

ON MONEY, VOTES AND POLICY

IN A DEMOCRATIC SOCIETY

by

Uri Ben-Zion and Zeev Eytan

Discussion Paper No. 73-35, July 1973

Center for Economic Research

Department of Economics

University of Minnesota

Minneapolis, Minnesota 55455

ON MONEY, VOTES, AND POLICY IN A DEMOCRATIC SOCIETY

by

Uri Ben-Zion and Zeev Eytan¹

An application of economic principles to the theory of democracy² leads to the view that there is a similarity between the behavior of entrepreneurs and political parties. The relationship is summed up by Downs [3] as follows:

Our main thesis is that parties in democratic politics are analogous to entrepreneurs in a profit-seeking economy. So as to attain their private ends, they formulate whatever policies they believe will gain the most votes, just as entrepreneurs produce whatever products they believe will gain the most profits for the same reason.³

One major difference, however, between the market for goods and the market for votes is that high income consumers have "stronger power" in the goods market than poor or low income consumers, but they are restricted to the same power in direct voting. The classical theory has therefore emphasized the point that each man has one vote, and that in the legal respect, all men are equal. The point that money helps to gain more influence for the wealthy or the better organized groups has been known but not always mentioned.

¹We are indebted to Gary Becker, Malcolm Burns, George Stigler and Gordon Tullock, and to participants of the Human Capital Seminar at the University of Minnesota, for their helpful comments and suggestions. Support of the Spencer Foundation through a postdoctoral fellowship at the University of Minnesota (Ben-Zion) is gratefully acknowledged. We alone are responsible for the remaining errors.

²The classical examples of this approach are Arrow [1], Downs [3] and Buchanan and Tullock [2].

³Downs [3], page 295.

In this note we question the view that political power is independent of economic power, and claim that, via political contributions, there is at least a limited market in which political power can be "bought" by economic resources. The practical importance of the transaction is that government policy may differ in this case from that chosen under the assumption of equality of political power.

Section I presents the two approaches to political contributions, and the role of money in political campaigns. Section II analyzes the model where campaign contributions are regarded as political investments by large contributors. Section III discusses the cases of collusion between contributors and between candidates and their implications for the political system. Finally, Section IV summarizes the conclusions of the analysis and their relationship to some recent literature.

I. Campaign Contributions and the Democratic Process

First we reconstruct the simple model of democracy, which follows the traditional lines. We assume that a candidate wants to maximize P , his percentage of the total votes.¹ There are n issues involved in the election campaign and each individual j forms his own opinion with regard to each issue i , which we denote as X_{ij} , and a weight which he attaches to the issue W_{ij} . The distance of a candidate from an individual depends on the candidates' positions with regard to relevant issues, the individual's positions and his subjective weights.² Similarly we can define as

¹In the simple approach, the only relevant result is winning or losing, and P can be regarded as the probability of winning. In a more general approach (see Stigler [6]), the percentage of votes for a known outcome is still a relevant variable as an indicator of the relative political power of the candidates. In order to simplify the discussion we shall use the former interpretation of P .

²While the model assumes a rational average vote, it does not however exclude individuals whose votes do not depend on the candidates' positions.

a weighted distance function $S(Y_{1_K} \dots Y_{n_K})$ which depends on the position¹ of the candidate K with respect to these relevant issues.²

The candidate maximizes his expected percentage of the votes by choosing a vector of optimal positions $(Y_1^* \dots Y_n^*)$ which minimize his weighted distance function. In a simple formal model we write:

$$P = f(S(Y_1 \dots Y_n), \alpha) \quad (1)$$

where S summarizes the candidate's policy positions and α represents some other personal characteristics of the candidate.³

For the optimal policy $(Y_1^* \dots Y_n^*)$ we get:

$$\frac{dP}{dY_1} (Y_1^* \dots Y_n^*) = \frac{\partial f(S)}{\partial S} S_1(Y_1^* \dots Y_n^*) = 0 \quad (2)$$

$Y_1^* \dots Y_n^*$ will depend on the parameter of the distribution of population preference. Suppose, for example, that S for a candidate is a weighted sum of the deviations of the individuals in the population from his own position, $S = \sum_i \sum_j W_{ij} |X_{ij} - Y_i|$, then the optimal policy is $Y_1^* = X_i$ (50%) which is the median position of the population in any relevant issue, i .

¹In a real world with limited and costly information, there is a difference between the true positions of the candidates and the subjective estimates of the positions made by different individuals. We assume, however, that changes in the actual position of the candidate will, on the average, be reflected in a similar change in their subjective image by individual voters.

²For simplicity, we will deal with one of the candidates and will replace the notation Y_{1_K} by simply Y_1 .

³For simplicity we assumed (implicitly) that the "personal factors", α , are independent of the candidate's policy $(Y_1 \dots Y_n)$, so that changes in the policy will not affect the "image", α , of the candidate $\left(\frac{d\alpha}{dY_1}\right) = 0$. α may include among other factors, trust in the candidate's, previous experience (incumbent) etc.

The inclusion of contributions (money) in the model can simply be regarded as an extension of the production function (1) to include another factor M which represents the value of the campaign expenditure. The candidate is assumed to have no money, and M is derived from the contributions of supporters in the population.¹

$$P = g(S, M, \alpha) \quad . \quad (3)$$

Since we tend to rule out the possibility of "buying votes" directly, campaign expenditures may enable the candidate to make his position clear and known to a larger number of potential voters. He can increase the percentage of his potential supporters who will actually vote for him, and he can improve his "public image" which may in turn affect voters' support. And he can also use some resources to find out what the voters' preferences are. Thus, in a realistic world, where obtaining or transferring information is a costly activity, the role of money is very important in "shortening" the distance between the candidate and his potential voters. A similar role is played by advertising expenditures of a firm in the product market by affecting demand for its specific brand.

If money is a neutral variable which is independent of the candidate's policy, then it seems that money contributions will have no effect on the candidate's position on different issues. If, however, a candidate can obtain contributions only in return for a change in his policy, he may have an incentive to do so if the loss of votes from changing the policy is less than the percentage of votes he can attract by using the money.

¹In this respect there is of course no difference between direct money contributions and contributions in kind (such as paying the candidate's expenses, or working for him below the market rate).

Let $(Y_1^*, Y_2^* \dots Y_n^*)$ be the optimal policies chosen by a candidate in the absence of any contribution.¹ Now assume that he is offered a contribution of dM to change his position to a closer point whose coordinates are $[(Y_1^* + \delta Y_1), (Y_2^* + \delta Y_2), \dots, (Y_n^* + \delta Y_n)]$. He will accept or reject the offer according to the sign (positive or negative, respectively) of the net effect on his percentage of the votes. The change in the percent of votes dP is the algebraic sum of the loss of votes as a result of a change (δY_i) in his policy and the gain in votes from the use of the money obtained by changing the policy in the election campaign.

$$dP = \left(\sum \frac{\partial P}{\partial S} \frac{\partial S}{\partial Y_i} \delta Y_i + \frac{\partial P}{\partial M} \cdot dM \right) .$$

In competition, the candidate's "own price" for changing one dimension, i , in his position will be

$$dM = - \frac{\sum \frac{\partial P}{\partial S} \frac{\partial S}{\partial Y_i} \delta Y_i}{\frac{\partial P}{\partial M}} .$$

The required price will be higher: (a) the higher is the required change δY_i ; and (b) the higher its "weight" $\left(\frac{\partial S}{\partial Y_i} \right)$ in the distance function S , where the "weight" is a reflection of the importance of the specific issue i to his potential voters.

II. Campaign Contributions and Market Equilibrium

It seems reasonable to assume that some contributors derive utility from campaign expenditures in the sense that they support what they consider the "correct" views and ideas which the candidate represents. Such contributors will usually contribute for one candidate whom they regard

¹Or in the case that contributions are only neutral.

as the "better qualified candidate", and they may do so even if it seems clear that the candidate's chances of winning are rather low. Also, the "return" to these idealistic contributors will not be in the form of "personal gain" from a policy, but in an "external utility gain" from the rational implications of the policy. These contributions are best regarded as "consumption expenditures" on the part of the individuals.

Another type of contribution which can be regarded as "investment expenditures" is contributions made by organizations like firms, labor unions, trade and occupational associations and other organized "pressure groups".¹ The main difference between these "collective contributions" and "individual contributions" discussed above, is that the former, like any other investment by firms, depends on its expected return on the investment.²

One particular feature of return on contributions is that there are some legal restrictions on the "candidate elected" to pay the contributors directly. There is no legal agreement or enforcement, and at best it is based on verbal understanding.³ The indirect payment cannot be legally viewed as a return to contribution and therefore has to be a part of a general government policy.

¹Pressure groups serve as intermediaries between individuals and the government. They try to influence the policy formation in a manner advantageous to the individuals belonging to the pressure group. They succeed in this by (a) contributing money, (b) encouraging to vote in a certain way, and in exchange for (a) and (b) get a policy beneficial to their constituency. Due to legal restriction contributions by organizations or firms may take a form of contribution by an executive or a major stockholder.

²For some discussion of "firms' contributions" along a similar line, see Tullock [7]. The idea that the government regulations and economic policies are influenced by the political power of the industry or organization which it regulates, was emphasized in the pathbreaking work of Stigler [5]. He has also mentioned the political contribution as a "means of payment" for favorable regulations.

³However, a candidate and a party have an incentive to keep their informal promises in order to maintain their credibility in future elections.

In the political process of a democratic society, it is easier for a government to find "a legal form" of payment to firms and organizations than to individuals. We believe, therefore, that the investment motive is more common in firm contributions.¹

From the point of view of the investor, campaign contributions may be a high risk venture for which the required expected rate of return is much higher than for alternative investment. The firm's return in the form of "specific favors, such as settling antitrust actions", and favorable regulations, makes it easier to pay firms rather than individuals.² Since the firm contributions are the larger in size on one hand, and require specific policy changes on the other hand, it is interesting to analyze the determination of market equilibrium in terms of the amount of contributions and the changes in the desired policy.

For simplicity of discussion, we deal with a contribution of one firm to one candidate.³ The firm desires specific changes in a candidate's vector of previously optimal policy positions $(Y_1^* \dots Y_n^*)$ to a new policy $(Y_1^0 \dots Y_n^0)$. The gain for the firm from a change in dimension i is assumed to be proportional to the change⁴ $\beta_i \cdot (Y_i^0 - Y_i^*)$. Its total expected gain is:

$$G = P \cdot \sum \beta_i \cdot (Y_i^0 - Y_i^*) \quad . \quad (4)$$

¹We will use the term "firm" when we refer to a contribution for an investment purpose; thus, the term "firm" will refer to corporations, unions, and other organizations, as well as to some individuals.

²Personal appointment may be one way to pay for service of the individual or the firm which he represents.

³Some aspects of joint action by firms and candidates will be discussed in a later section.

⁴Without loss of generality, we assume that the policy variable is measured in such a way that all β_i are positive.

The total amount of money that the firm may offer to "buy" such changes is:

$$M = \frac{G}{(1+\rho)} = \frac{P \cdot \sum \beta_i (Y_i - Y_i^*)}{(1+\rho)} \quad (5)$$

where ρ is the required return on investments in the same risk class.¹ Note that if there are many firms which are interested in a similar policy change, we can simply aggregate their contribution supply functions.

Again, the candidate maximizes his percentage of votes, facing a given supply function of contribution. Let S_0 be the distance of the classical optimal policy which minimizes the distance of the candidate from his potential voters. We can write the distance at any other point of chosen policy as:

$$S = S_0 + \bar{S}(Z_1 \dots Z_n) \quad (6)$$

where $Z_i = (Y_i^0 - Y_i^*)$ is the change of the i th component of the policy vector, and $\bar{S} = (S - S_0)$ is the added distance of the policy vector $(Y_1^0 \dots Y_n^0)$ over S_0 , the minimum distance of the classical optimal policy $(Y_1^* \dots Y_n^*)$.

The "market equilibrium" in a world with firm contributions is therefore determined as the policy vector that maximizes the percentage of votes function (3) subject to a contribution constraint (5).

Note the above system is solved simultaneously since the contribution M which affects the percentage of votes P in (3) also depends on the probability P in (5).

¹The main determinant of ρ is the "risk" of the return from the political investment.

We can substitute (5) and (6) in (3) to obtain:

$$P = g(S_0 + \bar{S}(Z_1 \dots Z_n), \frac{P}{1+\rho} \sum_{i=1}^n \beta_i Z_i, \alpha) \quad (7)$$

and the optimal policy vector is determined by the changes Z_1 from the previous position of equilibrium derived earlier in (2).

Using an implicit function framework and S we can write:

$$\frac{\partial P}{\partial Z_1} = g_1 \frac{\partial S}{\partial Z_1} + g_2 \left(\frac{\partial P}{\partial Z_1} \frac{M}{P} + \frac{P \beta_1}{1+\rho} \right) \quad (8)$$

and the necessary condition for optimum policy can be written:

$$0 = \frac{\partial P}{\partial Z_1} = \frac{\left(g_2 \frac{P \beta_1}{1+\rho} + g_1 \frac{\partial S}{\partial Z_1} \right)}{\left(1 - \frac{g_2 M}{P} \right)} \quad (9)$$

In the classical case where contributions do not affect the percentage of votes and $g_2 = 0$, (9) yields that the optimal solution is $S_1 = \frac{\partial S}{\partial Z_1} = 0$, which means that we are in the point of minimum distance.

In the general case where $g_2 > 0$, we get:

$$g_2 \frac{\partial M}{\partial Z_1} = -g_1 \frac{\partial S}{\partial Z_1} \quad (10)$$

so that in equilibrium, a candidate will change his policy only up to the point where the marginal gain in votes through the additional contribution $\left(g_2 \frac{\partial M}{\partial Z_1} \right)$ is equal to the marginal loss of votes through changing policy.

In discussing the results it may be useful to illustrate a simple case as follows. Let the distance function be

$$S = S_0 + \frac{1}{2} \sum W_i Z_i^2 \quad (11)$$

where W_i is the weight of the policy dimension i . We also assume the percentage of votes function can be approximated over the relevant range by a Cobb-Douglas function:

$$P = g(S, M, \alpha) = P_0(\alpha) \cdot S^{-\gamma_1} \cdot M^{\gamma_2} \quad (12)$$

where $\gamma_1 > 0$ and $\gamma_2 > 0$. Then since

$$g_1 = -\frac{\gamma_1}{S} P \quad (13a)$$

$$g_2 = \frac{\gamma_2}{M} P \quad (13b)$$

and also

$$\frac{\partial S}{\partial Z_i} = W_i Z_i \quad (13c)$$

$$\frac{\partial M}{\partial Z_i} = \frac{P_0 \beta_i}{(1+\rho)} \quad (13d)$$

(10) can be written simply as:

$$P \cdot \frac{\gamma_2}{M} \cdot P_0 \frac{\beta_i}{(1+\rho)} = P \cdot \frac{\gamma_1}{S} \cdot W_i Z_i \quad (14)$$

or

$$Z_i = \frac{P_0}{(1+\rho)} \cdot \left(\frac{\beta_i}{W_i} \right) \cdot \left(\frac{\gamma_2}{\gamma_1} \right) \cdot \left(\frac{S}{M} \right) \quad (15)$$

We can derive the following conclusions from (15):

(a) The change in the optimal policy with regard to specific dimension i will be higher, the higher the potential gain to contributors (β_i) from changing the dimension.

(b) The changes in policy will be higher the lower is the weight (W_i) of the specific policy dimension in the distance function. This conclusion suggests that contributions may be more related to those specific favors in policy dimension, which are not regarded as crucial in the political campaign (see also Tullock [7]);

(c) For a given change in policy the size of the contribution will be higher the higher is the initial probability $P_0(\alpha)$ that the candidate will be elected.¹ In other words, the investment motive will lead to higher contributions to the leading candidate;

(d) The changes in the optimal policy for a given amount of contributions will be higher the higher are coefficients of money (γ_2) in the probability function (12) and the lower is the coefficient of the distance (γ_1). The ratio of these coefficients $\left(\frac{\gamma_1}{\gamma_2}\right)$ can be viewed as a measure of the relative effectiveness of the two inputs (policy and money) in the probability function;²

¹In the case of a contribution of a new firm to an already established candidate, $P_0(\alpha)$ can be regarded as including the effects of other contributions obtained previously from other firms.

²The relative effectiveness of the inputs may depend in part on the information available to the public with regard to the change in policy and the existence of an economic "deal" between the candidate and the contributor.

(e) Finally, since firms regard contributions as investments, they may reduce the risk by contributing to both candidates, especially when the race is very close. In the case of a potential landslide, however, the model clearly suggests that large contributors will support the prospective winner.

III. The Case of Collusion Between Firms and Between Candidates

There are some special aspects of the political sector that may lead to a collusion between contributors and between candidates. Such a collusion may affect the results of the earlier section.

First, we note that some of the organized contributors like unions and associations are basically a form of collusion between individuals with joint economic interest, and for some organizations, the political involvement may be one of the major economic activities.

Similarly, since government policy and regulations are commonly made on an industry-wide basis, they can be regarded as a "public good" for firms in the industry, and firms will have an incentive to make a "joint venture" in political investment by contributing jointly to political parties.

As in any other economic cartel, there may be an incentive for individual members to share the benefits without sharing the cost, and the cartel has to enforce control on its members. For a cartel with a large number of members,¹ in which direct control of contributions and rewards is rather difficult, the cartel may have a collective contribution which is financed by the dues of its members (if such members' dues are feasible). This is probably the case for unions, occupational associations,

¹Either individuals or relatively small firms.

trade associations, and other formally organized pressure groups.

In the case of a cartel with a small number of large corporations, it is more likely to observe firm contributions on an individual basis in line with the cartel agreement. This cartel agreement is probably more stable than a simple producers' cartel for the following reasons:

(a) The firm's participation is given in monetary terms and is simply identifiable by a candidate;

(b) Since firm saving (by not paying its share in the cartel contribution) is the candidate's loss, the candidate has "no incentive" to make a special "lower cost deal" with the firm. Furthermore, in this case, the candidate has a common interest with the "cartel manager" to avoid "cheating";

(c) Finally, in the oligopolistic case, the candidate elected may have a special reward and punishment mechanism for large individual corporations. Direct purchase by the government, and the antitrust legislation may be part of this mechanism.

With regard to the candidate, one would expect that in a classical political world, the candidate would compete in every possible policy aspect, with regard to every relevant issue. This is not necessarily the case in a world with imperfect information and costly political campaigns. It seems that politicians have tried to construct some rules of the political game which restrict the campaign in much the same way that other competitive players in sports have formed rules and restrictions to obtain efficient and cheaper ways to determine a winner. A few simple examples of such "accepted rules" are: (a) the restriction of the direct campaign to a relatively short period before

the election; and (b) the use of a relatively small number of major campaign issues, and avoidance of some other subjects as potential campaign issues.

In a world with investment contributions, the efficiency consideration will still hold. By restricting the length and the extent of the political campaign, candidates are able to reduce significantly their need for campaign financing and their demand for political investment.

Collusion between major candidates may also take the form of an agreement on a common view with regard to a given policy issue (dimension) even though the common position is clearly different from the one chosen by the average voter, and bias is in favor of a specific industry, organized union, or other group of potential contributors. This may be the case when all candidates have been offered political contributions in return for their support in a given "biased policy". If each candidate will consider the offer individually, he may find it "politically expensive", if it will reduce his percentage of votes by shifting voters to other candidates who are less "biased" than he is. If, however, all major candidates have accepted the biased policy in return for political contributions, then the "political cost" of accepting the offer becomes much cheaper. This is the case since the political choice is based on the relative position of the candidate,¹ and a common position in one of the policy's dimensions (even though it may be an important one) will have a weaker effect on their relative ranking and their percentages

¹Formally, we can write the percentage of votes function (1) of a given candidate to depend, not only on his position, but on the position of alternative candidates as well.

of votes.¹

This analysis suggests that potential contributors may have an incentive to contribute to all major candidates,² and that candidates may have an incentive to form a joint policy with regard to "high contribution" issues.

IV. Implications of the Analysis

One observed phenomena with regard to political contributions is that leading candidates tend to attract more campaign contributions. In particular, in the case of a clear lead, large contributors (or political investors) tend to contribute mainly to the leading candidate. This relationship can be interpreted as the candidates who attract the voters are also able to attract the contributions.³ A similar argument has led Penniman [4] and Winter [8] to conclude that campaign contributions are not a major factor in the political system, since the ability of a candidate to attract contributions depends on his ability to attract the potential voters (in the public opinion polls and in the elections).

Our model suggests that large contributors contribute more to a leading candidate, not because they also "like" the candidate, but rather as a result of a rational investment policy. Candidates with a higher probability of winning also have a higher probability of being

¹It may have some effect, however, since potential supporters of the candidate may: (a) decide not to vote, (b) reduce their normal contribution and the level of their support, (c) realize that their candidate is not that different from the others, and shift their votes to other candidates. The sum of these effects may be different for different candidates.

²Another reason which was suggested before, is risk aversion on the part of the political investors.

³This interpretation also assumes the direction of causality.

able to pay their specific political debts to the contributors. We suggest, therefore, that the relevant purpose and impact of political investment is not the election of an unpopular and less desired candidate, but rather the adoption of a less desired policy by a leading and popular candidate. We believe that what is relevant to the political system as well as to the contributors, is the policy rather than the identity of the elected officials. It is not a surprise, therefore, that contributors spend more resources to change the policies of the leading candidates than to increase the percentage of votes of "losing candidates".

We emphasize, therefore, that the "choice" of an already leading candidate by contributors should not be regarded as a sign of the unimportance of the contribution. The effects of contributions should be more carefully analyzed by studying the policies of political leaders, and their distribution of cost and benefits of the policies.

The results of this work depend clearly on its strong simplifying assumptions, we hope, however, that the formal model of democracy with contributions, may prove useful in understanding the present political systems.

REFERENCES

- [1] Arrow, Kenneth J. "Social Choice and Individual Values." (New York: John Wiley and Sons), 1951.
- [2] Buchanan, James M. and Gordon Tullock. "The Calculus of Consent." (Ann Arbor: The University of Michigan Press), 1962.
- [3] Downs, Anthony. "An Economic Theory of Democracy." (New York: Harper and Row), 1957.
- [4] Penniman, Howard R. "Financing Campaigns in the Public Interest." In Penniman and Winter (eds.), "Campaign Finances: Two Views of the Political Implications." (New York: American Enterprise Institute for Public Policy Research), 1971.
- [5] Stigler, George J. "The Theory of Economic Regulation." The Bell Journal of Economics and Management Sciences, Vol. 2, Spring 1971, pages 3-21.
- [6] Stigler, George J. "Economic Competition and Political Competition." Public Choice, Vol. XIII, Fall 1972. pages 91-106.
- [7] Tullock, Gordon. "The Purchase of Politicians." Western Economic Journal, Vol. X, No. 3 (September 1972), pages 354-355.
- [8] Winter, Ralph K. "Money, Politics and the First Amendment." In Penniman and Winter (eds.), "Campaign Finances: Two Views of the Political Implications." (New York: American Enterprise Institute for Public Policy Research). 1971.

DISCUSSION PAPER SERIES

- | | | |
|-------|---|--|
| 71-1 | A Subordinated Stochastic Process Model
with Finite Variance for Speculative Prices | Peter K. Clark
April 1971 |
| 71-2 | A Note on Approximate Regression Disturbances | Clifford Hildreth
January 1971 |
| 71-3 | Induced Innovation in Agricultural Development | Yujiro Hayami
Vernon W. Ruttan
May 1971 |
| 71-4 | Wage Structures in Latin America | Peter Gregory
June 1971 |
| 71-5 | Optimization and Scale Economies in
Urban Bus Transportation | Herbert Mohring
June 1971 |
| 71-6 | An Approach to the Study of Money and
Nonmoney Exchange Structures | Neil Wallace
June 1971 |
| 71-7 | Coalitions, Core, and Competition | Marcel K. Richter
June 1971 |
| 71-8 | Instantaneous and Non-Instantaneous
Adjustment to Equilibrium in Two-Sector
Growth Models | Antonio Bosch
Andreu Mas-Colell
Assaf Razin
July 1971 |
| 71-9 | A Static Nonstationary Analysis of the
Interaction Between Monetary and
Fiscal Policy | Neil Wallace
August 1971 |
| 71-10 | Are There Exogenous Variables in Short-Run
Production Relations? | Christopher A. Sims
August 1971 |
| 71-11 | An Adjusted Maximum Likelihood Estimator
of Autocorrelation in Disturbances | Clifford Hildreth
Warren T. Dent
October 1971 |
| 71-12 | Wage Fund, Technical Progress and
Economic Growth | Hukukane Nikaido
December 1971 |
| 71-13 | The Economics of Malnourished Children:
A Study of Disinvestment in Human Capital | Marcelo Selowsky
Lance Taylor
December 1971 |
| 72-14 | Industrial Capacity Utilization in Colombia:
Some Empirical Findings | Francisco E. Thoumi
April 1972 |
| 72-15 | Monopolistic Competition, Objective Demand
Functions and the Marxian Labor Value
in the Leontief System | Hukukane Nikaido
May 1972 |

Discussion Paper Series (Continued)

- | | | |
|-------|--|---|
| 72-16 | The Stability of Models of Money and Growth
With Perfect Foresight | Thomas J. Sargent
Neil Wallace
May 1972 |
| 72-17 | Consumerism: Origin and Research Implications | E. Scott Maynes
June 1972 |
| 72-18 | Income and Substitution Effects in Labor
Force Participation and Hours of Work | H. Gregg Lewis
June 1972 |
| 72-19 | On Investment in Human Capital under Uncertainty | Assaf Razin
July 1972 |
| 72-20 | Ventures, Bets and Initial Prospects
(Revised in March 1973) | Clifford Hildreth
August 1972 |
| 72-21 | A Competitive Market Model for "Futures"
Price Determination | Peter K. Clark
August 1972 |
| 72-22 | Rational Expectations and the Dynamics of
Hyperinflation | Thomas J. Sargent
Neil Wallace
September 1972 |
| 72-23 | Seasonality in Regression | Christopher A. Sims
September 1972 |
| 72-24 | The Impact of the Wage-Price Freeze on Relative
Shares: A Test of Short-Run Market
Expectations | Sol S. Shalit
Uri Ben-Zion
December 1972 |
| 73-25 | A Model of the Eurodollar Market | Charles Freedman
February 1973 |
| 73-26 | A Note on Exact Tests for Serial Correlation | Christopher A. Sims
March 1973 |
| 73-27 | The Cost of Capital and the Demand for
Money by Firms | Uri Ben-Zion
March 1973 |
| 73-28 | Distributed Lags | Christopher A. Sims
March 1973 |
| 73-29 | Economic Factors Affecting Population
Growth: A Preliminary Survey of
Economic Analyses of Fertility | T. Paul Schultz
April 1973 |
| 73-30 | A Note on the Elasticity of Derived Demand
under Decreasing Returns | Assaf Razin
May 1973 |
| 73-31 | The Use of Operational Time to Correct
for Sampling Interval Misspecification | Peter K. Clark
May 1973 |

Discussion Paper Series (Continued)

- | | | |
|-------|--|--|
| 73-32 | International Capital Flows, Interest Rates,
and the Money Supply | Charles Freedman
May 1973 |
| 73-33 | A Model of Investment under Interest
Rate Uncertainty | Elisha A. Pazner
Assaf Razin
June 1973 |
| 73-34 | An Intergenerational Model of Population Growth | Assaf Razin
Uri Ben-Zion
July 1973 |
| 73-35 | On Money, Votes and Policy in a
Democratic Society | Uri Ben-Zion
Zeev Eytan
July 1973 |