Competitive Aspects in the Metropolitan Region of Recife Bidding Terms for the Delegation of Its Urban Bus System

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Abstract: This paper discusses aspects related to competitiveness in the ITB (invitation to bid) of the public tender for the concession of the urban bus public transport services in the RMR (Metropolitan Region of Recife) in the Brazilian northeastern region. The bid was made public through a consortium formed by the two major cities of the RMR—Recife and Olinda, and the government of the State of Pernambuco. Throughout the paper, the basic features of the bidding terms are presented and some aspects of these characteristics that undermine competitiveness are pointed out and submitted to criticisms. Aspects such as the small number of lots, the lack of diversification of lot sizes and the possibility of forming consortia with unlimited number of participants were targeted. In order to prove the criticisms stated, a simulation of an arrangement amongst incumbents is presented, based on the rules of the tender, in which the allocation of incumbents ex post bidding does not differ from the ex ante scenario. Thus, the main objective of this article is to assess whether good practices that foster competition were followed by the ITB and the main conclusion is that competitiveness was put in jeopardy.

Key words: Competition, competitive tendering, urban buses, public transport.

1. Introduction

Rolim et al. [1] discussed aspects of some Brazilian competitive tendering processes that had undermined competitiveness, so this paper sheds some light upon a new specific Brazilian tendering process to assess whether its clauses have improved in comparison with previous Brazilian experiences. Hence, the main objectives of this article are: (1) to analyze whether the bidding terms for the concession of the urban bus public transport services in the Metropolitan Region of Recife STPP/RMR (Passenger Public Transport System of the Metropolitan Region of Recife), in the Brazilian northeastern region, have put competitiveness in jeopardy; (2) to discuss the market structures ex ante and ex post the tendering process.

The bidding was announced by the GRTC (Greater Recife Metropolitan Transport Consortium) [2], a public consortium comprising the municipalities of Recife and Olinda, two major cities of the RMR, and by the government of the State of Pernambuco [3]. This dispute was long awaited [4] since services have neither been awarded through tendering processes nor preceded by contracts and have been conducted based solely on service orders, and been renewed under a “negotiated re-contracting” basis in the same pattern observed in other Brazilian cities [5]. Therefore, it is not only at odds with constitutional principles, but also not in compliance with adequate parameters of economic regulation.

The bid was first released through ITB (invitation to bid) 01/2013 and its initial session occurred on April 16th, 2013, but no bidder attended. Seven out of eight lots in which the STPP/RMR has been divided

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(the eighth lot had been previously tendered so it was not included in ITB 01/2013) were simultaneously auctioned. With the failure of the first process, the GRCT changed some conditions and subsequently released ITB 02/2013 covering only two lots comprising the BRT (bus rapid transit) corridors and with its initial session due on July 30th, 2013. The remaining lots will be later auctioned through another ITB so far scheduled for August 30th, 2013 [6].

These authors could not foresee that ITB 01/2013 would fail and intended to analyze not only features such as bidding terms clauses that jeopardize competition, the amount of participants, the ex ante market structure, but also the resulting ex post market structure. Nevertheless, the bidding had not yet been completed by the time this article was written. The analyses developed are not restricted to the features of the ITB and it will be appointed a possible ex post market structure resulting from any collusion that may occur due to inconsistencies observed in the ITB which favor an accommodation of incumbent entrepreneurs.

This article is not limited to formal and legal aspects. Many opinions and conclusions rely on the discretion, seen as a duty and not a right, to choose from the many options given by legislation, those which better fit the case to adequate principles both of economic regulation and auction theory. In addition, the article also criticizes aspects where legislation is not necessarily aligned with the most appropriate principles so occasionally regulatory changes may be suggested.

The authors would like to state that the analysis in this paper is theirs alone and do not represent the official point of view of the institutions where they work. The authors also do not intend to suggest that their findings indicate the bidding terms violate any laws or rules.

This paper is divided into: (1) this introduction; (2) a description of the features of the ITB; (3) analyses of the features of the ITB in the light of adequate

principles aiming at fostering competition; (4) a simulation of how inconsistencies identified in “c” may cause the ex post market structure to reproduce the ex ante structure due to the loss of competitiveness enabled by the bidding terms themselves; (5) conclusions; and (6) references list.

2. Main Features of the Bidding Terms

Table 1 presents the main features of ITB 02/2013 [7]. The analyses further developed in Sections 3 and 4 are based on these characteristics and it is assumed that when the remaining lots are tendered, these features will be adopted as well.

The object under dispute comprises 371 routes divided into seven lots shown in Fig. 1 that also shows an eighth lot (already operated by CRT (Cidade do Recife Transporte S/A)) already tendered. Currently, the entire STPP/RMR is operated by 18 companies¹ [8]. ITB 02/2013 comprises Lots 4 and 7.

Recife, Pernambuco’s capital and its largest city, had an estimated population of 1,537,704 inhabitants in 2010 over an area of 218.435 km² (7,037.61 inhabitants/km²). In turn, the RMR comprises 14 municipalities and had a total population of 3,690,545 inhabitants in 2010 over 2,551.825 km² (1,446.24 inhabitants/km²) [9]. Recife’s total fleet (including all modes) corresponds to 543,631 vehicles and the RMR has a total fleet of 998,865 vehicles. In 2010, Recife’s fleet grew by 9.12% [10].

Figures from ITB 01/2013 show the evolution of the number of passengers of the seven lots under dispute from 2011 to 2014: 468,048,298 (2011); 474,763,208 (2012); 476,035,342 (2013, estimate);

¹BOA—Borborema Imperial Transportes Ltda.; CAX—Rodoviária Caxangá Ltda.; CDA—Cidade Alta Transporte e Turismo Ltda.; AVC—Auto Viação Cruzeiro Ltda.; EME—Empresa Metropolitana S/A; GLO—Transportadora Globo Ltda.; ITA—Transportadora Itamaracá Ltda.; PED—Empresa Pedrosa Ltda.; ROL—Rodolinda Transportes e Turismo Ltda.; ROD—Rodotur Turismo; RME—Rodoviária Metropolitana Ltda.; STA—Auto Viação Santa Cruz; SJT—Auto Viação São Judas Tadeu; SPA—Empresa São Paulo Ltda.; TRC—Transportes Coletivos Ltda.; VRC—Expresso Vera Cruz Ltda.; VML—Viação Mirim Ltda.; and CRT—Cidade do Recife Transporte S/A.

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Table 1 Main features of the bidding terms.

Feature	Description
Participation requirements (number of requirements)	Legal compliance (2); technical qualification (7); financial and economic qualification (5); fiscal compliance (8); labor compliance (1); commitment of non use of child labor (1); bidding bond of USD 4,550,625.00 (1).
Contract type	Fixed-price contract with economic price adjustment; the GRCT will pay the operator for each passenger she carries a price named PRO (operator remuneration price) lower than the fare paid by the passengers.
Bidding type (awarding criterion)	The lowest PRO the operator charges the GRCT, limited to a maximum PRO (PROmax) that functions as a reserve price set up in the bidding terms (each lot has a specific PROmax). It is a paper-based sealed bid tendering.
Fare setting method	The GRCT sets a fare that should cover PRO and the expenses of the GRCT for managing the STPP/RMR.
Consortia	Companies are allowed to join as consortia with unlimited number of participants, provided that no more than four of them will be active operators of the system. In addition, the same company may not take part in more than one consortium.
Awarding constraints	Each bidder may submit proposals for as many lots as desired, but can only win one lot due to Pernambuco State Law 14,474/2011 that does not allow one operator to hold more than 20% of the system in order to avoid lock-in.
Abnormally low tenders	Tenders will be rejected according to Federal Law 8,666/1993 arts. 44, § 3º and 48, II, conditional on the bidder not being able to justify its price quotation.
Adjustment clause	Annual adjustment based on the IPCA (general consumer price index).
Contractual review clause	Broad price review, including production indices, every four years (note: there is no adjustment in revision years).
Economic and financial rebalancing clause	Rebalancing may occur at any time during contract execution due to any unforeseen eventualities that may happen.
Demand risks	Demand risks are borne by contractors.
Contractual period	15 years, with the possibility of renew for another 5 years, since the performance indicators established in the bidding terms are met throughout the contract execution.
Estimated contractual value	Approximately USD 6.76 billion for the seven lots during the initial 15 years.
Changes	Since the contracts will be comprised of lots of lines, rather than isolated lines, there may be contractual changes with creation and modification of lines within the bidding batches with two restrictions: (1) each contractor may operate no more than 20% of the lines of the STPP/RMR (limit imposed by Pernambuco State Law 14.474/2011); (2) contracts may not exceed their initial value in 25% (due to Federal Law 8.666/1993, art. 65, I, b), unless some unforeseen eventualities require deeper changes (Federal Law 8.666/1993, art. 65, I, a).
Performance indicators	Fortnightly full payments conditional on contractors simultaneously meeting at least 90% of the four contractual performance indicators: travel rate index, travel interval index, vehicle failure index and user satisfaction index.
Contractor flexibility at the operational level	The GRCT establishes technical and operational parameters such as fleet, frequencies, times of operation and inspection.

The exchange rates from BRL (Real) to USD (US dollar) were consulted at www4.bcb.gov.br/?TXCONVERSAO, taking the publishing date (June 26th, 2013) of the bidding terms as the point of reference. However, figures may vary over time according to fluctuations in the exchange rate.

497,782,670 (2014, estimate).

3. Analysis and Criticism of Some of the Features Adopted in the ITB

Initially, it should be mentioned that the kind of analyses here proposed should be viewed in a systemic way since different parameters are simultaneously involved and even slight deviations from adequate principles in a single parameter may lead to pitfalls. It is always important to bear in mind

that auction design matters [11]. For instance, bidding packages of lots in successive bids may result in more competitiveness than bidding for all batches simultaneously in a single bid. Nevertheless, the apparent advantage of differentiating the moments of dispute may be mitigated and collusive behavior through bidding rings may be fostered since the participation of consortia without restrictions on the number of their members has been allowed.

It is beyond the scope of this article to discuss

Fig. 1 STPP/RMR and its eight lots (CRT and seven under dispute).

contract theory so it will not be discussed whether the payment structure resulting from the adopted type of contract (fixed-price contract with economic price adjustment) is the most appropriate in comparison to cost-reimbursement contracts (cost-plus) or to incentive contracts. It is also beyond the scope of the article to discuss the most adequate kind of procurement, whether negotiations or competitive tendering processes.

Hence, in the following subsections, some features of the bidding terms are confronted with some assumptions here considered as good practices, bearing in mind the search for competitiveness as a principle since its commitment may result in hiring an inefficient company at higher prices [12, 13]. In the analysis, it was considered that issues such as ownership of depots, contractual terms, size of lots and participation requirements are critical to maintaining contestability amongst incumbents [14]. Accordingly, any features of the bidding terms that pose a barrier to entry on the bidding or may facilitate collusion among potential bidders will be considered harmful to competitiveness.

3.1 Participation Requirements

In competitive tendering contests, it is usual that only qualified companies may bid in order to ensure proper execution of the contract so participation requirements are set up in the bidding terms. Table 1 shows that ITB 02/2013 established eight categories of requirements and a total of 25 documents to be presented by bidders. Despite requiring such a number of documents depending on the discretion of the public authority in charge of the bidding terms, it should be stated that other countries generally require the bidder to satisfy three to five categories [15]. Thus, it can be interpreted that the Brazilian legislation or its implementation by public authorities may be demanding too many qualification documents for interested companies, which may somehow restrict competitiveness.

3.2 Competitive Tendering Format

Assuming that procurement processes through negotiations are not allowed by Brazilian concession legislation, the debate remains whether the competitive tendering format better suited to the case would be a sealed-bid tendering or an auction².

Knowing the degree of uncertainty regarding the costs of running the service is fundamental for a more suitable choice. The production costs of a contract involve two dimensions: private values and common values [16]. The latter relates to the company's ability to identify and measure the different tasks to fulfill the contract, e.g., the composition of demand, and the former relates to the company's efficiency in performing each task required by the contract [18]. Thus, the choice of the competitive tendering format

²ITB 02/2013 may be considered a procurement auction in which the auctioneer is a buyer and bidders are sellers who have costs of supplying the object [17]. Nevertheless, we have adopted a different approach to make comparisons easier so we have considered sealed bid tendering a competitive tendering process in which prices are submitted through sealed-bid tenders (being it paper-based or on-line) and auction a competitive tendering dynamic descending price competition [13].

depends on the degree of uncertainty present in these components.

Albano et al. [18] state that in situations in which uncertainties regarding common values, prevailing auctions would be employed (since, in these cases, the dynamics of the bids would help generate information to competitors to mitigate the uncertainties) while sealed bid tendering would be appropriate when uncertainties on private values prevail. Kagel and Levin [19] reported that sealed bid tendering before uncertainties on common values (as it is the case since the risks of demand are assumed by competitors) do not lead to efficient outcomes and the magnitude of the winner's curse increases with the number of participants. In contrast, a reduction in the number of participants in general reduces competitiveness. Ref. [20] indicates that, in the presence of affiliated information (as is also the case since incumbents are interested in the bidding), the procurer benefits more from an auction than from a sealed bid tendering procedure.

In turn, Klemperer [11] cites fiascos in auctions in which uncertainties involving common values prevailed and reports cases of extreme success (regarding both competitiveness and economy) in which a hybrid solution (the Anglo-Dutch auction) consisting of an initial auction followed by a sealed tendering was employed. In this model, inexperienced bidders may gather information produced by more experienced competitors during the dynamics of auction, thus enhancing competitiveness [18].

Milgrom [21] states that the main advantage of the Anglo-Dutch auction is its ability to attract more bidders. Another advantage of the Anglo-Dutch auction is the lessening of the possibility of collusion. The benefits of this procedure were reaped by the British government in the auction for its 3G mobile phone spectrum [11].

Thus, it can be concluded that the adopted competitive tendering format, despite being in accordance with Brazilian law, does not produce more

efficient results and does not enhance competitiveness, suggesting a need for a revision of legislation to expand the formats allowed by law.

3.3 Division into Lots and the Participation of Consortia (Joint Bidding)

In this paper, the following assumptions suggested by GEIPOT (Brazilian Company of Transportation Planning) [22] targeting the quantity and dimensions of lots when granting urban bus systems are considered good practice:

- The size of the lot is closely related to the construction of a competitive contestability environment;
- The formation of lots with different sizes and complexities should be prioritized;
- The search for lowest fares and best allocative efficiency should be suggested;
- The variation in lot size helps to ensure the contestability of the market;
- The grouping of services in order to obtain benefits from bundling itineraries in the same geographic area should be suggested;
- The division of lots as a function of the number of vehicles and the technological and operational complexity of the routes should be suggested;
- The operation and the vehicular technological complexity increase with the size of the lot.

The system was divided into seven large lots, according to the classification indicated in Ref. [22]. Thus, the recommendation of varying lot sizes as a function of the number of routes and fleet was not followed. Since there are neither small- nor medium-sized lots, barriers to entry are raised, hampering the access of small- or medium-sized companies. Thus, in order to survive, these companies will be tempted to bid jointly with larger ones through consortia, leaving competitiveness in jeopardy. In fact, Nash and Wolanski [23] state that large lots are barriers to entry for small operators.

To give just one example of the size of the lots,

Gibson [24] cites that Wellington (New Zealand) envisaged extending the number of buses from 60 to 86 in order to be considered a large lot. For the ITB 02/2013, the smallest lot (Lot 4) had 243 vehicles. Other figures are as follows: 429 (Lot 1), 351 (Lot 2), 406 (Lot 3), 351 (Lot 5), 366 (Lot 6), 498 (Lot 7).

It should be stressed that the permission for consortia to participate does not eliminate the barrier to entry for small- and medium-sized companies. Indeed, if these companies win a lot through a consortium, their role may be weakened by the pressure their stronger associates may exert upon them during the contractual execution. In the worst scenario, the small and medium companies could be excluded from the consortium. A different situation occurs, however, if those companies are given the opportunity to compete by themselves for a small- or medium-sized lot. If successful, the liability for the contract would lie solely with the small/medium-sized company, so maintaining the company provision of services or not would depend only on their relationship with the GRCT, and not with third parties.

In addition to GEIPOT [22], the findings of Amaral et al. [25], when comparing the results from London and several cities in France, state, among other reasons, that the sizes of the lots interfered in the resulting competitiveness. According to these authors, the results were better in London than in France since in London the contests involved small batches and in France large lots.

Another aspect that should be addressed derives from auction theory, which establishes basic requirements for the division of an object into lots when the formation of consortia is allowed in order to mitigate the possibility of collusion [26]:

- The number of lots should be smaller than the expected number of participants;
- The number of possible combinations resulting from the various possible arrangements between the potential bidders should be smaller than the number of

lots;

- When it is impossible to establish a number of lots smaller than the number of potential bidders (e.g., due to technical or geographical constraints), the number of lots should be increased (which implies smaller lots) so that small firms may face large firms. In addition, increasing the number of lots hampers coordination between bidders, thus fostering competitiveness.

The requirements mentioned above are necessary but not sufficient conditions, since even in situations in which the number of lots is smaller than the number of interested bidders collusion may occur (e.g., through rotation schemes, subcontracting agreements and multi-markets).

In contrast to the requirements above, ITB 02/2013 allows for a scenario in which the number of possible arrangements amongst incumbent firms, taking into account the permission to form consortia with an unlimited number of components, is greater than the number of lots in dispute. Of course, this poses a threat to competitiveness, due to a real possibility of collusion [1] since there are 18 incumbents who may group into seven consortia and each wins one lot (a simulation of this situation can be seen in Section 4).

This threat to competitiveness is reinforced by the fact that a competitor may not be granted a number of routes that exceed 20% of total routes from the STPP/RMR³. Thus, the ITB clauses may cause the legislation to produce an opposite effect to its purpose (which was to avoid market concentration) since the bidding terms facilitate collusion, thus jeopardizing competitiveness.

It should be noted that one of the differences between ITB 02/2013 and ITB 01/2013 was the tendering being split into two stages. However, this measure aiming to enhance competition may be undermined by the bidding terms themselves for not

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³It should be cited that Pernambuco State Law 14,474/2011 establishes the same rule given by Federal Law 8,884/1994, art. 54 aimed at tackling actions that concentrate relevant markets in 20% or more.

diversifying the size and scale of the lots and for allowing the formation of consortia with an unlimited number of participants.

3.4 Contractor Inflexibility at the Operational Level

The GRCT establishes technical and operational parameters such as fleet, frequencies, times of operation and inspection leaving no room for contractors to seek innovative ways to foster innovation (e.g., through strategies related to maintenance, personal scales, definitions of vehicle model or travel schedules). Therefore, bidders have no way of differentiating their services from their competitors, since the public authority has imposed the way to provide the services in the bidding terms. This lack of flexibility ends up jeopardizing competitiveness, as it affects efficiency. Santos et al. [27] cite that good regulatory practice establishes that decisions regarding operational definitions should be left to the operators. Hence, the bidding terms do not adopt appropriate regulatory practice in this field as well.

This lack of flexibility also benefits incumbents, who already have more knowledge of how they are assessed and enforced by GRCT during contractual execution. Thus, this aspect also undermines competitiveness.

3.5 Lack of Balance between Lot PROs

Fig. 2 should lead one to criticize the adoption of the same fare for the seven lots, although their production costs differ. The pricing model is designed as follows:

(1) The user pays a fare determined by the GRCT, which should cover the following expenses:

- the contractors' payment (PRO);
- the maintenance of the economic and financial balancing of the concession;
- the costs arising from the management of electronic ticketing;
- the management of the STPP/RMR;
- the costs involved in running integrated terminals, stations and stops;
- gratuities and allowances;

(2) Contractors will be paid according to the PRO they tender, limited to a reserve price (PROmax) set up by the GRCT;

(3) Since the STPP/RMR is comprised of an integrated system in which passengers change buses inside integrated terminals without paying another fare, but the GRCT still lacks the technology to count the number of integrations between buses, the amount to be paid to contractors by the GRCT corresponds to the number of ticketed passengers plus an estimated number of integrated passengers multiplied by the contractor's PRO. To cover this expense, the GRCT collects from passengers an amount equal to the fare multiplied by the number of ticketed passengers. The balance between revenue and expenses has been met so far.

One could conclude from Fig. 2 that GRCT's revenues substantially differ amongst lots which suggest that users of certain lots subsidize those of others. For instance, users from both Lots 1 and 6 will pay the same fare (USD0.98) whilst production costs in Lot 6 are considerably lower than costs in Lot 1.

On the other hand, differentiating fares in a system that seeks integration is not feasible. Thus, the solution would comprise a review of the amount and distribution of lots, including the establishment of

Fig. 2 Fare vs. PROmax per lot.

smaller lots and greater flexibility in the types of buses (to meet the fluctuation of demand during operation), provided no imbalance in the system would occur. This equalization could benefit users, since, in different lots, users would pay fares in accordance with their operating costs, thus avoiding some lots subsidizing others.

Fig. 2 compares fares with PROs taking into account the most usual fare (Fare A: USD0.98).

3.6 Contractual Terms

ITB 02/2013 has adopted a 15-year term, renewable for another 5 years. Terms as long as this have been commonplace in many Brazilian biddings for the concession of the urban bus public transport services [1, 28].

Gibson [24] and Augustin and Walter [29] cite that long terms can attract more bidders. However, long terms undermine both market contestability and the possibility of new bidders entering competition besides the incumbents in future rounds. It should be remembered that, in urban bus markets, competition for the market rather than competition in the market should be sought. In other words, competitiveness through market contestability occurs in different but complementary ways: at the time of entry (i.e., through the bidding process) and through the possibility of both incumbents and new companies from outside the system, having a chance to win the bidding which should be repeated frequently [30].

In addition, enforcement of regulations (e.g., surveillance, control and performance analysis) and short contractual terms would improve efficiency and cost savings. Otherwise, the longer the terms and the more lenient the enforcement, the lower the competitiveness and the greater the tendency for the formation of cartels, with higher risks for the system [27].

Contractual terms of around 5 years are recommended in Refs. [22, 30-33], with occasional extensions to 7 years depending on contractors'

compliance with performance indicators [27]. The Swedish experience would recommend terms between 3 and 5 years [34]. Nash and Wolanski [23] cite 8 years as optimal terms (and this may even be lower, between 2 and 3 years, before the existence of a second-hand market for vehicles). Tukiainen [35] estimated 4.78 years as the average length of terms for contracts in Helsinki. Terms such as those established in the bidding terms have been applied to the operation, maintenance and improvements of rail services [23], activities with significant sunk costs.

It should also be stressed that the cash flow of the concession shows a 10-year period with an IRR (internal rate of return) of 8.95%. Nevertheless, the ITB established the contractual term for 15 years, with the possibility of extension for another 5 years conditional to some performance indicators. Thus, the extrapolation of the contract term beyond 10 years suggests impairment of competitiveness, as well as the establishment of inflated fares.

4. Possible Market Structure ex Post Analysis of the Bidding Model

In this section, it will be shown how the above mentioned inconsistencies in the ITB may result in a market structure ex post bidding that reproduces the structure ex ante due to the lack of competitiveness that arise from the bidding terms (e.g., barriers to entry and collusive behavior). It should be stated that both the knowledge of the ex ante market structure and the details of the ITB design are crucial to prevent the dispute from occasionally resulting in a fiasco [11]. Thus, the inconsistencies in the bidding terms may indicate that the contracting authority (the GRCT) has not conducted an adequate study of the market structure.

To analyze the proposed bidding model, it is initially important to characterize how the incumbents would operate in the years 2011 and 2012, hence ex ante bidding. Therefore, Table 2 shows how current routes are distributed amongst incumbent operators

and to which lots these routes fit. The closest lots to the incumbents depots are also shown.

Based upon the ITB clauses criticized in Section 3, it is possible to speculate on a possible arrangement of incumbents in which each operator wins (hence ex post bidding) the routes (hence the lot) in the area more closely located to their depots without a significant change in the percentage of routes operated by each company. This scenario is justified since the location of depots constitutes a deciding factor when choosing which route to compete for, not only because proximity to depots facilitates daily operations, but also due to difficulties in obtaining large lots for such large batches in an already well-established urban area. The unavailability of suitable locations can be a strong barrier to entry for new entrants [23, 24]. Table 3, drawn up in accordance with the requirements of the ITB, exhibits this possible composition.

From Table 3, it can be seen that, even without breaching the ITB clauses, since the participation of consortia with unlimited number of members is

allowed, it is possible to accommodate each incumbent into the lot their depots are nearer to, which in itself is quite a comfortable situation. It can also be noted that, in this scenario, there is no significant variation in the number of routes allocated to each company between ex ante and ex post tendering. It can thus be inferred that the ITB clauses do not hinder the emergence of collusion.

ITB 02/2013 also depicts incumbents' revenue in the years 2011 and 2012, and a projection of revenue for the years 2013 and 2014. Thus, Table 4 shows a summary of the evolution of revenue per lot for the possible composition shown in Table 3. Table 4 elaborates on information given in Table 3 and presents the composition according to the business groups the incumbents belong to. It can be seen that the composition allows all the incumbents to benefit, thus confirming that the bidding terms leave competitiveness in jeopardy.

From the simulation in Table 4, it can be seen that only Lot 2 represents a reduction in revenue between 2011 and 2014, which could affect the possible

Table 2 Division of routes according to incumbent operators ex ante bidding.

No.	Incumbent operator	Closest lots to depots	Ex ante lot	Division of routes per lot (ex ante bidding)							Ex ante number of routes
				1	2	3	4	5	6	7	
1	BOA	1	1	31	6	16	-	-	-	-	53
2	CAX	6	6	-	3	3	2	-	35	4	47
3	CDA	7	7	-	-	-	1	-	-	29	30
4	AVC	2	2	8	-	-	-	-	-	-	8
5	EME	3	3	-	7	32	-	-	-	-	39
6	GLO	5	5	-	-	-	-	16	3	-	19
7	ITA	7	7	-	-	-	1	4	1	39	45
8	PED	5	5	-	-	-	-	15	1	-	16
9	ROL	7	7	-	-	-	-	-	1	-	1
10	ROD	7	7	-	-	-	-	-	1	9	10
11	RME	4	4	-	-	-	34	-	-	-	34
12	STA	3	3	-	3	8	-	-	-	-	11
13	SJT	2	2	12	-	-	-	-	-	-	12
14	SPA	6	6	-	-	-	-	2	16	-	18
15	TRC	5	5	-	-	-	1	12	-	-	13
16	VRC	2	2	-	29	4	-	-	-	-	33
17	VML	3	3	-	-	4	-	-	-	-	4
Total				51	48	67	39	49	58	81	393

Table 3 Possible composition of incumbents by lot ex post bidding.

No.	Incumbent operator	Closest lots to depots	Ex ante lot	Ex ante number of routes	STPP/RMR	Ex post lot (possible composition)	Ex post number of routes	STPP/RMR	Variation
1	BOA	1	1	53	13.49%	1	53	14.29%	0.80%
2	CAX	6	6	47	11.96%	6	38	10.24%	-1.72%
3	CDA	7	7	30	7.63%	7	27	7.28%	-0.36%
4	AVC	2	2	8	2.04%	2	8	2.16%	0.12%
5	EME	3	3	39	9.92%	3	51	13.75%	3.82%
6	GLO	5	5	19	4.83%	5	17	4.58%	-0.25%
7	ITA	7	7	45	11.45%	7	37	9.97%	-1.48%
8	PED	5	5	16	4.07%	5	15	4.04%	-0.03%
9	ROL	7	7	1	0.25%	6	1	0.27%	0.02%
10	ROD	7	7	10	2.54%	7	8	2.16%	-0.39%
11	RME	4	4	34	8.65%	4	38	10.24%	1.59%
12	STA	3	3	11	2.80%	3	12	3.23%	0.44%
13	SJT	2	2	12	3.05%	2	11	2.96%	-0.09%
14	SPA	6	6	18	4.58%	6	15	4.04%	-0.54%
15	TRC	5	5	13	3.31%	5	12	3.23%	-0.07%
16	VRC	2	2	33	8.40%	2	24	6.47%	-1.93%
17	VML	3	3	4	1.02%	3	4	1.08%	0.06%
Total				393	100.00%		371	100.00%	

Table 4 Revenue evolution per company per lot (2011-2014) according to the possible composition and to incumbent business groups incumbents.

Ex post lot	Operator	Number of routes 2011 and 2012	Number of routes 2014	Revenue 2011 (USD)	Revenue 2012 (USD)	Revenue 2013 (USD)	Revenue 2014 (USD)	Variation between 2011 and 2014
1	BOA	53	53	67,247,142	74,060,406	71,463,806	72,236,605	7.42%
	AVC							
2	SJT	53	43	50,909,417	55,231,844	38,984,304	42,222,674	-17.06%
	VRC							
	EME							
	STA							
	VML							
3, 4, 6	RME	153	159	150,563,031	165,317,312	178,885,215	192,113,109	27.60%
	CAX							
	ROL							
	SPA							
	GLO							
5	PED	48	44	45,677,051	49,202,747	49,556,247	49,556,247	8.49%
	TRC							
	CDA							
7	ITA	85	72	88,712,376	95,893,698	89,357,102	94,617,832	6.66%
	ROD							
Total		393	371	403,109,017	439,706,007	428,246,674	450,746,467	11.82%

composition. However, despite the small number of passengers⁴ in comparison to other companies of the STPP/RMR, the greatest advantage of VRC and SJT

seems to be the fact that these companies would no longer compete on the road (competition in the market) in their main operation areas with larger companies

⁴Data from ITB 01/2013.

(ex ante tendering SJT competes directly with BOA and VRC competes with BOA and EME).

This accommodation would enable innovations in service and demand generation for these operators. It also should be stated that the ITB allows changes in the number of routes so the apparent loss of Lot 2 may be mitigated through possible future changes to the contract.

Besides all this, one should remember that, due to previous experience and observations during actual field operations, incumbents have less uncertainty about common values regarding demand than other competitors so they are in better conditions to predict the effects of the winner's curse [18]. Because of this, even in a situation where the requirements of the ITB does not jeopardize competition, incumbents generally have inherent competitive advantages. McAfee and Williams [36] point out that the level of uncertainty for a new company is greater than for an incumbent, so new entrants feel compelled to take more risks thus facing competitive disadvantages. Thus, incumbents' benefits are greatly increased when an ITB establishes rules that encourage their accommodation in consortia in which every potential bidder may profit.

5. Conclusions

This article described some aspects of ITB 02/2013 regarding the concession of the Public Transport Passenger System of the Metropolitan Region of Recife which ultimately jeopardized competition.

Initially, the basic features of the ITB were presented, then it was assessed whether those aspects undermined competitiveness or not, notably the possibility of forming consortia with unlimited number of participants. Also the division into lots, the participation requirements, the competitive tendering format, the type of competitive tendering procedure adopted, and the inflexibility imposed by the GRCT on operators at the operational level, the lack of balance between the PROs of several lots, each of which tended to jeopardize competitiveness to a

greater or a lesser extent, were studied.

In order to reinforce the criticism made to the ITB, a simulation of a possible arrangement amongst the incumbents was presented, based on the rules of the tender, in which the allocation of companies ex post bidding does not differ from the ex ante scenario. This simulation does not correspond to a guesswork, rather it constitutes a real possibility given by the bidding terms themselves what suggest the public authority in charge may not have developed an adequate study of the market structure. It is thought that this fact alone is enough to justify the criticisms made throughout this article. The considerations here developed may be adapted and applied to other ITBs in order to help fostering competition.

Finally, it is noteworthy stating that inadequate practices criticized in this article are not exclusive to the bidding conducted by the GRCT and some of them have been observed in recent biddings for delegation of public transportation by bus in other Brazilian cities.

As recommendations for future work, it could be pointed out the need for strict review on the Brazilian ITBs way has been conducted, so good practices related to the economic regulation could be adopted. Legislation review should also be pursued since most of the ITBs have adhered to the laws, but the laws are not necessarily in line with the best practices.

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