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A Political Theory of Government Debt

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Ricardian equivalence implies that the public debt affects neither wealth nor welfare. Rational, far seeing individuals undo privately any intergenerational transfers made by government. This conclusion is puzzling. Complaints about the burden of the debt on future generations are common in countries with public debt or current and prospective deficits. Why do rational individuals complain about a burden that, according to Ricardian equivalence does not occur?

This paper reports the results of research that seeks to answer this question and to extend the analysis of debt and deficits by analyzing the reasons for issuing government debt. A basic premise of this research is that government debt in a democracy responds to the wishes of the majority. A main role of government is to redistribute income within and between generations in a world in which there is inequality in the distribution of income and wealth. Our model, therefore, includes people who differ in ability and, therefore, in income and in their assets or non-human wealth. With the exception of these changes we retain the framework introduced by Barro (1974). There is complete certainty, lump sum taxes and intergenerational transfers from parents to children.

Since there is perfect certainty, some relatively poor individuals know that their progeny will include relatively wealthy individuals. To smooth consumption across the generations, they find it optimal to consume more than they produce and to leave negative bequests (debts) to these offspring. Laws restrict private, negative bequests, so the relatively poor individuals cannot leave negative bequests. They are bequest constrained, and they seek to relax the constraint and increase their consumption by voting for deficits and public debt finance. When deficits are created, the national debt increases and the consumption of such individuals increases, crowding out savings and
decreasing capital formation. This induces, in turn, changes in wages and the return to capital.

Individuals who are not bequest constrained are indifferent to the mix of debt and taxes, just as in Barro (1974). They can reverse privately any reallocation between generations by altering the intertemporal allocation of bequests. They are not indifferent, however, to the changes in interest rates and wages resulting from debt issues and from the effects of debt on the capital stock.

The attitude of each individual in the economy towards debt finance depends on the effects this method of finance has on his welfare. In general a present value neutral decrease in current taxes accompanied by an increase in debt affects individual welfare through several channels. First by enabling the bequest constrained individuals to reallocate consumption between themselves and their offsprings. Second, by changing the returns to capital and labor. The optimal amount of debt finance from the point of view of a single individual depends on such personal characteristics as his ability and the ability of his progeny, the amount of non human wealth he inherits from his parents, and on whether he is bequest constrained, and if he is -- on how far he is from an optimum.

I. Structure of the Economy, Redistribution Through the Political Process and Crowding Out.¹

The economy has the familiar overlapping generations structure. There are a large number of individuals each of whom lives for two periods. The number of young (first period of life) and of old (second period of life) individuals is the same and is denoted by N. The group of individuals who are young in period t is referred to as generation t. Each individual works when
young and consumes in both periods of life. When young, individuals can save part of their resources to consume during old age or to pass as a bequest to the next generation. These savings take the form of capital or of government bonds which are perfect substitutes for capital in the portfolios of individuals. Capital and bonds carry the same interest rate, so individuals are indifferent to the composition of their portfolios. Output is produced by means of an aggregate constant returns to scale production function which utilizes capital and labor. The existing amount of capital depends on past and current individual saving decisions as well as on past and current political decisions concerning the national debt. Each young individual inelastically supplies one unit of labor so total labor input is equal to N. Returns to capital and labor are determined competitively. Since individuals differ in their productivity levels, wage rates differ across individuals.

When old, each individual receives a lump sum transfer that can be thought of as social security. This transfer is financed by a combination of lump sum taxes on the current young and issuance of government debt that has to be repaid with interest in the next period. Those living in period t (the young of generation t and the old of generation t-1) determine by majority rule the size of the social security benefits to be paid to each member of generation t when he is old. This amount, which is paid out in the next period (t+1), is precommitted by social contract. The living in t also determine by majority rule the allocation of financing of current governmental expenditures between taxes and bonds. These expenditures, for current lump sum transfers to the old and to service the debt issued in the previous period, are taken as given by individuals who vote in t. The reason is that each period's spending has been precommitted by the political decision of those who voted in period t-1. Thus, each individual can be viewed as casting his vote
for or against alternative three dimensional tax cum social security schedules whose components are the sizes of (1) the current lump sum tax on the young, (2) the debt to be issued, and (3) the lump sum benefit to be paid to the current young when they become old in the next period.

Because of the government's budget constraint and of the fact that the welfare of young individuals' in \( t \) depends only on the total size of government expenditures in this period (and not on their composition) the choice of schedules can be reduced to the choice of one single variable - the level of the national debt. Each individual, depending on his personal characteristics, generally prefers a different level of debt. The actual choice of debt is determined by the preferences of the median voter. He chooses the debt level that he prefers most.

When the voter substitutes debt for taxes, the resulting increase in government bonds is absorbed in the portfolios of non-bequest constrained individuals. The latter release an equal amount of physical capital. This capital is consumed by the bequest constrained individuals since their consumption increases when debt is substituted for taxes. Hence, factors that increase the level of debt most preferred by the median voter induce some crowding out of capital. The amount of capital crowded out depends on the number of bequest constrained individuals and on the severity of the constraints they face.

II. Who Likes Debt and Who Dislikes It?

Bequest constrained individuals obviously prefer some debt to no debt at all. Individuals with small inherited wealth or with little human capital are likely to be bequest constrained. The larger is the real wage expected for their children, the more serious is this constraint. Hence individuals with little human and non human wealth, who expect their children to have higher
wages than they have, are likely to vote for some debt financing of the budget.

Individuals with large amounts of non-human wealth are unlikely to be bequest constrained. They know that an increase in debt crowds out real capital and raises the interest rate. They may vote for a large debt to increase the rate of return to wealth that such a debt produces. To the extent that capital and labor are complements, individuals with large labor productivity and small non-human wealth are likely to vote against deficits because of the decrease in real wages caused by crowding out of capital.

To summarize, two types of individuals are likely to vote to increase debt -- those with small total wealth and those with large amounts of non-human wealth. Individuals with intermediate levels of non-human wealth who depend mainly on labor income are likely to vote for a small debt or for no debt at all.

An additional element that affects individual attitudes towards debt finance is the length of life during retirement. This element can be introduced into the formal structure of the overlapping generations model by using the marginal utility of consumption in the second period of life as a proxy for the length of time spent in retirement. A higher marginal utility is positively correlated with longevity for two reasons. First, more resources are needed to sustain a given consumption stream when life is longer. Second, the need for health and other types of care increases with age. It can be shown, using this specification that a larger fraction of individuals in the economy is likely to become bequest constrained when longevity increases.
III. Factors that are Conducive to Larger Debts and Deficits

Changes in the distribution of labor productivity, in the distribution of wealth, in the rate of growth of the economy and in longevity affect the attitudes of individuals toward deficit financing. Changes in these factors change the identity of the median individual as well as his most preferred level of debt, thereby inducing through the political system changes in national debt. The following proposition summarizes conditions that are normally conducive to a choice of larger debts under majority rule.

Proposition 1 A larger debt is more likely:

a. the larger the fraction of individuals below a certain level of income and wealth;

b. the smaller the fraction of individuals whose main source of income is from wages;

c. the higher expected longevity;

d. the more spread out the distribution of individuals by total wealth or income;

e. the larger the expected rate of growth of the economy;

f. the higher the degree of equality of opportunity as measured by a low correlation between the wages of parents and the wages of their children;

g. the more sensitive the return to capital to a change in the capital-labor ratio; and

h. the less sensitive the level of wages to a change in the capital-labor ratio, when capital and labor are complements.

By definition, deficits are created when the national debt increases\(^2\). Hence, any of the factors in Proposition 1 that increase debt also increase the deficit for a time. Some of the implications of this general principle are summarized in Proposition 2.
Proposition 2  Budgetary deficits are larger under majority rule in periods in which there has been an increase in:

a. the fraction of individuals below a certain level of income and wealth;
b. the fraction of individuals whose main source of income is not from wages (rentiers);
c. expected longevity;
d. the spread of the distribution of income;
e. the expected rate of growth of the economy.

When capital and labor are complements, a decrease in the birth rate is also conducive to large deficits. The reason is that, given the current capital stock, a decrease in reproduction increases the capital-labor ratio expected for the future and therefore the wage rates expected for future generations. Hence a larger fraction of the currently living individuals prefers a higher debt, increasing the debt level preferred by the median voter and with it the size of deficits produced by the political system. By producing deficits and crowding capital out, the political system smoothes consumption intertemporally by reducing the future capital stock in line with the expected reduction in population or its rate of growth.

IV. The Reagan Deficit and Some Preliminary Evidence

How relevant is the discussion above for explaining the deficits created by the Reagan administration during the first part of the eighties?

We do not have a definitive answer to this question. However, we present preliminary evidence to establish that some of the changes that are conducive to deficits according to Proposition 2 materialized (or at least did not change in the wrong direction) during the ten or fifteen years that culminated in Reagan's presidency.

Data based on returns to the Internal Revenue service in 1970 and 1982
(summarized in table 1) indicate that the fraction of returns with adjusted gross income below $15000 per year (in constant prices) increased from about 45% in 1970 to almost 52% in 1982. This evidence seems to support implication a of Proposition 2. But data on the cumulative distribution of household income from the census of population (table 2) shows only a minor increase in the fraction of individuals with relatively low income. We conclude that there is no evidence to support the view that between the beginning of the seventies and the beginning of the eighties the fraction of low income individuals decreased. The evidence seems to support the opposite conclusion which is consistent with part a of Proposition 2.

Table 3 suggest that between 1970 and 1982 the fraction of returns with large shares of wages in adjusted gross income decreased substantially. This is consistent with implication b of Proposition 2.

Table 4 shows that life expectancy at various ages above fifty increased at all ages between 1969 and 1982. The percentage increase ranges from a minimum of 10% up to a maximum of 20% and rises with age. This is consistent with part c of Proposition 2.

Between 1970 and 1980 the variance of household income from the census of population data shows a slight increase. This is consistent with part d of Proposition 2. However, the Internal Revenue Service data shows a small decrease in the variance of adjusted gross income between 1970 and 1982. The verdict regarding the changes in the variance of income appears to be inconclusive. The decrease in the birth rate since the sixties, however, is consistent with the view that part of the recent increase in deficits is a (possibly delayed) response to this lower birth rate.

Although the evidence we consider does not settle the issue, it suggests that some of the partial effects implied by the discussion in section IV are
in a direction that is conducive to deficits while the effect of the remaining factors was either neutral or inconclusive. Hence the preliminary data is not inconsistent with the view that integrated political-economic models of the type described here may contribute to our understanding of the recent surge in deficits. But a more definitive verdict must await further, more detailed study.

V. Effects of War, Uncertain Lifetimes and Investment in Human Capital on the Debt

The discussion can be extended to the case of an exogenous, but possibly fluctuating level of expenditures for the provision of a public good. In particular, the theory implies that an increase in government expenditures (possibly due to war) causes, as in Barro (1979), an increase in public debt even with lump sum taxes. The mechanism that produces this result is, however, different than that suggested by Barro. If all the increase in government expenditures had been financed by current taxes, the fraction of individuals who are bequest constrained would have been larger, increasing the debt level most preferred by the median voter. Realizing this fact, the political process uses both higher taxes and higher debt to finance wars or other exogenous increases in public expenditure. A related implication is that deficit finance is more likely when public expenditures increase and surpluses are more likely when they decrease.

Lifetime uncertainty normally increases the level of debt preferred by most individuals even if they do not expect to be bequest constrained on average. This is the case whenever there is a positive probability that the individual will live long enough (and or will become sufficiently ill) to make the bequest constraint binding. The individual knows that in some states of nature he will be bequest constrained and in others he will not be. If he is
an expected utility maximizer he prefers debt to current taxes as long as there is a positive probability that he will be bequest constrained. The reason is that in the states in which he is not constrained he is indifferent between debt and taxes, but in the states in which the constraint is binding he is strictly better off with a larger debt and smaller taxes. Hence, as long as he is taxed at a level that leaves a positive probability of a binding constraint he prefers further substitution of debt for taxes. Consequently, lifetime uncertainty increases the level of debt most preferred by the median voter inducing political institutions to produce a larger debt.

High returns to investment in human capital may induce parents to invest in their children's education not only for the sake of the children but also to provide for their own retirement. Bequest constrained parents have no way to recapture this investment in retirement. Substitution of debt for taxes releases the constraint and enables them to recapture the investment and its higher yield by adjusting their (positive) bequest downward. Hence, the national debt is likely to be higher the larger is the quantity of investments in human capital which yield a return that is higher than the return on physical capital.
Footnotes

1. A full description of the model underlying this structure and some of the results below is in Cukierman and Meltzer (1987).

2. This statement abstracts from inflationary finance of the deficit.

3. It is hard to test part e of Proposition 2 because of the elusiveness of long term expectations about real output growth.

4. This argument abstracts from general equilibrium effects of changes in the debt on his welfare through changes in his wage and the return to capital.

5. The detailed argument is in Cukierman (1986).

6. This argument is due to Drazen (1978). It is relevant as long as the return to human capital is larger than the return to physical capital.
References


Table 1 - Distribution of Adjusted Gross Income in 1970 and 1982

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 15000</td>
<td>44.74</td>
<td>51.71</td>
</tr>
<tr>
<td>15000-75000</td>
<td>53.46</td>
<td>46.77</td>
</tr>
<tr>
<td>Above 75000</td>
<td>1.80</td>
<td>1.52</td>
</tr>
<tr>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td></td>
</tr>
</tbody>
</table>


Calculated from tables on all returns by the size of adjusted gross income (table 4 in 1970 and table 1.4 in 1982). 1970 income brackets were converted into 1982 prices by using the consumer price index.

Table 2 - Distribution of Household Income in 1969 and 1979

<table>
<thead>
<tr>
<th>Household Income (in 1979 dollars)</th>
<th>1969 %</th>
<th>1979 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 5000</td>
<td>14.5</td>
<td>13.3</td>
</tr>
<tr>
<td>5000 - 9999</td>
<td>28.7</td>
<td>29.2</td>
</tr>
<tr>
<td>10000 - 14999</td>
<td>44.1</td>
<td>44.5</td>
</tr>
<tr>
<td>15000 - 24999</td>
<td>74.9</td>
<td>71.1</td>
</tr>
<tr>
<td>Above 25000</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 3 - Distribution of the Share of Salaries and Wages in Adjusted Gross Income 1970 and 1982

<table>
<thead>
<tr>
<th>Share of Salaries and Wages in Adjusted Gross Income (Percent)</th>
<th>Cumulative Percentage of Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 93</td>
<td>7.75 0</td>
</tr>
<tr>
<td>90 - 90.99</td>
<td>38.14 10.34</td>
</tr>
<tr>
<td>87 - 89.99</td>
<td>57.83 50.38</td>
</tr>
<tr>
<td>84 - 86.99</td>
<td>72.71 61.43</td>
</tr>
<tr>
<td>81 - 83.99</td>
<td>82.13 79.65</td>
</tr>
<tr>
<td>78 - 80.99</td>
<td>96.61 97.52</td>
</tr>
<tr>
<td>Below 78</td>
<td>100.00 100.00</td>
</tr>
</tbody>
</table>

Source: Same as that of Table 1

The share of salaries and wages in adjusted gross income was obtained by dividing the total amount of salaries and wages within each income bracket by total adjusted gross income within that bracket. The distribution was obtained by forming wage share intervals and calculating the fraction of returns within each wage share interval.

Table 4 - Average Remaining Lifetime at Various Ages in 1969 and 1982

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Expected Remaining Years of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1969</td>
</tr>
<tr>
<td>50 - 55</td>
<td>25.7</td>
</tr>
<tr>
<td>55 - 60</td>
<td>21.8</td>
</tr>
<tr>
<td>60 - 65</td>
<td>18.1</td>
</tr>
<tr>
<td>65 - 70</td>
<td>14.8</td>
</tr>
<tr>
<td>70 - 75</td>
<td>11.8</td>
</tr>
<tr>
<td>75 - 80</td>
<td>9.3</td>
</tr>
<tr>
<td>80 - 85</td>
<td>7.0</td>
</tr>
<tr>
<td>85 and over</td>
<td>5.0</td>
</tr>
</tbody>
</table>