# A SIMULATION MODEL OF URBAN POLITICS[1]

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## Summary

As part of a projected simulation of the social, political, and economic character of an urban community, a simulation model of the political subsystem of a large city has been constructed. The model assigns utility functions and decision rules to the aldermen and mayor of the city, who take into account both potential votes and job and favor patronage. A bargaining submodel is included, and the roles of the mayor, the media, and community interest groups are taken into account explicitly. The construction of the model and the validation process are discussed.

## Introduction

The purpose of this paper is to describe a pre-liminary model of the political aspects of an urban community and the decision-making process within the City Council. The model portrays what might be termed the "reconstructed logic"[2] of the operation of the political system, and indicates how the political system might operate if decisions on all aspects of political behavior had to be made consciously. Because the events we wish to describe represent only a small fraction of the decisions pertinent to the urban politician, the sum total of these other actions is treated stochastically for each alderman, with shocks applied to many variables. In addition, un-certainty and risk are built into the model by impos-ing prior probability distributions upon various events and interactions.

We have intentionally taken into account many more variables and processes than would be required for a macroscopic description of urban political phenomena, as we wish to ascertain, through sensitiv-ity studies, which processes are most important in determining the course of political events in an urban community. As a result the model comes consid-erably closer to portraying the complexities of the real world than do most urban models (political or otherwise). While the representation of reality is still somewhat stylized, the stylization is much less drastic than that normally associated with social science models. And the running time on an IBM 360/65 is not inordinate, about twenty seconds per time period.

## Basis of the Model

Our tentative description of political processes in an urban community is based largely on case studies of urban politics by Banfield and various co-authors, and particularly on Myerson and Banfield's discussion of the public housing controversy in Chicago in 1949-52[3]. The validity of their insights is emphasized by recent (April, 1971) news reports regarding Federal determination of sites for low cost public housing in the city of Chicago.

Our initial model describes a city of one million voters, divided into twenty wards, each with a total vote of 50,000 per election. Each ward chooses its own alderman on a de facto partisan basis. Some of the wards are ethnically and socio-economically homogeneous, others are split, and several are transi-tional in character. The twenty ward committeemen are assumed, for the purposes of this model, to be in per-fect accord with the aldermen from the corresponding districts, regardless of whether or not they are actually the same persons. Bargaining among the aldermen takes place in the process of arriving at a decision.

The city has a strong Democratic machine and a small group of aldermen who are relatively influential in running the City Council. The mayor is elected by a partisan city-wide election, and is a Democrat and the leader of the Democratic machine of the city. He interacts with the aldermen in various ways to in-fluence the outcome of a controversy, with his power resulting from his control of both Party and city bureaucracy. His bargaining position vis-a-vis the county, state, and Federal governments results to a large extent from his strong position as the leader of the state's Democratic Party, but, in return, a more than proportionate amount of city patronage accrues to the Republican Party. Other state and Federal government interactions with the city are taken to be exogenous, with strong congressmen exer-cising their influence through the aldermen who are elected within the congressmen's districts.

A number of special-interest groups are concerned with politics in the city, in addition to the polit-ical parties. These include business and industrial interests, industrial and craft unions, churches, various civic organizations, and even organized crime, along with ad hoc organizations which emerge under the pressures of specific controversies. The newspapers and other mass media constitute another interest-influence group, as do the various independent agencies which are associated with the city government.

While the present model is constructed to fit conditions appropriate only to Chicago and a few sim-ilar machine cities, the structure of the model is sufficiently flexible to accommodate a large variety of U.S. cities. For example, since politics at the ward level depends primarily on the socio-economic and ethnic characteristics of the ward and the resources available to the alderman/ward committeeman, rather than on the existence or strength of a political machine, the model can describe non-machine cities and nominally non-partisan cities, so long as the ward structure is strong. Similarly, with relatively minor changes in the model we can portray a strong mayor with a mediating philosophy, or a weak mayor with either a mediating or an interventionist approach to city government. We can also describe a city with a

strong independent city manager or almost any of the
many political forms that appear in U.S. cities today.
Major changes, however, would be needed to model a
city in which the wards are unimportant either because
of at-large aldermanic elections or because the city
(or at least most of it) is relatively homogenous
socially and economically.

## The Scenario

In order to develop the model efficiently and
realistically we decided to utilize a specific case
study as a guide. While the model is applicable to a
variety of other situations, we wanted to ensure that
the essential features of at least one case study
would be represented adequately. We chose as our
sample the Chicago housing controversy in 1949-52.
Our information on the sequence of events was gathered
primarily from Meyerson and Banfield's _Politics,
Planning And The Public Interest._
The basic facts are these:

In July 1949 the Chicago Housing Authority
put before the Mayor and City Council a prelim-
inary proposal which called for building 40,000
units of low-rent housing over the next six
years. In the autumn of that year the Authority
selected sites for the first 10,000 units, and in
November it submitted them to the City Council
for approval. A committee of the Council held
public hearings on the sites in February; it
withheld approval from five of the seven sites.
In March a sub-committee of the Council went
looking for other sites; its recommendations,
however, proved unacceptable to almost all con-
cerned. Then, at the beginning of April, the
Authority submitted a revised proposal to the
Council. Council never voted on this proposal.
Instead, the leaders of the Council framed a
compromise. When the Authority demurred at the
compromise, the Mayor in May appointed as con-
sultant to the Council an engineer who proposed
building projects in "stages" in order to avoid
the necessity of relocating slum-dwellers. Late
in May this consultant persuaded the heads of the
Public Housing Administration in Washington not
to hinder the compromise he and the Council
leaders were urging upon the Authority. Although
the staff of the Authority considered the com-
promise program undesirable, there seemed by the
middle of June no alternative to it other than to
give up the housing altogether. The heads of the
Authority accepted the compromise accordingly,
but it turned out that before the Council itself
would ratify it (as it did in August 1950) more
public hearings would be held and changes would
be made in the terms of the compromise. After
the Council had finally approved the sites, some
further efforts were made to have the Public
Housing Administration reject the program, but
these were unavailing. By early 1952 the ques-
tion which had been raised in the middle of 1949
was largely decided.[4]

It is this sequence of events that we would like to
represent (in a generic sense).
Two modifications to the background of the sce-
nario have been made; however, no fundamental change
in the nature of the model is involved: We use twenty
aldermen instead of the fifty members of the Chicago
City Council, each representing uniformly sized wards
of roughly the average size of a Chicago ward. And we
consider first a mayor of the type of Daley or Kelly
(strong interventionists), rather than one like
Kennelly (mediator), who was actually in office at
that time.

## Overview of the Model

Figure 1 shows the overall structure of the
political model. The key actors in this model are
the aldermen and the mayor. Each alderman is pre-
sumed to know what the voters in his ward want him to
do on the issue in question, ranging from taking a
neutral position to undertaking strong activities
either in favor of or opposed to the proposition. He
chooses his initial position on the basis of the
votes he can hope to gain or lose (which depend on
both his position and the actual outcome) and on the
number of additional jobs or favors he can hope to
gain for his constituents and allies as a result of
the outcome of the issue. He assesses the probable
result on the basis of his (assumed) perfect knowledge
of the initial positions of the other aldermen. He
can also bargain a change in his position (if he has
taken one of the more central positions) for an incre-
ment to his stock of jobs and favors furnished by an
alderman holding a strong position on the issue. This
negotiation takes place in the box labeled "Bargaining
Process".
Meanwhile, the mayor can determine his own posi-
tion on the issue and decide when and whether to inter-
vene, according to a predetermined set of decision
rules. The mayor has the power, subject to certain
constraints, to force a decision or to delay it. In
his dual role as the Democratic Party leader and
mayor, he can bargain or facilitate (or impede) the
bargaining process. By announcing his position on
the issue in question, he can influence directly the
probability of passage of a proposition. He can also
use the city bureaucracy (and be used by them, on
occasion). Finally, the mayor may initiate compro-
mises on the issue in question. However, at all times
the mayor is cognizant of several measures of con-
flict, which, in conjunction with his position and
his philosophy of government, guide his timing and
actions.
The Republican Party interacts with the voters
and with the Republican aldermen, but, in the present
version of the model, it is not nearly as influential
as the Democratic Party.[5]
The communications media can exert pressure on
the mayor and aldermen, in the latter case primarily
by influencing the voters. They can also be used by
the mayor or aldermen to publicize their position and
to keep up voter interest in the issue.
Organized groups, such as labor unions, the
Chamber of Commerce, the Urban League, etc., may
choose to act as pressure groups for the issue in
question, and ad hoc groups against or in favor of the
proposition may also arise. These groups, either
directly or through the media, may exert pressure on
the mayor and the aldermen.
The time steps for this model are months, and the
model is run until the proposition in question has
been decided. At the end of each month the situation
is evaluated, bargains are made or not made, and other
changes associated with the movement of time are taken
into account at one instant. If no decision is made
at the end of a time step, we adjust stochastically
the stock in trade of the aldermen to represent the
many political activities that are of far greater
interest to the daily life of the individual politi-
cian than to our model. We then proceed to the next
time step.

## The Selection of Functional Forms and Parameter Values

Since the choice of parameters and functional
relationships plays a crucial role in the behavior of
the model, a few words on the philosophy of these
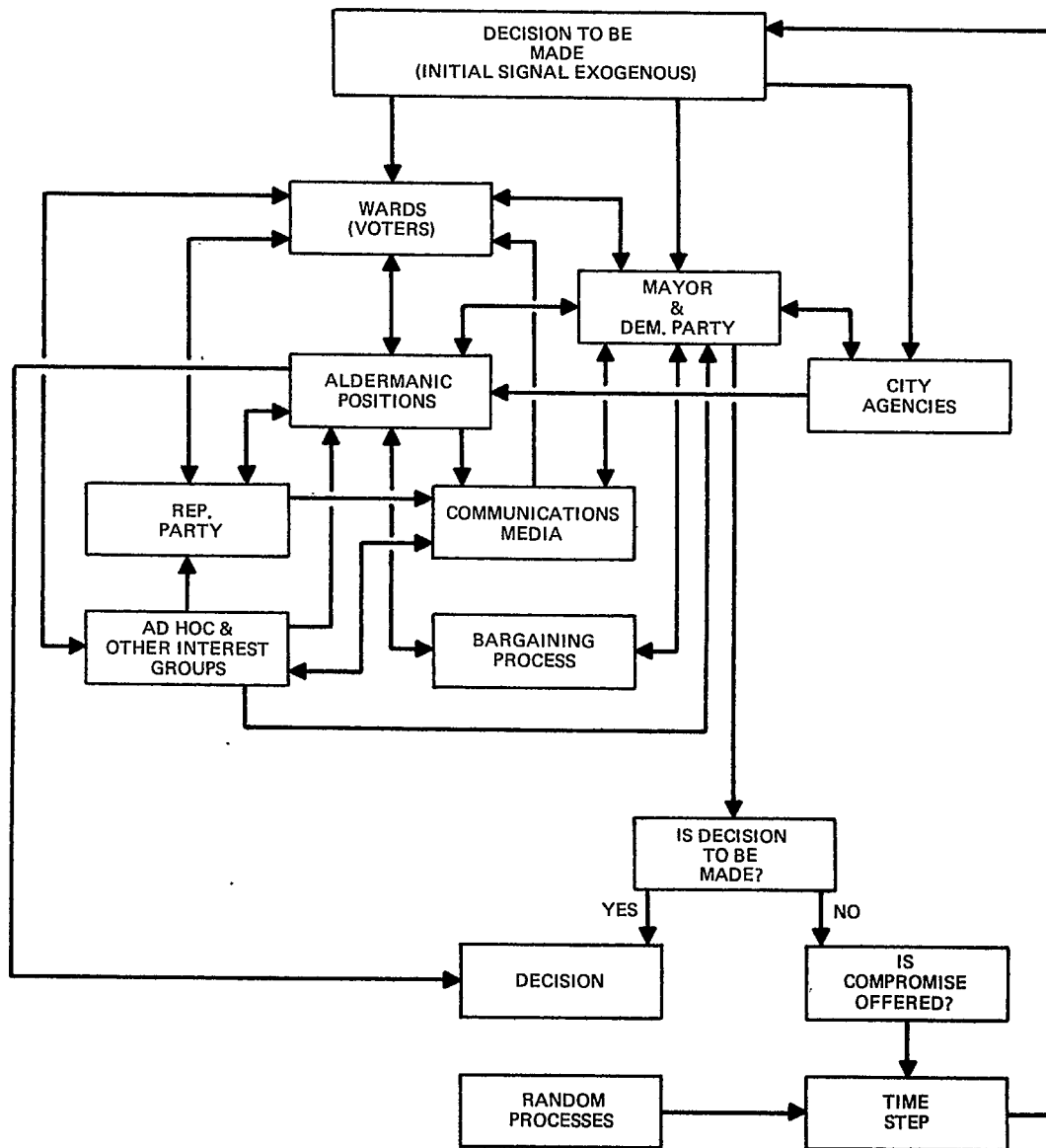selections may be in order.

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                  │          DECISION TO BE          │               │
                  │              MADE                │               │
                  │    (INITIAL SIGNAL EXOGENOUS)    │               │
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Figure 1 — General Structure of Political Model

Our basic approach has been to examine both quantitative data and descriptive information in some detail in order to gain insight into each pertinent major process. We seek to determine the essential behavior and constituents of each part of the process, so that we can determine the key variables, directions of and bounds upon the effects, and the relative importance of both the variables and the effects. We try, in this process, to get some indication of the general form of the relationship (linear, S-shaped, U-shaped, etc.) and to develop a feeling, without undertaking a major research project, for the mean and the variance of the intermediate and the ultimate results of the process. Only in this way can we hope to develop a realistic model in a reasonable time.

It is evident that a large number of qualitative constraints impinge upon the selection of the particular functional forms and numerical characterizations which the processes described in the model must obey. These constraints narrow considerably the possible range of forms and values that the numerical expressions of the model may take. The functional forms we have chosen are mutually consistent and are so "scaled" that, in our model, they produce effects of approximately the desired magnitude.

## The Determination of Aldermanic Postures

We now begin the detailed description of our urban political model. Whenever a decision to be modelled is brought before the City Council, each ward is assigned two indices. One of these we call E, a measure of the impact of the proposed decision upon the welfare of the voters in the ward, as they themselves perceive it.[6] This perceived welfare index is a measure of the anticipated economic, social, and psychological impact on the life style of the voters. It can range from -3, a very strong anticipated negative impact on welfare, to +3, an equally strong positive impact. The other index, I, represents what we choose to call the "ethos effect". It represents a measure of the extent to which the voters in the ward, in choosing their positions on an issue, tend to take into account the welfare of people in other wards. Typically, wards composed primarily of the middle and wealthier classes, particularly if highly educated, tend to have values of I approaching the maximum (I = 2), while the poorer wards with a poorly educated populace tend to have I = 0, or even negative.

Values of E and I are assigned not only for the original proposition, but also for its rejection and for several compromise positions. Both indices are chosen on the basis of the socio-economic characteristics of the people in the ward. The "natural position" of the alderman is determined from the values of E and I for the original proposition, and represents the posture the voters of the ward would prefer him to adopt.

Each alderman is assumed to have a certain amount of political capital at the start of the period. One component of this capital is the excess number of votes, over the minimum required for election, that the alderman can expect to get at the next election. The second component is the stock of jobs and favors which he can dispense. The alderman is also characterized by the estimated maximum number of votes he can expect to gain in the next election and by a parameter representing his relative strength and influence in the City Council. All these parameters are initially exogenous, but the vote parameters are modified endogenously.

To see how the alderman determines his position, an examination of Figure 2 will be helpful. The alderman may adopt any of five positions (-2, -1, 0, +1, +2), representing the range from strong opposition to strong support of the proposition. We assume each alderman has a utility function which permits him to aggregate the individual components of his political capital into a single index. We assume that the aldermen will choose a posture which will maximize the expected value of his utility function.[7] By hypothesis, his utility function reflects the observation that he is generally reluctant to adopt a non-neutral position unless he expects strong backing for this position by his supporters.

The alderman estimates the probabilities associated with the passage or failure of the proposition and with the acceptance of the two compromise positions on the basis of his personal knowledge of the postures of the other aldermen.[8] He weights their votes by the product of their strengths in the City Council and their positions. This weighting reflects, first, the fact that a strong alderman carries more weight in the ultimate decision and, second, the likelihood that an alderman who feels more strongly will be more successful in gathering uncommitted votes.

The alderman estimates his vote payoffs from a specified function of E, I, and V. His vote payoff matrix consists of two components, one of which depends solely on which of the possible outcomes of the proposition in question will take place, and one which depends only on the position adopted by the politician. The result component depends, in addition, on the difference between the E and I for the result as compared with the E and I for the original proposition, as an adverse result which is better than expected is received more favorably than the same result would have been if it had been completely anticipated.

In constructing the position component we assume that the penalties for being wrong are larger than the rewards for being right, and that the big jump in votes comes where the alderman switches from the "right" position to the "wrong" position, with lesser changes being associated with different degrees of intensity of rightness or wrongness. Since we also believe that there is a saturation effect to the number of votes one could lose and to the number of votes one could gain as one goes towards extreme positions, we use an S-shaped fit for this component of the vote payoff matrix.

The alderman also allows for an unforeseen "disaster". The disaster probabilities and penalties are assigned stochastically, with a higher average probability being associated with a less central position and a higher average penalty going with a position further from the natural position of the ward's voters.

The alderman's job payoff matrix is a function of outcome alone. It is constructed from exogenous parameters representing the number of new patronage jobs that will become available, the fraction he would normally get, and the additional jobs (if any) he may be awarded to compensate him for whatever damage the proposition or compromise may cause him with the voters in his ward.

The alderman's vote payoff matrix is then modified by several effects intended to reflect some additional aspects of reality. The clique to which he belongs (see below) will tend to move his position towards the mean position of the clique members (clique effect). The announcement of a position on the issue by the mayor will influence some voters, as will an announcement of a Republican Party position in Republican wards. The impact of publicity through the mass media and through various pressures exerted by interest groups will also be taken into account, though probably through a different mechanism.

Job payoffs will also be modified by the actions of interest groups.

After all these adjustments are made, the alderman is ready to enter the bargaining process.
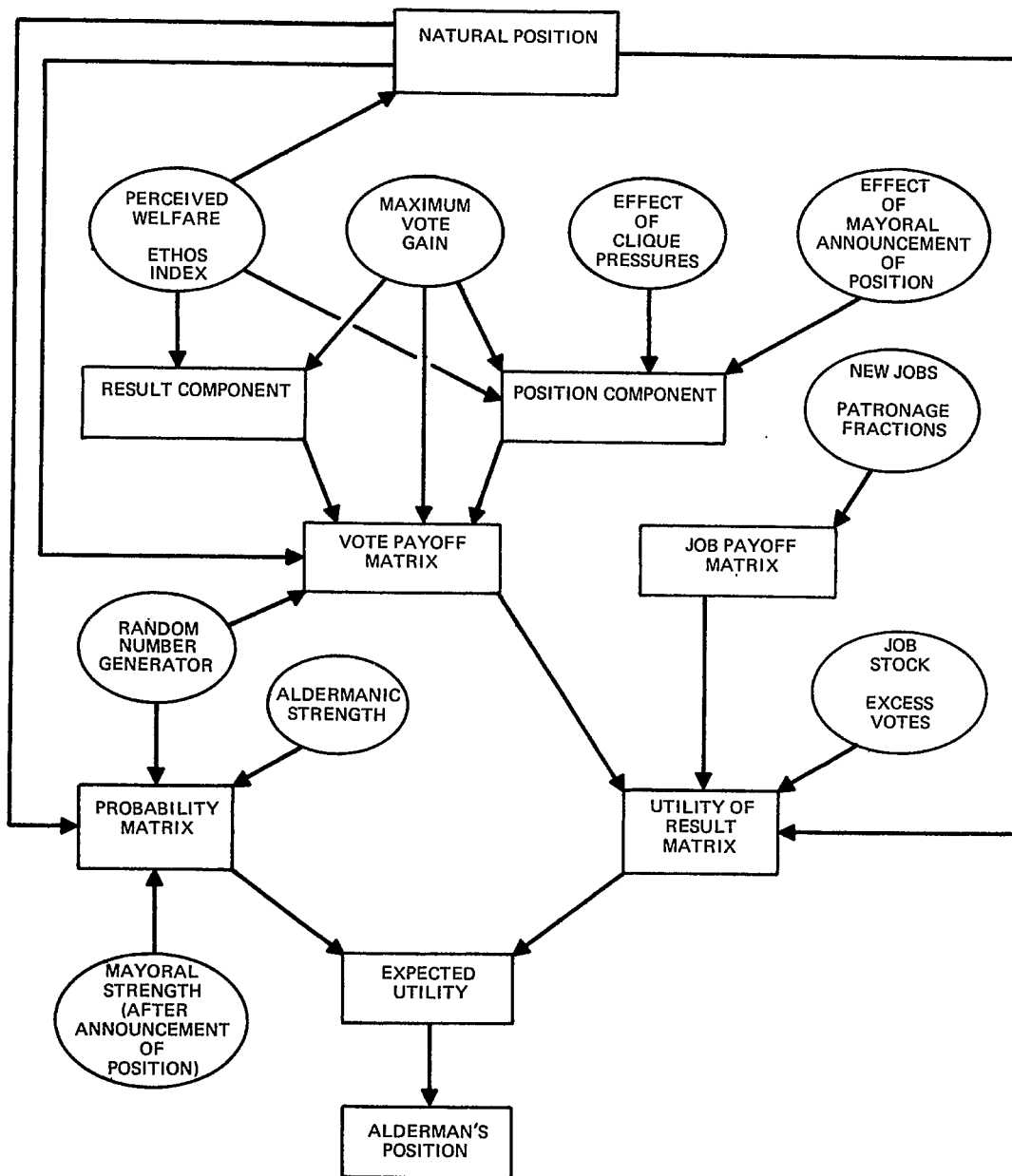
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Figure 2 -- Aldermanic Position Calculation

## The Bargaining Process

The bargaining process consists of attempts by those aldermen who feel strongly in one direction or another to pick up support from those who feel less strongly. Since there is no real way, in our model, by which an alderman can directly affect the electoral voting in another alderman's ward, the payoff for switching positions comes in terms of jobs and favors. The payoff can be direct or, through a deal on some other proposition, indirect. We postulate that each alderman who wishes to procure additional help will compute (however subconsciously) the increase in expected value of utility that he would get from this additional help (because of the increased probability of the passage of the legislation which he favors), and those who feel less strongly will compute the amount of compensation in terms of jobs that would be required to persuade them to change their votes. Whenever an alderman who wishes to gain a vote can offer enough to an alderman who is willing to sell his, a bargain may be struck at some intermediate value of jobs exchanged.

The complications arise when we try to make this process more realistic. We first recognize that aldermen, like other people, tend to form cliques, within which communication is relatively rapid, reliable, and well received. We therefore divide all aldermen into three groups: members of one clique, members of a second (rival) clique, and non-clique members. We now take into account the following factors (the strength of which may vary with the stage of development of the controversy):

(1) An alderman would rather gain an ally who is strong than an ally who is weak;

(2) He would rather convert someone else to a comparable degree of enthusiasm than simply gain an extra vote;

(3) He would rather deal with someone in his own "clique", rather than someone with whom he has less rapport; and

(4) A proposed deal or bargain might not be accepted (or even offered--communications sometimes break down).

The bargaining process evolved for this model therefore goes as follows (see Figure 3). We first separate our aldermen into two groups, those with a position of +2 or -2, and those with intermediate positions. Those in the extreme positions are potential buyers (of City Council votes) and are eligible to make deals by offering to give up some number of their jobs and favors in order to get another alderman to change his position. However, they cannot change their own positions in order to accept jobs from another alderman. The other group (potential sellers) can accept jobs in return for a shift in position, but they cannot offer jobs to others. The bidding and asking prices are determined for each alderman by the change in expected utility of a possible transaction. If the bidding price exceeds the asking price for a buyer-seller pair, a deal can be struck through the bargaining procedure, and the appropriate changes in position and job stocks can be made. If, as the result of a deal, an alderman changes his position from, say, +1 to +2, he can then try to gain additional votes in his own right in a later time step.

The bargaining procedure itself (see Figure 4) is complicated by the factors indicated above. After one of the buyers is chosen at random, a search is made for a potential seller among the strong aldermen. The buyer has a preference (in order) for gaining a new ally, precluding the opposition from gaining an

ally, or moving a neutral alderman to a favorable position. He would also rather deal with a member of his own clique than with a non-clique member or a member of a rival clique (in that order). He therefore adjusts his bidding price and his order of searching for a deal to reflect these preferences. If he cannot find a strong seller, he seeks a deal with a weaker alderman, searching again in the same order. Meanwhile, each potential seller adjusts his asking price and his probability of acceptance to reflect clique membership. The search for a deal continues by each buyer in turn until he makes a deal or learns that a deal is impossible in the present period. In either case he is done with the bargaining process for the period, as no more than one deal per participant is allowed per period.

If, at some point in this process, a deal is possible, as signalled by the buyer's offering price exceeding the seller's asking price (with all the adjustments due to clique and position taken into account), a deal is offered at a price one-third of the way from the seller's price to the buyer's price. The probability that the deal will be accepted depends both on whether the two parties are in the same clique and on the difference between the price offered and the seller's asking price. The outcome is then determined stochastically.

If a deal is rejected, then the search for a seller continues as if this deal had not been possible. On the other hand, if a deal is accepted, the appropriate position changes and transfers of jobs are made, and both the buyer and the seller are excluded from further participation in the bargaining process during the current period.

## The Mayor and the Democratic Party

There are so many possible variations of city governmental organization that it is not profitable to develop a single model that will encompass all major structural forms. The present model is designed to be applicable to cities in which the mayor, as well as the aldermen, are elected on a de facto partisan political basis. We treat the mayor and his local party organization as a single actor in the city drama, an assumption that appears to be valid for most partisan cities most of the time.[9]

Within this framework several postulations of mayoral behavior are possible. The mayor may choose to operate primarily as a mediator of conflicting interests, using his good offices to assist the contending parties and the contending aldermen to arrive at some mutually acceptable agreement or compromise. Alternatively, his philosophy may be more that of a leader of the city, in which case he will tend to intervene far more often, particularly in major decisions, in order to bring about results which he deems desirable. In either role he may be strong or weak, i.e., effective or ineffective. We believe that all four combinations of characteristics are possible; the experienced observer of the urban scene can probably give examples of each. To date we have programmed only a strong interventionist mayor, analogous to Daley of Chicago.

The mayor, like the aldermen, has a set of perceived welfare and ethos indices for any controversial issue. However, for the mayor these values of E and I represent an assessment based not on voter opinion, but rather on what he thinks is good for the city, the party, and himself. His natural position on the issue, derived from his values of E and I, is his future public position.

Whether and when he announces his position on the issue depends on what that position is, his assessment of the prospects for success, and the age of the
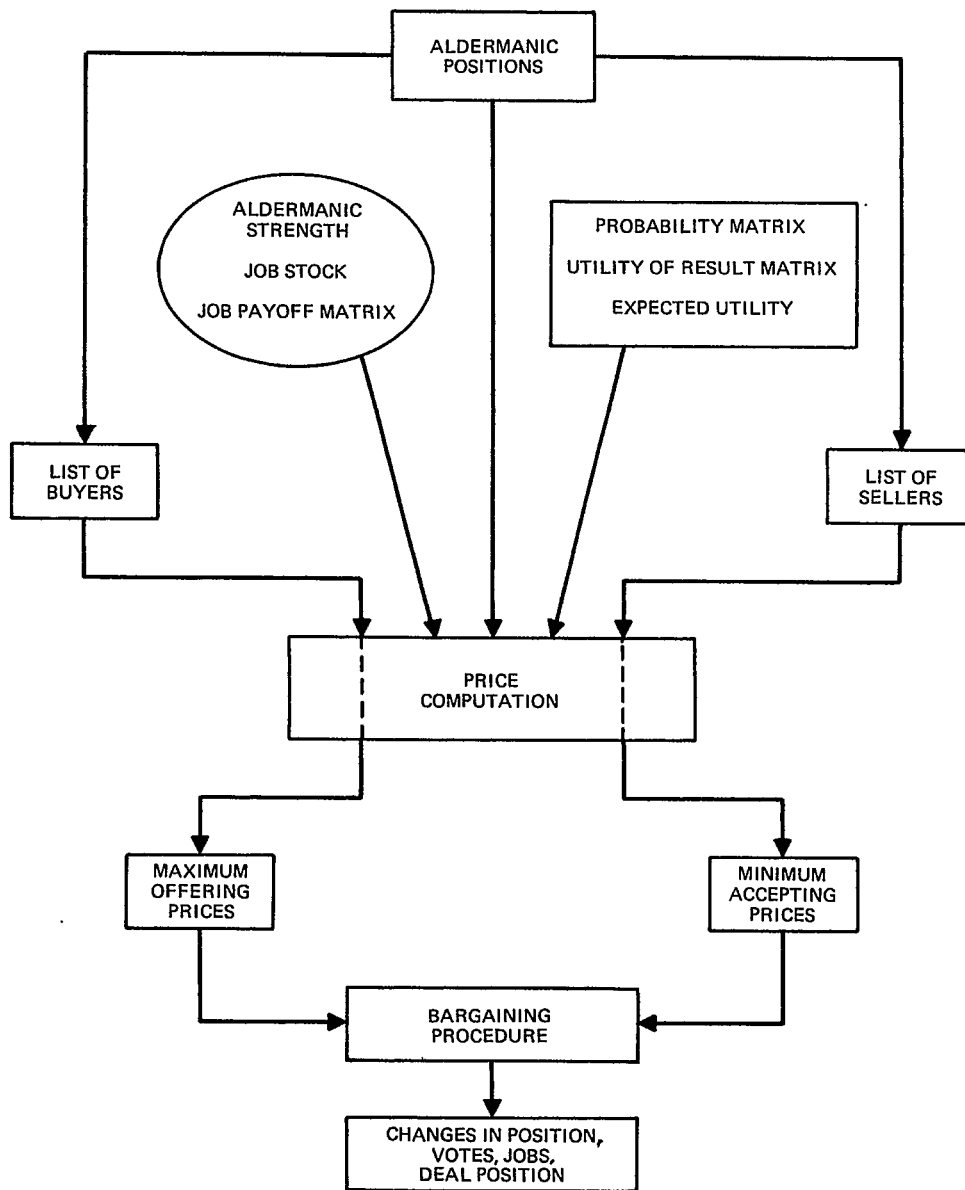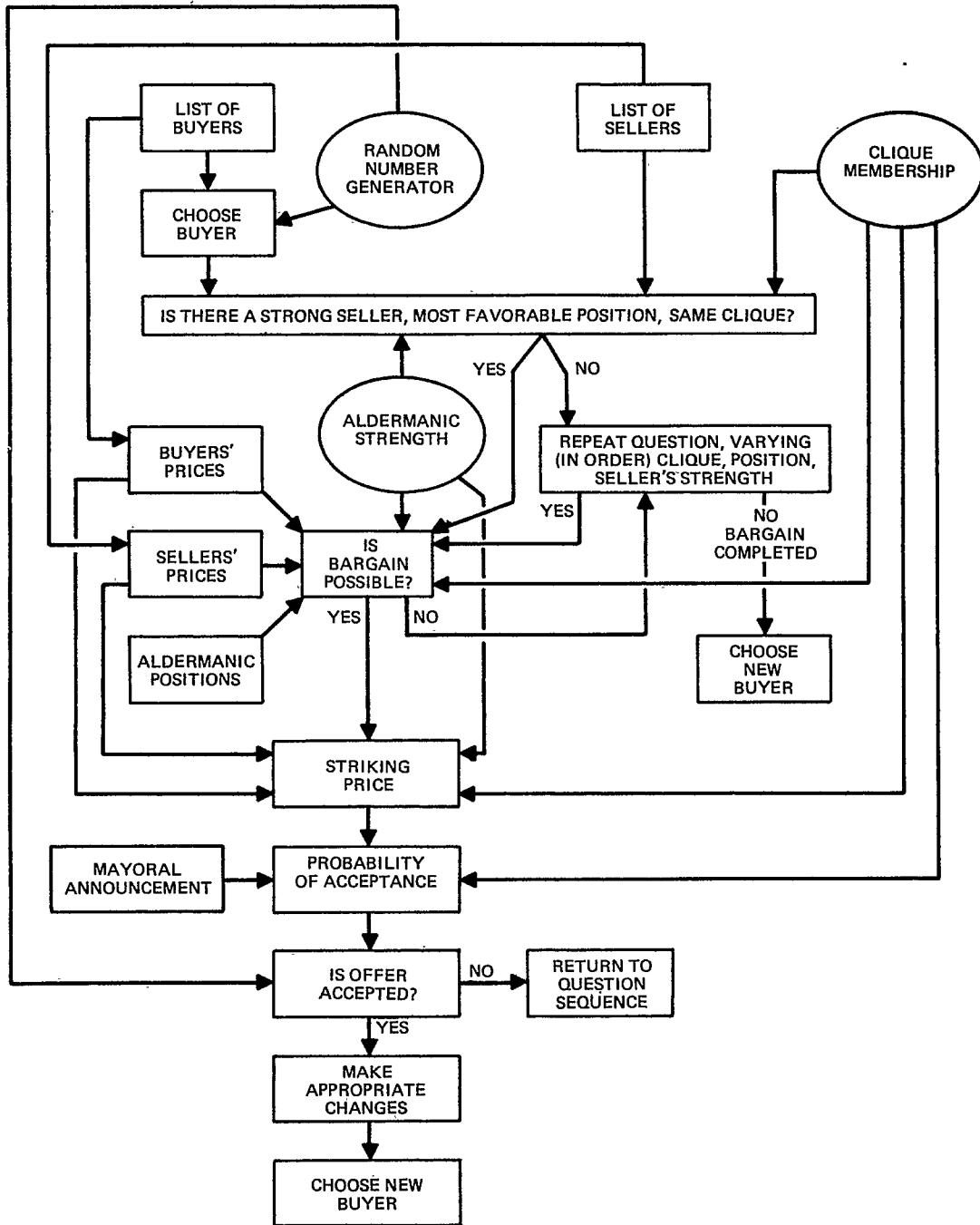
Figure 3 — Bargaining Process

Figure 4 — Bargaining Procedure For Each Buyer

controversy. The mayor will tend to announce if he has a significant probability of influencing the result, if a decision in his preferred direction is virtually a sure thing, or, possibly, in desperation to try to avert defeat against strong odds.

The probability of a mayoral announcement also depends on the level of conflict in the community. Conflict is measured by five indices, three of which are based on the number of Democratic, Republican, and total (respectively) aldermen who hold extreme positions. The fourth index is the number of wards that are split significantly by the controversy. The fifth measure of intra-city conflict is intended to represent the fact that any fight over an issue important to the participants tends to create resentment over the actions and tactics (and inferred actions and inferred tactics) of the participants.

The vote payoff matrix for the mayor is constructed (except for his "disaster") from the aldermen's vote payoff matrices, as one of the criteria by which the mayor's performance is judged by other party officials is party success at the polls. These payoffs are then modified by postulated effects of the level of conflict in the city. The mayor's "disaster" is computed stochastically (like that of an alderman), but also depends upon the level of conflict within the city, and particularly on the amount of dissention in the Democratic Party ranks.

For the mayor's job payoff matrix we assume that half of the available patronage is distributed by the aldermen, and that the mayor controls the Democratic Party's share of the rest, along with any personal "fiefs" he may have developed.

From his vote and job payoff matrices the mayor can compute his expected utility. He uses this quantity, however, only to govern his bargaining behavior after he has announced his position, as his position itself is governed by "higher" considerations.

The mayor plays a key role in the operation of the model in a number of ways. First, through a set of decision rules, the mayor determines when a binding vote is to be taken on the issue in question and when a compromise should be introduced. Second, even before the mayor's position is announced, the character of the mayor determines the extent of bargaining in the early periods of the controversy, a strong mayor inhibiting inter-clique bargaining for several months. Third, an announcement of the mayor's position triggers a variety of effects. His position, with a strength at least equal to that of a powerful alderman, is thereafter considered in aldermanic calculations of the subjective probability of passage of the proposition. We assume that the announcement triggers off enough political action to update all aldermen's information on the positions of their colleagues and, at the same time, to suggest a recalculation of the "disaster" effects. The aldermen's vote payoff matrices are directly affected, and the clique effect is reinforced. The mayor's announcement (if not an expression of neutrality) increases the probability of acceptance of bargains offered in the direction of the mayor's preferences and decreases the probability in the opposite direction. The mayor may himself enter the bargaining process, if he has announced an extreme position, as a potential buyer of votes, with all the resources of the Democratic Party behind him. In this process he is treated as a member of all cliques.

These mayoral effects are intended to put into the model some of the realities of mayoral power, particularly when the mayor is strong.

## The Republican Party

While the Republican Party in a Democratically-dominated city like Chicago is quite weak at the polls, it still plays some role in city decision-making, partly because it is not totally impotent and partly because the county and state governments may be strongly Republican. We assume in our model that the announcement of the Republican Party position will influence the payoff matrices of the Republican aldermen and will provide some reinforcement of the clique effect for all aldermen. In addition, if the Party takes an extreme position on the issue in question, it may enter the bargaining process. In this event, Republican aldermen are treated as clique members and Democrats as members of the rival clique.

## Events at the Time Step

One of the crucial assumptions we make, and one we believe to be quite realistic, is that an alderman's stock in trade (votes he can expect in the next election and his supply of potential jobs and favors) is not determined to any large extent by the decisions which we wish to portray in our model, but rather depends on the accumulation of small actions that an alderman takes for his friends and constituents and that have no real long-run impact on the operation of the city. We believe, for example, that an alderman's real currency, in ethnically oriented wards at least, comes when he helps some of the neighbors at Christmas time, aids victims of a fire, or helps to get the streets cleaned or to improve garbage pickup, and so on. And in the wealthier wards, his stock in trade tends to be based on his "overall image" and on "string-pulling".

To represent these kinds of processes in a realistic way is not very useful from our point of view and probably intractable as well. We therefore treat these effects as a sequence of stochastic processes which, at each time step, alter both the job stock and the expected vote parameters.

Mayoral, Republican Party, and interest group announcements are considered at the time step. At longer intervals, the Mayor reviews his decision rules for a possible City Council vote or the introduction of a compromise, and at comparable intervals, the aldermen occasionally recalculate their disaster probabilities and penalties.

We take into account explicitly the growth in the voter population and the possibility of trends in the national election picture. We assume that the change in votes due to national trend is unidirectional for six months, with its sign redetermined stochastically at the end of that period.

At the time step we also change some of the conflict indices both stochastically and systematically to reflect polarization, mediation, and "time-heals-all-wounds" effects.

## Model Validation

One of the thorniest aspects in model building is the determination of the extent to which the model offers a reasonable description of reality. This problem is exacerbated, in the present case, by the fact that the parameters and functions used in the model are based on descriptive and qualitative inputs derived from case studies of urban political processes, rather than on statistical fits to firm quantitative data.

The validation process we intend to apply will be the analysis of the model to see whether the dynamic behavior of the model as a whole approximates the qualitative features of the process of urban political decision-making. That is, we do not intend to examine the individual fits of the several pieces of the model, but rather we shall ask whether the entire approach is concordant with generally accepted views of the political process in an urban environment.

Intimately associated with the validation process is the question of the sensitivity of the model performance to changes in model parameters and functional relationships. Since one can put reasonable bounds on the values of many of the inputs and intermediate outputs, one can determine which processes and parameters must be at least moderately well understood and which are unimportant to the outcome and operation of our model of the urban political process.

In view of the stochastic nature of the model, we cannot require that the outcomes and sequences of events produced by the model for a specific controversy simulate precisely the actual sequences and outcomes of the real-life events that are being represented. The model must, however, be able to reproduce, with some reasonable probability, outcomes and dynamic processes close to those actually observed.

## Status of the Work

At the time of writing, the model as described above has been programmed (in PL-1) for an IBM 360/65 computer. A formulation of the role of the media and the interest groups has been worked out and will be discussed at the conference. Sensitivity runs, a prerequisite for validation, are being prepared.

## References

1  We are indebted to the Center for Advanced Study in the Behavioral Sciences for support of this project and to the National Science Foundation for the senior post-doctoral fellowship which has assisted one of us (I.A.) in this effort.

2  We are indebted to A. Tversky for this rather descriptive term.

3  Myerson, M., and Banfield, E.C., Politics, Planning And The Public Interest, The Free Press (Glencoe, Ill.), 1955.

4  Myerson and Banfield, op. cit., pp. 26-27.

5  For a city in which the mayor and his political party need to be represented separately, the two parties would play analogous roles.

6  Facts have very little to do with the value of E; if the people in the ward think that a particular act will cause property values to decline or "undesirable people" to move into the neighborhood, then no number of studies which indicate that these effects will not occur will affect the value of E.

7  Other decision rules can be assumed, if desired, for some or all of the aldermen.

8  We assume that information is generally imperfect among the aldermen, with periodic updating.

9  New York City is a prominent exception.