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The budgetary and welfare effects of tax-deferred retirement saving accounts ☆

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ABSTRACT

The present paper analyzes the budgetary, macroeconomic, and welfare effects of tax-deferred retirement saving accounts, similar to U.S. 401(k) plans, in a dynamic general-equilibrium overlapping-generations economy with heterogeneous households. Because of the initial deferral of tax payments, the short-run budgetary cost of tax-deferred accounts is significantly higher than the long-run cost. Therefore, the budget-neutral introduction of tax-deferred accounts would make current and near-future households worse off, although it would increase national wealth and total output in the long run. If the government spread the short-run cost to future households by increasing debt, the policy change could make all age cohorts, on average, as well off as the economy without tax-deferred accounts. Due to increased government debt and debt service costs, however, national wealth and total output would decrease in the long run. Thus, introducing tax-deferred accounts would not increase national wealth and improve social welfare at the same time. This is partly because the policy change is regressive and reduces the risk sharing effect of the current income tax system.

1. Introduction

Tax-deferred retirement saving accounts, such as U.S. 401(k) plans and individual retirement accounts (IRAs), are designed to provide a sizable positive effect on household savings, and thus aggregate wealth accumulation, through tax-favored properties. Yet, few papers have analyzed the budgetary cost and the welfare effect of introducing these accounts. Like most other government programs, tax-deferred accounts are not self-financing. Although we can expect additional tax revenue from increased economic activity, a large percentage of tax benefits households receive from these accounts must be financed eventually by either cutting government expenditure or increasing other tax revenue. In addition, the short-run budgetary cost of newly introduced or expanded tax-deferred accounts is much higher than the long-run cost. Because, at the beginning of the policy change, many working-age households contribute to tax-deferred accounts (and pay less taxes), but few retired households withdraw their money from these accounts (and pay more taxes). Therefore, without considering the budgetary cost and the government financing, we cannot fully evaluate the effects of tax-deferred accounts on the overall economy.

The present paper analyzes the budgetary, macroeconomic, and welfare effects of introducing tax-deferred accounts, similar to U.S. 401(k) plans, by extending a standard dynamic general-equilibrium overlapping-generations (OLG) growth model with heterogeneous agents. Households in the model economy are heterogeneous with respect to age, working ability, and asset holdings in regular taxable accounts and tax-deferred accounts. In this economy, households receive idiosyncratic working ability shocks each year and choose consumption, labor supply, and savings in these two accounts to maximize their expected lifetime utility. Introducing stylized 401(k)-type tax-deferred accounts to the economy, the present paper solves the model for an equilibrium transition path to evaluate both the short-run and the long-run effects of tax-deferred accounts across time and age cohorts.

The stylized tax-deferred retirement saving accounts analyzed in the present paper have the following properties. Contributions to the tax-deferred accounts are income-tax deductible, capital income generated in the accounts is not taxable, and withdrawals from the accounts are all income taxable. Annual contributions are capped by the contribution limit and labor income, whichever is smaller. There are 10% early withdrawal penalties if households are aged 59 or younger.[1] Thus, from the households' point of view, the main advantage of tax-deferred accounts is the reduction of lifetime income-tax burden through deferring tax payments and smoothing taxable

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[1] In 401(k) plans, 10% early withdrawal penalties are applied to the distributions before reaching age 59 and 1/2. For simplicity, however, the model assumes 10% penalties by households younger than age 60.

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income (or equivalently, smoothing marginal income tax rates). First, deferring tax payments decreases the present value of lifetime tax payments for newborn households even if government tax revenue in each period is unchanged. Second, when the income tax schedule is progressive, smoothing taxable income over the life cycle reduces lifetime income tax payments, since marginal tax rates are higher when households are working and lower when households are retired.[2] The main disadvantage of tax-deferred accounts is lower liquidity due to early withdrawal penalties. Therefore, to analyze these positive and negative effects, the model economy has to be equipped with heterogeneous households, idiosyncratic wage shocks, a progressive income tax, and liquidity constraints.[3]

The previous empirical literature mainly estimates how much tax-deferred retirement saving accounts increase national saving. More specifically, these papers estimate what percentage of tax-deferred saving is new saving rather than a replacement of other traditional saving. For example, Venti and Wise (1990) estimate the parameters of their static utility maximization model by using the Consumer Expenditure Survey (CEX) data and show that the vast majority of IRA contributions represent net new saving. Gale and Scholz (1994) estimate their dynamic utility maximization model by using the Survey of Consumer Finances (SCF) data and show that raising the annual IRA contribution limit would have resulted in little, if any, increase in national saving. Poterba et al. (1995) use the Survey of Income and Program Participation (SIPP) data, compare the other financial assets of 401(k) eligible families and non-eligible families, controlling the other heterogeneity, and find little evidence that 401(k) contributions substitute for other forms of personal saving. Attanasio and DeLeire (2002) test the changes in financial assets and consumption of new IRA contributers and continuing IRA contributors by using the CEX data, and they find that households financed their IRA contributions from existing savings or from saving that would have been done anyway, and at most 9% of IRA contributions represented net additions to national saving. Also, Benjamin (2003) uses the SIPP data and finds that about one quarter of 401(k) balances represent new national savings, one quarter is foregone tax revenue, another one quarter is conversions from pre-existing DC plans or foregone DB assets, and the remaining quarter represents substitution from other household assets.

Since predictions on the net saving effect of tax-deferred accounts differ widely in the empirical literature, it becomes more important to construct a life cycle model and check how households of different age, income, and wealth would change their saving behavior when tax-deferred accounts were newly introduced. To the best of my knowledge, İmrohoroğlu et al. (1998) are the first to numerically analyze the long-run effect of tax-deferred accounts on individual saving and national wealth by using a dynamic general-equilibrium OLG model with heterogeneous agents. They show that approximately 9% of IRA contributions constitute incremental saving. Their model with a flat income tax also suggests that the effect of tax-deferred accounts would likely be small, because these accounts do not affect the rate of return on incremental saving for households whose originally-intended saving was above the annual contribution limit of tax-deferred accounts.

This is not necessarily the case in an economy with a progressive income tax, however. The first-order conditions of the household's optimization problem in Appendix A imply the following effects of tax-deferred accounts: households save more by the direct marginal effect if the originally-intended saving is below the contribution limit; *in addition*, any contributions to the tax-deferred accounts possibly reduce the marginal labor income tax rate and increase the ratio of consumption to leisure; and any future contributions possibly reduce the future marginal capital income tax rate and increase current saving in regular taxable accounts. For this reason, it is important to assume endogenous labor supply and a progressive income tax system in the model economy. More recently, Kitao (2010) extends İmrohoroğlu et al. (1998) by introducing endogenous labor supply, idiosyncratic wage shocks, and a progressive income tax, and Ho (2011) in addition considers 401(k) eligibility shocks that are correlated to the wage shocks in his heterogeneous-agent OLG model.

The primary contribution of the present paper relative to the previous dynamic general-equilibrium literature is that this paper solves the model economy for an equilibrium transition path and analyzes both the short-run and long-run effects of introducing tax-deferred accounts. This is very important for the policy assessment because tax-deferred accounts change the timing of tax payments of households over the life cycle.[4] With the initial deferral of tax payments, the short-run cost of introducing tax-deferred accounts is significantly higher than the long-run cost, and the government has to finance this additional cost eventually.

The present paper first calibrates the heterogeneous-agent OLG model to the U.S. economy without tax-deferred retirement saving accounts. Then, this paper introduces the stylized tax-deferred accounts described above to the economy, solves the model for equilibrium transition paths under four different government financing assumptions, and evaluates the policy effects on the government budget, macroeconomic variables, and social welfare both in the short run and in the long run. Since tax-deferred accounts are costly for the government, the individual and macroeconomic effects depend on how and when the government finances the cost of introducing these accounts. To close the government intertemporal budget constraint, the present paper makes the following four assumptions: cutting the government's transfer payments to households uniformly to balance the budget each year (Run 1), increasing marginal income tax rates proportionally each year (Run 2), increasing marginal income tax rates once at the time of policy change and increasing government debt gradually (Run 3), or increasing marginal income tax rates 10 years after the policy change and increasing government debt gradually (Run 4).

The main findings from the policy experiments are as follows. If the government uniformly cut transfer payments to households each year to balance the budget, the policy change would increase both national wealth and total output throughout the transition path, but it would make all age cohorts, on average, worse off. The overall welfare level would be lowered because the policy change reduces the progressiveness of the current individual income tax and weaken its risk-sharing effect. If the government proportionally increased marginal income tax rates each year instead, national wealth and total output would decrease and current households would be worse off in the short run, although both wealth and output would increase and future households would be better off in the long run.

Then, the question is whether the policy change could make both current and future households, on average, better off by issuing government bonds and spreading the transition cost to future households. If the government increased marginal income tax rates just once 10 years after the policy change and increased its debt gradually, welfare effects on all age cohorts would be close to zero, i.e., both current and future households could be, on average, as well off as the baseline

[2] This tax-saving effect is even larger when the economy is growing and the government adjusts income tax brackets to avoid automatic tax increases.

[3] A representative-agent stochastic OLG model does not work for this paper, since average households face liquidity constraints much less likely except for the very early stage of their lives. An OLG version of Krusell-Smith (1998) type growth model with both aggregate and idiosyncratic shocks would work better. Yet, adding at least three state variables would make the computation of transition paths prohibitively expensive, since we cannot use linear-quadratic approximations in the economy with liquidity constraints and precautionary savings.

[4] A transition analysis is known to be important for a policy change that affects the timing of tax or transfers and involves intergenerational redistribution. For example, Domeij and Heathcote (2004) write "Pure steady-state welfare comparisons are very misleading …in part because tax changes imply substantial redistribution in the short run."