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The November 15, 1969 Mobilization to End the Vietnam War in Washington, D.C. represented one of the largest gatherings of people to express dissenting views in the history of the nation. It has been variously estimated that between 119,000 and 1,000,000 people participated in the march and that every state (plus the District of Columbia) was represented. City officials of Washington stated that they were told by the Nixon Administration that the total was 320,000. The Washington police chief estimated the total to be 250,000, "conservatively."[1]

Although these numbers are large, we believe they fail to capture the full significance of the march. Taken alone, they provide no indication of the intensity of feeling among those participating. The fact that many of the demonstrators traveled long distances, involving large time and travel costs, indicates a significant desire to register their feelings in this way. The decision to make such a journey may reveal a greater intensity of feeling than a five-mile drive to attend a local rally or the cost of the stamp and stationery to write one's congressman.

The purpose of this paper is to suggest a better way of assessing this intensity of feeling, or "willingness to pay," in the case of political demonstrations than is possible by examining only the total number of participants. The technique which we employ is the travel-cost method for estimating demand functions.[2] The method has been used to infer from individual choices the willingness to pay for outdoor recreation sites and the economic benefits from public investments in such facilities. The novelty of this paper lies in the application of the technique to participation in a political event rather than consumption of a publicly provided good or service. We suggest that the technique has relevance for models of political choice involving individuals' intensities of feeling on issues as well as their ordinal ranking of outcomes.[3]

We first outline the model, and then describe its application to the November 1969 mobilization based on data gathered on attendance by states. Finally, we discuss the potential and limitations of our model and this approach.

I. The Model

Our procedure is to derive statistically a "demand curve" for participation in the march and to accept the area under this demand curve as a measure of willingness to pay. The travel cost method of estimation is a special case of the general gravity model of social interaction. Other studies have used these types of models to estimate demand functions for transportation, communication, recreation, and tourism.[4] In these models the independent variable V_{ij} is the number of

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[1] The 119,000 estimate was based upon aerial photographs and released by Secretary of Defense Laird. Subsequent to its release, it was withdrawn. The 1,000,000 figure comes from some of the organizers of the march. See the newspaper article by Robert F. Levey.

[2] For an exposition of this method and references to the literature, see Marion Clawson and Jack L. Knetsch, ch. 5.

[3] In such models, opportunities for the formation of coalitions can arise, and vote trading can be an important optimizing mechanism. See Edwin T. Haefele.

[4] For example, see Richard E. Quandt and William J. Baumol; Joseph J. Seneca and Charles J. Cicchetti; and Clawson and Knetsch.

visits, trips, or messages from source i to destination j. The variable V_{ij} is held to be a function of some gravity variable representing the attraction potential for each point, e.g., population N for i and j; other socioeconomic variables S for i and j, and distance D, taken to be a surrogate of the cost of overcoming the separation between source and destination. A general statement of such a model is:

$$(1) \qquad V_{ij} = \frac{A N_i^{\beta_1} N_j^{\beta_2} S_i^{\beta_3} S_j^{\beta_4} U_{ij}}{D_{ij}^{\beta_5}}$$

where A is a constant and U_{ij} is a random error term. The modification which we employ hypothesizes that the number of visits from the ith source depends on the attractive force of the destination and the "push" factors of the ith source, say population N_i, socioeconomic variables at source i, and the cost of traveling from i to j. The model can be expressed in terms of the visitation or participation rate and the parameters can be estimated by multiple regression techniques from data detailing the numbers and characteristics of visitors from each source.

Since price is not explicitly stated in the function, a proxy for price must be used to move from the estimated participation equation to the demand curve. In the model as it has been applied, the proxy for price is taken to be changes in travel cost. If a \$1 increase in the price or admission charge for a facility has the same effect on participation as a \$1 increase in travel costs, all the necessary points on the demand curve for the site can easily be calculated. For example, for a price of \$5, the quantity, Q^5, is:

$$(2) \qquad Q^5 = \sum_{i=1}^{n} \frac{A N_i S_i^{\beta_1}}{(D_{ij} + 5)^{\beta_2}},$$

where D_{ij} is price per mile times distance, and the summation is over all visitor sources. Because travel time is a component of travel costs, the value of travel time is included in the empirical estimates presented below. To ignore this component of travel cost would lead to a consistent downward bias in the derived demand function.[5]

[5] Suppose that the money travel cost to a park from City A is \$1 and the trip takes one hour. If a gate fee of \$1 is hypothetically imposed, total money costs become \$2. The conventional model assumes that the people from City A will now have the same participation rate *ceteris paribus* as was recorded for people from City B which is twice as far away, i.e., with travel costs of \$2 and two hours of travel time. But since travel time from City A has not increased, this assumption overestimates the effect of the gate fee in reducing participation. Hence, the estimated demand curve would lie below the true demand curve. To correct for this, it has been suggested that a composite distance variable be formed including both time and money costs, and that only the money cost be hypothetically increased to generate the points on the demand curve. See Frank J. Cesario and Knetsch.

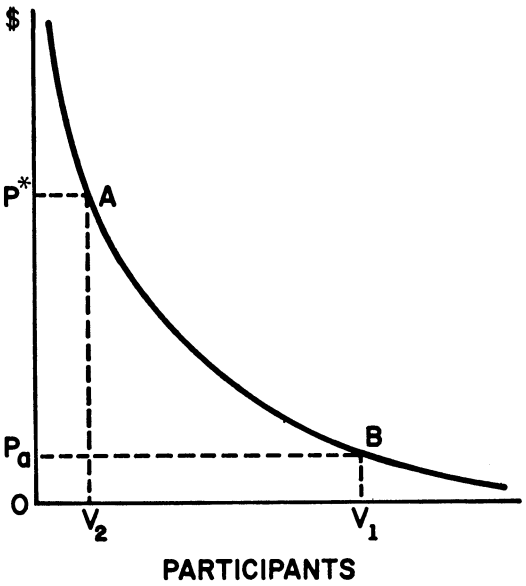

FIGURE 1

Having found the demand curve, we determine the area under the curve by integration. In Figure 1, where P_a is the actual cost of participation (travel time plus mileage, both in dollar terms), the rectangle OP_aBV_1 represents the actual expenditure by all people coming from a particular source. This is the value in exchange or the opportunity costs of the resources (including time) devoted to traveling to the destination and returning. The area under the demand curve but above P_a is an untapped willingness to pay.

II. The Data and the Empirical Results

To estimate the participation equation,

data on participants, population, travel cost, travel time, and other socioeconomic variables are required for each source. Each of the thirty-two states east of and bordering on the Mississippi River (plus Texas and the District of Columbia) was considered a separate source. Data on the number of participants from each source came from a questionnaire mailed to the student body president, the editor of the student newspaper, and the chairman of the sociology department of each of a selected sample of over 200 colleges and universities. The questionnaire asked for an estimate of the total number of participants from that state; the response rate was about 45 percent. Because estimates from some states varied substantially, the median of all estimates was chosen for each state. Population is for the year 1967. Distance and travel time came from the Rand McNally Road Atlas.[6] Travel costs are assumed to be 5.5¢ per person per mile based on operating costs for private automobiles.[7] The opportunity cost of travel time is taken to be $1 per hour.[8] To reflect differences in the composition of the populations and differences in political attitudes among states, college student enrollment in the state as a percentage of population and the combined Nixon-Wallace 1968 presidential vote in the state as a percent of the total state vote were used in some of the regression estimates.

The participation relationship was estimated in several functional forms with alternative specifications of the exogenous variables. All of the equations are double logarithmic regression equations (see Table 1). An instrumental variable technique analogous to two-stage least squares was used for estimation to avoid the asymptotic bias and inconsistency of ordinary least squares.[9]

In each of the equations the percentage of students in each state is positively related to the state participation rate. In equations C and D the coefficient for the state Nixon-Wallace vote percentage is negative, indicating an inverse relationship between the moderate and conservative political position and participation in the march. Equations A and C have the additive $(M+T)$ measure for the travel (distance and time) variable, while equations B and D use the multiplicative form $(M \cdot T)$.

All four equations are statistically significant, and all account for about 70 percent of the variation in the dependent variable. Because the additive form for the travel cost variable generates a lower demand function than the multiplicative form, it was chosen to estimate the demand function.[10] Moreover, although both equations A and C predict the number of marchers to be 316,900, equation A explains a higher percentage of the variation in the total *number* of marchers from each state than does equation C.

Since the regression was estimated in the logs, the demand curve is asymptotic to the vertical axis. Thus, consumer surplus is undefined. To obtain an estimate of consumer surplus, the demand curve above P_a for each state was integrated from the actual number of state participants (OV_1 in Figure 1) to 5 percent of the actual number of participants (OV_2). Then the rectangular area OP^*AV_2 was added for the percent of the participants not included in OV_2-OV_1. This procedure, therefore, excludes some portion of the full consumer surplus of the 5 percent of the participants of each state with the

[6] Distance and travel time was from the largest city in the state, except for Florida, Tennessee, and North Carolina. For these states, geography and population distributions suggested that Tampa, Nashville, and Raleigh would be more appropriate points from which to measure distance. Also, the population of the adjoining Maryland and Virginia counties was allocated to the District of Columbia.

[7] The data on operating costs of automobiles is from *Cost of Operating an Automobile*. On the basis of supplemental data on the per person per mile rates of air, rail and charter bus travel, the 5.5¢ figure appears justified as a "best guess."

[8] Participation and travel cost data by state are presented in the Appendix.

[9] Since both the dependent and some independent variables are deflated by population, ordinary least squares estimation would violate one of the classical least square assumptions [$E(X'U)$ must equal 0] and generate "least squares bias." The instrumental variable technique adjusts for this effect and ensures asymptotic unbiasedness.

[10] Because the multiplicative form implies a convex trade off function between time and travel costs, it yields higher estimates of participation for each increase in assumed cost than does the additive form.

TABLE 1—EMPIRICAL RESULTS OF DEMAND ESTIMATION MODEL*

Dependent Variable: participants as a percentage of state population	Constant	Students as a percent of state population	Combined percentage of state votes for Nixon and Wallace	Travel cost variable (additive)	Travel cost variable (multiplicative)	R^2/F
Equation A	−12.3493	4.1136	—	−1.1459	—	.68
	(− 2.4)	(2.8)	—	(−7.0)	—	34.4
B	−12.3797	4.1911	—	—	− .5255	.68
	(− 2.4)	(2.9)	—	—	(−7.1)	35.5
C	−10.4355	2.9344	−1.9303	− .9034	—	.70
	(− 2.1)	(1.9)	(−1.9)	(−4.4)	—	35.5
D	−11.2117	3.3809	−1.3429**	—	− .4384	.69
	(− 2.2)	(2.1)	(−1.2)	—	(−4.2)	24.3

(Note: t-values appear in parenthesis below their respective coefficients.)
* All variables in natural logs.
** Marginally significant at about the 80 percent level.

highest willingness to pay. The value in exchange was determined by multiplying the number of participants (OV_1) predicted by regression equation B by the total travel cost (OP_a) including imputed travel time costs and equals $OP_a \cdot OV_1$.

The total consumer surplus of the event was estimated by subtracting value in exchange of each state from the total area under the demand curve of each state ($OP^*ABV_1 - OP_aBV_1$) and aggregating over all of the states. This procedure yields an estimate of $10.1 million. Based on the 5.5¢ per person per mile and $1 per hour opportunity cost, the value in exchange is $7.1 million.[11] The total willingness to pay for participation in the event—the sum of consumer surplus and value in exchange—is $17.2 million, which is slightly more than $54 per marcher.

III. Conclusions

Although we have estimated a participation function, used it to generate a demand curve, and calculated the area under it, the question of interpretation remains. There are several possible interpretations. The logic of our technique tells us that we have estimated the aggregate willingness of the participants in the march to pay for the opportunity to express their views in the context of that event. This statement, however, does not distinguish between the event per se and the sentiments which moved people to participate. Our data provide no empirical basis for making such a distinction. It should be emphasized that our estimates imply nothing regarding the benefits and costs experienced by nonparticipants because of the occurrence of the march. In the case of nonparticipating beneficiaries, the "free-rider" phenomenon may indicate the potentiality of substantial benefits.

At one extreme the march could be viewed as a consumer good and participation in it the consequence of utility maximizing decisions no different from the decision to purchase a bottle of wine. Conventional welfare analysis would then lead us to conclude that the net benefit of the march was the consumer surplus ($10.1 million) less any external costs.[12] This position, however, would

[11] While the coefficients of the explanatory variables are insensitive to time and travel cost values, the constant term of the estimated equation, and therefore the estimate of benefits, is sensitive to the values chosen. For example, if travel costs are taken to be 4¢ per person per mile, the estimate of the area under the demand curve is reduced from $17.2 million to $13.5 million. We feel that an estimate of value in exchange of from $5 to $10 million and of consumer surplus of from $10 to $20 million is a valid interpretation of the data we have analyzed in this study.

[12] The costs borne by others because of the November march have been estimated to be $1.8 million by Representative Gerald R. Ford of Michigan. This figure includes: $240,000 for private buildings that were damaged; $28,000 for government property damage, $473,776 for additional overtime for law en-

likely misrepresent the significance of the event and the motivations of the people who came to Washington for it. While many of the participants felt that their participation was enjoyable, if not rewarding and at times moving, it is unlikely that many would have come if all there was to it was the prospect of a walk, a few hours in the autumn chill, and a whiff of tear gas to cap the day.

At the other extreme, participation in the event could be viewed purely as an act of political expression. Then the area under the demand curve (including value in exchange) would represent an intensity of political feeling or a willingness to commit resources to achieve a desired political end. In this light, participation involved the commitment of resources to an act of production with the desired output being a specific change in public policy.[13]

There are other possible interpretations. For example, one could view this measure as an indication of untapped political capital that could be mined by candidates or organizations advocating particular policies. In this perspective, the $8 million debt of the National Democratic Party in 1970 is eclipsed by our $17.2 million estimate of willingness to pay.

To summarize, we have presented an estimate of the revealed willingness to pay for the opportunity of participating in a particular political demonstration and have suggested that this estimate is an indication of the intensity of feeling of participants toward the political issue. Our results illustrate a technique for evaluating the feelings of those people acting in a particular way on a particular issue and clearly not the feelings of all people toward this issue. However, *ex post* analyses of the behavior of individuals toward political issues do have meaning as indicators of the intensity of political feeling, especially in the context of models of vote trading, coalitions, and advocacy.

forcement and clean-up personnel, and $963,088 to maintain troops and National Guardsmen in the city. No doubt there were other positive and negative consumption externalities. One respondent said, "Thanks for having it in Washington. Our campus was clean and quiet that weekend."

[13] Some credence is given to this interpretation by both the feeling that after November 15th the mass demonstration as a tactic was dead and the observed outpouring of energy and time into more conventional modes of political activity after President Nixon's announcement of the Cambodian invasion.

Appendix

State	Median Number of Marchers	Average Round Trip Cost[a] (Time and Distance)
Alabama	200	$118.28
Arkansas	85	166.17
Connecticut	15,000	52.62
Delaware	1,500	15.11
Florida	1,700	147.78
Georgia	250	96.46
Illinois	6,500	109.57
Indiana	1,000	87.54
Iowa	325	159.48
Kentucky	375	99.90
Louisiana	75	173.89
Maine	500	83.14
Maryland[b]	12,500	5.95
Massachusetts	15,000	68.07
Michigan	15,000	74.87
Minnesota	1,000	173.01
Mississippi	25	157.56
Missouri	725	135.95
New Hampshire	500	73.92
New Jersey	5,000	32.76
New York	50,000	35.09
North Carolina	14,000	34.28
Ohio	5,000	53.61
Pennsylvania	26,250	20.96
Rhode Island	1,500	62.33
South Carolina	340	73.43
Tennessee	950	110.51
Texas	1,000	223.26
Vermont	1,000	83.34
Virginia[b]	6,000	16.49
West Virginia	700	59.22
Wisconsin	6,750	122.86
Metropolitan D.C.	103,000	1.12
	300,000	

[a] This estimate is based on the use of 5.5¢ per person per mile as the travel costs and $1 per person per hour for the time costs implied by the travel.

[b] Not suburban District of Columbia.

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