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REGULATING JOINT BIDDING IN PUBLIC PROCUREMENT[♥]

G. L. Albano*, G. Spagnolo** and M. Zanza***

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ABSTRACT

Joint bidding is the practice of two or more independent suppliers submitting a single bid, a practice widespread in private and public procurement. This practice may generate efficiencies through synergies and information sharing, but may also be abused to reduce the number of competitors or - even worse - to facilitate/enforce collusion among them. Hence it must be regulated. In this paper we first present results from a survey on the regulation of joint bidding in European public procurement, documenting how the very existence and the type of regulation differ across countries, and that - where present - regulation is often related to the ability of an individual firm to be admitted as a solo bidder. Borrowing from the theories of joint bidding in auctions and of horizontal mergers and joint ventures in oligopoly, we then review the basic economics of bidding consortia and the effects that these can have in terms of bidding competition, coordination among firms, risk management, exploitation of other synergies and entry. In the final part of the paper we compare several practical criteria that could be adopted for regulating bidding consortia in public procurement in a consistent way by assessing their relative degrees of restrictiveness. The only strong conclusion we can draw is that there is an urgent need for further theoretical and empirical/experimental research on this very important issue for public procurement.

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1. INTRODUCTION

Joint bidding, be it in auctions or in procurement tendering, is the practice of two or more similar firms submitting a single bid. Bidding consortia among potential competitors, whether or not temporary, are rather common in public and private procurement, but are well known to researchers because they were (sporadically) used by some oil companies in US auctions for offshore leases.¹ In late 1975, however, the U.S. Department of the Interior decided to forbid the largest crude-oil producers to submit joint bids for outer continental shelves leases. The presumption was that joint bidding aimed at reducing the number of bids and thereby lowering prices, though there was very little research at the time that would support such a policy change.²

Of course, if it does not encourage entry, joint bidding reduces the number of independent bids. In fact, unregulated joint bidding could easily be used to enforce price fixing agreements among all bidders, thus eliminating competition altogether. Therefore joint bidding must be somehow regulated, the problem is how.

Note that joint bidding consortia can be used as a price-fixing device to eliminate competition all together is not a purely theoretical consideration. This situation occurred, for instance, in a case investigated by the Italian Competition Authority (ICA).³ The Municipality of Milan filed a complaint by alleging the existence of a collusive agreement among the insurance companies that were invited to submit a tender for an insurance contract. Indeed, following the “boycott” of two public tenders and a third unofficial tender, the Municipality found itself bound to negotiate privately the insurance service with a single group of companies led by Assitalia. The ICA found that, after the call for tender, some of the main insurance companies joined a consortium to make a co-insurance bid to the Municipality. The ICA noted that the strategy adopted by the bidding consortium,

¹ Our focus in this paper is on “horizontal” bidding consortia, among similar firms that are normally competing with each other, so we disregard “vertical” consortia between firms specialized on different components of – say – a bundled procurement contract, which are usually admitted and welcome in procurement.

² See Iledare and Pulsipher (2007) for a recent empirical assessment of the effects of this regulation.

³ See ICA Decision No. 5333 of 25 September 1997, *Bollettino* No. 39/97

besides eliminating the rivalry among its members, aimed at deterring other companies from participating in the competitive process.

In this paper we first present results from two surveys on the regulation of joint bidding in European public procurement documenting how existence and type of regulation differ enormously across countries; and that – when present - regulations are in several cases related to the ability of an individual firm to be admitted as a solo bidder. The variety of regulatory approaches we found in Europe, sometimes contradictory and including many cases of no regulation at all, calls for an economic analysis of the likely consequences of the regulation of bidding consortia on the degree of competition in procurement, and, ultimately, on the buyer's expected savings. We hold that some restrictions on the formation of bidding consortia must be adopted. The absence of specific legal constraints and a *de facto* antitrust immunity for bidding consortia would simply make “bidding rings” legal as in the example above. However, although joint bidding *must* always be restricted to prevent their use as coordination devices, limitations should rely on sound economic principles, since in several situations joint bidding may generate sizeable efficiencies besides costs.

Borrowing from the theories of joint bidding in auctions and of horizontal mergers and joint venture control in oligopoly, we then review the basic economics of bidding consortia and the effects that these can have in terms of bidding competition, coordination among firms, risk management, exploitation of other synergies and entry. Finally, we compare several practical criteria that could be adopted for regulating bidding consortia in public procurement in a consistent way by assessing their relative degrees of restrictiveness.

In conducting our analysis we will keep other aspects of “procurement design” fixed, in particular we will assume the number and the size of lots to be fixed.⁴ These aspects interact with the regulation of joint bidding in a complex way, thus providing a challenging task to procurement officials. However, in order to better highlight the several possible effects of regulation of bidding consortia on participation and competition we will assume “lot design” to be exogenously given.

The remainder of this paper is organized as follows. In Section 2 we present the results from our survey of regulatory approaches to joint bidding in Europe. In Section 3, we discuss some pro- and anti-competitive effects

⁴ For more on lots' design in procurement see Grimm, Pacini, Spagnolo, Zanza (2006).

of bidding consortia. In Section 4, we analyze in more detail the nature of synergies arising when several firms join a bidding consortium. The main conclusion we draw is that if a centralized procurement agency is able to assess synergies among firms of different size it can design the procurement process and, in particular, restrict bidding consortia so as to maximize savings and/or efficiency. Finally, in Section 5, we discuss the main consequences of linking the constraints on bidding consortia to an individual firm's ability to participate in a competitive procurement as a solo bidder. Section 6 concludes with a call for further research.

2. THE REGULATION OF JOINT BIDDING IN EUROPEAN PUBLIC PROCUREMENT

In Europe, the regulation of joint bidding in procurement varies significantly across countries. Table 1 summarizes the different regulatory approaches of European Countries as resulting from two surveys administered by Consip Research Unit in 2004 and 2005 to members of the other members of the EU Public Procurement Learning Lab.⁵

- PLACE TABLE 1 ABOUT HERE -

At a time when competition and regulation policies in different countries are rapidly converging towards common standards, the variety of regulatory approaches to joint bidding across European procurement agencies appears striking.⁶ In several cases, such as Belgium, Cyprus, Czech Republic, Denmark, Hungary, and Poland there exist almost no constraints to the formation of bidding consortia. Analogously, in France, even those firms that can participate as solo bidders are allowed to form bidding consortia as long as the aim or the effect of the grouping is not a restriction of competition. This is equivalent to say that the procurement agency bears the burden of proving the harmful effect of the grouping when it aims at imposing some restrictions. Similarly, in

⁵ The EU Public Procurement Learning Lab is a peer support group of European public procurement agencies launched on November 2003 by the Italian Department of Public Administration, jointly with the Ministry of Economy and Finance and Consip S.p.A. in order to compare activities and share useful knowledge. Further information is available at <http://www.consip.it/online/Home/Studieprogetti/Progetti/Eulab.html>.

⁶ Table 1 in the Appendix provides a detailed comparative description of both the criteria for individual participation and for the formation of bidding consortia in some European countries; further information on the rather different public procurement practices in Europe can be found in Carpineti, Piga, Zanza (2006).

the UK, a clear line seems to be drawn between “genuine” (that is, pro-competitive) bidding consortia and collusive bidding, but again the nature of firms’ agreement can be challenged *after* the bidding process.

In those cases in which joint bidding is regulated, regulatory requirements differ but tend to be related to the inability of an individual firm to be admitted as a solo bidder. Thus the criteria inspiring the restriction of bidding consortia mirror the ones regulating individual participation. This is the case in Italy, Austria and Romania.

3. BASIC ECONOMICS FOR THE REGULATION OF JOINT BIDDING

The analysis of (horizontal) bidding consortia in procurement bears some resemblance with the analysis of horizontal mergers and joint ventures in oligopolies. Mergers and joint ventures typically lead to a fewer number of competitors, higher market power of merging firms and thus higher prices for consumers. By reducing the number of competitors and facilitating communication mergers and joint ventures may also facilitate the formation of collusive agreements.

However, merging and partnering firms may exploit complementary assets, or cost “synergies”, that enable the merged or jointly acting entity to achieve production costs lower than the sum of any single firm’s cost in absence of the merger or out of the venture. The overall effect on welfare, as first illustrated by Williamson (1968), is then the net sum between the loss in consumer surplus, due to higher prices, and the enhanced production efficiency due to cost synergies (if firms behave competitively).⁷

Although analogously ambivalent forces are at work in procurement markets, greater emphasis has been put in the recent debate on the market-power consequences of bidding consortia in the form of reduced number of participants.⁸ The term ‘participants’ is sometimes misleading since it may be unclear whether it refers to the number of distinct submitted bids or, rather, the overall number of participants in a procurement competitive

⁷ See Farrell and Shapiro (1990) for a classic formal analysis of unilateral effects of horizontal mergers, Motta (2004) for an integrated treatment, and Baker and Shapiro (2007) for a critical discussion of the current state of the art in US merger control policy. For the antitrust treatment of joint ventures between competitors see Federal Trade Commission (2000), Vonortas (2004) and, for the more specific case of research joint ventures, von Graevenitz (2005).

⁸ See Klemperer (2007) for an encompassing review of competition policy issues in ‘bidding markets’ that includes - with a rather negative take - joint bidding, a negative take partly due to recent results like Levine (2004), Iimi (2004), but partly linked to the need to clarify that ‘bidding markets’ are not that different from other markets. The Italian Antitrust Authority recommended that “[...] a *properly designed procurement procedure should guarantee the highest level of participation of undertakings interested in the selection process. Pursuing such an objective requires ... the correct adoption, from a competitive perspective, of such institutions as bidding consortia*”. For a general introduction to participation issues in procurement see Albano, Dimitri, Perrigne and Piga (2006); Calzolari and Spagnolo (2006) focus instead on the benefits of restricting participation when relational contracting is necessary to govern non-contractible aspects of the procurement.

process, individually or jointly. Obviously, the two concepts do not necessarily coincide if potential participants can form bidding consortia. It is then useful to label “*number of bids*” (NoB) the numerousness of distinct bids submitted by either solo bidders or bidding consortia, and “*number of participants*” (NoP) the numerousness of participants *regardless* of whether they bid as solo bidders or as members of a bidding consortium.

The difference between NoB and NoP can be illustrated by the following example in which two scenarios are considered. In the first scenario, 4 suppliers compete independently for 2 homogeneous lots. In the second, 15 suppliers form 3 bidding consortia of equal size that compete for 2 homogenous lots. It is immediate that NoB is higher in the first scenario (4 bids vs. 3), whereas NoP is higher in the second (15 participants vs. 4). Assessing whether or not bidding consortia are anti-competitive requires an estimate of their impact on both NoB and NoP. However, we will hold that the objective of fostering competition in procurement is not always well served by pursuing either of the two.

We will re-emphasize that synergies arising from bidding consortia may enhance competition in procurement competitive processes despite joint bidding reduces the number of distinct bids.⁹ A centralized procurement agency, unlike almost all antitrust authorities, is typically in the position to estimate with reasonable precision cost savings that are likely to originate from bidding consortia, since it acts more as a regulator than as a competition authority thanks to the presence of managers with market-specific knowledge and to the repeated nature of the relationship with existing firms. Thus, a procurement agency should try to take synergies into proper account in order to evaluate the possible pro-competitive effects of bidding consortia in procurement auctions, besides anticompetitive ones.

⁹ A current strand in the antitrust literature on horizontal mergers seems to challenge the view that economies of scale are a merger efficiency. In particular, Farrell and Shapiro (2000) advocate that a greater weight should be given to “credible claims of genuine (and merger specific) efficiencies based upon the close integration of specific, hard-to-trade assets owned by the merging parties.” (pag. 3) Here, we use *synergies* as a proxy for *efficiency gains* since the cost-reducing effect is common to bidding consortia and horizontal mergers. The main reason for adopting a more narrow interpretation of synergies is that it would be incorrect to push too far the resemblance between mergers – which are, in general, permanent - and bidding consortia – which are, by their nature, a fixed-term agreement among firms.

3.1 Joint Bidding and Information Sharing

Bidding consortia allow firms to pool resources that are crucial in formulating a valid bid. In particular, they may share information about the likely value of the contract (e.g., forecasts about final demand, geophysical surveys on tracts in oil-lease auctions), jointly bear fixed costs, or even combine production facilities.

The recent economic literature on joint bidding, starting with Krishna and Morgan (1997), has almost exclusively explored the novel aspect concerning information sharing with uncertain common value of the supply.¹⁰ This point can be grasped by considering oil-lease auctions. When firms bid for the drilling right on a particular tract, the value of the object (i.e., the market value of the quantity of crude oil) is common to all participants, but unknown at the time the auction takes place. In such an environment each bidder is typically assumed to hold only one piece of information about the value of the object. More specifically, a bidder's information is captured by a signal that is correlated with the unknown, common value and, conditional on the latter, independent from all other bidders' signals (e.g., geophysical surveys on tracts). *Ex ante*, each bidder's signal is an unbiased estimate of the common value. *Ex post*, however, the winning bidder learns that she has been overly optimistic: since she has won, she was likely to have received the highest among all signals, probably an overoptimistic signal. Moreover, the higher the number of competitors, the worse the news of winning the object if this risk was not properly anticipated. Thus in formulating her bid each bidder has to take this information into account. Failing to do so may cause the bidder to suffer from the "winner's curse," that is, to incur losses.¹¹ Expert bidders, aware of the risk of suffering from the winner curse, will then react by shading their bids downwards, reducing revenue for the buyer or auctioneer.

Imagine now that bidders are allowed to form bidding consortia, and that this possibility does not affect entry. What would be the effect of bidding consortia on expected prices? Joint bidding generates mainly two opposite effects.

1. Bidders joining a bidding consortium rely on better information on the common value before submitting a joint offer. Using more than one signal, due to more than one geophysical survey, generates a more

¹⁰ See also Hendriks and Porter (1992) and Hendriks, Porter and Tan (2000), Levine (2004), Iimi (2004).

¹¹ For an accessible introduction to the winner curse in procurement tenders see Albano, Dimitri, Pacini, Spagnolo (2006).

accurate estimate of the common value, thus reducing the risk of incurring in the winner's curse, which in turn implies a more aggressive bidding (from expert bidders) and *higher* prices.

2. Bidding consortia reduce NoB and thus lead to *lower* competition and prices.

Although clear-cut theoretical results are difficult to establish due to the interplay of opposite forces, some recent experimental evidence seems to point towards the same prediction in both first- and second-price auctions joint bidding leads to lower prices when it does not affect participation through entry.¹² Without further entry induced by joint bidding, the impact of a reduced number of bidders (lower NoB) tends to outweigh the more aggressive bidding induced by the more precise information held by each bidding consortium.

3.2 Expanding the View on the Economics of Bidding Consortia

The economic analysis of bidding consortia based on information sharing only is admittedly restrictive. The parallel between bidding consortia and mergers and joint ventures in oligopolies leads us to consider some additional dimensions (asymmetry, coordinated effects, risk and *synergies*), and to recall that joint bidding may affect firm behaviour through many other channels than information sharing, some of which have been extensively discussed in the literature on horizontal mergers, joint ventures and merger control. In what follows we will briefly discuss asymmetry, coordinated effects, and risk while we will dwell on the emergence of *synergies* in bidding consortia in the next section.

3.2.1 Asymmetry

Consider a procurement market in which suppliers are heterogeneous with respect to their capacities so that they differ in marginal costs. Suppliers submit price-quantity schedules to a buyer, as in a first-price multi-unit auction, and procurement is split among the best offering suppliers in order to minimize the buyer's payment. Firms are paid prices submitted for the quantities the buyer purchases. If we keep NoP fixed, bidding consortia obviously induce a lower NoB. Does this automatically imply higher purchasing prices for the buyer? The answer depends upon the composition of bidding consortia, as in an asymmetric situation bidding consortia

¹² See, for instance, Mares and Shor (2004).

could increase competition by reducing asymmetries and levelling the play-field, even if NoB decreases. For instance, when only a subset of firms join (or merge), competition may become tougher if the asymmetry between the two consortia (merged firms) is reduced, namely if the second most efficient consortium gets closer to the most efficient one. This force is exactly the one in place in a standard two-firm asymmetric-cost Bertrand game, and would lead to the conclusion that the buyer pays *lower* prices thanks to joint bidding.¹³ Of course the opposite happens if joint bidding increases the asymmetry among bidders, increasing the advantage of the largest bidder.

3.2.2 Coordinated Effects.

Coordinated effects may also arise, because bidding consortia may either facilitate the operation of an existing cartel or favor the emergence of a new one. On the one hand, the decline in the number of competitors (lower NoB) may make it easier to adopt a strategy of “splitting the market”: each bidding consortium may (tacitly) agree to submit bids only on a limited number of objects/contracts, thus limiting competition and keeping prices high. On the other hand, joint bidding may hinder cartel formation and stability when it increases asymmetry among bidders.¹⁴ The balance between the former (anti-competitive) and the second (pro-competitive) effect depends upon several firm-specific dimensions that need a case-by-case evaluation.

3.3.3 Risk Management, Budgets and Entry.

A bidding consortium insures the buyer, at least partially, against procurement **risk**, that is, the risk arising when a unique supplier finds it impossible to procure a service due to an unexpected averse shock to production costs. A bidding consortium allows its participants to pool individual risks linked to unforeseeable events, thus making it more likely that the procurement contract is successfully carried out. This last effect may soften financial constraint, removing obstacles to bidding linked to a limited budget, and also foster the entry of new

¹³ See Chiesa (2005) for a recent formal analysis related to this type of considerations.

¹⁴ See e.g. Comte et al. (2003) for a model obtaining a similar effect for horizontal mergers; Motta (2004) offers a consistent overview on the likely effects of horizontal mergers and of merger control policies. .

bidders that would not have appeared otherwise. Both these two effects tend to increase competition in terms of more aggressive and a larger number of offers.¹⁵

4. BIDDING CONSORTIA, SYNERGIES AND PARTICIPATION

Bidding consortia may enhance competition if firms can exploit synergies. As briefly discussed in the Introduction, assessing synergies in horizontal mergers is a difficult task for any antitrust authority since the latter is unlikely to have access to exactly those pieces of information (e.g., complementarities in the cost structures of merging entities) proving the existence of such synergies. A centralised procurement agency, instead, finds itself in the privileged position of being a regulator that is most likely to interact over time with a fairly stable set of competitors in procurement markets. Assessing synergies among those competitors is easier for the agency and is a crucial dimension for deciding the extent to which bidding consortia should be restricted.¹⁶ In (horizontal) bidding consortia, synergies are often generated by reduction in fixed costs. Suppose, for instance, that suppliers are highly concentrated in two different geographical regions, north and south. If the procurement contract consists of one single national lot, requires firms to set up administrative offices in both regions and does not allow subcontracting between potential competitors, as is customary not make collusion harder to sustain, then solo bids force participants from each region to duplicate their fixed office costs and might lead to higher purchasing prices for the buyer.¹⁷

It is worth reiterating that bidding consortia induce a lower NoB under the assumption of a fixed NoP, that is, under the assumption that the number of suppliers potentially interested in the contract is *given*. It would be misleading, however, to analyze the impact of bidding consortia on expected prices without investigating the extent to which the magnitude and the nature of synergies among firms determine *both* the set of competitors potentially interested in the procurement contract (NoP) *and* the number of independent bids (NoB). We will

¹⁵ See Gilley et al. (1985) for empirical evidence that joint bidding ameliorate bidders' financial and budget constraints, often through risk sharing, and Moody and Kravant (1988) for empirical evidence that joint bidding may foster entry and increase number of bidders and bid-taker revenue.

¹⁶ So, again, we are taking a much softer – that is, in favor of bidding consortia – stance than the one advocated by Farrell and Shapiro (2000).

¹⁷ Suppose that 25 firms are located in the north and other 25 in the south. If cost-reducing synergies are strong enough, 25 two-firm consortia would be likely to bid more aggressively than 50 solo bidders, thus reducing the buyer's expected purchasing price.

argue that restricting bidding consortia is likely to have different impacts on NoP and NoB depending on the nature of synergies arising among firms.

In order to analyze these interacting forces we consider a scenario in which the set of potential participants is composed of small and big firms. We will make the assumption that *transaction costs* related to the formation of a bidding consortium are increasing in the number of its members and decreasing in their asymmetry.¹⁸ Since firms are heterogeneous in their sizes, synergies may have different magnitudes depending on the composition of bidding consortia. It will be then useful to explore each possible scenario in turn.

- High/Low Synergies among big firms, low synergies among small firms

If a procurement agency opts for restrictive criteria concerning the composition of bidding consortia, then NoB may increase as a consequence of a potentially higher number of solo bidders. Of course, we should not expect the emergence of mixed bidding consortia, since among small firms there are no synergies to be exploited, while transaction costs are positive.

The overall impact on expected prices and efficiency depends upon two opposite forces. A higher NoB is likely to increase expected buyer's savings. This is just an effect induced by a higher number of competitors. However, in the case of relevant synergies between big firms, the latter, that are forced to participate as solo bidders, are likely to be less aggressive than what they would have been had bidding consortia been allowed. Since they cannot exploit synergies they have to be more cautious in bidding, thus negatively affecting the buyer's expected savings. We can then derive the following conclusion.

When synergies among big firms are small, limiting bidding consortia in order to increase the number of independent bidders is likely to have a positive effect on the buyer's expected savings. When synergies are substantial and the number of big firms is high, restricting bidding consortia among big firms may instead negatively affect savings and efficiency.

¹⁸ The presence of a big player may facilitate the solution of co-ordination problems in the formation of consortia.

- High/Low Synergies among big firms, high synergies among small firms

Restricting bidding consortia among big firms, but not the ones among small firms, may spur both NoP and NoB even to a greater extent than in the previous scenario. New small ‘entrants’ would now be willing to participate and this for two main reasons. First, since big firms cannot regroup in bidding consortia, some new small ‘entrants’ (possibly the most efficient ones) may consider themselves in a position to compete with big firms that participate as solo bidders. Second, some small firms (new entrants or even existing ones) may participate by forming bidding consortia given the existence of positive synergies. Thus a higher number of small firms, whether new efficient entrants or regrouped in bidding consortia, may enhance competition, thus increasing the buyer’s expected savings. We can then conclude the following.

When synergies among small firms are high, restricting bidding consortia among big firms may have a positive impact on the buyer’s expected purchasing price through an enhanced participation of small firms given that big firms are forced to participate as solo bidders.

When positive synergies arise among both small and big firms, permissive rules for bidding consortia between large firms may crowd out the participation of small firms.

- High synergies among big firms, small firms, and among large and small firms

We are finally left to consider the situation in which positive synergies arise both in bidding consortia composed by big firms only and bidding consortia with big and small firms.¹⁹ Suppose that the magnitude of synergies is higher when firms are homogenous for a *fixed* number of members.²⁰ Restricting bidding consortia among big firms is then likely to (i) increase the number of big firms participating as solo bidders; (ii) facilitate the formation of mixed bidding consortia, thus increasing the participation of small firms (both those already operating in market and new entrants). Thus

¹⁹ In public procurement, bidding consortia regroup, in most cases, firms of different sizes.

²⁰ That is, a consortium (Big, Small) generates *lower* synergies than a (Big, Big) one.

If transaction costs arising from the size of mixed bidding consortia are moderate then limiting bidding consortia among big firms may have a positive impact on the buyer's expected purchasing price via a higher participation of big firms as solo bidders and a more aggressive bidding of mixed consortia with an increased number of small firms.

The analysis undertaken so far highlights that limiting bidding consortia (mainly among big firms) does not always generate identical consequences in terms of number of active participants and number of independent bids. More importantly, it may have different impacts on the buyer's expected savings depending on the nature and magnitude of synergies among small and big firms. Nonetheless, our discussion suggests that the decision of restricting joint bidding should be taken on the basis of an evaluation of the optimal composition of bidding consortia, that is, an assessment of which types of firms are most likely to achieve the strongest synergies. Moreover, if a centralized procurement agency is able to assess whether or not synergies are likely to arise among potential participants, then it can fine tune lot size and/or rules for bidding consortia in order to maximize savings and, possibly, efficiency.²¹

5. SOME CRITERIA FOR RESTRICTING BIDDING CONSORTIA

Having discussed most of the potential economic consequences of limiting bidding consortia, we now analyze which *criteria* might be used in the practice of public procurement to determine such limits.

In some European countries, for instance, it is customary to link the criteria for restricting bidding consortia with those regulating an individual firm's ability to participate in a procurement competitive process.²² Any firm potentially interested in a procurement contract is normally allowed to submit a bid on a specific lot whenever the firm's size is high enough with respect to the economic value of the lot, where the firm's size is

²¹ When synergies arise among lots (e.g., fixed production costs for geographical lots), rather than being firm-specific, higher levels of efficiency and savings may be achieved by allowing for package bidding (see Dimitri, Pacini, Pagnozzi and Spagnolo (2006)).

²² Austria, Italy and Romania adopt explicitly such a link. In other countries the admissibility of bidding consortia is decided on a case-by-case basis by Antitrust Authorities following a procedure that resembles the one adopted in merger cases. France adopts an extremely permissive stance in that firms can form bidding consortia even if each one of them possesses all the prerequisites to participate as a solo bidder. The burden of the proof of possible harmful consequences of bidding consortia relies on the procurement agency.

typically measured by the turnover realized over a predetermined period of time. Thus a broad rationale for limiting bidding consortia could be phrased as follows:

(C.A) Whenever two or more firms realize a yearly turnover greater than or equal to the value of a subset of lots those same firms cannot form a bidding consortium.

The criterion as stated is too broad in that it leaves the size of the subset of lots unspecified. We will then explore different scenarios that differ in the number and nature of lots.

- One lot

In this simple case, applying *(C.A)* produces an immediate limitation of bidding consortia. If, say, three firms achieve individually a yearly turnover at least equal to the value of the single lot they cannot form a bidding consortium. Notice, however, that *(C.A)* does not forbid any firm with a turnover above the value of the lot to form a bidding consortium with any number of firms whose turnover is *below* the value of the lot.

- Several lots with different economic values

In this case, *(C.A)* must also specify which particular subset of lots to consider. We consider four possible criteria:

(C.Aa) The relevant subset of lots is the lot with the lowest value;

(C.Ab) The relevant subset of lots is the lot with the highest value;

(C.Ac) The relevant subset of lots is the lot with the highest value for which the bidding consortium submits an offer;

(C.Ad) The relevant subset of lots is the one for which the bidding consortium submits an offer.

(C.Aa) is clearly the *most* restrictive criterion from an *ex ante* perspective, that is, the one that most limits bidding consortia for any given composition of lots and sizes (yearly turnovers) of firms. It is not possible,

however, to determine which criterion is the *least* restrictive since for criteria *C.Ac* and *C.Ad* the extent to which they are restrictive depends upon the actual offers of its members that are not known *ex-ante*. To see this last point consider the following

Example 1. There are 3 lots, A, B, and C whose values are 10, 20 and 40 million Euros. Consider two distinct scenarios. In the first one, a bidding consortium is willing to bid on lots A and B. In the second one, the same consortium is willing to bid on lots B and C. In the table below, we compute the critical value with respect to which to compare the firms' yearly turnover.

Table 2 -

Relevant Rule	Scenario 1: Bidding consortium bids on A and B	Scenario 2: Bidding consortium bids on B and C
<i>(C.Aa)</i>	10	10
<i>(C.Ab)</i>	40	40
<i>(C.Ac)</i>	20	40
<i>(C.Ad)</i>	30	60

It is immediate that criterion *(C.Ab)* is the least restrictive under scenario 1, whereas *(C.Ad)* is the least restrictive under scenario 2. Moreover a limited pairwise comparison leads to the following

Result 1. *(C.Ac)* always dominates *(C.Ab)*.

Argument. In order to prove the statement, we will show that *(C.Ac)* achieves the same objectives as *(C.Ab)*, but at a lower cost. Suppose without loss of generality that five small/average-sized firms are interested in the

lowest-valued (LV) lot for which they would also be able to bid as solo bidders. Moreover, assume that the same firms are not interested in the highest-valued (HV) lot for which they would *not* be able to bid as solo bidders (that is, individual participation criteria are not fulfilled). If *(C.Ab)* were used, those firms would be able to form a bidding consortium to bid only for the (LV) lot. Thus *(C.Ab)* would imply a cost in terms of reduced NoB since five firms would submit only one bid. If *(C.Ac)* were to be used, the same firms would still bid for the (LV) lot, but they would be forced to do so as solo bidders, thus increasing NoB on that lot. In this case, *(C.Ac)* increases NoB with respect to *(C.Ab)*. Suppose now that the same firms are interested in the (HV) lot and consider forming a bidding consortium to bid for that lot. *(C.Ab)* and *(C.Ac)* would generate the same outcome, that is, those five firms would be able to submit a joint bid. The two criteria induce the same NoB, and our argument is complete.

The discussion above points out that it is not always possible to establish a clear ranking among the four criteria in terms of their permissiveness towards bidding consortia. Moreover, a procurement agency could also partially soften each one of them by, say, fixing *ex ante* the size of bidding consortia composed by firms that would be able to participate as solo bidders. This last point can be illustrated in the following

Example 2.

Consider a procurement tendering with two identical lots of 3 million Euros each. Suppose that the set of potential participants includes seven firms with yearly turnovers of 7 million Euros and three firms with yearly turnovers of 15 million Euros. Even if criterion *(C.Ad)* were to be used, all firms should participate as solo bidders. Instead, the procurement agency could partially release the constraint by allowing *at most two* firms with turnover of 7 million Euros to submit joint bids. Such a policy might reduce marginally the number of bids but would allow smaller firms to compete – through bidding consortia – on a more level playing field with big firms.

- Several Heterogeneous Lots

When lots differ with respect to their economic value *and* to other technical aspects, the criteria defining a firm's ability to be admitted to the tender may vary across lots, due to the presence of two distinct dimensions. Consequently, defining criteria for restricting bidding consortia based on an individual firm's ability to participate as a solo bidder on one specific lot (as for criteria *(C.Aa)*-*(C.Ac)*) cannot be optimal since lots are very likely to differ at least with respect to their technical requirements. We propose the following criterion

(C.H) Two or more firms can form a bidding consortium only for those lots for which they do not satisfy individual participation requirements.

The rationale behind *(C.H)* is to rule out, for each specific lot, any bidding consortium in which one or more firms satisfy *both* the economic *and* the technical requirements to participate as solo bidder(s). Given that it is quite unlikely that a high number of firms are able to participate as solo bidders, criterion *(C.H)* leaves the door open to the formation of potentially numerous bidding consortia especially if they are interested in bidding for a large number of lots. This (potentially anti-competitive) scenario might be counterbalanced by imposing a rule that links the maximum number of firms that can join a bidding consortium to the number of lots for which members of each consortium can participate as solo bidders. We can illustrate this idea by using

Example 3.

Suppose that a procurement contract consists of 3 (more generally N) heterogeneous lots. There are ten potential participants. One firm satisfies all requirements to participate as solo bidder on the three lots; three firms can be solo bidders on two lots; six firms on one lot only. The adoption of *(C.H)* would allow an all-inclusive bidding consortium, thus leading to a potentially high purchasing price for the buyer.

The counterbalancing constraint that would restrict the composition of bidding consortia in this scenario could be stated as follows:

The maximum size of a bidding consortium should be: 1 firm if the latter can participate as a solo bidder on all lots for which it plans to submit a bid (generically N); 2 firms if they can participate as solo bidders on $N-1$ lots; 3 firms if they can participate as solo bidders on $N-2$ lots etc.

6. CONCLUDING REMARKS AND A RESEARCH AGENDA

We have stressed that a procurement agency's objective to maximize savings and/or efficiency should lead to a more careful consideration of the pro-competitive consequences of bidding consortia. Restricting too much the formation of bidding consortia in order to prevent a lower number of bids may be counterproductive, since firms' enhanced market power might be counterbalanced by the entry of additional joint bidders and/or by a higher aggressiveness caused by joint bidding due to the presence of strong synergies.

We have held that the procurer's knowledge of the characteristics of potential participants is crucial in assessing the nature and the magnitude of synergies among types of firms that should guide the criteria to limit the formation of bidding consortia. When the limitation of bidding consortia is linked to an individual firm's ability to participate as solo bidder, there exist several criteria limiting joint bidding. The explorative analysis developed in last section of the paper shows that general rules are difficult to state although it is possible to spot the most crucial economic forces that should guide any procurement agency in a case-by-case approach.

The regulation of bidding consortia is admittedly a multifaceted problem. In this paper we have explored only qualitatively the impact of joint bidding on participation and competition, thus a more rigorous approach, both theoretical and empirical/experimental, is needed to validate, at least to some extent, our tentative conclusions.

Other issues have been left aside and need a careful analysis. To mention one, consider the case of a multiple-lot procurement competitive tendering. Should firms submitting a joint bid on one lot be allowed to bid *independently* on a different lot? Casual observations reveal an additional puzzle. The Italian Procurement Agency (Consip S.p.A.), for instance, forbids on legal grounds those firms submitting a joint bid on one lot to compete either as solo bidders or to join a different bidding consortium on a different lot. Blocking the composition of bidding consortia seems to be rooted on the ground that firms submitting a joint bid on one lot

may create a collusive “splitting-the-lots” strategy. However, in *American Medical Response, Inc. v. City of Stockton*²³, the Eastern District of California took exactly the *opposite* stance by stating that a joint venture (that is, bidding consortium) agreement provision forbidding the parties from bidding independently was *per se* illegal under Section 1 of the Sherman Act because it amounted to an attempt by competitors to fix the amount of the bid. These conflicting views confirm that much more research is needed on the regulation of joint bidding in private and public procurement.

We hope this work will persuade at least some of our readers that the optimal regulation of joint bidding in procurement is an interesting and highly policy relevant area for future theoretical and empirical/experimental economic research.

²³ Case No. CIV-S-05-1316 DFL PAN (E.D. Cal. March 29, 2006).

TABLE 1: A COMPARATIVE ANALYSIS OF PARTICIPATION REQUIREMENT(S) AND BIDDING CONSORTIA

Country	Requirement	Bidding Consortia
Greece – Ministry of Developm.	Criteria defined on article 20-23 of 93/36/EEC Directive.	Firms can aggregate themselves into a larger entity in order to submit common offer. Once firms are grouped together and submit common offer they are considered as a single participant. Firms can be aggregated into a larger entity before expiry of the time limit for receipt of offers, fixed by contracting authority. Each member of the group must meet the criteria of article 20 and 21 of 93/36/EEC Directive.
Austria- BBG	<ul style="list-style-type: none"> • Cumulative specific budget revenues (i.e. relative to the good/service object of the contract) of the last two years that does not need to be greater than the whole value of the frame-contract. This allows SMEs to enter the auction but permits each firm to win only a number of lots that can be covered by that cumulative specific budget revenue. • Bank warranties; • Ability to execute the contract (adequate network of outlets); • Quality certificates. 	<p>A firm that is able to participate alone can form an enterprise group with firms that can not participate alone. If two firms can participate alone they can not group. Once firms are grouped together they are considered as a single participant. Austrian cartel law also covers grouping of firms whereby grouping should be prevented between two or more firms able to bid individually.</p> <p>BBG did not impose any restrictions except in one particular case. Until now there has been made very limited use of this possibility by SME.</p>
Italy (Consip)	<p>Cumulative specific budget revenues (i.e. relative to the good/service object of the contract) of the last two years that does not need to be greater than the whole value of the frame-contract. This allows SMEs to enter the auction but permits each firm to win only a number of lots that can be covered by that cumulative specific budget revenue.</p> <p>Bank warranties;</p> <p>Ability to execute the contract (adequate network of outlets);</p> <p>Quality certificates.</p>	<p>A firm that is able to participate alone can form an enterprise group with firms that can not participate alone. If two firms can participate alone they can not group. Once firms are grouped together they are considered as a single participant. Italian and European laws do not establish particular restrictions to grouping. Restrictions we eventually impose are discretionary, and may vary from auctions to auctions. However, Consip followed the indication provided by the Italian Antitrust Authority during 2003, which noted that, in order to obtain sufficient levels of competition in the auctions, grouping should be prevented between two or more firms able to bid individually.</p>
United Kingdom (OGC)	<p>Financial standing and integrity of financial dealings</p> <p>Technical capability and capacity to execute the contract (adequate network of outlets);</p> <p>Quality certificates.</p>	<p>A firm that is able to participate alone can form an enterprise group with other firms that support their bid, typically in terms of capacity or expertise. Once firms are grouped together they are considered as a single participant. Genuine consortia bidding are allowed whereas collusive bidding in an attempt to distort the market is not and subject to challenge and legal proceedings.</p>
Sweden	<p>No restriction of participation of firms. All firms are welcome to participate. However, they must meet certain standards. No bankruptcy, no taxdebts, etc.</p>	<p>small firms that have special competence in certain areas may group together and submit a joint bid. In Sweden they do not regulate this in any special way.</p>
France	<p>For public works candidates must prove their technical qualifications, either with a system of certificates delivered by professional</p>	<p>The French code rules that "companies may submit their application or tender in the form of joint grouping ... subject to adherence to rules relating to free prices and competition"</p>

	<p>organisations or by providing written testimonies that they have successfully delivered similar works in a recent past.</p> <p>For services the requirement is basically past similar experiences.</p> <p>For goods we specify a minimum revenue only for very large contracts because courts have judged that nothing legally prevent a firm from multiplying 3 or 4 times its revenues with one public contract, unless the PA have solid technical reasons to think the firm will not be able to do it. For national frame contracts the most important requirement is the ability to deliver the goods all over the territory, that is about 7 000 different addresses. Candidates can prove the disposition of the necessary network with their own structure but also with the intervention of subcontractors.</p> <p>During the execution of a contract the MINEFI can't notify to a poorly performing contractor that it will be excluded from future tenders (this is not a penalty you can write in the specifications), but in a future tender when they check the qualifications of candidates we can use evidences of poor performances in a previous contract as evidences of insufficient qualifications (you need a convincing file). It is not clear in case-law how long a contracting authority can legally refuse to accept candidatures from previously failing contractors.</p>	<p>So even two (or more) firms able to participate alone can group as long as the aim or the effect of the grouping is not a restriction of competition, that is to say that it is the PA which has to prove the harmful effect of the grouping if it wants to bar it. The code allows groupings so the contracting authorities may not bar them. They can sometimes mandate that tenders should be submit by groupings. For example for a contract dealing with the design and realisation of a building only groupings with (at least) one architect, one technical consultancy, one public works firm ... can compete.</p> <p>There are two kinds of groupings:</p> <p style="padding-left: 40px;">The grouping is said to be joint when each of the members of the grouping undertakes to perform, within the context of a contract divided into lots, the lot or lots that he is likely to be entrusted with.</p> <p style="padding-left: 40px;">The grouping is said to be of a joint liability when each of the members of the grouping is liable for the performance of the entire contract, whether or not the operation is divided into lots.</p>
Denmark	<p>Bidding enterprises may not have outstanding debts to the public sector.</p> <p>they must certify that they do not use child labour, that they respect equality between sexes, races and religions and respect the UN's declaration of human rights and so on.</p>	<p>Enterprises can group together to participate.</p> <p>There are no regulations of this kind. There are not many instances of grouping of firms in relation to auctions initiated by SKI A/S. A rough estimate would be that less than 1 in 20 auction bids are from a group of firms. Usually only two or three firms to form a group.</p>
Ireland	<p>Qualification criteria or pre-qualification based on legal, financial and technical capacity (the latter would include relevant experience and references).</p>	<p>enterprises can group together to participate to the auction but one Supplier must take overall responsibility for the tender/bid. Each member of a consortium must meet the minimum legal, financial and technical capacity requirements as appropriate. Each member must be in a position to produce a Tax Clearance Certificate and must confirm their standing vis-à-vis the Ethics in Public Office Act</p>
Romania	<p>Bank warranties;</p> <p>Ability to execute the contract (adequate network of outlets);</p> <p>Quality certificates;</p> <p>Official papers of the company for the issuing of the digital certificate.</p> <p>most of these requirements are also to be</p>	<p>A firm that is not able to participate alone can set up, together with other companies, a group. Although minimum criteria are required for each company separately. Once firms are grouped together they are considered as a single participant. In this case a leader of the group would be defined. Romanian and European laws do not establish particular restrictions to grouping. Restrictions we eventually impose are discretionary, and may vary from auctions to auctions. However, SEAP followed the indication provided by the</p>

	shown to the contracting authority when the contract is sign and / or the goods/services are provided.	Romanian Competition Authority, which noted that, in order to obtain sufficient levels of competition in the auctions, grouping should be prevented between two or more firms able to bid individually.
Belgium	barriers are placed as low as possible, with account taken of the competition aspect. To obtain an auction with a good result on the price level, ABA only want to allow the firms that have the competence that guarantees a perfect execution of the contract. To obtain that result, they selection seriously. The right level of barriers can only be obtained after a thorough market investigation. selection criteria always are justified in a written document meant for the functionaries who have to approve the tender. ABA contacts a lot of suppliers or firms and show them some fragments of the tender. They can give their opinion. ABA always ask them to justify their answers. For big tenders (for delivering goods of executing services of more than € 500.000) ABA do a publication in the Belgian and European journal in which ask for reaction of interested firms on their possibilities and competences. Only at the end of the discussion with those firms, ABA start the redaction of the technical specifications and the selection and awarding criteria. ABA always watches that the tender isn't written on the body of the firms contacted.	<p>In the Belgian regulations the grouping of companies into a temporary trading company or a main contractor/subcontractor is provided for. It is up to the tendering authority to verify whether the bidders are abusing a monopoly or oligopoly or not. The best solution to this is a reliable market survey. The main contractor/subcontractor relationship and a temporary company are provided for in the Belgian regulations on government contracts. By doing so, small firms, when registered as one entity, can enjoy a range of advantages, i.e. the turnovers can be combined, the references of the various companies can be taken into account, etc. This means a consortium can be selected for the government contract and can make a better bid thanks to the bundling of efforts. As already stated, agreements between various bidders that lead to a disruption of competition are also forbidden in Belgium.</p> <p>Example: contract for the IT-platform for the Belgian identity card. Eight Belgian companies went together in one concern. It was a negotiated procedure. ABA negotiated till the moment that obtained normal prices and normal conditions (terms, quality of the products and services,...). It is clear that releasing a big contract in one lot is very dangerous to stimulate the creation of monopoly situations, because the number of companies that are able to execute the contract in that case is very limited. In the future those kind of contracts will be cutted in many lots. The advantage is that the chances of the SME's will increase.</p> <p>It sometimes happens that various selected candidates group together and submit a joint bid. This is permissible as long as all candidates are selected, unless the schedule of conditions states otherwise. It has already occurred (especially with complex government orders for services) that ultimately only one bidder remains, because all selected candidates have grouped themselves into a consortium. It is self evident that the time of the price formation must be closely viewed and that the discounts which can then be achieved will be rather minimal. If the contracting authority notices that the price develops unfavourably due to the lack of competition, it can always opt not to follow up the current procedure and decide to launch a new government order, while taking account of the elements that have led to inadequate competition.</p>
Cyprus	Usually it required by participants to provide bank warranties and certificates that they have no outstanding obligations with VAT, Social Security and Tax. Then depending on the nature of the item auctioned, additional requirements may include some sort of financial information, previous experiences demonstrating ability to execute the contract, quality certificates etc.	<p>Once firms are grouped together they are considered as a single participant.</p> <p>No regulations exist for the grouping of firms</p>
Czech Republic	The Czech Act for public contracts (40/2004) makes it possible to restrict a number of tenderers using other criteria then technical,	According to the Act it is possible to make consortia of firms - applicants for contract. There are conditions for certification of qualification in these cases in this Act. However, the

	<p>economical and legal qualification. This possibility is applicable for restricted procedures only. The institution will recognize the advantages and disadvantages of this possibility in the future.</p>	<p>institution haven't registered such a tendency yet. there aren't any national regulations for grouping of firms.</p>
Hungary	<p>the Hungarian law not just provide the possibility to use "restriction" on the base of financial-economical standing and/or technical-professional capacity, but it is an obligation for the contracting authorities. Generally the followings are used in Hungary: yearly balance, yearly revenue (from the activity which is concerned in the given award procedure), similar contracts from the previous years/experiences, bank statement from the bidder's financial condition, quality control measurements and – especially in works contracts – the demonstration of the professionals and the machines which will be involved during the execution of the contract.</p>	<p>Several bidder may establish a group in order to add their capacity together, and to fulfil the requirements they should to participate in the procedure.</p> <p>On the one hand, in accordance with the EU directives, the bidders may group together freely to take part in a procedure. This "phase" isn't specially regulated in the national law (only the bid should contain the relevant information on the group, or in Hungary rather called: consortium).</p> <p>On the other hand, if the group wins the contract they may be required to establish a company. This is regulated in the national company law.</p> <p>The contracting authorities usually don't request specific information regarding the group, giving the relevant information is the interest of the bidders. The contracting authority should know whether the bidders have joined together in a consortium or their relation is contractor-subcontractor. (The name, the co-ordination among the tenderers, the leader of the group, any other information which is necessary for the contracting authority in order to "realize" that this is a consortium are usually given by the groups.)</p>
Poland	<p>The awarding authority may request from contractors only documents necessary to conduct a procedure, specified in the notice, specification of essential terms of the contract or invitation to submit tenders.</p> <p>Where the value of the contract exceeds 60 000 Euro, the awarding authority shall request from the contractors documents proving that they satisfy the conditions for participation in the procedure. For the contracts below 60 000 Euro the awarding authority may request those documents.</p> <p>The categories of documents are specified in the Regulation of Prime Minister of 7 April 2004 and are related to the candidate's:</p> <ul style="list-style-type: none"> - economical and financial standing; - technical capacities; - experience and knowledge. <p>The awarding authority shall also require the candidates to pay a deposit where the value of the contract exceeds 60 000 Euro. If the value of the contract is below 60 000 Euro, it may do so.</p> <p>As the execution of the contract is concerned the awarding authority shall require a security. Security shall serve to cover claims in respect</p>	<p>According to the Public Procurement Law contractors may compete for a contract jointly. The contractors shall appoint a plenipotentiary to represent them in the contract award procedure or in the procedure and conclusion of a public procurement contract.</p> <p>Participants forming a group shall be jointly responsible for the execution of the public contract and provision of security on due performance of the contract.</p> <p>There are no particular regulations for grouping of firms in Polish legal system. The consortia are established on the basis of civil law contracts between the entities</p>

	<p>of non-performance or improper performance of a contract. If a contractor is at the same time a guarantor, this security shall also serve to cover claims in respect of quality guarantee.</p> <p>The awarding entity shall require the contractor to provide security, if :</p> <ul style="list-style-type: none"> - the contract value exceeds 60 000 Euro for works; - the contract value exceeds 5 000000 Euro for supplies and services; - a procurement contract is to be concluded for a period longer than 3 years. 	
Malta	Participation by firms is not usually restricted other than by bank guarantees (bid bond) in auctions exceeding a certain amount.	Firms are allowed to group together and participate in an auction as a single participant. Usually there are no restrictions to the grouping of firms unless this gives rise to a cartel, which would be against competition law.
Germany – (BESCHA)	<ul style="list-style-type: none"> • Cumulative specific budget revenues (i.e. relative to the good/service object of the contract. The revenue depends on the amount of the purchase); • Bank warranties; • Ability to execute the contract (adequate network of outlets if necessary); • References (if useful) • Authority attestations about the payment of taxes and social insurance contributions • Quality certificates. 	<p>There are no special conditions for the establishing of bidding communities (group of firms). The bidding community has to fulfil all requirements in the same way a single firm has to.</p> <p>In procedures without a reverse auction the bidding community must be established until the end of the time limit for receipt of tenders. In procedures with reverse auctions the group must be founded before the auctioning procedure.</p>
Slovakia*	According to Article 29 and 30 of the Act, tenderers or candidate interested in participating in contract award, must fulfil some requirements – mandatory (§29) and not mandatory, as financial and economic standing and technical capacity in executing supply contracts, in awarding contracts for works and to provide a service (§30).	

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