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Voting on the "Optimal" Size of Government

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Abstract

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represent those of the IMF or IMF policy. Working Papers describe research in progress by the
author(s) and are published to elicit comments and to further debate.

Viewing fiscal policies as the outcome of democratically resolved conflicts of households
over public goods and taxes, the "economic model of politics" proposes a public choice
approach, which does not rely on social welfare functions. With it, a country's overall budget
can be derived endogenously, electoral fluctuations explained on the basis of changes to the
individuals' income and wealth, and political behavior described in terms of the individuals'
decisions regarding votes, abstentions, and party membership. The model suggests that a
country's wealth distribution is a crucial variable affecting its economic stability and the
government's size relative to output.

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I. INTRODUCTION

The extensive—and conceptually strikingly heterogenous—politico-economic literature (surveyed, e.g., by Frey, 1974; Alesina and Tabellini, 1988; Persson, 1988; Schneider, 1992; and Olters, 2000) is unified by the underlying premise that political decisions, in the absence of linguistic, religious, or ethnic divisions,[2] are essentially economic ones. However, whereas elections—often to a considerable degree—influence the fiscal policies pursued by governments installed on the basis of their results, government behavior is typically modeled exogenously, usually by means of a benevolent, permanently installed "social planner."

Ever since Samuelson (1954) managed to convincingly demonstrate that the decentralized pricing system was incapable of optimally allocating both private and public goods, elections were seen as a necessary complement to the market system, collectively determining the "generally desired" amount of public goods. The proposed "economic model of politics" (EMP) will therefore be based on a definition of "politics" as the social coordination mechanism resolving redistributive struggle among voters over the "optimal" size of government. The widely employed social planner approach, which abstracts from the notion of conflict, is hence viewed as being an unsatisfactory tool for the purpose of describing the political process that underlie the determination of fiscal policies.

As a whole, the contributions in the "economic theory of politics" (ETP) are based on the assumption that individuals' preferences for a certain political party mainly reflect either their concerns for the economy as a whole[3] or their socioeconomic status relative to others in the economy.[4] Hence, politics can be modeled with standard instruments of economic theory,

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[2] For politico-economic questions regarding the provision of public goods in ethnically divided regions, see, e.g., Alesina, Baqir, and Easterly (1999) and Kuijs (2000). Both studies find that the provision of public goods and the heterogeneity of the underlying society are negatively correlated (the former authors analyzed U.S. regions and cities, while the latter one replicated the results using cross-country data).

[3] See, for instance, the early political-business-cycle studies (Åkerman, 1947), the fundamental ETP contributions (Downs, 1957; and Frey and Lau, 1968), studies on vote and popularity functions (Kramer, 1971; and Stigler, 1973), and the Phillips-curve-based political-business-cycle models (Nordhaus, 1975; and MacRae, 1977), which have voters assess and vote on the macroeconomy.

[4] While the functional segmentation of an electorate along production factors—i.e., capital versus labor—has become increasingly more meaningless, the economic aspect of the electorate's socioeconomic categorization still plays an important role in determining the behavior of an individual inside the voting booth (see also Przeworski and Sprague, 1985), implying that, with increasing wealth, an individual becomes "more conservative." The underlying idea of politics being concerned with redistributive issues runs through the ETP literature from Kalecki (1943) to Hibbs' (1977) partisan theory and the current contributions

with votes but representing the economic agents' intrinsically rational responses to conditionally expected, policy-induced changes of variables directly affecting their respective levels of individual utility. The present paper will attempt exactly that, proposing a model that replaces exogenously defined social welfare or policy functions with individual utility functions determining votes, party membership decisions, and party platforms.

The EMP proposed here explicitly represents the pivotal interactions between the political and purely economic spheres of the model economy, demonstrating that households are *homines oeconomici* (who supply labor and capital and demand goods and services for consumption purposes) as well as *homines publici*. In their latter role, they decide on whether to participate in a general election and—if affirmative—how to vote, and whether to join a political party. In the latter case, members are entitled codetermine that party's preelection policy platform.[5] The households' incentives to participate in elections stem from the fact that, while economic actions influence individuals' gross incomes (i.e., their respective wage and capital earnings), their political decisions determine their salaries' net value and ability to consume public goods. Legitimized by the support of at least half the voters, the elected governments—"controlled" by the incumbent party's members—will be entitled to adjust the amount of publicly supplied goods and the corresponding rates of income taxes required to finance them.

In short, the total amount of personal satisfaction at the end of every period is the result of everybody's economic *and* political behavior. Since it is, after all, the individual who constitutes the theoretical nucleus of the explanation of economic and political outcomes, vote (rather than preference) aggregation will serve as explanatory variable for the determination of "optimal" economic policies.[6] As every individual is interested in an outcome in which the marginal amount of individually generated levels of utility derived

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on inequality and growth (Persson and Tabellini 1994; and Alesina and Rodrik, 1993 and 1994). The current study will complement this line of research.

[5] The political influence derived from the membership in a political party stems from that person's ability to pull that organization (marginally at least) in the direction of his or her optimal (or most-favored) program. Cardholding members will also ensure that a democratically legitimized political government will indeed exploit its temporary control over the available policy instruments to alter the state of the economy as announced in the constituting party's preelection platform. See also Aldrich (1983), who analyzes the implications of individuals' decisions to join a political party on the ensuing electoral dynamics, showing that, as a result, "parties might be characterized as 'semi-responsible' in the sense of providing both stable and opposing viewpoints..." (p. 97).

[6] The quotation marks indicate that the optimality concept employed throughout this paper is unrelated to the Pareto criterion. While every individual acts in his or her own best interest, the collective derivation of the economic policies to be pursued occurs on the basis of democratic rules.

from the availability of additional public goods exceeds the absolute value of the marginal disutility stemming from paying the correspondingly higher income taxes, the individually "optimal" level of government spending is attained at the point at which these two variables just balance. Obviously, the individual optimum is a function of that person's income and wealth. Once those "personal finance" variables change—e.g., as a result of the government's behavior—political preferences will adjust as well.

For reasons of mathematical simplicity, the EMP will require governments to balance their budgets in every period, levying a proportional income tax. Thus, policymakers decide "only" on how much to spend on the generally valued public goods and on how high to set the corresponding tax rates. It would be purely coincidental if any political party intended to spend exactly as much as any particular voter would have preferred it to. Generally, no program is—from that person's point of view—truly optimal. Nevertheless, one party's implicit policy outcome is likely to be superior to the one(s) offered by the opposing candidates. The voter, comparing the different levels of expected utility implicit in the parties' platforms, will cast his or her vote for those politicians whose party promises the highest degree of (expected) individual satisfaction in the parliamentary term ahead.

In line with Downs' (1957) initial—and, for the purpose of his subsequent analysis, abandoned—characterization of a political party, these organizations are represented as entities that are unable to derive utility independently. They therefore lack the capacity to devise policies that would follow the internal logic of a Downsian vote maximizer.[7] Owing to the costs of active political participation (membership dues as well as the long hours spent in meetings, discussions, and conventions), policy platforms represent partisan compromises that have been made within a political party to accomodate members' diverse policy preferences. By representing political parties in this way, it is easier to explain why, for instance, large groups of unpaid volunteers actively support candidates who, even if ultimately successful, would typically not be able to offer any direct benefits in terms of monetary compensation or professional promotion.

Describing political parties in this fashion has several—rather significant—implications. The most important one of these is the fact that partisan programs will change over time (even if technology and productivity do not). This could be the case either because new members join political parties (and/or others are leaving it) or because the policy-induced changes to the

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[7] The ultimately "non-Downsian" model design proposed here originates largely from the author's conviction that the direct analogy between political optimization problems (maximizing votes) and economic ones (maximizing consumption and profits) is misleading, mainly because the relationship between votes and political benefits is a nonmonotonous one. Whereas vote-share increases from, say, 48½ to 49½ percent (or from 50½ to 51½ percent) would add little or no extra benefits to the party and its politicians, the rise from 49½ to 50½ percent—marking the difference between opposition and incumbency—would generate (almost) all of the possible utility gains to be won in an election.

income and wealth variables cause a change in the active party members' political preferences.[8]

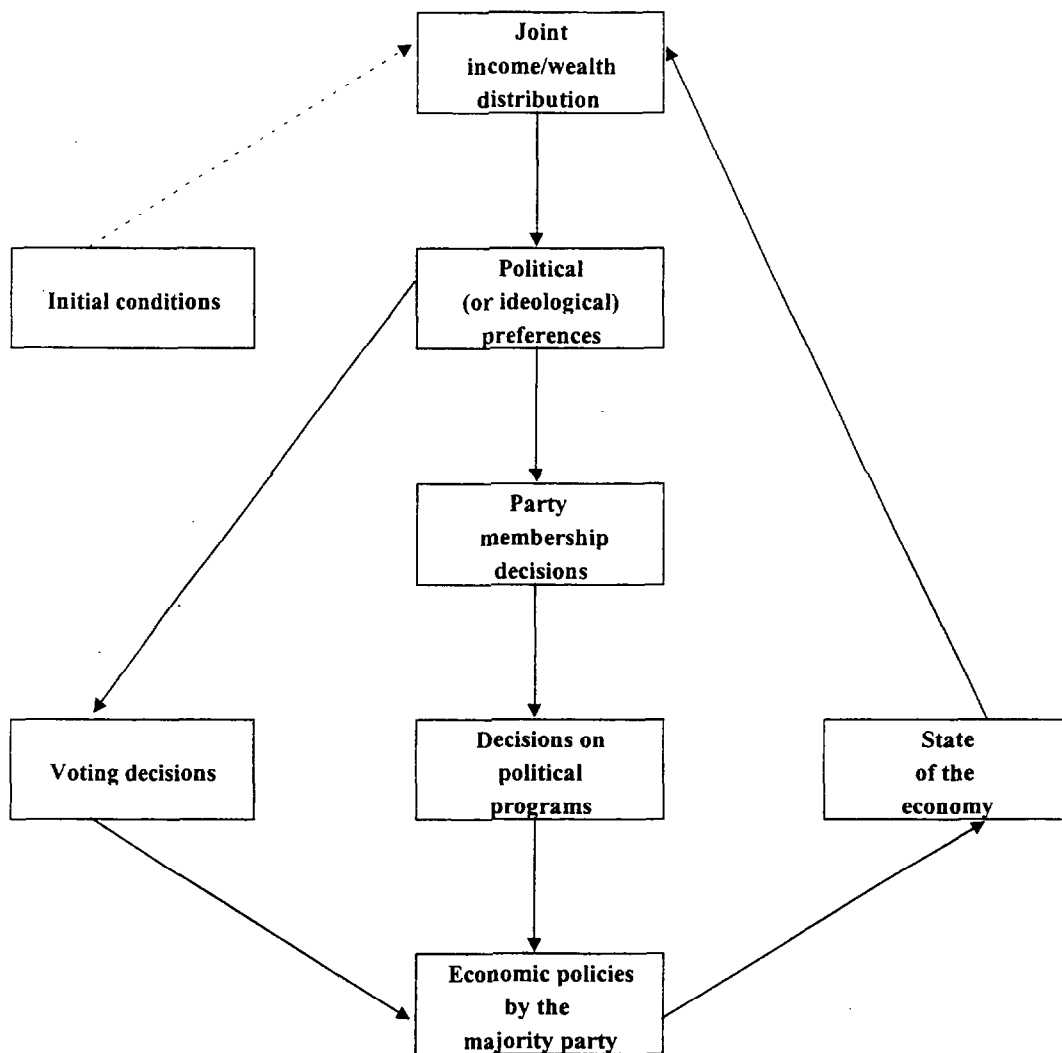## II. A POSITIVE MODEL OF "OPTIMAL" GOVERNMENT SPENDING

The flowchart of Figure 1 summarizes the sequence of economic decisions that will be considered below. Central to the understanding of the model is the particular positions of households within the income/wealth space, which determine the type of policies households would like to see pursued. These, in turn, influence the intensity of their political interest. If, as a result of the individuals' respective positions within the joint income/wealth distribution, their political concerns are exceptionally developed, these agents will have larger incentives not only to express their political preferences at the ballot box but also to join (and actively participate in) political parties. In that case, their votes count when it comes to determining the respective parties' policy programs.

In this context, it should be noted that the two political decisions are quite separate: while the electorate decides which party will form the next government, it is the members of the incumbent party who will choose the actual policies. These, in turn, affect key macroeconomic variables and the joint income/wealth distribution, which can be observed at the end of each parliamentary term, requiring individuals to decide on votes and party membership anew. The permanent reevaluation of both political decisions will be reflected in the succession of different governments and the gradual evolution of all the parties' policy programs. Thus, over the course of one period, denoted t and defined to consist of an entire parliamentary term, economic players will, in chronological order, make the following decisions and engage in activities as listed below:

(i)   The political party with a share of votes exceeding 50 percent (won in the general election held at the end of period $t - 1$) forms the government.

(ii)   In an attempt to improve the economic well-being of its members, the government implements its pre-announced platform.

(iii)   Individuals and firms optimally adjust their behavior to these new policies.

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[8] Socialist parties, in particular, which had—originally—represented workers with extremely meager incomes and without any nonhuman wealth, used to push for a very large public sector, supplying a wide range of public (as well as private) goods. Once these parties were able to implement a few of their programs, the partial redistribution of national income allowed workers to access education and health facilities, enjoy higher wages, and accumulate some wealth. Consequently, they began to join the "middle class." This change was reflected in the workers' political attitudes—with diminishing marginal benefits of public goods and increasing marginal disutility of higher taxes, "labor party" platforms, quite naturally, became increasingly more moderate. By historical standards, they are, in fact, rather "conservative" today; cf., e.g., Featherstone (1988).

Figure 1. On the Nature of the Politico-Economic Interaction

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                              ┌──────────────┐
                         ◄----│    Joint      │◄
                    .·        │ income/wealth │ ·
              ..·             │ distribution  │   ·
         ..·                  └──────┬───────┘     ·
    ..·                              │              ·
┌──────────────┐           ┌─────────▼─────┐         ·
│              │           │   Political   │          ·
│ Initial conditions │     │ (or ideological) │        ·
│              │       /   │  preferences  │           ·
└──────────────┘      /    └───────┬───────┘            ·
                     /             │                     ·
                    /      ┌───────▼───────┐             ·
                   /       │     Party     │             ·
                  /        │  membership   │             ·
                 /         │   decisions   │             ·
                /          └───────┬───────┘             ·
               /                   │                     ·
       ┌──────▼──────┐    ┌────────▼──────┐    ┌─────────▼────┐
       │             │    │ Decisions on  │    │    State     │
       │ Voting decisions │ political     │    │   of the     │
       │             │    │  programs     │    │  economy     │
       └──────┬──────┘    └───────┬───────┘    └──────▲───────┘
               \                  │                  /
                \         ┌───────▼───────┐         /
                 \        │ Economic policies │    /
                  ◄───────│    by the     │────►
                          │ majority party │
                          └───────────────┘
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(iv)   The end-of-period states of the relevant macroeconomic variables, affected by the incumbent government's fiscal policies, are revealed.

(v)   Individuals decide whether to join a political party, stay in it, or discontinue membership.

(vi)   Party members decide on their respective party's policy program.

(vii) Nonindifferent voters express their political preferences at the ballot box.

Step (vii) closes the cycle, leading up to the subsequent period's announcement of the election result and the formation of a new government. Within this sequence of events, the joint income/wealth distribution affects the economy in two ways. First, it explains the frequency of changes in government—or, inversely, the likelihood of political dynasties.

Second, it derives the "optimal" size of government as desired by the competing parties. These two effects combined will thus determine the severity and magnitude of the shift in economic policies when there *is* a change in government.

A. Assumptions

The underlying economy is described by a stylized, shockless real business cycle-type macroeconomic model. Basic economic decisions are made in the three traditional markets—goods, capital, and labor. The following list of additional assumptions will help to keep clear the view on the essential elements of the model: the economy is closed; the population (the labor force/the electorate) does not grow; prices in all markets are flexible; there is no technological progress; government consists of only one (the federal) level; policymakers are obliged to balance their budgets at all times; and there is no inflation.[9]

B. The Economy

Firms supply goods and services at market prices, which households consume together with the public goods (financed by the government with the revenues from a proportional income tax). The publicly provided commodities, while valued by the voters, neither stimulate nor retard economic growth throughout the course of the current legislative period. A standard Cobb-Douglas production function allocates an income share α (with $\alpha < 1$) to the production factor capital and β (with $\beta < 1$) to labor.[10] A is the economy's productivity parameter. Therefore,

$$(1) \qquad Y_t^{\,S} = A\,K_{t-1}^{\alpha}\,N^{\beta},$$

where K_{t-1} represents the stock of capital accumulated until the end of period $t - 1$ for production in period t (i.e., K_{t-1} is generally known in t) and N the labor force.[11]

Consequently, the output level Y_t^S, which is produced by utilizing all available production factors at "normal" levels, is not a function of the economic policies pursued by the government elected for period t. Assuming unfettered competition, all production factors are paid their marginal products. Aggregate capital income, $r_t\,K_{t-1}$, thus equals αY_t^S and

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[9] The last assumption can be rationalized by viewing decisions regarding the appointment of central bankers and the design of monetary policies as being taken outside the democratic process.

[10] Since the variable K_{t-1} is defined to be the amount of capital accumulated by the end of period $t - 1$, available for production in t, the production function exhibits the constant-returns-to-scale property if $\beta = 1 - \alpha$.

[11] Given the assumption of a constant population size, N does not have a time subscript. The particular form of the production function presupposes that labor is inelastically supplied.

aggregate labor (or wage) income, $w_t N$, in the general case, βY_t^S, and, given a constant-returns-to-scale production function, $(1 - \alpha)Y_t^S$.

In this closed economy, goods and services will be demanded by the private sector for either consumption, C_t, or investment, I_t, purposes and by the government for the provision of the public good, G_t. Therefore,

$$(2) \qquad Y_t^D = C_t + I_t + G_t.$$

Goods markets are assumed to clear continuously, i.e., $\forall t$, $Y_t^S = Y_t^D \equiv Y_t$. (As the derivation of the "optimal" amount of government spending motivates this paper, G_t will be derived in the following.)

For reasons of mathematical simplicity, it will furthermore be assumed that the underlying decision-making processes leading to the private sector's determination of both consumption and investment decisions remain stable over time and can be represented by linear equations with econometrically determined parameters. It will be supposed that these are significant and general knowledge. Subsequently, expected consumption will be tested as follows, using both Keynesian and long-run representations[12]:

$$(3) \qquad c_{it}^a = \hat{\varepsilon}_{i0}^c + \hat{\varepsilon}_{iy}^c (1 - \tau_t)(w_{it} + r_t k_{it-1}),$$

$$(4) \qquad c_{it}^b = \hat{\varepsilon}_{ik}^c \left(k_{it-1} + (1 - \tau_t)(w_{it} + r_t k_{it-1}) \right).$$

In equation (3), $\hat{\varepsilon}_{i0}^c$ represents autonomous consumption, $\hat{\varepsilon}_{iy}^c$ the marginal propensity to consume, τ_t a proportional income tax, and w_{it} individual i's wage rate. In (4), $\hat{\varepsilon}_{ik}^c$ symbolizes i's propensity to consume out of nonhuman wealth (or "cash on hand"). To generate a dispersion in labor incomes, it will be assumed that every individual i possesses a particular, exogenously determined degree of labor productivity, denoted ϕ_i, so that $w_{it} = \phi_i w_t$, where $\phi_i \in \mathbb{R}^+$ and $N^{-1}\sum_{i=1}^{N} \phi_i = 1$. Individual i's wealth, k_{it-1}, is

$$(5) \qquad k_{it-1} = \sum_{s=0}^{t-2} \left\{ \prod_{q=s+1}^{t-1} (1 + r_q) \right\} \left((1 - \tau_s) y_{is} - c_{is} \right).$$

Defining $\hat{\varepsilon}_0^c = \sum_{i=1}^{N} \hat{\varepsilon}_{i0}^c$, $\hat{\varepsilon}_y^c = \dfrac{1}{N}\sum_{i=1}^{N} \hat{\varepsilon}_{iy}^c$, and $\hat{\varepsilon}_k^c = \sum_{i=1}^{L} \hat{\varepsilon}_{ik}^c$, equations (3) and (4),

respectively, can be rewritten to yield an expression for aggregate consumption:

$$(6) \qquad C_t^a = \hat{\varepsilon}_0^c + \hat{\varepsilon}_y^c (1 - \tau_t)\left(w_t N + r_t K_{t-1} \right),$$

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[12] Same lower-case letters indicate macroeconomic variables expressed in per capita terms.

$$(7) \qquad C_t^{\ b} = \hat{\epsilon}_k^c K_{t-1} + \hat{\epsilon}_k^c (1 - \tau_t)\left(w_t N + r_t K_{t-1}\right).$$

To simplify the notation for the remainder of this paper, the expressions $\hat{\epsilon}_0^c$ of equation (6) and $\hat{\epsilon}_k^c K_{t-1}$ of (7) will be denoted by $\hat{\epsilon}_{1(t-1)}^c$. Analogously, $\hat{\epsilon}_2^c$ will be used in lieu of both $\hat{\epsilon}_y^c$ and $\hat{\epsilon}_k^c$. Therefore,

$$(8) \qquad C_t = \hat{\epsilon}_{1(t-1)}^c + \hat{\epsilon}_2^c (1 - \tau_t)\left(w_t N + r_t K_{t-1}\right).$$

With a balanced-budget requirement, tax revenues, by definition, are equal to government spending, i.e., $\tau_t Y_t \equiv G_t$. Rewriting the goods market equilibrium condition in (2)—and substituting (8) and the balanced budget expression into that equation—yields an expression for aggregate investment (or, equivalently, an expression for the demand for loanable funds):

$$(9) \qquad I_t \equiv \sum_{i=1}^{L} s_{it} = -\hat{\epsilon}_{1(t-1)}^c + (1 - \hat{\epsilon}_2^c)(1 - \tau_t) Y_t.$$

Consequently, higher government expenditures, requiring higher income tax rates, reduce aggregate consumption and crowd out private sector investment as $\partial I_t / \partial \tau_t = -(1 - \hat{\epsilon}_2^c) Y_t < 0$. This outcome will affect the next period's—and the next government's—ability to produce goods and services. Every individual inelastically supplies one unit of labor in exchange for a paycheck, which is equal to his or her marginal contribution, i.e., $w_{it} = \phi_i w_t$.

C. The Electorate

While the function according to which households derive utility is identical for all individuals, every voter is "individualized" through the assignment of a particular socio-economic status (i.e., by assuming a distinct, exogenously determined degree of labor productivity—and, consequently, wage income—and by allocating particular initial endowments of wealth).

The voters generate satisfaction, denoted u, using a utility function with present-period consumption of both private goods, c_{it}, and a public good, G_t, as variables. The valuation of the latter variable is dependent on the parameter λ, which captures the cultural differences in the valuation of the public good:

$$(10) \qquad u_{it} = u\left(c_{it}(\tau_t), G_t, \lambda\right),$$

where $\partial u_{it} / \partial \tau_t < 0$ and $\partial u_{it} / \partial G_t > 0$. The two politically determined variables—τ_t and G_t—thus directly affect i's degree of material satisfaction; see equations (3) and (4). Therefore, the trade-off between the marginal disutility caused by an incremental increase in taxes and the marginal utility generated by a corresponding expansion in the provision of the public good ultimately determines i's political preferences.

Households form expectations in a manner consistent with Simon's (1982) approach; being "boundedly rational," they understand the underlying model as much as the government does, and they possess the ability to form conditional expectations over the one parliamentary term ahead. They are familiar with the relevant econometric techniques needed to make learned forecasts—or, at a minimum, they have costless access to the results of these estimates. Before casting their votes, households calculate the expected income tax rates and the amount of the public good implicit in the policy programs presented by the competing parties. On that basis, they compare their expected conditional utility payoffs—see (10)—and decide on their voting intentions accordingly:

$$
\left.\begin{array}{l} v_{it}^{(+j)} = 1 \\ v_{it}^{(-j)} = 0 \end{array}\right\} \text{ iff } u_{it}\left(c_{it}^{*(+j)}, G_t^{*(+j)}, \lambda\right) - u_{it}\left(c_{it}^{*(-j)}, G_t^{*(-j)}, \lambda\right) > \Xi,
$$

$$
(11) \qquad \left.\begin{array}{l} v_{it}^{(+j)} = 0 \\ v_{it}^{(-j)} = 0 \end{array}\right\} \text{ iff } \Xi \geq u_{it}\left(c_{it}^{*(+j)}, G_t^{*(+j)}, \lambda\right) - u_{it}\left(c_{it}^{*(-j)}, G_t^{*(-j)}, \lambda\right) \geq -\Xi,
$$

$$
\left.\begin{array}{l} v_{it}^{(+j)} = 0 \\ v_{it}^{(-j)} = 1 \end{array}\right\} \text{ iff } u_{it}\left(c_{it}^{*(+j)}, G_t^{*(+j)}, \lambda\right) - u_{it}\left(c_{it}^{*(-j)}, G_t^{*(-j)}, \lambda\right) < -\Xi.
$$

The (exogenous) parameter Ξ represents the cost of voting; it is assumed to be small. The superscripts $*(\pm j)$ denote the conditional expectations given the implementation of party $(\pm j)$'s policy program. In cases in which the expected utility differences are smaller than the cost of voting, i is indifferent and therefore abstains from voting. The number of households casting their ballots in the election at time t will be symbolized by N_t^v and those abstaining by N_t^a, where $N_t^v + N_t^a = N$.

D. Political Parties

With political parties defined as coalitions of households with similar economic interests, it follows that members seek to gain temporary control over the available fiscal policy tools in order to improve their overall economic situation. Hence, if elected, party j is expected to fully capitalize on its privilege of incumbency and to pursue the policies specified in its preelection program.[13]

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[13] This model abstracts from any time-inconsistency problems. This assumption is in line with some recent contributions; see., e.g., Alesina (1988). In his rational, partisan-theoretic model, Alesina provides a framework through which he can demonstrate that rational and forward-looking voters understand that political parties have an incentive to announce convergent platforms in order to increase their electoral chances. As a result, "in a one-shot

(continued...)

Subsequently, if party j succeeds in securing popular support in excess of 50 percent of those households casting ballots, it is democratically legitimized to form the government during period t. Formally, party j, if elected into office, will be denoted J_t:

$$(12) \qquad j \rightarrow J_t \quad \text{iff} \quad V_{jt} = \frac{1}{N_t^v} \sum_{i=1}^{N_t^v} v_{it}^j > \frac{1}{2},$$

where V_{jt} is the share of votes cast for $j \in \{-j, +j\}$ in t and $V_{(+j)t} + V_{(-j)t} = 1 \ \forall t$.[14] The idea of j caring about the same variables as individuals is captured by modeling a political objective function, denoted $\mathcal{E}_{jt}$, which approximates its members' utility functions; see equation (10):

$$(13) \qquad \mathcal{E}_{jt} = \ln\left(\frac{\hat{\varepsilon}_{1(t-1)}^c}{N} + \hat{\varepsilon}_2^c (1 - \tau_t)\left(\Omega_{jt}^w w_t + r_t \Omega_{jt}^k\right) \right) + \frac{\lambda \ln(G_t)}{\left(\Omega_{jt}^w w_t + r_t \Omega_{jt}^k\right)^\varphi},$$

where the variable Ω_{jt}^w represents—see (14)—the median amount of human capital (labor productivity) among j's members and Ω_{jt}^k their median nonhuman capital, thereby reflecting j's "ideological" emphasis on labor and capital income, respectively. Implicit in the definition of the party j's objective function is the idea that, for all $\varphi \neq 0$, its valuation of public goods is inversely related to the median of the party members' gross incomes. The determination of these ideological variables results from j's programmatic preelection convention, in which all members of j at t, m_{jt}, decide on j's most-favored ideological positions—Ω_{jt}^w and Ω_{jt}^k.

By assuming that (i) the joint distribution of wealth and income is general knowledge, (ii) the (opportunity) costs of party membership are relatively high, and (iii) the internal balance defining the party's preelection position is sensitive to shifts in policy positions (leading to defections and, potentially, the breakup of a political party), both preelection strategizing and post-election moral hazard problems become unlikely.[15] And if everyone

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(...continued)
electoral game the only time-consistent equilibrium is one in which no convergence is possible, the two parties follow their most preferred policies, and the voters rationally expect this outcome" (p. 796).

[14] For the purpose of the subsequent computer simulations, it was assumed that if $V_{(+j)t} = V_{(-j)t} = \frac{1}{2}$, a "grand coalition" of both parties will be formed, with the government's policies representing the average of both parties' programs.

[15] The statement can be made even stronger if one is willing to suppose that party members make that individual the party leader who is—personally—defined through his or her median income and median wealth (relative to all party members). That way, they can ensure the

knows the preferences and the political interests of the party members, voters who are not party members will be able to rationally form expectations of the actual policy program—even if politicians campaign on policy platforms that are incongruous with the true political agenda (see footnote 13). Therefore,

$$(14) \qquad \Omega_{jt}^{w} = \overset{M_{jt}}{\underset{m_j=1}{\text{v}}} (\phi_{m_j}) \quad \text{and} \quad \Omega_{jt}^{k} = \overset{M_{jt}}{\underset{m_j=1}{\text{v}}} (k_{m_j t}),$$

where v $(\cdot)$ represents the median of the M_{jt} party members' income and wealth variables, respectively. If elected, j will pursue fiscal policies as below.

Prior to the programmatic decision made in (14), i must have determined whether to become a party member (in which case he or she would be privileged to codetermine Ω_{jt}^{w} and Ω_{jt}^{k} in the way described above). This decision is a reflection of i's political interest, generated by large utility differences implicit in the party programs proposed at $t - 1$: if the ideological variable has generated excess utility over the alternatively proposed (or implemented) policy program beyond the constant cost of political participation, denoted ψ, then i will join j in t, i.e., $i \in j$ iff

$$(15) \qquad u_{it-1}\left(c_{it-1}^{*(\cdot j)}, G_{t-1}^{*(\cdot j)}, \lambda\right) - u_{it-1}\left(c_{it-1}^{*(\neg j)}, G_{t-1}^{*(\neg j)}, \lambda\right) \geq \psi.$$

Otherwise, the costs of political participation outweigh the benefits and i remains an "armchair democrat." Clearly, party membership costs exceed the costs of voting, i.e., $\psi > \Xi$.

E. Optimal Party Platforms and Government Policies

As long as neither r_t nor w_t depends on the present government's policies, the parties' ideology expression can be simplified to read

$$(16) \qquad \Omega_{jt} = \Omega_{jt}^{w} w_t + r_t \Omega_{jt}^{k}.$$

Once card-carrying members of political parties have established their respective ideology parameters Ω_{jt}^{w} and Ω_{jt}^{k} (and, hence, Ω_{jt}), representing—see (14)—the median delegate's gross income, the political parties solve the following constrained maximization problem:

$$(17) \qquad \max_{\tau_t, G_t} \mathcal{E}_{jt} = \ln\left(\frac{\hat{\varepsilon}_{1(t-1)}^c}{N} + \hat{\varepsilon}_2^c(1 - \tau_t)\Omega_{jt}\right) + \frac{\lambda \ln(G_t)}{\Omega_{jt}^{\varphi}},$$

(...continued)
incentive compatibility of the party's compromise platform. That, however, would require the diagonal distribution of labor productivity and wealth endowments.

subject to $\tau_t Y_t = G_t$.

The first-order condition, after substituting the constraint into the objective function, is

(18) $\qquad \dfrac{\partial \mathcal{Æ}_{jt}}{\partial G_t} : \dfrac{\lambda}{\Omega_{jt}^{\varphi} G_t} - \dfrac{\hat{\varepsilon}_2^c \Omega_{jt}}{\hat{\varepsilon}_{1(t-1)}^c N^{-1} Y_t + \hat{\varepsilon}_2^c \Omega_{jt}(Y_t - G_t)} \equiv 0$.

Solving (18) for G_t yields the following expression for either party's optimal amount of government spending:

(19) $\qquad G_t^{*(\pm j)} = \dfrac{\left(\hat{\varepsilon}_{1(t-1)}^c N^{-1} + \hat{\varepsilon}_2^c \Omega_{jt} \right) \lambda Y_t}{\left(\lambda + \Omega_{jt}^{\varphi} \right) \varepsilon_2^c \Omega_{jt}}$.

Given (19), the optimal tax rate implicit in ($\pm j$)'s policy program is $\tau_t^{*(\pm j)} = G_t^{*(\pm j)}/Y_t$. Moreover, the expression clearly demonstrates that (i) the "optimal" level of government spending increases with the size of the economy and (ii) political parties that represent a clientele with higher streams of labor and capital income—see also Figure 2—will propose a lower level of government spending than do those representing poorer voters, as

(20) $\qquad \dfrac{\partial G_t^{*(\pm j)}}{\partial \Omega_{jt}} = - \dfrac{\lambda Y_t \left(\hat{\varepsilon}_{1(t-1)}^c N^{-1}(\lambda + (\varphi + 1)\Omega_{jt}^{\varphi}) + \varphi \hat{\varepsilon}_2^c \Omega_{jt}^{\varphi+1} \right)}{\hat{\varepsilon}_2^c \Omega_{jt}^2 \left(\lambda + \Omega_{jt}^{\varphi} \right)^2} < 0$.

Those differences, however, are diminishing with further increases in the policy-platform parameter Ω_{jt} as

(21) $\qquad \dfrac{\partial^2 G_t^{*(\pm j)}}{\partial \Omega_{jt}^2} = \dfrac{\lambda Y_t \left(a_{12} + a_{13}\Omega_{jt}^{\varphi} + a_{14}\Omega_{jt}^{\varphi+1} + a_{15}\Omega_{jt}^{2\varphi} + a_{16}\Omega_{jt}^{2\varphi+1} \right)}{\hat{\varepsilon}_2^c \Omega_{jt}^3 \left(\lambda + \Omega_{jt}^{\varphi} \right)^3} > 0$.

The second derivative is positive as the terms a_{12}, a_{13}, a_{15}, and a_{16} are positive and a_{14} is nonnegative: $a_{12} = 2\hat{\varepsilon}_{1(t-1)}^c N^{-1} \lambda^2 > 0$, $a_{13} = (\varphi + 1)\hat{\varepsilon}_{1(t-1)}^c N^{-1}(4 - \varphi) > 0$, $a_{14} = \hat{\varepsilon}_2^c \varphi\lambda(1 - \varphi) \geq 0$, $a_{15} = \hat{\varepsilon}_{1(t-1)}^c N^{-1}(\varphi + 1)(\varphi + 2) > 0$, and $a_{16} = \hat{\varepsilon}_2^c \varphi(\varphi + 1) > 0$.

The partial derivatives of $G_t^{*(\pm j)}$ with respect to $\hat{\varepsilon}_2^c$ also reconfirm economic intuition that, with an increasing marginal propensity to consume (and a balanced budget requirement), optimal government spending decreases. With a higher λ, i.e., a higher cultural value placed on the public good, optimal government spending will increase.

F. Policy Implications

The EMP has attempted to sketch the essential elements in the democratic process culminating in the collective decision on the "optimal" size of government expenditure as a

function of income, ideology, and individuals' consumption behavior; see (19). The proposed approach is broader than most others employed in traditional ETP models, which have—if allowing for any explicit element of democratic decision-making—relied on the Downsian median voter or, otherwise, simply on a social planner's constrained maximization of a well-behaved social welfare function, thus abstracting from any intrahousehold *conflicts* (which—in the author's view—symbolize the very essence of politics). By representing the social coordination mechanism over the "optimal" provision of public goods as a two-tiered decision-making process regarding votes and party membership, derived on the basis of the households' (explicitly modeled) economic situations, the EMP bases its results—the collective decision on G_t^* (and thus τ_t)—on standard microeconomic foundations. Thus, the author believes, the Downsian (1957) median-voter theorem can be extended to add to the comprehension of the political processes and dynamics underlying democratic decisions.
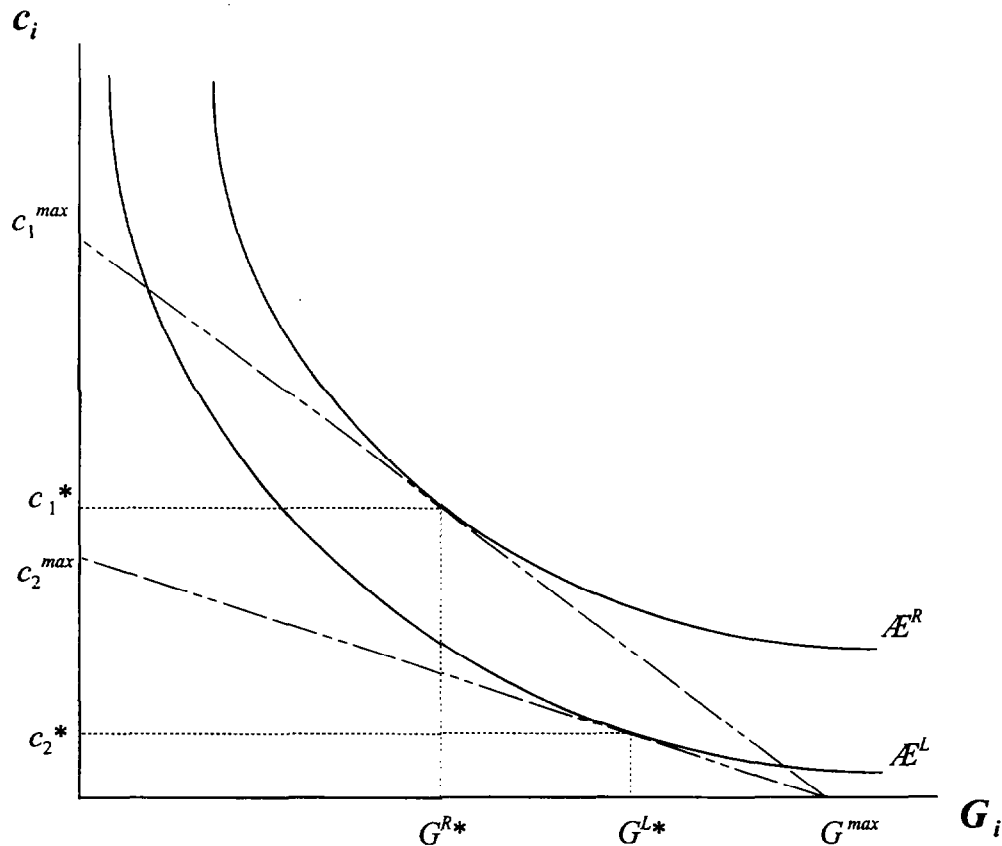
Figure 2 depicts the intuition behind this model's main result. The valuation of public goods by households (and hence by the median delegates) is inversely related to their private consumption possibilities. As represented by (20), political parties representing a poorer clientele (L) advocate higher spending, as their supporters greatly benefit from an increased supply of public goods, which are largely financed by voters in higher-income brackets. However, with changing gross incomes, the voters' political preferences change as well; those who see their economic positions improved will become more conservative (and vice versa). This explains why not only voting behavior, but also party ideologies change over time. For a country as a whole, this means that, everything else being equal, the result of an (exogenously enduced) widening of the income gap will create more dissimilar party programs and, consequently, larger politically induced fluctuations when a change in government takes place. Hence, the "economic value" of a small degree of inequality in income and wealth can be found in the succession of relatively constant approaches to economic policies—with a correspondingly low amount of politically induced fluctuations and few requirements on the part of firms and households to repeatedly (re)adjust their behavior, in a substantial manner, to a new political environment.

To confirm the intuition behind the EMP, several computer simulations have been run, demonstrating the—deterministic—model's ability to generate politico-economic fluctuations and substantiate the aforementioned policy implications.[16] The model's core results are summarized in Figure 3 representing (*a*) party L's election results[17] as well as overall voter turnout; (*b*) changes to party-membership and participation rates, including the variation in the median delegates' relative positions; (*c*) the proposed—and actually implemented—income tax rates; and (*d*) the households' utility differences inherent in the

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[16] For details, a printout of the computer simulation program, and alternative simulation results, see Olters (2000).

[17] The corresponding results for R—generated on the basis of 101 households over 200 periods (i.e., 800 years, if a parliamentary term consists of four years)—are simply the inverse.

Figure 2. "Optimal" Amounts of Government Spending

With respect to political preferences, the EMP captures the following relationship. As homines publici, *individuals determine their preferred composition of consumption goods—i.e., private versus public. In the extreme, if more than half of them decided to pay 100 (0) percent of their income to the government as taxes, every individual's basket of consumption goods would contain only G^{max} (c_i^{max}), with $i \in \{1, 2\}$. In general, however, given the individuals' different levels of income and the two parties' underlying political objective functions, $Æ^L$ and $Æ^R$, they—ideally—would want to see policies adopted that would allow for a combination $\{c_i^*, G^{j*}\}$, with $j \in \{L, R\}$. With the actual policy determined by the ruling party's median delegate—household 1 (2) for the center-right (-left) party—, one can easily imagine the role that a society's average wealth and its degree of inequality in income and wealth play in determining democratic fiscal policies: a richer economy leads to more conservative left-wing parties, while a more egalitarian society results in milder changes in economic policies following a change in government.*

two parties' proposed programs.[18] In particular, it can be shown that electoral equilibria, if narrowly defined as a given party's unique vote share, do not (necessarily) exist; by contrast, the model shows that democracies move steadily toward an equilibrium "range" within which the key macroeconomic variables oscillate. Furthermore, for the purposes of election forecasts, the center-left party's *median delegate* appears to be the single most important variable to follow. This result stems from the relatively greater importance of public goods in generating utility for poor households, leading to a relatively larger variability in the preelection programs proposed by party on the left of the political spectrum.
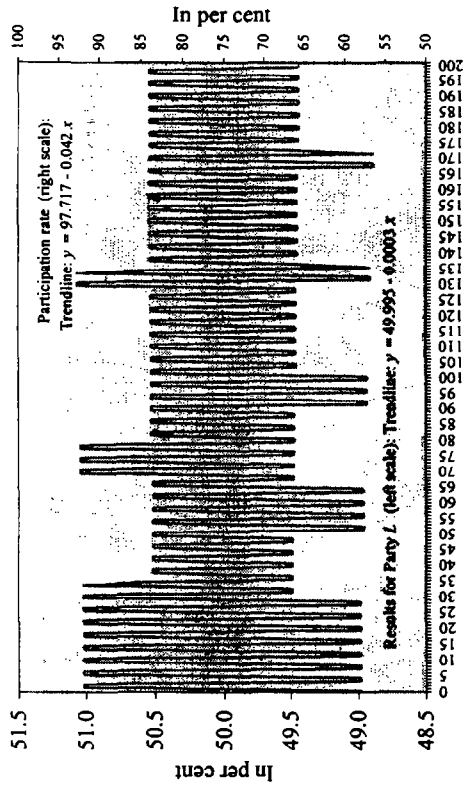
The politically induced fluctuations are derived through the interaction of the households' backward-looking party-membership—equation (15)—and their forward-looking voting decisions—equation (11). For example, in the wake of a newly installed center-right (R) government ("benefiting" from a campaign, in which L proposed an overly "liberal" platform), households' conditional utility differences implicit in L's and R's programs increase (Figure 3, panel d)—and that in an especially pronounced manner for the ones that have supported or joined L in previous periods. In reaction, some of its supporters will choose to actually join L. Their decisions will lead to more centrist platforms—and, possibly, election victories. The more moderate approach, however, will cause the utility differences to decrease again. Hence, marginal party members will leave L, party membership will fall, and L's policies become more "extreme," increasing the likelihood of election defeats (Figure 3, panel b). This behavioral pattern, determining the electoral and, subsequently, politico-economic fluctuations, implies that small changes in the households' levels of utility may result in considerable fluctuations of key macroeconomic variables.

Altering the underlying model economy's structure and running alternative simulations, the following—testable—hypotheses were derived on the basis of the EMP: (i) the economy's average prosperity and the government's relative involvement are negatively correlated; (ii) the more equal distribution of income and wealth, the more likely it is that the electorate will vote for (relatively more moderate) center-left parties; (iii) richer countries change governments more often; and (iv) the underlying production function has a significant impact on voting behavior (with more income allocated to capital, for instance, the electorate's propensity to vote for more moderate center-left parties increases).
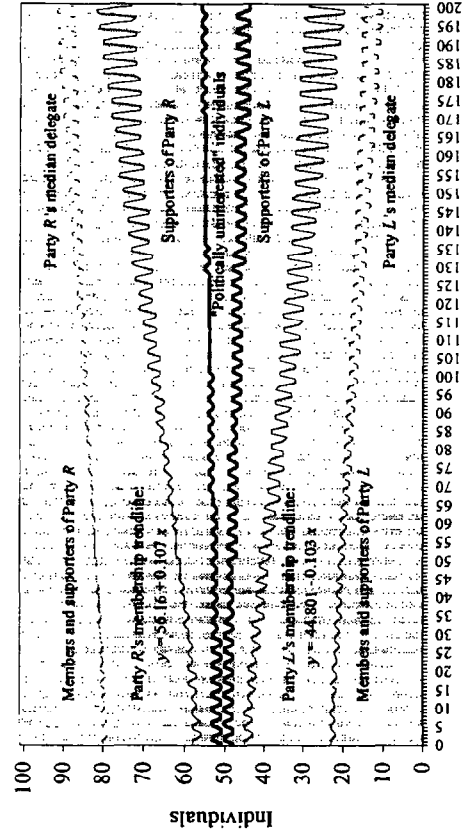
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[18] In panels b and d, periods in which the center-left (-right) party governs are represented by grey (white) columns. The relative decrease in the proposed (and, consequently, actual) tax rates over the course of the 200 periods (see panel c) stems, to a large extent, from the households' accumulation of non-human capital, resulting in—especially—the centre-left party of becoming more moderate in its party platforms. This development is reflected in the decreased political participation (panels a and b) and in the narrowing of the utility differences implicit in the two parties proposed programs (see panel d).
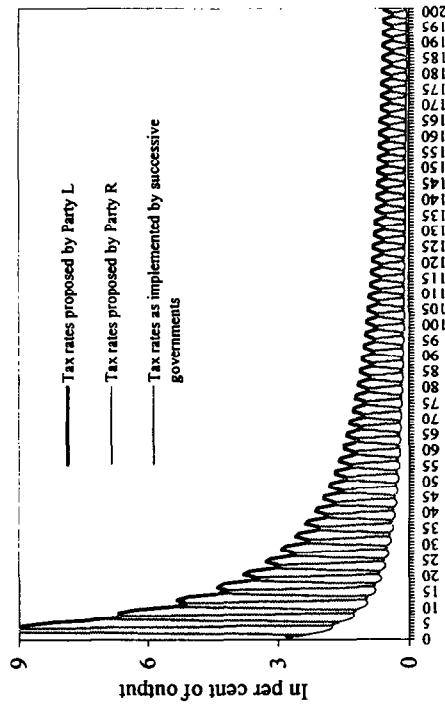
Figure 3. EMP Simulation Results

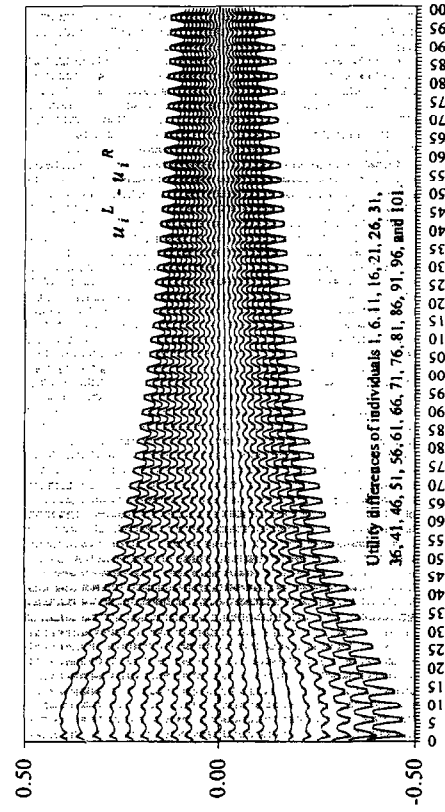Panel a. Results for Party L and Participation Rate

Panel b. Political Participation

Panel c. Proposed and Actual Tax Rates

Panel d. Utility Differences Between Parties L and R

Panel a (text labels):

In per cent

In per cent

Participation rate (right scale): Trendline: $y = 97.717 - 0.042 x$

Results for Party L (left scale): Trendline: $y = 49.993 - 0.0003 x$

Panel b (text labels):

Individuals

Party R's median delegate

Members and supporters of Party R

Supporters of Party R

Party R's membership trendline: $y = 56.16 + 0.107 x$

"Politically uninterested" individuals

Supporters of Party L

Party L's membership trendline: $y = 44.80 - 0.103 x$

Members and supporters of Party L

Party L's median delegate

Panel c (text labels):

In per cent of output

Tax rates proposed by Party L

Tax rates proposed by Party R

Tax rates as implemented by successive governments

Panel d (text labels):

$u_i^L - u_i^R$

Utility differences of individuals 1, 6, 11, 16, 21, 26, 31, 36, 41, 46, 51, 56, 61, 66, 71, 76, 81, 86, 91, 96, and 101.

Assumptions: $A = 1.00$, $\alpha = 0.55$, $\beta = 0.45$, $\lambda = 0.045$, $\phi = 1$, $K_{-1} = 630$ (where $k_{101} = 10.0$, $k_{100} = 1.0065 k_{101} - 0.125$, $k_{99} = 1.0065 k_{100} - 0.125$, etc.), $\varepsilon_1 = 0.05$, $\varepsilon_2 = 0.75$, $\psi = 0.01$, and $\Xi = 0.05$.

III. CONCLUSIONS

The previous half-century has witnessed an enormous increase in productivity and wealth, especially in Western democracies. During the same time, the ideological confrontation that characterized the political debate between the competing parties has decreased considerably, both in intensity and substance. This paper suggests that these two developments (economic growth and ideological conversion) have not only occurred concomitantly but are indeed related and jointly determined. The "economic model of politics" implies that the richer a society (and, particularly, the richer the poor), the more equal are the parties' proposed programs, affecting the country's overall growth and its investment path. At the same time, however, it has to be emphasized that the conjectured conclusion of the grand ideological debates—the "end of history" (Fukuyama, 1989)—must not be confused with the concept of steady states. Election results, as postulated here, will continue to fluctuate and governments of different political colors succeed one another.

With the EMP, it seems possible to endogenize, with simple tools, political behavior into economic modeling—by defining politics, in broad terms, as the collective decision-making process over the "democratically" acceptable amount of income redistribution. The median voter concept, so immensely influential in previous ETP contributions, has thus been complemented by the median delegate approach, underlying the determination of party programs. As a result, the political process is fought in the center (deciding elections) *as well as* further toward the wealth extremes, where party delegates pass preelection manifestos and thus determine, for the incumbent party, the actual design of fiscal policies. Both decisions affect the economy as well as next period's political decisions, creating fluctuations in the relevant politico-economic variables. Given the two-tiered mechanism of determining the "optimal" allocation over public goods, the political process will allow essentially every household, at some point in time, to be represented by a government implementing policies very close to its preferred program—thereby offering a possible explanation of democracies' longevity.

As such, this model—with its intuitive appeal and realistic results—should serve as a first building block toward a more comprehensive description of the intricate, multi-tiered political processes characterizing democracies. This research agenda is aided by the fact that, in contrast to earlier ETP contributions, this model does not have to rely on exogenously defined policy functions or the existence of a social welfare function; the variables defining households' political decisions are those typically considered in consumer theory—with the addition of the *public good*, which has been included in the voters' utility functions. Future research on the EMP could extend the government's tool variables to include the progressivity of income taxes, specific social welfare programs, and budget deficits. It would also be interesting to broaden the underlying economy's structure (e.g., to permit households' income/leisure choices), to introduce the possibility of having a party leadership strategically influence platforms, and/or to use econometrically derived parameter specifications describing specific countries to describe the politico-economic interactions as postulated here and hence to evaluate this model's immanent ability to accurately forecast election outcomes.

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