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A Consideration of Cost-Benefit Analysis
In the Context of Public Policy Decision-Making

Philosophy Honors: Senior Thesis

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INTRODUCTION

Just what is to be understood by the term "cost-benefit analysis" ("benefit-cost analysis")? The question itself arises from a curiosity into how government decisions (which affect all) are made. This paper gives an elementary discussion of constitutive parts, raising and responding to some initial criticisms. It seems fairly evident, unneedful of additional explanation or elaboration. The individual on the street would simply declare that it sounded like some rather ordinary decision-making process which involved the consideration of the costs and benefits incurred by the paths of action that might be selected. "Ordinary" means accessible to anyone and not the exclusive claim of the degreed economists or the governmental guardians; rather, a common-sense listing, accounting, of the "pros and cons." This hypothetical individual has grasped the core of the matter, but the peripheral understanding is mistaken.

Cost-benefit analysis appears to have a history similar to those of its siblings in economic phenomena: people knew it existed and engaged in it previous to its identification and description. The United States manifestation of "benefit-cost analysis" (as it is known on this side of the Atlantic (Campen: 12)), is traced to the River and Harbor Act of 1902 (Campen: 16). The Flood Control Act of 1936 is more often cited because of its wording directing choices such that "the benefits to whomsoever they accrue are in excess of estimated costs"(Campen: 16). The problem with this high-intentioned phrasing was that an instruction sheet was not enclosed,

leaving the agencies to figure out to the best of their abilities just what was to be understood by the terms. What then happened was reasonable behavior on the part of the agencies: they each sought their own self-interest, and "benefit-cost studies were intended to justify projects that the agencies wanted to undertake rather than designed to provide serious, critical analyses of the (project) merits" (Campen: 17). This approach, faults noted, will provide a basis for a criticism of cost-benefit analysis to be discussed later.

The question remains. The lay response given above is a solid first step. The second steps are as varied in size and direction as are the views, kinds, manners, weights, situations, intentions, and applications of cost-benefit analysis. Other factors which color "what is to be understood..." include political inclinations, motives, and the effective power of the utilizers.

A response drawing from the field of the social science of economics (although not necessarily the response of an economist) is that it (cost-benefit analysis) is applied welfare economics (Campen: 16). The regression commences: what is to be understood by "welfare economics"? For starters, the term "welfare" in this context is not what is contemporarily understood. Rather, it refers to the "spread" between what the consumer is willing to spend for a product and the actual price of that product. A simple market example of this is the student in desperate need of a writing implement so as to take that mid-term, who is ardently willing to pay ten dollars for the

article which is rung in the cash register at seventy-nine cents (plus tax). The surplus enjoyed by the consumer, the consumer's welfare, is tidily quantified at \$9.17. And there is a flag on the play -- the next statement sounds suspiciously normative for a science -- the consumer is better off than if the register had rung up the full sum determined by the consumer's willingness. This concept is then extrapolated to the community of consumers. At the societal level, the situation bears only slight resemblance to the that of the "simple market" -- the evaluation, appraisal of the action is in terms of who is to be made better or worse off by the choice, and by how much. The society is the recipient of the costs and benefits of the course of action, the whole and only reason for conducting the analysis.

The Pandora's box opens and questions flood the lines as the example explodes; that is, questions of welfare are globally present. The first measure, which serves dually as offensive and defensive, is to establish limiting parameters for discussion. The specific application of cost-benefit analysis is that which might be described as the setting of an objective; selecting a means, a course of action, with an eye to that objective; and studying the effects of that course of action. In the realm of public policy decision-making, cost-benefit analysis is a technique for comparing alternative courses of action, or even between A or not-A.

EXPOSITION

The service of cost-benefit analysis is derived from its setting, the economic system of the free marketplace. As described first by Adam Smith, the functioning of the ideal free marketplace would result in the optimal economic benefit over all. Smith posits that the individuals' pursuit of their own self-interest results in the the maximization of the interest of society as a whole. The model of the ideal free market is defined by a number of characteristic conditions in order that it might work perfectly to achieve the best economic outcome.

- A) In the market for each good, there are a large number of relatively small buyers and sellers.
- B) All firms in the same industry produce similar goods;... products are completely standardized among firms and there is no brand loyalty among consumers.
- C) Resources are completely mobile. Owners of productive resources (land, labor, capital) are free to put them to whatever use they please.... There are no barriers to establishing a firm in any industry.
- D) Each economic agent is an optimizer. Each individual acts to maximize ... satisfaction, each firm acts to maximize its profits.
- E) Each agent has perfect knowledge, ... knows with certainty all present and future prices.
- F) There are no price rigidities. Prices may move up or down subject to market pressures. (Sassone: 56,58)

From this elementary definition can be drawn two additional descriptive statements:

Prices are determined by the market equilibration of supply and demand in the long run, goods are produced and sold at the lowest possible price (Sassone: 57)

Given all of the above, then, the market would work perfectly, requiring no intervention from without. With participants as free and as numerous as described, no one individual's action can change the whole. The homogeneity of the product ensures that the demand curve (indicative of consumer preference) is uniformly elastic. "Perfect" is understood to be the state of all the individuals pursuing their own self-interest and being equally satisfied in that pursuit, thanks to the concomitant accomplishment of the best interest of the society which the individuals comprise. It cannot be too obvious by this point that such "perfection" is not even mostly approximated, and that there is a need for the intervention of an outside agency. The question at hand, however, is not a criticism of the market system or a political statement supportive of government involvement. Rather, a decision is to be made of a course of action. It is to be gained from the discussion immediately foregoing that a decision in the marketplace will have effects, positive and negative, which are to be understood in the context of the marketplace. To make sense of the effects is the purpose of cost-benefit analysis.

THE COST-BENEFIT ANALYSIS MACHINE

The imagery of a machine lends to one view held of cost-benefit analysis as a "neutral machine" (Campen: 26). Simply speaking, a machine would conduct cost-benefit analyses in the following fashion:

1. A problem or case is rendered by the operator for consideration.

2. The operator specifies the objectives of the study, determining what is to be maximized.
3. The objectives are interpreted and contained in a function.
4. The function is then maximized "given the empirical relations in the economy and the institutional constraints that may be appropriate."
(Ibid.).
5. The results are then submitted to the operator as 'input' for the decision on the case or problem.

The initial step needs little additional explication. The difficulties in its execution could be the defining of the problem, although the instance of considering between one course of action and another seems fairly straightforward. This step is before the threshold to the room housing the cost-benefit analysis machine is even crossed, and is all in the hands of the operators. In language of an example, in the arena of public policy decision-making, this step is the legislators' determining that either policy X or policy Y ought to be implemented to deal with the problem of litter in the State Park system.

The second step is the presentation of the question to the machine. The machine, one might say, is sharp but ignorant. Submemory A would receive, as the operators intend, the values or variables which are to be maximized (or minimized). Submemory B would receive, as the operators best understand, a description of that in respect to which the costs and benefits are to be analyzed. For submemory C, all of the details of the

relevant situations would have to be spelled out as explicitly as the operators themselves know. Continuing with the example above, A might contain the objectives of conservation and least cost operation. In B would be the description of the two policies. The data of C would be all manner of general and specific information about the State Park system, its concerns, its business, as well as information about the State's economy overall.

The third step introduces the "magic." With the proper amount of mathematical wizardry, the software of the machine crunches and chugs on the information that was entered into the subroutines to produce an algorithm, to build an equation. The function centers on record A; garnishes it with data from record B, weighted according to its relationship to A; all the while peeking at record C to note if any instances of A (the concerns to be optimized) will be overlooked. At the conclusion of this activity, the machine produces as complete a function as could be constructed from the information given. Again, from the example, the machine would focus on conservation and least cost operation, and consider how the proposals of the respective policies affect/effect the objectives, and describe this in mathematical relations. The general information file would be surreptitiously consulted as a guide in developing the function.

The fourth step is "merely" the maximization of the expression derived. "Merely" -- what a deceptive little descriptor! -- includes

primarily the application of the function with respect to the information in record C, plus all else. The significant difficulty in the operation of this step is the problem of quantification. How are the costs, benefits, and maximization to be understood? The costs and the benefits exist in any of a number of classes: real, pecuniary, direct, indirect, secondary, tangible, intangible. (Campen, passim, cf. Ray, Sassone, Sugden). In the example, the function would be run with the data of the third set C. Perhaps it would be discovered that policy X hypothetically boasts of a high conservation value but is proportionally high in price (an economic understanding -- as expected by the establishment of the parameter in the second step). Policy Y yields a relatively moderate advance in conservation at an equal price.

The fifth step returns the results of the analysis to the operator "who then somehow combine(s) the information and analysis received... with other considerations in the final process of reaching a decision." (Campen: 25, emphasis added). Here the legislators review the the product of the machine, with other considerations. Perhaps both policies fit the budget slot available, and the more moderate approach claims adaptability for more of the different types of problems (e.g., water recreation areas and road sides as well as forested campgrounds).

PUBLIC POLICY APPLICATION

The need for cost-benefit analysis with respect to government expenditures is due to the government's not being a profit-oriented firm and not having a vested interest in reducing costs or seeking economic efficiency. Thus, the government tends to emphasize need and disregard cost (McKean: 12). To restate, the private firm seeks to maximize net revenue, profit; whereas the purpose of cost-benefit analysis in public policy decision-making is to maximize "social benefit" (Mishan: xix). In economics there are two curves, one representing all the possible combinations of inputs (Kapital, Labor) to produce a certain outcome, one representing all the possible combinations of inputs at a constant cost. The former is labelled the isoquant curve, the latter the isocost. Working within income restraints, the private firm moves carefully primarily to maximize output at the lowest possible (fixed) cost. Governments, on the other hand, tend to have a job that must be done (think of a favorite pork-barrel spending item), and cost is "no object."

PROBLEMS IN CONDUCTING A COST-BENEFIT ANALYSIS

Given as simple an understanding of cost-benefit analysis as was outlined above, one can now begin to examine the process and its assumptions for gaps and problems in the conduct of the technique. For a first attack, one might question, for soundness, feasibility, and validity, the descriptive conditions of the "ideal" marketplace. The

attack is easily phrased: can it exist, does it exist, how close can it be approximated, how does the approximation serve as a starting point for application, how should the results of the process be understood with regard to this fact?

The ambiguity in the value of the separation of decision-maker and the technician of the cost-benefit analysis provides more questions. The selection, definition, and description of the problem: How much and what sort of responsibility is on the part of the analyst in this initial step? The fallibility of the decision-maker, a lack of clarity in the communications between the agents could lame the runner on the starting block. Conversely, if the technician and the decision-maker were closely bound, a possibility for conspiracy or a negative union-of-interests might result. This union would be negative in that it existed at the expense of the rival, the citizenry or the consuming public.

In the submission of all the relevant information to the "machine" for the cost-benefit analysis lie problems among the most crucial to the evaluation of the technique. The neat little word "all" encompasses much more than which might at first be listed. "All" is not an insignificant amount of information from only a few areas. "Relevant" is also a provoker of questions: it may not be possible given the contemporary (with the conduct of the analysis) knowledge of the situation to be able to predict or even anticipate possible effects or areas of effects of the decision. For the process to continue from the information-gathering

point, considerations of truth-reflective calculations of price, discounting over time, the probability or uncertainty involved in the expectation of the effects, and the quantification of non-economic or non-quantifiable costs and benefits in economic terms must be included.

Primary in the considerations are, of course, the setting and understanding of the objectives. Declaration of costs and benefits requires more than just indication of the desirable and the undesirable. The role of the politician operator is to select in the interest of the constituency, the citizenry in general, and the world at large, a hierarchy that is dangerously subject to blindness and bias. Is it beyond rational expectations that the local legislator should look at those affected outside of the group which is responsible for re-election? Determining costs and benefits is more than listing "ultimate values" (McKean: 26). Secondary are lower level priorities which are objects of "suboptimization" (McKean: 30). In the case of a public policy decision, the primary objective might be the task to be accomplished (drug-abuse education programs in junior high schools), with the secondary concern of reasonable cost.

CRITICISMS

Cost-benefit analysis is subject to criticism from many sides. One line of argument can be drawn from the standard attacks on Bentham-Mill utilitarianism. Consideration of these criticisms sets the stage for others. Below are outlined some of the arguments against utilitarianism in the terms of cost-benefit analysis, followed by some responses. The problems that will be discussed are: bilateral incidence of bias, identification of costs and benefits, measurability, distribution, minority rights, uncertainty, and time.

Cost-benefit analysis cannot claim to be purely technical and free of bias. Necessarily the perspective of the decision-maker, and possibly the perspective of the analyst will be evident in its formulation. The decision-maker (singular or a collective) expresses the objectives of the course of action under consideration, which are viewed from limited horizons, which do not encompass exactly the whole of the universe. In the case of a legislative agent, this bias could be a favoritism to a region, constituency, or industry. Here is encountered the age-old question of the interest of a politician -- is the legislator able to separate, recognize, and adopt the interests of the people? What people? Parochialism is possibly an instance of limitation, yet to whom, to what community is the legislator responsible? It does seem absurd that the good Senator should conduct a study of or submit an apology to the X industry in M-land because of protectionist policies (tariffs, quotas) which are to be implemented

domestically. Again, the objectives and interests must be prioritized. If M-land is a critical ally, then perhaps the objective of tranquil relations ranks higher than the protection of jobs in the good Senator's home State. Perhaps not, which is example of the issue at hand. Would a public policy choice benefitting a regional segment of the population at the cost of an minimal-but-positive increase in threat to the whole of the population be wise/ appropriate/ justifiable/ justified?

Clearly the decision-maker utilizes a judgement in determining the objectives of a course of action (or an as-yet-to-be-developed course of action). The bias is understood as a given, but this does not render it safely impervious to criticism. In the political realm, such comments occur normally in the language of position (e.g., "left," "right," "conservative," "liberal"). Whether or not these objectives are correct remains an open question. Ultimate objectives are not produced de novo; rather, they are traditionally described (e.g., in the Constitution) or defined (e.g., in a party platform). The costs and benefits of the course of action under consideration are then derived with respect to the stated objective. Because of the directness of the relationship, the question of whether the "correct" goods are being measured is seated in the construction of objectives and not in the conduct of the cost-benefit analysis. The weights accorded the respective entities are also drawn from their relation to the objectives. For example, if the objective is the reduction of fuel dependency, through the establishment of bicycle lanes, a benefit would be the reduction of fuel

consumption, with the improvement of physical health an achievement en route, so to speak.

The second area of bias is in the analyst's drawing up of the algorithm: the degree of relatedness to the decision-maker. Which is the preferred position: detachedness or involvement? If the analyst is too detached, one might envision missed/ discounted connections, old news, surprises, meaninglessness. If the analyst is too close, a "conflict of interests" might exhibit itself in the shifting of weights of costs and benefits in order that the desirable result might be produced. The analyst needs to have an understanding of the question at hand to make the results intelligible to the decision-maker.

The positional interpretation of evaluator relativity makes the truth value of such statements as "this state of affairs is good" and "X is a better state of affairs than Y" primitively dependent on the position occupied by the person making the statement (or by the person on whose behalf the statement is made)....
Why? Because of the evaluator's involvement in the state of affairs under consideration.
(Sen: 114,118)

Cost-benefit analysis encounters an obstacle in its operation with the problem of quantification. Are the benefits and costs measurable? The standard method of accounting, of simply adding gains and subtracting losses does not adequately address the question. As mentioned before, the kinds and characteristics of benefits and costs do not always easily lend themselves to dollar sign assignments. Those that do often entail other calculations. The improvement of physical health above receives a numerical value from the

decrease of health benefits insurance companies would pay, for example. The effects of a course of action might even remain ungauged and merely be listed: "one child per year will die as a result of implementation." The value of a benefit or a cost is not even consistent to the individual. Consider the economic principle of diminishing marginal utility. This curve describes how utility or satisfaction is increased/ affected by the acquisition of additional units of the article. The slope initially increases and then reaches some point at which it decreases. The concept was rather entertainingly illustrated once with the following example. At a party, the first glass of wine imbibed imparts pleasure (+3 utils), the second raises the enjoyment more (+4 utils), the third is ok (+2 utils), the fourth begins to cause drowsiness (0 utils). From this picture, it is evident that the value to the individual of a loss might exceed the value of a gain (compare the two directions at the point between the second and third glasses). The recognized faults of interutility comparison are: that each individual has a unique marginal utility curve pattern; that the currently held position (along the curve described by the function) of the individual cannot be cursorily identified. How should a legislator or decision-maker understand this? How can this be taken into consideration when calculating costs and benefits? Again, the best interests of the affected parties must be considered.

Assumptions must be made. One imagines that a generalization is indulged -- covering a range around the norm of the population distribution. This range, this norm, this distribution will discount someone's

satisfaction. Individuals will be over-satiated (possibly to the point of negative and not just diminishing marginal utility), others will be less than satisfied. These in the minority might be addressed with complementing policy choices of taxes and subsidies to offset or augment the affects of the central course of action.

Pareto distribution refers to the choice between two parties. Let the benefits be distributed such that one of the individuals (also applicable to collective entities) believes that her welfare has been increased, let the other believe that he, too is better off; or, that his welfare is unchanged; or, that he is worse off. The first situation is one of Pareto Superiority, the second of Pareto improvement, the third -- to be announced. Introducing the willingness to pay criterion complicates the computation. "WTP" refers to the optimized amount an individual would pay or receive for the individual's change in welfare. A hypothetical Pareto situation is created and labelled "Potential Pareto Improvement Criterion." (Campen: 29) The question is no longer are all the parties better off or at least not diminished in welfare, but

"by how much does the total sum of money that the gainers from a project would be prepared to pay to ensure that the project is undertaken exceed the total sum of money that the losers from a project would accept as compensation for putting up with it?"
(Sugden Williams: 94)

The additional measures of compensation described above are a part of the calculations in a deceptive sense. They factor into the consideration -- but they do not necessarily have to be executed if the project is selected. A concern is voiced that the interests of the individuals who

repeatedly fall outside of the arbitrarily demarcated region might be entirely discounted or consistently ignored -- a clear exploitation of the minority. The danger is realistic, thanks to the PPIC, that the "redeeming value" of "good intent" supersedes the ability (need) to make good.

Consequentialist approaches are also criticized for ignoring the question of distribution, for being naively oblivious to the present distribution of goods and perhaps assuming that all the members affected will be equally served or disserved by the course of action. Legislators would not fall victim to this sort of blindness; program choice at this level take into account the current distribution in part of the calculations. In an ideal Paretian fashion, it is expected that legislators would seek to maintain the status quo or to contribute to a more equitable distribution. The danger (and possibly "necessary evil"?) of the Potential Pareto Improvement Criterion is that it would allow the legislator to rest easily with whatever had been wrought in the comforting knowledge that the short-changed segment of the population could receive its proper allocation of benefits, but it there is no requirement that they should.

In dealing with any expected outcome effects, the solutions are subject to the caprices of the future. Very little in this universe is neatly, safely predictable. We make our best guesses, and that is all they are. The problem of unpredictability has several aspects: (1) that the known elements will not interact as expected (2) to produce (such) that the outcome which is expected will not occur (3) as expected (i.e., with a

significantly different intensity). Probability is incorporated, with limited efficacy. A completely unexpected unanticipated event of untold proportion and far-reaching repercussions could occur the day after the chosen project's operations are inaugurated and render the careful measurements, calculations, and predictions invalid.

Evaluations of costs and benefits includes the factors of probability and time. Time refers to when the effects are expected to be experienced. Distant effects are reduced by means of the standard financial device of the present value formula. The formula takes the expected future value of the asset (denominated in money terms) and pulls it forward, discounting the value over the "lapsed" time period using a "discount rate" derived from the interest rate or real rate of return. A sibling calculation enables the comparison of a present good with another at a specified point in the future.

A separate line of criticism is taken from elementary macroeconomics. Governmental fiscal policy is effective or not, depending on one's description (Keynsian or neoclassical or ---) of the relevant curves. The problem of the "crowding out" effect refers to either the action of the government in the place of private interest actions (social security where there was private charity), or the usage of financial capital on the part of the government in competition with private interest funding. This could be a hidden cost not included in the calculations. An additional concern is the possibility that such government activity would be countercyclical or procyclical, alleviating or aggravating the current (or future) economic

conditions. The problem is not fatal to the undertaking of projects; rather, it should be included as an area of incidence for costs and benefits.

RESPONSE

In response to the criticism that cost-benefit analysis cannot claim to be purely technical and free of bias, one must look "realistically" at the world in which it exists. A view of anything is taken from a perspective, every perspective is incomplete, somehow limited. Decisions must be made, and in some reasonable space of time to retain their desired efficacy. Necessarily then, in the "real world," there will be a lacuna in the perfect information, and the show will go on. As regards the bias of the analyst, the danger of abuse is recognized: the classic line runs (addressing the economist), "what's two plus two?" and the reply, "what would you like it to be?" There are two reasons for error in the conduct of cost-benefit analysis: that of ordinary mistakes the calculations, and that of actual faults in the whole undertaking. All decision-making apparatus are susceptible to those with intent to deceive.

The correct identification of what are the costs and benefits has been called an art. It is hoped that in a democratic system there would be various information inputs so as to construct a best approximation of what is to be sought or augmented (positive, benefits) and what is to be avoided or diminished (negative, costs).

The issue of minority rights does remain unaddressed by cost-benefit analysis itself. It is hoped that other measures will be

taken, that the excuse of Potential (Pareto) Improvement will not shield the decision-making authorities from their responsibility to the whole and not merely the larger (more vocal, powerful, etc.). A possible avenue might be attention to the societal concern of distributive justice.

The problem of uncertainty is in part accepted as a realistic information lack. The multitude, it has been observed, tend to be present-oriented. Market prices may not be ideal for there is no perfect competition which acts to set them, but they are representative of a recognized value, and are therefore of significance in calculations.

Quantification is a controversial point, but it serves in context. Utilizing a common denominator (e.g., dollars) enables comparison and simplification of variables. Not everything can be converted, but what cannot is listed for the decision-maker to take into consideration.

The concern of government crowding-out effects can be anticipated, perhaps, by a knowledge of the condition of the economy. There will be lags in execution. Some economic theorists hold that government policy actions will have no effect, due to compensatory activity in the private sector.

Cost-benefit analysis reduces the variables in a question, making the decision more clear. It is a means of consolidating information so

as to make the information more manageable. It is thought that utilization of cost-benefit analysis is an improvement over the "square one" image of a listing of all the factors that are to be considered in the decision. That first picture is more highly prone to all of the weaknesses cited against cost-benefit analysis, but to a (perniciously) worse degree. It does not advertise itself as a political or moral agent; rather, it is a technique to be used responsibly by decision-making agents.

CONCLUDING COMMENTS

In Samuel Scheffler's book The Rejection of Consequentialism (Clarendon, 1984), he quotes Bernard Williams in criticism of classical utilitarianism, that "the day cannot be too far off in which we hear no more of it." Scheffler's next paragraph opens with "and yet the day refuses to come..."pp3,4. He extends his suggestion as to why utilitarianism is still around, what sorts of plausibilities it holds which compensate for its failings. Recall the Biblical story of Gamaliel (Acts 5:34-9) who is asked to do something about those new Christian folks. He sagely replies that he will do nothing: if the new church is of human construction, it will fall of its inherent imperfections; if of the design of God, then it will resist eternally any attacks. Perhaps there is too great a liberty taken in this metaphorical extension, but thoughts are provoked. As the criticisms of utilitarianism are extrapolated, so too can the rebuttals of those criticisms serve in support of cost-benefit analysis.

A good question to ask after the criticisms listed above is (in classic reductio ad absurdum), "suppose these difficulties find cost-benefit analysis unfit to carry any freight -- then what?" What sorts of alternatives are available, feasible, viable? A venture would be to say "not much of anything." In good tyrannical style, in place of public agencies, there could be a dictator who chooses courses of action with his own interest patently at the center. Easily in mind the example of the Somoza family which helped the donations for the recovery from the 1975 earthquake in Nicaragua find their way into the vacation fund....

It is of interest to note that the passerby, without the Ph.D. in environmental science or whatever, upon learning of two policy proposals would "rationally" select the one that weighed out the best, that produced the most for the money and energy invested; without drawing on "other considerations." Part of the advocacy of a process as exhaustive as cost-benefit analysis is due to the danger of error in first impression decisions made in ignorance.

Emily Dickinson recognized how "much madness" (as judged by the general public) could make "divinest sense" -- if the eye that perceived was a discerning one. In support of cost-benefit analysis is the hope that the additional apprehension of the problem and its situation by the more discerning eye would be to the greater benefit of the general public and the society that contained it. That discerning eye could overcome some of the more crippling criticisms and limitations brought forward and discussed here.

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