3.1) and (4.1), the objective function in (7) can be re-written as:

$$W = [1 - (1 - \pi)^n] \left[CS(p_l) + \Pi(p_l) - (1 - \alpha)\lambda[(c_h - c_l)Q(p_h)] \right] +$$
$$+ (1 - \pi)^n [CS(p_h) + \Pi(p_h)] \tag{1.2}$$

After some simple algebra, (1.2) can be re-expressed in a more convenient form:

$$W = \frac{1 - (1 - \pi)^n}{(1 - \pi)^n} \left[CS(p_l) + \Pi(p_l) - (1 - \alpha)\frac{\pi(1 - \pi)^{n-1}}{1 - (1 - \pi)^n}[(c_h - c_l)Q(p_h)] \right] +$$
$$+ [CS(p_h) + \Pi(p_h)] =$$

$$= \frac{1 - (1 - \pi)^n}{(1 - \pi)^n} [CS(p_l) + \Pi(p_l)] - (1 - \alpha)\frac{\pi}{1 - \pi}[(c_h - c_l)Q(p_h)] +$$
$$+ [CS(p_h) + \Pi(p_h)] \tag{2.2}$$

By maximising (2.2) with respect to both prices, one obtains:

$$\frac{\partial W}{\partial p_l} = 0 \qquad \rightarrow \qquad p_l^* = c_l \qquad\qquad\qquad (3.2)$$

$$\frac{\partial W}{\partial p_h} = -(1-\alpha)\frac{\pi}{1-\pi}[(c_h - c_l)Q'(p_h)]] + c_h - p_h = 0 \qquad (4.2)$$

$$\rightarrow \quad p_h^* = c_h - (1-\alpha)\frac{\pi}{1-\pi}[(c_h - c_l)Q'(p_h)]] \qquad (5.2)$$

For sake of simplicity, one can assume a linear demand function, having the following functional representation:

$$Q(p) = a - p \qquad\qquad\qquad (6.2)$$

which implies:

$$Q'(p) = -1 \qquad\qquad\qquad (7.2)$$

By substitution of (7.2) in (5.2), one gets a more explicit price solution also for high types:

$$p_h^* = c_h + (1-\alpha)\frac{\pi}{1-\pi}(c_h - c_l) \qquad\qquad •$$

Proof 3. **Optimal menu in two-types cases with favouritism –** _Proposition 3 -_

Consider the tendering authority's maximisation problem defined in expressions through (14) to (17). In subsection IV.1, we assumed an exogenous probability η of favouritism and very generous economic conditions $\{p_F; S_F\}$ for "favoured operators".

In the remaining $(1-\eta)$ percent of cases, there is genuine competition, on equal foot, as in Section III. The optimal menu contract for "non-favoured firms" maximises the objective function (14) under constraints (15)-(17). By _Lemma 1_, the participation constraint (16) for the high-type implies that for low-types (17), _i.e._

$$U_h \geq 0 \qquad \rightarrow \qquad U_l > 0 \qquad\qquad (1.3)$$

Again, since rents are costly, both the relevant participation constraint and the compatibility constrain hold as equalities:

$$U_{h(N.F.)}^* = 0 \qquad\qquad\qquad (2.3)$$

$$U_{l(N.F.)}^* = \lambda[(c_h - c_l)Q(p_h)] \qquad\qquad (3.3)$$

where, as before, the ratio λ is given by:

$$\lambda = \frac{\frac{(1-\pi)^{n-1}}{n}(1-\eta)}{\frac{1-(1-\pi)^n}{n\pi}(1-\eta)} = \frac{\pi(1-\pi)^{n-1}}{1-(1-\pi)^n} \qquad\qquad (4.3)$$

Based on these findings, the constrained objective function to be maximised can be written as:

$$W = \eta * [CS(p_F) + \Pi(p_F) - (1-\alpha)U_F + B] +$$

$$+ (1-\eta)\{ (1-(1-\pi)^n)[\, CS(p_l) + \Pi(p_l) - (1-\alpha)\frac{\pi(1-\pi)^{n-1}}{1-(1-\pi)^n}[(c_h - c_l)Q(p_h)]\,]$$

$$+ (1-\pi)^n[\, CS(p_h) + \Pi(p_h)]\,\} \tag{5.3}$$

Expression in (5.3) can be rewritten in a more convenient form. To do this, lets preliminary define the following quantity:

$$F = [CS(p_F) + \Pi(p_F) - (1-\alpha)U_F + B] \tag{6.3}$$

Then, by substituting (6.3) in (5.3) and applying some algebra:

$$W =$$

$$\eta F + (1-\eta)\{ (1-(1-\pi)^n)[\, CS(p_l) + \Pi(p_l) - (1-\alpha)\frac{\pi(1-\pi)^{n-1}}{1-(1-\pi)^n}[(c_h - c_l)Q(p_h)]\,] +$$

$$+ (1-\pi)^n[\, CS(p_h) + \Pi(p_h)]\,\} =$$

$$= \frac{\eta}{1-\eta}F + (1-(1-\pi)^n)\left\{ CS(p_l) + \Pi(p_l) - (1-\alpha)\frac{\pi(1-\pi)^{n-1}}{1-(1-\pi)^n}[(c_h - c_l)Q(p_h)]\right\} +$$

$$+ (1-\pi)^n[\, CS(p_h) + \Pi(p_h)] =$$

$$= \frac{1}{(1-\pi)^n}\frac{\eta}{1-\eta}F + \frac{(1-(1-\pi)^n)}{(1-\pi)^n}\left\{ CS(p_l) + \Pi(p_l) - (1-\alpha)\frac{\pi(1-\pi)^{n-1}}{1-(1-\pi)^n}[(c_h - c_l)Q(p_h)]\right\} +$$

$$+ [\, CS(p_h) + \Pi(p_h)] =$$

$$= \frac{1}{(1-\pi)^n}\frac{\eta}{1-\eta}F + \frac{(1-(1-\pi)^n)}{(1-\pi)^n}[\, CS(p_l) + \Pi(p_l)] - (1-\alpha)\frac{\pi}{(1-\pi)}[(c_h - c_l)Q(p_h)] +$$

$$+ [\, CS(p_h) + \Pi(p_h)] \tag{6.4}$$

By maximising (6.4) with respect to prices, one gets:

$$\frac{\partial W}{\partial p_l} = 0 \quad \rightarrow \quad p^*_{l(N.F.)} = c_l \tag{7.4}$$

$$\frac{\partial W}{\partial p_h} = -(1-\alpha)\frac{\pi}{1-\pi}[(c_h - c_l)Q'(p_h)]] + c_h - p_h = 0 \tag{8.4}$$

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$$\rightarrow \quad p^*_{h(N.F.)} = c_h - (1 - \alpha)\frac{\pi}{1-\pi}[(c_h - c_l)Q'(p_h)]] \tag{9.4}$$

As before, if one assumeS, for simplicity, a linear demand function of the type:

$$Q(p) = a - p \qquad\qquad Q'(p) = -1 \tag{10.4}$$

By substitution of (10.4) in (9.4), one obtains a more explicit price solution:

$$p^*_{h(N.F.)} = c_h + (1 - \alpha)\frac{\pi}{1-\pi}(c_h - c_l) \tag{11.4}$$

Observe that the optimal menu contract under favouritism does not differ from the optimal reimbursement rule without favouritism (see previous proof). The reason is intuitive: with probability η, the authority agrees to award the contract $\{p_F; S_F\}$, in exchange for bribes or electoral support of value B. With probability $(1 - \eta)$, she faces the same maximisation programme of Section III, with analogous solutions.

The only relevant difference is that the chance to select the most efficient providers is decreasing in the probability of favouritism η and the first-best asymptotic outcome is never achieved. Indeed, at the limit, the probability to award services to a low-cost type is still $(1 - \eta) < 1$, and decreasing in the degree of favouritism or corruption. •

Proof 4. **Optimal bonus component with unverifiable Y**

With quadratic, additive cost function, as in (39), the marginal condition for optimum under (35) and (36) implies that:

$$\breve{a}_i = \frac{b \cdot h_i}{2k_i} \quad \forall i = 1,2 \tag{1.4}$$

$$\breve{a}_3 = 0 \tag{2.4}$$

The bonus component in the incentive scheme is chosen as to maximise total social welfare. In particular, by recalling risk-neutrality assumption, the agent's expected welfare is given by:

$$E[w] - C(\breve{a}_1, \breve{a}_2) = t + b(\breve{a}_1 h_1 + \breve{a}_2 h_2) - k_1(\breve{a}_1)^2 - k_2(\breve{a}_2)^2 \tag{3.4}$$

The principal's expected wealth is:

$$E[y - w] = q_1\breve{a}_1 + q_2\breve{a}_2 + q_3 0 - t - b(\breve{a}_1 h_1 + \breve{a}_2 h_2) \tag{4.4}$$

Therefore, by summing up (3.4) and (4.4)) and substituting for (1.4), expected social welfare is:

$$E[y] - C(\breve{a}_1, \breve{a}_2) = b\frac{q_1 h_1}{2k_1} + b\frac{q_2 h_2}{2k_2} - b^2 k_1(\frac{h_1}{2k_1})^2 - b^2 k_2(\frac{h_2}{2k_2})^2 =$$

$$= b\frac{q_1 h_1}{2k_1} + b\frac{q_2 h_2}{2k_2} - b^2\frac{h_1^2}{4k_1} - b^2\frac{h_2^2}{4k_2} = \tag{5.2}$$

$$= b\frac{q_1 h_1}{k_1} + b\frac{q_2 h_2}{k_2} - b^2\frac{h_1^2}{2k_1} - b^2\frac{h_2^2}{2k_2}$$

And maximising (5.4) with respect to b one gets the optimal incentive component:

$$\frac{q_1 h_1}{k_1} + \frac{q_2 h_2}{k_2} - b\frac{h_1^2}{k_1} - b\frac{h_2^2}{k_2} = 0$$

hence:

$$b^* = \frac{\dfrac{q_1 h_1}{k_1} + \dfrac{q_2 h_2}{k_2}}{\dfrac{h_1^2}{k_1} + \dfrac{h_2^2}{k_2}} = \frac{\dfrac{k_2 h_1 q_1 + k_1 q_2 h_2}{k_1 k_2}}{\dfrac{k_2 h_1^2 + k_1 h_2^2}{k_1 k_2}} =$$

$$= \frac{q_1 h_1 k_2 + q_2 h_2 k_1}{h_1^2 k_2 + h_2^2 k_1} \qquad \bullet$$