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18 On the Political Economy of Public Service

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A positive study of the intertemporal variation of public services and investment is undertaken, with special emphasis on the electoral period. The government is assumed to undertake public investments in order to maximise its utility over the current election period, subject to the constraint that such policy assures re-election. Government utility depends on various elements, to which the various parties assign different weights according to their ideology. Alternatively, it is assumed that governments want to maximise the time period during which they are in power. A major influence on public expenditures is exerted by bureaucracy, which is assumed to act incrementally and tends to maximise budgets.

These behavioural assumptions are studied within a macroeconomic framework by simulating the effects of various exogenous shocks upon the system. It is shown how well the government fares under various environments of voters' preferences, and when there is a change of party in power. The model serves as a step towards the development of empirically estimated politico-economic models.

I. INTRODUCTION

Public expenditures and the supply of public services show considerable variation over time; in particular, there is a close connection with the legislative term. Such variations in public expenditures (and other government actions) may lead to 'political business cycles', though a more appropriate name would be 'politico-economic cycles'. These have recently received attention from theoreticians, especially in Europe.¹

¹ The author is grateful to Friedrich Schneider for performing the computations and for helpful comments.

² For empirical evidence, see, for example, Findley (1970) and Snyder (1970). For England in particular, see Bow (1964), esp. p. 384, and Prest (1968).

³ The forerunner is Kalecki (1934). Goodhart and Blanch (1970) and Modhakers (1972) analyse the phenomenon in the Phillips-curve context. Special emphasis is put on the time perspective by Frey and Lau (1968) and Laidmann-Koch (1970). A simple simulation model of the politico-economic system without public services and bureaucracy, and with no explicit optimizing behaviour of the government, is presented in Frey (1974).
The approach taken in the present paper can be characterised as having three main aspects:

1. The study is positive, i.e., sets out to be explicative and concerns itself with intertemporal variations of public services;
2. the analysis is in an explicit macro-economic framework, which seems appropriate because of the quantitative importance of public services in a modern society;
3. the theoretical background is given by the new political economy or public choice. However, the restrictive setup of, for instance, Downs (1957) is abandoned: the government is assumed to maximise its own utility; elections are discontinuous; and the emphasis lies on the disequilibrium dynamics.

The government is not the only politically relevant decision-maker that will be taken into account: public bureaucracy will also be considered.

Section II presents the basic model. In section III it is assumed that the government maximises its utility; and, in section IV, that it maximises the length of its stay in power. In section V bureaucratic behaviour is added, and some concluding remarks are made in section VI.

II. THE BASIC MODEL

The model developed is kept as simple as possible. It is composed of four parts, among which are three sectors:

1. the economy,
2. public services, and
3. the polity

The fourth part consists of the interaction equations connecting these sectors, and is itself made up of two parts:

a. the popularity function transmitting economic impulses into the political sector; and
b. the reaction functions showing how the government uses the various instruments to reach its goals.

The economy is pictured as a real one-good model. The emphasis lies on intertemporal aspects introduced through investment equations and various

\* Note that it is only under four very strong conditions that utility maximisation non-trivially boils down to vote maximisation by the government: (1) a two-party system, (2) perfect political competition, (3) continuous elections, and (4) full equilibrium.

\* Current public expenditures often impede growth by subsidising inefficient sectors such as agriculture. For a theoretical discussion see Bernholz (1966).

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Time lags. Full employment of capital and labour is assumed. The time periods can be interpreted as each covering half a year, with elections taking place each fourth year (i.e. at \( t = 8, 16, 24, 32, \ldots \)).

The basic model consists of the following equations.

THE ECONOMY

Real national income \( Y \) depends on the real capital stock \( K \) by means of a linear-limitational production function

\[ Y(t) = k(t) \cdot K(t) \]  (18.1)

Capital productivity \( k \) rises as public services (PS) increase their share of national income (i.e. more are offered), and falls as the share of current public expenditures (PEC) increases. This last effect is due to the anti-productive effect of much current public expenditure.\(^5\)

\[ k(t) = k_0 + k_{PS} \left[ \frac{PS(t)}{Y(t)} \right] - k_{PEC} \left[ \frac{PEC(t)}{Y(t)} \right] \]  (18.2)

where \( k_0 = \text{const.} \)

Real capital stock is increased by 'private' investment \( I \) and 'political' investment \( PI \), and decreased by depreciation \( D \).

\[ K(t + 1) = K(t) + I(t) + PI(t) - D(t) \]  (18.3)

The terms 'private' and 'political' investment refer to the controlling entity. A considerable part of the investment undertaken for private profit reasons can be controlled by government intervention. Thus, 'political' investment covers not only infrastructural investments in the widest sense, but also part of investment in the private sector. It is undertaken by government for political reasons.

To minimise the fluctuations originating from privately controlled investment, it is simply taken to be a constant fraction of income.

\[ I(t) = v \cdot Y(t) \]  (18.4)

Capital depreciation is proportional to capital stock:

\[ D(t) = d \cdot K(t) \]  (18.5)

Private consumption goods are simply assumed to be a constant fraction of income:

\[ C(t) = c \cdot Y(t) \]  (18.6)

The government politicians receive an 'income' in the form of consumption goods. This 'political' consumption, \( PC \), is residually determined by

\[ PC(t) = \text{residual} \]
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\[ PC(t) = Y(t) - I(t) - D(t) - C(t) - PT(t) \]  \hspace{1cm} (18.7)

where \( PT \) represents government expenditures for investment and public services.

PUBLIC SERVICES

Government expenditures can be used for investment into real capital ('political investment', \( PI \)) or for the production of public services. The latter expenditures must be split up into those immediately increasing the output of public services (current public expenditure, \( PEC \)), those increasing it only after a time lag of two periods (medium-run public expenditure, \( PEM \)), and those increasing it only after a lag of four periods (long-run public expenditure, \( PEL \)). Total government expenditures \( (PT) \) are

\[ PT(t) = PI(t) + PEC(t) + PEM(t) + PEL(t) \] \hspace{1cm} (18.8)

The production function for the output of public services is

\[ PS(t) = PEC(t) + \beta_{PEM} \cdot PEM(t-2) + \beta_{PEL} \cdot PEL(t-4) \] \hspace{1cm} (18.9)

It is reasonable to assume that \( 1 < \beta_{PEM} < \beta_{PEL}, \) i.e. that expenditures with a lagged effect have a higher productivity.

THE POLITY

Using the analogy of real capital, we introduce the concept of a political capital stock, which reflects the long-run or basic evaluation of the government's performance from the voters' point of view. A similar concept is used by some empirically-oriented political scientists (for instance, Campbell, Converse, Miller and Stokes, 1960) and corresponds to the stock of 'goodwill' as estimated in econometric studies of advertising (for instance, Peles, 1971, and Tsurumi, 1973).

Political capital stock \( PK \) is increased by popularity \( POP \) and decreased by political depreciation \( PD \):

\[ PK(t+1) = PK(t) + POP(t) - PD(t) \] \hspace{1cm} (18.10)

The depreciation of political capital is due to voters forgetting past government achievements. It is assumed to be proportional to the stock:

\[ PD(t) = \delta \cdot PK(t) \] \hspace{1cm} (18.11)

Popularity, on the other hand, refers to the consumer-voters' short-run or current evaluation of the government's behaviour.

In each time period \( t \), the politicians in power estimate their likely vote share, \( S(t) \), at the next election. They base this estimate upon the stock of political capital accumulated. They know that the (reasonably rational) voters base their judgement of the government's expected performance over the next electoral period not upon short-lived impressions reflected in popularity ratings, but, rather, upon their more basic evaluation reflected in political capital. Thus, government politicians expect their electoral vote share to rise if political capital is increased.

\[ S(t) = S(t-1) + \gamma [PK(t) - PK(t-1)] \] \hspace{1cm} (18.12)

The vote share received by the government is measured in percentage points such that \( 0 < S(t) < 100 \). Before the elections, it indicates the vote share expected by the government if it does not undertake any action to influence popularity ratings. At election time, \( S \) indicates the actual vote share received by the government. If \( S \) is lower than a given minimum share, \( SMIN \), the government changes and is taken over by the former opposition party (or by a coalition of former opposition parties). The size of \( SMIN \) depends on a great many factors, such as the number of competing parties and their coalition possibilities; institutional factors (for instance, the number of seats that, on the basis of \( S \), are obtained in parliament); and so on. In the present model, \( SMIN \) is taken to be exogenously determined and is fixed at 50 per cent; and the opposition is assumed to comprise only one party and not to compete strategically with the party in power (which would involve the construction of a differential game).

Similarly to the government, the opposition party builds up a stock of political capital (in this case, \( PKO \)):

\[ PKO(t+1) = PKO(t) + POPO(t) - PDO(t) \] \hspace{1cm} (18.13)

\[ PDO(t) = \delta \cdot PKO(t) \] \hspace{1cm} (18.14)

where the opposition's popularity and depreciation are \( POPO \) and \( PDO \), respectively.

The consumer-voters have expectations concerning the provision of private consumption and public services. These expectations are formed on the basis of discounted past experience. The consumption expectation \( EC \) is

\[ EC(t) = (1 - \lambda_{C}) \sum_{i=0}^{\infty} \lambda_{C}^{i} C(t-i) \]

and the expectation about public services \( EPS \) is

\[ EPS(t) = (1 - \lambda_{PS}) \sum_{i=0}^{\infty} \lambda_{PS}^{i} PS(t-i) \]
Using Koyck transformations, this simplifies to
\[ EC(t) = (1 - \lambda_C)C(t) + \lambda_C EC(t - 1) \]  
and
\[ EPS(t) = (1 - \lambda_{PS})PS(t) + \lambda_{PS} EPS(t - 1) \]

**INTERACTION EQUATIONS**

In this simple model, government popularity \( POP \) is influenced only by the level of private consumption and the supply of public services, as compared with voters' expectations.

\[ POP(t) = POP(t - 1) + \pi_C [C(t) - EC(t)] + \pi_{PS} [PS(t) - EPS(t)] \]

Population is also measured in percentage points; hence, \( 0 \leq POP(t) \leq 100 \).

Popularity functions have recently received much attention from mathematical political scientists and economists. A connection between economic conditions (mainly inflation, unemployment and growth of income) and party popularity has been conjectured for a long time—for instance, by Åkerman (1947) for various European countries, and by Bean (1940) for the United States. The Nazi takeover in Germany has been shown to have been closely related to the failing economic situation in the Weimar Republic (Kaltfleiter, 1966).

These studies, however, used inadequate statistical methods. Of great interest are the recent studies by Goodhart and Bhanasi (1970) and Kramer (1971), which use regression and spectral analysis for Great Britain and the United States, respectively. Frey and Garbers (1972) have produced a corresponding study for Germany. Though there is some criticism of these approaches, it seems reasonable to assume that popularity functions reflect a relationship existing in reality, and that public services are a significant determinant (a proposition that is so far untested).

The second type of interaction equations, the *action and reaction* functions of political decision-makers, is discussed below.

**III. A UTILITY-MAXIMISING GOVERNMENT**

**THE MAXIMISATION PROBLEM IN THE POLITICO-ECONOMIC SYSTEM AS PERCEIVED BY THE GOVERNMENT**

It seems that, for most governments, the relevant time horizon is confined to one term and the next election. Such a government is not concerned with any

\[ ^* \text{The parameter values used in the simulation runs discussed later in this paper were chosen with a view to realism: } K_C = 0.125, K_{PS} = 0.18, K_{PEC} = 0.07, \psi = 0.08, d = 0.05, \epsilon = 0.50, \delta_{PEM} = 1.15, \delta_{PEL} = 1.40, \delta = 0.20, \beta = 0.50, \lambda_C = 0.68, \lambda_{PS} = 0.70. \]

For reasons of capacity, \( P^I \) can be changed only to the extent of five units per period.

\[ ^\dagger \text{See, in particular, the discussion between Stigler (1973) and Okun (1973).} \]

\[ ^* \text{Primed parameters indicate the values as perceived by the government.} \]

\[ ^\dagger \text{Note from (18.15), (18.16), and (18.17) that the total effect is} \]

\[ \delta POP(t)/\delta C(t) = \Pi_C - \Pi_C(1 - \lambda_C) = \Pi_C\lambda_C \]

\[ \text{and} \]

\[ \delta POP(t)/\delta PS(t) = \Pi_{PS} - \Pi_{PS}(1 - \lambda_{PS}) = \Pi_{PS}\lambda_{PS} \]

election farther in the future. It seeks to maximise the utility of being in power (\( PU \)) over the election term \( T_{i+1} < T_i \) (where \( T_i \) indicates election dates occurring at \( t = 8, 16, 24, \ldots \)) subject to the condition of re-election at the end of the term. The maximisation problem is

\[ \max \sum_{(\text{policy instruments})} PU(t) \]

subject to \( S(T_i + 1) > S/M \)

\[ (\text{the Lagrangian multiplier corresponding to this constraint will be denoted by } \Lambda, \text{ with } \Lambda = 0 \text{ indicating that it is nonbinding, } \Lambda > 0 \text{ that it is binding.)} \]

Government utility depends on the government's ideological views about the levels of consumption and public services available to the population, and on its own consumption:

\[ PU(t) = i_C \cdot C(t) + i_{PS} \cdot PS(t) + \epsilon \cdot PC(t) \]

The government does not have full information about the political-economic system in which it is acting. It is forced to perform the above maximisation problem within the system as it perceives it, which is certainly simplified as compared with the 'true' structure developed in section II. Thus, the (small) effect of public expenditures on capacity output is disregarded (\( K_{PS} = 0, K_{PEC} = 0 \)). Due to incomplete information, the government finds it particularly difficult to make an estimate of the popularity function (18.17). It has only a vague notion of how consumption and public services affect its popularity and feels unable to separate the direct effect of \( C(t) \) and \( PS(t) \) from the indirect effect through the induced change in voters' expectation.

To reduce complexity, the government takes the popularity function to be

\[ POP(t) = \Pi_C C(t) + \Pi_{PS} PS(t) \]

but makes a conservative estimate of \( \Pi_C \) and \( \Pi_{PS} \) to take account of the changes in voters' expectations (\( \Pi_C \) and \( \Pi_{PS} \) will be taken to be much smaller than \( \Pi_C \) and \( \Pi_{PS} \), respectively).

The maximisation problem that the government perceives is solved here by dynamic programming. However, a solution can be found, or, at least suitably approximated by means of intuitive reasoning of a sort that may well be within the capabilities of government politicians.
The optimal (starred) values for the policy instruments available to the government have the following properties.

1. Due to a four-period lag, long-run public expenditures \( PEL^* \) can have no effect on the current election term during the last four periods before an election, and, thus, are always reduced to zero for these four periods.

2. For a similar reason, political investment \( PI^* \) is always reduced to zero in the last period before an election.

Particularly interesting results can be presented for the case of governments with special ideological views. For the purpose of exposition, three 'ideal' types of government ideology ('ideal' in Max Weber's sense) are assumed.

1. An 'extreme left-wing' government that puts no value at all on private consumption and on its own political consumption. It is interested only in providing the population with public services.
   \[
   PU_{Lw}(t) = \epsilon PS(t) \quad (18.18a)
   \]
   \[
   \epsilon = \epsilon = 0
   \]

2. An 'extreme right-wing' government that is interested only in the population's consumption level.
   \[
   PU_{Rw}(t) = \epsilon C(t) \quad (18.18b)
   \]
   \[
   \epsilon = \epsilon = 0
   \]

3. An 'extreme exploitative' government whose only desire is to consume as much as possible during the period in power.
   \[
   PU_{EX}(t) = \epsilon PC(t) \quad (18.18c)
   \]
   \[
   \epsilon = \epsilon = 0
   \]

Moreover, a complete set of optimal policies can be specified only if the many degrees of freedom due to the linearity of the conceived (and 'true') politico-economic model are removed. It is realistic to assume that the government solves the problem by a rule of thumb, i.e. by allocating equal amounts to each 'free' instrument within the limits set on public expenditures and 'political' consumption, as given by

\[
PT(t) + PC(t) = Y(t) - C(t) - I(t) = m \cdot Y(t) \quad (18.19)
\]

where \( m = 1 - \epsilon - \nu \).

If the re-election constraint is non-binding, the extreme left-wing government allocates its expenditures solely for the production of public services and completely disregards political investments. Long-run public expenditures having no effect in the current election period are discontinued in the four last periods before the election; all outlays are then devoted to current public properties.

The extreme right-wing and extreme exploitative governments have the same optimal policy, as, in order to achieve, in the last period, the highest attainable level of private and political consumption (a 'consumption orgy'), they are both concerned to increase capital accumulation as much as possible.

If the governments have to use their instruments in order to achieve re-election, the optimal policies of the various types of government become much more similar. Ideological values must be sacrificed in order that power be retained, which means that the government now has to take into account voters' opinions as reflected in the parameters of the popularity function. The extreme left-wing and right-wing governments pursue practically identical policies, with the obvious difference that, shortly before elections, the left-wing government switches to current public expenditures. Right-wing government's behaviour during the election period is to increase its 'political' consumption to its maximum \( mY(t) \), as given in equation (18.19). The exploitative government's policy depends on the strength of the re-election constraint: no general description can be given. As before, of course, no type of government undertakes any investments \( PI \) in the election period, since these would have no effect on output in the current election term.

In order to obtain more definitive results, it is interesting to see how the three types of government fare with their optimal strategies under alternatively perceived 'environments'. These environments are characterised by the voters' preferences with respect to public services and private consumption as they materialise in the popularity function. Two basic environmental conditions are discussed here: one in which the voters have a bias for public services (\( H_L^* = 0.05, H_{PS} = 0.1364 \); the population is 'left'); and one in which the voters have a bias for private consumption (\( H_L^* = 0.1, H_{PS} = 0.05 \); the population is 'right'). On these assumptions, it can be shown by simulation (though, to save space, the exact figures are not reproduced here) that only a right-wing or exploitative party in power in a right-wing environment can simply maximise its own utility without regard to elections. In all other cases, the government must make a compromise in order to stay in power. Under this proviso, the extreme right-wing and exploitative governments expect to stay in power indefinitely. This is due to the fact that their own goals -- the maximisation of private or 'political' consumption -- involves building up the real capital stock, which is, at the same time, a prerequisite for political survival in the long run. Under the simplified politico-economic structure that is assumed, the left-wing government is in a much more difficult situation. Even when environmental conditions are favourable (i.e. if the voters also are 'left'), it can expect to survive only for three legislative periods. At the fourth election it is defeated, even if in the preceding electoral period it takes voters' wishes into account as much as possible. With a right-wing population, the left-wing government can expect to hold power for only two periods; a defeat at the third election is unavoidable.
APPLICATION OF THE 'OPTIMAL POLICY' AS PERCEIVED BY THE GOVERNMENT

The government, having no knowledge of the 'true' structure of the politico-economic system, is forced to apply the policy that it finds optimal within the system as it perceives it. Thus, it sets the instruments available (PI, PEL, and PEC) as in the previous section. The simulation results (again, the figures are not given here) show that the choice of that policy is not very advantageous for any type of government; at best, the government is re-elected for another term. This result, of course, is not surprising, as the structure of the two systems is different. The government’s lack of knowledge, especially about the influence of voter’s expectations on popularity, is a major reason for its poor performance. It is interesting to note that expectations have the same importance in quite different fields of disequilibrium economics (see, for instance, Stiglitz, 1973).

IV. A GOVERNMENT MAXIMISING THE LENGTH OF ITS STAY IN POWER

THE THEORY

A Government that considers not only the current election term, but, in addition, the periods thereafter, will, if it expects to receive more than the necessary vote share (SMIN) in the next election, take any opportunity that it can to shift the current re-election potential—given by $S(t)$ into the future. This can be achieved by (a) building up the real capital stock by increasing political investment, (b) increasing public expenditures designed to push up the supply of public services in future periods (PEM, PEL), and (c) decreasing current public expenditures (PEC).

The corresponding simple linear reaction functions are

$$PI(t + 1) = PI(t) + \rho_{PI} \cdot [S(t) - SMIN]$$  \hspace{1cm} (18.19a)

$$PEL(t + 1) = PEL(t) + \rho_{PEL} \cdot [S(t) - SMIN]$$  \hspace{1cm} (18.19b)

$$PEM(t + 1) = PEM(t) + \rho_{PEM} \cdot [S(t) - SMIN]$$  \hspace{1cm} (18.19c)

and

$$PEC(t + 1) = PEC(t) - \rho_{PEC} \cdot [S(t) - SMIN]$$  \hspace{1cm} (18.19d)

If $S(t) < SMIN$, public expenditures with an immediate popularity effect (PEC) are increased, and all other expenditures (PI, PEM, PEL) are decreased. Such behaviour corresponds to discounting the future, with the rate of time discount equal to one minus the re-election probability: a government absolutely certain to win the next election has no need to discount over the respective election term; but, when the re-election is uncertain, the next term is 'worth

less to the government than is the current one, and so on. If $P_n$ is the probability of being re-elected in period $n$, the probability of being continually in power over period $n$ and of being thrown out of power in period $n + 1$ is

$$(1 - P_{n+1}) \prod_{t=1}^{n} P_t$$

A government interested in staying in power for as long a time as possible has to maximise the sum of the different periods of uninterrupted government, $t = 1, 2, \ldots$, weighted by the above probability. Realistically assuming that the government is never absolutely sure of being re-elected ($0 < P_n < 1$), this reduces to

$$\sum_{t=1}^{\infty} \prod_{\tau=1}^{t} P_{\tau} = Z_t$$

Putting

$$\prod_{\tau=1}^{t} P_{\tau} = Z_t$$

it follows that

$$Z_t = P_t Z_{t-1}$$

from which it is easy to see that $P_t = 1 + \rho_t$, with $\rho_t$ the rate of time discount of period $t$.

THE SIMULATION RUNS

The politico-economic system as developed in equations (18.1)–(18.17), combined with the government’s behavioural equations (18.19), is in stationary equilibrium if all expectations are fulfilled ($EC = C, EPS = PS$) and if the government has been elected with the minimum share of votes ($S = SMIN$). This stationary equilibrium serves as a starting point for the application of exogenous shocks to the popularity function. These exogenous shifts may be due to external developments (for instance, international crises) or to internal noneconomic shocks (such as political scandals).

Table 18.1 shows the effects of positive popularity shocks of +20 and +5 percentage points, and negative popularity shocks of −5 and −20 percentage points. For simplicity, the table shows only the two variables entering the popularity function—consumption $C(t)$ and public services $PS(t)$—and the government’s vote share in the election periods $S(t)$.

13 See Frey and Ramser (1974). Compare the present approach to that of Imasaki (1970), who, simply and quite untheoretically, stipulates an 'instantaneous government'.

14 It is assumed that consumption has a somewhat larger weight in the popularity function than public services have: $\rho_{C} = 0.30, \rho_{PS} = 0.20$.

15 The assumed parameter values are: $\rho_{PI} = 0.95, \rho_{PEL} = 0.10, \rho_{PEM} = 0.10, \rho_{PEC} = 0.35$. 
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<th>Run</th>
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<td>171</td>
<td>125</td>
<td>108</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PS</td>
<td>178</td>
<td>197</td>
<td>219</td>
<td>164</td>
<td>185</td>
<td>204</td>
<td>168</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>50</td>
<td>58-81</td>
<td>(41-19)</td>
<td>86-93</td>
<td>51-27</td>
<td>(48-14)</td>
<td>75-75</td>
<td>(48-01)</td>
<td></td>
</tr>
</tbody>
</table>

Note: The figures for consumption and public services are rounded. In the rows for vote shares, the upper figure shows the election outcome for party 1, where the lower shows that for party 2. Figures in parentheses indicate an insufficient vote share (S < SMN) and a change of government.

### Run 1
With an exogenous popularity increase of only 5 per cent (see Figs. 18.1-4), the government just manages to win the first election, but can hardly use high public expenditure to give people a sense of discretionary planning. The government's election result is somewhat lower (S = 60 per cent). The real capital stock for the next period is similar to the previous period, and the election result is a little higher (S = 65 per cent). Then, the government's consumption and public services increase, causing a small rise in election results. However, an attempt is made, nevertheless, to give an initial explanation of the other economic aspects of public service.

### Run 2
Because of the simultaneous interdependence of variables in the political economic system, it is not easy to give a verbal account of the development. However, an attempt is made, nevertheless, to give an intuitive explanation of the other economic aspects of public service.

---

Fig 18.1(a)
expenditures for future public services ($PEL$, $PEM$). The same holds true for the following election term, in which consumption and public services stay nearly constant. After the election victory, at $t = 16$, the capacity effect of the increase in political investment leads to a rise in consumption, while public services fall somewhat, mainly due to the non-possible reduction of current public expenditures. The effect is a more comfortable victory at the next election. Now the government is able to invest in future public services, which yield a maximum vote share at $t = 32$, despite a consumption setback due to displacement.

Run 3

The government’s policy is quite different when it suffers an exogenous popularity decrease, even if only as small as 5 per cent (see Figs. 18.2a–c). Fearing that it will not be re-elected, the government reduces investment in real capital and (less severely) long- and medium-run public expenditures. At the same time, short-run public expenditures are somewhat increased. These drive up both consumption and the supply of public services, and the government is re-elected. In the new term, a long-run policy is pursued to begin with, but the concomitant decline in popularity forces the government to reduce long-run expenditures ($P$, $PEL$ and $PEM$) and strongly to step up expenditures with an immediate effect on public-services output. Though this reversal of policy
has a positive effect on both consumption and public services, the government receives only 42 per cent of the vote and, thus, is defeated.

The new government comes into power with a relatively small majority (58 per cent) and, therefore, is soon forced to pursue a short-run policy. It manages to increase public-expenditure output somewhat, but consumption steadily decreases. The real capital stock gradually falls as political investment is reduced to zero. The government stays in power for only one period, as its vote share does not go beyond 36 per cent in \( t = 24 \).

Succeeding governments are confronted with the same situation. The real capital stock and national income gradually fall, as no party in power can afford to undertake any significant investments. For the same reason, public-services output experiences a long-run fall. There are, however, some short-run fluctuations within this long-run trend, and in period 48 a government manages to be re-elected, partly because voters’ expectations have been adjusted strongly downwards.

**Run 4**

With an exogenous popularity loss of 20 per cent, the real capital stock and consumption have a long-run falling trend. Public services show more marked short-run fluctuations than consumption does. There are many government changes, but after a large victory (i.e. a heavy defeat of the party in power) the new government is sometimes able to obtain re-election for another term (here at \( t = 24 \)).

**V. BUREAUCRATIC BEHAVIOUR**

Governments have only partial control over policy instruments; bureaucracy also has an important say. Within the politico-economic model developed, this influence shows in two forms:

1. Bureaucracies resist structural changes for various reasons (for example, established positions may be threatened, and lack of information may make it difficult to adapt quickly to changed circumstances). Empirical studies show that bureaucracies act ‘incrementally’ (Wildavsky, 1964). They are willing – or can be forced – to follow only part of the government’s intentions regarding expenditure.

2. The income, career and prestige of any bureaucrat are closely linked with the size of the entity in which he is acting. Each bureaucrat is interested in continually increasing the size of overall bureaucracy and, hence, of the budget. Bureaucrats are even described as ‘budget maximisers’ (Niskanen, 1971).
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These two effects may be formalised as

\[ PIB(t) = INC_F \cdot PIB(t-1) + b_F \cdot [PI(t) - PI(t-1)] \]

\[ PELB(t) = INC_PEL \cdot PELB(t-1) + b_{PEL} \cdot [PEL(t) - PEL(t-1)] \]

\[ PEMB(t) = INC_{PEM} \cdot PEMB(t-1) + b_{PEM} \cdot [PEM(t) - PEM(t-1)] \]

\[ PECB(t) = INC_{PEC} \cdot PECB(t-1) + b_{PEC} \cdot [PEC(t) - PEC(t-1)] \]

The letter \( B \) after an expenditure category indicates the actual allocation undertaken by the bureaucracy. The first expression on the right-hand side shows the auto-dynamic effect of continually rising expenditures (all \( INC > 1 \)); the second expression indicates that only fraction \( b \) of an expenditure change intended by the government actually materialises.

This bureaucratic behaviour is now introduced into the long-run maximisation model. It is assumed that the bureaucracy autonomously spends 1 per cent more per period in every sector, and that, in any period, only 95 per cent of the instrument changes intended by the government are actually effected. For reasons of space, only a verbal account of the results is given. Table 18.2 gives the vote shares for the model with bureaucracy; it should be compared with Table 18.1. The interference of bureaucracy with the government’s plans means that there no longer exists any equilibrium, and that there is a continuous tendency for any government to lose votes. While the government, taken

**TABLE 18.2**

**SIMULATION RUNS FOR THE POLITICO-ECONOMIC MODEL WITH BUREAUCRACY**

<table>
<thead>
<tr>
<th>Vote share</th>
<th>Election period</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>No exogenous shock</td>
<td></td>
</tr>
<tr>
<td>( S )</td>
<td>50</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>52.51</td>
</tr>
<tr>
<td>Exogenous popularity shock</td>
<td></td>
</tr>
<tr>
<td>+20%</td>
<td>50</td>
</tr>
<tr>
<td>( S )</td>
<td>50</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>50</td>
</tr>
<tr>
<td>+5%</td>
<td>50</td>
</tr>
<tr>
<td>( S )</td>
<td>50</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>50</td>
</tr>
<tr>
<td>-5%</td>
<td>50</td>
</tr>
<tr>
<td>( S )</td>
<td>50</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>50</td>
</tr>
<tr>
<td>-20%</td>
<td>50</td>
</tr>
</tbody>
</table>

\[ INC_F = INC_{PEL} = INC_{PEM} = INC_{PEC} = 1.01 \]

\[ b_F = b_{PEL} = b_{PEM} = b_{PEC} = 0.95 \]

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alone, would be able to manage the politico-economic system such that it survives exogenous popularity falls of 5 per cent for one term (\( S = 50-00 \) per cent) as shown in Table 18.1), the lack of adaptability and the incremental behaviour of the bureaucracy prohibits this success (\( S = 47-34 \) per cent).

**VI. CONCLUDING REMARKS**

The model formulated and the various simulation runs discussed serve three main purposes.

1. They should contribute to a better understanding of political–economic interaction, with special emphasis on the intertemporal fluctuations in the supply of public services.
2. They serve as an initial step towards an endogenous treatment of the government sector in economic models. This applies particularly to macro-econometric models, the use of which for explanation and as a forecasting device is severely limited. The future course of the economy in a modern society depends, to a very large extent, on the government’s actions, which, in all existing econometric models, are exogenous. Present econometric model-building suffers from a serious imbalance, since, whereas purely economic aspects are treated in a very refined way, nothing is said about government behaviour. The ‘reaction functions’ (see, for example, Friedelcaender, 1973) serve only the purpose of revealing the government’s preferences under the (completely unrealistic) assumption that there are no political influences.

3. Closely related is the fact that the model and simulation runs help towards a fuller understanding of the problems connected with the formal estimation of politico-economic relations (‘politiometrics’) such as the popularity function or the determinants of the supply of public services (in the sense of, for example, Pryor, 1968).

No general discussion of the merits and demerits of simulations is intended here. It must be pointed out, however, that the simulation runs presented are not thought directly to represent reality; they should, rather, give a ‘feeling’ of how the interaction of political and economic systems may be modelled.

Realism is approached only when the economic system is represented by a full-scale econometric model, the political and interacting equations are empirically estimated, and all are combined. Obviously, the analytic method is in some respects more powerful, but has a disadvantage in that it is difficult to deal with large models without having to deal almost exclusively with the mathematical instead of the material aspects. Here an attempt has been made to combine the analytic and simulation approaches.

**REFERENCES**


19 Some Considerations on the Productive Capacity of Consumption Expenditures

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This paper deals with the relation between the level and the structure of consumption and their influence on the labour productivity of the consumer. Assuming such a relationship, an optimal savings ratio will exist, below which savings are to be preferred over consumption and above which a consumption increase will contribute more to a rise in income than to higher savings. Empirical evidence is presented in so far as it was available to the authors.

I. INTRODUCTION

The mathematically precise economic growth models that have been in vogue since the 1940's seldom take explicit account of the notion of investment in human beings. Increases in tomorrow's income are assumed to result primarily from today's additions to material capital, and since consumption displaces capital investment, it becomes an enemy of growth, not a handmaiden.¹

In the existing economic literature a sharp difference is still made between consumption expenditures, on the one hand, and investments, on the other. This is done in spite of the fact that actual government policy often takes a different position, albeit implicitly.

The rationale of the distinction is that it is assumed that investments contribute to the increase of the capital stock and, therefore, via an increase in production, to a further increase in consumption potentials. With consumption, however, the end of the productive chain is reached. As Marshall has expressed it, 'consumption is the end of production'.

By putting the problem in this way, a number of important statements made