The Savers-Spenders Theory of Fiscal Policy

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Abstract

The macroeconomic analysis of fiscal policy is usually based on one of two canonical models--the Barro-Ramsey model of infinitely-lived families or the Diamond-Samuelson model of overlapping generations. This paper argues that neither model is satisfactory and suggests an alternative. In the proposed model, some consumers plan ahead for themselves and their descendants, while others live paycheck to paycheck. This model is easier to reconcile with the essential facts about consumer behavior and wealth accumulation, and it yields some new and surprising conclusions about fiscal policy.

Paper prepared for the meeting of the American Economic Association, January 2000.

The literature on the macroeconomic effects of fiscal policy and, in particular, of government debt is founded on two canonical models. The purpose of this paper is to suggest that both models are deficient and to propose a new model to take their place.

The first canonical model is the Barro-Ramsey model of infinitely-lived families. (Robert Barro 1974) According to this model, the government's debt policy redistributes the tax burden among generations, but families, who want smooth their consumption over time, reverse the effects of this redistribution through their bequests. Government debt is completely neutral--a proposition called Ricardian equivalence.

The second canonical model of government is the Diamond-Samuelson model of overlapping-generations. (Peter Diamond 1965) In this model, people smooth consumption over their own lifetimes, but there is no bequest motive. When the government issues debt, it enriches some generations at the expense of others, crowds out capital, and reduces steady-state living standards.

In this paper, I first discuss the facts that lead me to reject these canonical models. I then propose an alternative model and develop briefly its implications for fiscal policy.

I. Why We Need a New Model

Three facts persuade me that neither the Barro-Ramsey model nor the Diamond-Samuelson model are adequate for analyzing fiscal policy.

Fact 1: Consumption Smoothing is Far From Perfect

Both the Barro-Ramsey model and the Diamond-Samuelson model assume that all households use financial markets to smooth consumption over time. There is much reason to be skeptical about this assumption.

A large empirical literature, starting with Robert Hall's (1978) seminal random-walk theorem, has addressed the question of how well households intertemporally smooth their consumption. Although this literature does not speak with a single voice, the consensus view is that consumption smoothing is far from perfect. In particular, consumer spending tracks current income far more than it should.

In our 1989 paper, John Campbell and I considered a world populated with two types of consumers--some following the permanent income hypothesis and some following the simple rule-of-thumb of consuming their current income. In this world, consumption does not follow a random walk: Predictable changes in income lead to predictable changes in consumption, depending on the prevalence of rule-of-thumb behavior. We estimated that about half of income goes to rule-of-thumb consumers.

Subsequently, various papers have confirmed the great influence of current income on consumer spending. John Shea (1995) used micro data to examine predictable changes in wages resulting from union contracts and found that a predictable increase in the wage of 1 percent leads to an increase in consumption of 0.89 percent. Jonathan Parker (1999, p. 969) examined predictable income changes resulting from Social Security taxes. He reported that "the elasticity of expenditures on nondurable goods with respect to the predictable declines in income that are studied is around one-half." Nicholas Souleles (1999, p. 956) examined the effect of predictable

income tax refunds and concluded that "the response of total consumption was found to be at least 35 percent of refunds within a quarter, up to over 60 percent."

There are various ways to view this rule-of-thumb behavior. One possibility is that consumers deviate from the assumption of fully rational expectations. Perhaps some consumers naively extrapolate their current income into the future. Or perhaps all consumers weigh their current income too heavily when looking ahead to their future income because, as a psychologist might explain, current income is the most salient piece of information available. (Amos Tversky and Daniel Kahneman, 1973)

Alternatively, one can view the rule-of-thumb behavior as resulting from consumers who face binding borrowing constraints. The recent consumption literature on "buffer-stock saving" (e.g., Christopher Carroll 1997) can be seen as providing a richer description of this rule-of-thumb behavior. Buffer-stock savers are individuals who have high discount rates and often face binding borrowing constraints. Their savings might not be exactly zero: They might hold a small buffer stock as a precaution against very bad income shocks. But the existence of this small buffer does not alter the central result that their current income has a large influence over their consumption.

Fact 2: Many People Have Net Worth Near Zero

Examination of data on wealth holdings suggests that there are many households for which saving is not a normal activity. One striking comparison is between the income distribution and the wealth distribution. According to the U.S. Census Bureau, the lowest two quintiles of the income distribution earn about 15 percent of income. By contrast, Edward Wolff (1998) reports

that the lowest two quintiles of the wealth distribution holds only 0.2 percent of household wealth.

A related and equally striking fact is the low absolute level of wealth with which many households operate. Wolff reports that the mean net worth of the lowest two quintiles of the wealth distribution is a mere $900. If we exclude home equity on the grounds that it is not always liquid, the mean for this group falls to a negative $10,600, indicating that debts such as credit cards balances exceed financial assets. Net worth is zero or negative for 18.5 percent of households; excluding home equity, the number of households in the red rises to 28.7 percent.

Reflecting on these facts, one cannot help but be drawn to a simple conclusion: Many households do not have the financial wherewithal to do the intertemporal consumption smoothing assumed by much modern macroeconomic theory, including the Barro-Ramsey and Diamond-Samuelson models of fiscal policy. Acknowledging the prevalence of these low-wealth households helps explain why consumption tracks current income as strongly as it does.

Fact 3: Bequests Are An Important Factor in Wealth Accumulation

While many people have almost no wealth, a few have much. The top 5 percent of the income distribution has historically earned between 15 and 20 percent of all income. But the top 5 percent of the wealth distribution holds 60 percent of the economy's wealth and 72 percent of financial wealth (that is, wealth excluding home equity). This great accumulation by a small part of the population suggests some households have motives beyond normal life-cycle smoothing. A bequest motive is the obvious candidate.

As a matter of accounting, each dollar of wealth that a person holds will either be spent during his lifetime or left as a bequest after he dies. Laurence Kotlikoff and Lawrence Summers

(1981) estimated the relative importance of the two kinds of wealth. They concluded (p. 706) that "intergenerational transfers account for the vast majority of aggregate U.S. capital formation." Any model that attempts to explain how fiscal policy affects the economy must come to grips with this fact.

II. A New Model

The three pieces of evidence I have just discussed suggest that we need a new macroeconomic model of fiscal policy. Both the Barro-Ramsey model and the Diamond-Samuelson model are inconsistent with the empirical finding that consumption tracks current income and with the numerous households with near zero wealth. In addition, the Diamond-Samuelson model is inconsistent with great importance of bequests in aggregate wealth accumulation.

A new model of fiscal policy needs a particular sort of heterogeneity. It should include both low-wealth households who fail to smooth consumption over time and high-wealth households who smooth consumption not only from year to year but also from generation to generation. That is, we need a model in which some consumers plan ahead for themselves and their descendants, while others live paycheck to paycheck. To see what we might learn such a model, I sketch a simple example in the rest of this paper.

Imagine the economy is populated by two sorts of people. One group, which I'll call savers, has behavior that is described by the Barro-Ramsey model: They have an operative intergenerational bequest motive and, thus, infinite horizons. A second group, which I'll call spenders, consumes their entire after-tax labor income in every period. This savers-spenders

model of fiscal policy is extraordinarily simple (and its antecedents in my empirical paper with Campbell are obvious). But its policy implications could not be more radical, as the following propositions make clear.

Proposition 1: Temporary tax changes have large effects on the demand for goods and services.

In early 1992, President George Bush pursued a novel policy to deal with the lingering recession in the United States. By executive order, he lowered the amount of income taxes that were being withheld from spenders' paychecks. The order did not reduce the amount of taxes that spenders owed; it merely delayed payment. The higher take-home pay that spenders received during 1992 was to be offset by higher tax payments, or smaller tax refunds, when income taxes were due in April 1993.

What effect should this policy have? According to the logic of either the Barro-Ramsey or Diamond-Samuelson model of fiscal policy, consumers should realize that their lifetime resources were unchanged and, therefore, save the extra take-home pay to meet the upcoming tax liability. By contrast, President Bush claimed his policy would provide "money people can use to help pay for clothing, college, or to get a new car." That is, he believed that consumers would spend the extra income, thereby stimulating aggregate demand and helping the economy recover from the recession.

Evidence supports Bush's conjecture. Shortly after the policy was announced, Matthew Shapiro and Joel Slemrod (1995) asked people what they would do with the extra income. Fifty-seven percent of the respondents said they would save it, use it to repay debts, or adjust their withholding in order to reverse the effect of Bush's executive order. Forty-three percent said they

would spend the extra income. Thus, for this policy change, most people were planning to act as standard theory posits, but many planned to spend the extra income. This result is easily explained by the savers-spenders model of fiscal policy.

Proposition 2: Government debt need not crowd out capital in the long run.

Although the savers-spenders model gives fiscal policy a strong influence in the short run, it renders it less potent in the long run. In particular, if taxes are lump-sum (or if they are levied entirely on inelastically supplied labor), then government debt does not influence the steady-state capital stock. In a limited sense, debt neutrality holds in the long run, even if not in the short run. As Kent Smetters (1999) puts it, Ricardian equivalence is a "long-run leviathan."

This result follows from the standard steady-state condition: $f'(k) = \rho$. In the long run, the marginal product of capital must equal the savers' rate of time preference. (Including exogenous technological progress in the model would alter this condition, but not in any important way.) This equation pins down the steady-state capital stock, regardless of the level of government debt.

How can the government's debt policy have a strong short-run effect but no long-run effect? Imagine that the government gives everyone a one-time tax cut, financed by a permanently higher level of debt (and thus higher taxes to finance the interest payments). The initial response of the savers is to do nothing: They are Ricardian in looking ahead to their future tax liabilities. The spenders, however, immediately consume their tax cut. This extra consumption reduces investment, which in turn raises the marginal product of capital and thus the interest rate. The higher interest rate, in turn, induces savers to save more. Their higher saving continues until the

marginal product of capital driven back down to their rate of time preference. Hence, the debt-financed tax cut temporarily crowds out capital accumulation, but the permanently higher level of debt does not depress the steady-state capital stock.

Proposition 3: Government debt increases steady-state inequality.

Although Proposition 2 says that government debt does not affect the steady-state capital stock and national income, government debt does influence the distribution of income and consumption in the savers-spenders model. (For a similar result in a somewhat different model, see Kevin Fletcher, 1999.) A higher level of debt means a higher level of taxation to pay for the interest payments on the debt. The taxes fall on both spenders and savers, but the interest payments go entirely to the savers. Thus, a higher level of debt raises the steady-state income and consumption of the savers and lowers the steady-state income and consumption and the spenders. The spenders, however, already had lower income and consumption than the savers (for only the savers earn capital income). Thus, a higher level of debt raises steady-state inequality in income and consumption.

Proposition 4: Substantial long-run crowding out can occur if taxes are distortionary.

Proposition 2 regarding long-run debt neutrality holds if taxes are lump sum. As in the standard Barro-Ramsey model, things change dramatically if taxes are distortionary. To see how, suppose that taxes are raised with a proportional income tax with rate τ. The following equations describe the steady state:

$$y = f(k)$$

$$\tau y = rD + g$$

$$r = f'(k)$$

$$(1-\tau)r = \rho$$

where the notation is standard. The first equation is the production function. The second equation states that tax revenue τy equals the interest on the debt rD plus government spending g. The third equation states that the interest rate r equals the marginal product of capital. (Both interest income and capital income are assumed to be taxed at the same rate, so the tax does not affect this equation.) The fourth equation states that the after-tax interest rate equals the savers' rate of time preference ρ. Given these equations, it is straightforward to see how an increase in government debt affects the economy. Higher debt leads to higher debt service; a higher debt service requires a higher tax rate; a higher tax rate leads to a higher before-tax interest rate; and a higher interest rate leads to a smaller steady-state capital stock. As in the Diamond-Samuelson model, government debt crowds out capital, although the mechanism here is completely different.

Let's calibrate the magnitude of this effect. By differentiating this system of equations, we can solve for an expression to show how much debt crowds out capital:

$$dk/dD = \{\tau - (Df''/f') + [(1-\tau)ff''/(f')^2]\}^{-1}.$$

If the production function is Cobb-Douglas $y = k^{\alpha}$, this becomes:

$$dk/dD = \{\tau + [(1-\alpha)(D/k)] - [(1-\tau)(1-\alpha)/\alpha]\}^{-1}.$$

For the U.S. economy, taxes are about one-third of income ($\tau = 1/3$), capital earns about one third of income ($\alpha = 1/3$), and the government debt equals about one-sixth of the capital stock ($D/k = 1/6$). For these parameter values, $dk/dD = -1.125$. That is, an extra dollar of government debt reduces the steady-state capital stock by slightly more than one dollar. Naturally, this

numerical result is sensitive to various assumptions. (Introducing depreciation, so the production function is $f(k) = k^{\alpha}-\delta k$, reduces crowding out as measured by dk/dD, whereas taking a broad view of capital, so α is larger than 1/3, raises it.) Nonetheless, this example shows that substantial steady-state crowding out can occur simply because of distortionary taxation.

Proposition 5: The optimal steady-state capital tax from spenders' standpoint is zero.

Let's suppose that spenders are in the majority and therefore control tax policy. They have to pay for an exogenous level of government spending g, which can either be a public good or a transfer payment. The choice this majority faces is how much to tax labor income and how much to tax capital income. In making this choice, the goal is to maximize after-tax wages. Thus, the spender majority ignores the welfare of the saver minority.

To keep things simple, I start by comparing alternative steady states. The issue of tax policy then boils down to the following optimization problem:

$$\underset{\tau,\theta}{\text{maximize}}\ (1-\tau)w$$

subject to

$$w = f(k) - f'(k)k$$

$$\tau w + \theta f'(k)k = g$$

$$(1-\theta)f'(k) = \rho$$

The objective here is simply maximizing the after-tax wage, $(1-\tau)w$. In pursuing this goal, the spender majority faces three constraints. The first constraint says that labor earns its marginal product, which by Euler's theorem equals output left after capital is paid its marginal product.

The second constraint is a government budget constraint, which says that revenue from labor taxes plus revenue from capital taxes must equal government spending. The third constraint is the steady-state condition stating that the after-tax marginal product of capital equals the savers' discount rate.

I will skip the details of the solution and go straight to the result: $\theta = 0$. That is, the optimal tax on capital income is zero. This is true even though we have been doing the optimal tax problem from the standpoint of the spenders, who hold no capital.

Why do spenders want to exempt capital income from taxation? The reason is that the supply of capital is highly elastic in this model: In the long run, it is infinitely elastic at rate ρ. When capital is taxed, the quantity falls, which in turn depresses the real wage. This effect is large enough to make any tax on capital income undesirable, even from the perspective of people who own no capital.

In light of this result, one might wonder why the populace isn't clamoring to eliminate the taxation of capital income. One answer is that people are not focussed only on the steady state. In the short run, spenders are tempted to confiscate all capital and enjoy a temporary consumption binge. Indeed, the same high rate of time preference that induces spenders not to save may lead them to favor capital taxation, despite its adverse long-run effects. Of course, the usual issues of time consistency also arise here, as in any analysis of capital taxation.

III. Conclusion

Economists use simple models to develop and hone their intuition. For the macroeconomic analysis of fiscal policy, the two dominant models have been the Barro-Ramsey model of

intergenerational altruism and the Diamond-Samuelson model of overlapping generations. In my view, neither is satisfactory. A better model would acknowledge the great heterogeneity in consumer behavior that is apparent in the data. Some people have long time horizons, as evidenced by the great concentration of wealth and the importance of bequests in aggregate capital accumulation. Other people have short time horizons, as evidenced by the failure of consumption smoothing and the prevalence of households with near zero net worth. The savers-spenders theory sketched here takes a small step toward including this microeconomic heterogeneity in macroeconomic theory, and it yields some new and surprising conclusions about fiscal policy.

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