THE DETERMINATION OF THE WEIGHT OF A PREFERENTIAL PROCUREMENT PARAMETER IN A PRICE FORMULA FOR AWARDING CONTRACTS: THE CASE OF SOUTH AFRICA

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ABSTRACT. The South African Constitution provides for the advancement and protection of previously disadvantaged individuals in public procurement. This has led to a system of allocating preference points to certain bidders while not allocating them to others. In this the correct balance between advancement and non-racialism must be struck. This paper analyses the determination of a valid quantum for these preference points within that context. Simple linear models show how the current formulae must be understood against costs and profits. A statistical interpretation of the correct balance is then given in the case where representivity be accepted as the norm.

PROBLEM SETTING

In South Africa non-white contractors were previously disadvantaged by apartheid. Some of the disadvantages, for example inferior education provision, have effects continuing up to the present. A black building contractor who is now 50 years old most probably had an inferior education in comparison to his white competitor through no fault of his own; merely giving such a previously disadvantaged individual the same starting position in the race to win a contract, would not be equitable.

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Given the history of racial discrimination it is crucial that preferential procurement should not on its part amount to discrimination. The same constitution that makes preferential procurement possible has non-racialism and equality at its base. Procurement decisions must be taken within a value system of competing criteria. If white males were to be excluded from doing business with the state, the procurement system would not be fair. Giving a black contractor a better chance to win a contract than his white competitor, on the other hand, is equitable. This paper deals with the appropriate quantum of the preference.

CURRENT PROCEDURE

The quantification of the preference is effected by means of formulae that adjust the prices of competing bids downwards (when the state is buying) in terms of preference points in the case of previously disadvantaged bidders. Twenty out of a maximum of 100 points are available in the case of smaller contracts and 10 out of 100 points in the case of contracts worth more than a specified amount. We only deal with the latter case.

The South African Constitution, 1996, makes provision for the protection or advancement of groups disadvantaged by apartheid in its Section on public procurement (217). The details of this affirmative action is regulated by the Preferential Procurement Policy Framework Act, 2000 (PPPFA) and its regulations.

Under the PPPFA formulae are used to allocate *points* to a bid taking into account price but also allocating points to *previously disadvantaged individuals* (PDIs). The formula we consider calculates a point for price only (out of 90) and adds to it a point for PDI status (out of 10) resulting in an adjusted price point out of 100. The competitor with the highest points wins the contract, *ceteris paribus*. We say *ceteris paribus* because considerations other than price are also taken into account in the award of contracts by means of tenders. We will disregard them by limiting our analysis to contracts awarded on the basis of price.

Price is taken into account as follows in the formula prescribed when the state is buying

$$P_S = 90\left(1 - \frac{P_t - P_{\min}}{P_{\min}}\right) \quad (1)$$

Where

P_S = points scored for price of the tender under consideration

P_t = rand value of tender under consideration

$P_{\min}$ = rand value of lowest acceptable tender

while the *preference points* based on the PDI status of the bidder are given as

$$P_f \leq 10 \quad (2)$$

Where: P_f = preference points.

The formula for finding P_f is not shown here. It, *inter alia*, takes into account the race and sex of the owners or shareholders and the size of the business. The crux remains whether the bidder was previously disadvantaged in some way.

Finally

$$P^{adj} = P_S + P_f \leq 100 \quad \text{……... (3)}$$

Where: P^{adj} = adjusted price points.

We are satisfied that this formula, taken with the system applying it, constitute a correct interpretation of the principles for government procurement as set out in Section 217 of the Constitution (Pauw and Wolvaardt 2008). However, as indicated before, we do not know for certain that the allocation of the weights (90% to price and 10% for redress in the case of larger contracts) is correct. In order to start the investigation into the quantum of the weights we consequently model the costs of the extreme cases of *white male* and *full score PDI* bidders.

COSTS AND PROFITS

The tender prices for full score PDI and white male bidders are written as simple linear models.

For a PDI firm bidding

$$P_{pdi} = (c_b + C_{pdi})(1 + y) \qquad \text{……... (4)}$$

and for a white male firm bidding

$$P_w = (c_b + C_w)(1 + y) \qquad \text{……... (5)}$$

with C_{pdi} and C_w nonnegative random variables representing the costs of the two groups.

Here c_b = common basic cost

y = common profit margin

and the expected values satisfy the relation

$$E(C_{pdi}) > E(C_w). \qquad \text{……... (6)}$$

The very existence of the idea in the Constitution and consequent laws and procedures to advance and protect PDI individuals and firms imply that their costs are higher than that of white male bidders. Although this does not necessarily hold for all PDI firms vis-a-vis all white male firms, it is assumed to hold at least in the average as stated in (6). We assume that the same does not apply to the profit margins.

Replacing P_t in (1) by $P_{pdi} = (c_b + C_{pdi})(1 + y)$ from (4) and then adding preference points as in (3) one can derive the adjusted price or points, P_{PDI}^{adj} , out of a hundred for PDI firms. A similar process gives the adjusted price, P_W^{adj} , for white male firms.

First consider that (1) can be rewritten as

$$P_S = 90\left(\frac{2P_{\min} - P_t}{P_{\min}}\right).$$

Replacing P_t by $P_{pdi} = (c_b + C_{pdi})(1 + y)$ for PDIs gives

$$P_{PDI} = 90\left(\frac{2P_{\min} - (c_b + C_{pdi})(1 + y)}{P_{\min}}\right) \qquad \text{……... (7)}$$

as the price points of a PDI

and its total points or adjusted price points as

$$P_{PDI}^{adj} = P_{PDI} + P_f \,. \qquad \text{........ (8)}$$

Similarly

$$P_W = 90\left(\frac{2P_{\min} - (c_b + C_w)(1+y)}{P_{\min}}\right) \qquad \text{........ (9)}$$

and

$$P_W^{adj} = P_W \,. \qquad \text{........ (10)}$$

Comparing (7) and (9) one has similar formulae for price. However, since (6), $E(C_{pdi}) > E(C_w)$, it can be shown that $E(P_{PDI}) < E(P_W)$.

This means that on the average, but not in all instances, P_{PDI} will be less than P_W. Some compensation must be introduced. This is the reason for the term P_f in (8). The concern is that these preference points may under or overcompensate resulting in either not enough help for PDIs to be able to get their equitable share of contracts awarded, or unfair treatment of white males.

The cost and profit based models developed above explain the processes underlying the problem conceptually and fundamentally; more information on the distributions of C_{pdi} and C_w is required to get to numerical answers on the value of P_f.

FINDING THE RIGHT POINT

Another but related approach is to take the statistics regarding contract winners into account. Contracts must be awarded in accordance with a system that is fair, equitable, transparent, competitive and cost-effective (Section 217 of the Constitution). In the light of the criterion of equitableness (equity) one can ask what a fair percentage of contracts would be to award to each of two extreme classes: namely white males with zero preference points and full score PDIs. Obviously, the value of P_f determines the percentage division of contracts and given this percentage one can set up a procedure to analyse the data on contracts allocated to obtain the desired value of the preference points.

Such a choice of the percentage will also have to take the other criteria into account in the light of existing facts regarding the award of contracts, the sustainability of firms, profit margins, and the premium paid by the state for redress. A starting point could be equitableness as representivity. (Representivity is currently used as a legal norm to guide the composition of the work force in South Africa. This norm says that the number of workers of a certain racial group at a certain level of work must be roughly in relation to the percentage of the population that that racial group occupies.)

If our assumption regarding the cost structure of white male firms is correct, it would be unconstitutional (*ceteris paribus*) if the percentage of contracts awarded to such firms fall far below their representivity level. This could be used to find an upper bound on P_f , the preference points.

Setting the percentage is a contentious political matter involving public money and race and may take years to be settled. Inversely, analysing the effect of different values of P_f may aid in getting to this decision. The approach is to assume a correct percentage and to find the P_f value that yields this. This can be repeated for different values of the percentage.

One starts by recording the distribution of the price only points of all bidders in a specific segment, say, contracts more than R500 000. Due to the structure of the formula (1) there is a maximum (full marks) value for the lowest bid when the state is buying, while negative points are possible. For every point value the number of bids scoring that point is recorded. In our case the maximum points for price only is 90, but that is simply because the current weight of the preference points is 0,1. Obviously, one is interested in potential winners and will therefore look at the high end of the distribution.

Investigating the feasible number of preference points must start with a possible zero preference points; an anchor point since P_f cannot go below this. With zero preference points all the winners of the various contracts in the system will score 100 points because somebody must bid the lowest price for each contract. If there was a tie between more than one bid, the winner would still have offered the lowest price. At the mark of 100 points the winners are divided between white male and PDI points. The number of winners equal the number of contracts awarded and forms a percentage of all point allocations. If the *a priori* defined distribution between the two classes is satisfied, the process stops and the answer is zero preference points. If not, one moves to a point equal to 100 minus a chosen number of preference points.

All these points (such as 90) resulting from more than zero preference points have certain interesting features. The first is that every white male bid (those not qualifying for preference points) bidding the lowest price for a contract would lie here. Secondly, no other white male bid can win the contract under the limitations we have put on this analysis. Thirdly, PDI bids could also lie at this point because of the existence of preference points: even if a PDI has not scored the lowest price, preference points can take them to a point equal or beyond the points scored by a lowest white male bid. Therefore at the maximum point level for white males a distribution between the two classes will probably manifest itself.

Let us assume that this point is the current 90, which is 100 minus the current 10 preference points. Observe that a number of PDI bids may lie between 91 and 100 points "to the right" of this mark. Except for the bids lying at 100 points, the other high scores are not necessarily winners because a bid scoring, say, 91 points, may be for the same contract as one scoring, say, 92 or more points. Therefore, all PDI resulting in more than 90 points must be inspected and double counts eliminated. Once this is done, the winners in this interval must be added to the winners at the point under inspection and compared with the number of white male winners at that point. It the required division between the two classes is obtained or approximated, the answer has been found. If the white male winners are overweight, one moves to a point resulting from postulating a higher number of preference points. If the white male winners are underweight one moves in the opposite direction.

If the white male winners are underweight at zero preference points the game changes.

CONCLUSION

We have shown that the current preferential procurement system is amenable to rational analysis. Furthermore, the existing data on contracts can be analysed to aid in getting to a decision on a defendable weight to the preference points. However, even the procedure that we have suggested implies a certain point of view with regard to the balancing of criteria and the division of contracts along racial lines.

REFERENCES

Pauw, J. C., & Wolvaardt, J. S. (2008). "Preferential Procurement in South Africa: How Many Criteria?" Paper presented at *The 18th Triennial Conference of IFORS,* Sandton.

South Africa, Republic. (1996). *Constitution of the Republic of South Africa, 1996.* Pretoria, South Africa: Government Printer.

South Africa, Republic. (2000). *Preferential Procurement Policy Framework Act 5 of 2000.* Pretoria, South Africa: Government Printer.

South Africa, National Treasury. (2001). *Preferential Procurement Regulations.* Pretoria, South Africa: Government Printer.