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Newsletter

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Portfolio Selection with Capital Gains Tax, Recursive Utility, and Regime Switching

Prof DAI Min, from the Department of Mathematics at the National University of Singapore, and his co-authors have developed a continuous time model to explore the implications of having a capital gains tax on investors' portfolio choice decisions.

It is well recognised that transaction costs dramatically alter investors' portfolio choices. The capital gains tax rate, typically ranging from 10% to 40%, is much higher than the rate of transaction costs. Thus, the capital gains tax must play a role in investors' portfolio choice decisions. However, in contrast to the extensive literature on continuous-time portfolio selections with transaction costs, relatively little research exists on capital gains taxes.

Prof Dai and his co-authors developed a continuous-time investment and consumption model with a capital gains tax and the following two important features. First, they chose the recursive utility introduced by Epstein and Zin (1989) and Duffie and Epstein (1992). They found that various factors, such as the tax rate, risk aversion, the interest rate, stock returns, and volatility, jointly affect optimal portfolio allocation, whereas intertemporal substitution does not. Second, they considered a regime switching market in which there are two regimes ("bull" and "bear") with different fundamental parameters, such as expected returns and volatility, and switching between the two regimes, from one to the other, according to a Markov chain.

They found that investors might trade or stop trading purely because of a change in regime, and that there is a distinct cross-regime effect on optimal portfolio allocation. In particular, investors tend to raise stock investments in a bear regime so as to reduce potential tax payments upon regime switching. Given reasonable parameter values, regime switching has a greater impact on optimal portfolio allocation in a bear regime than in a bull regime.

References

Cai J, Chen X and Dai M (2018) "Portfolio selection with capital gains tax, recursive utility, and regime switching." *Management Science* 64(5), 2308-2324

Duffie D, Epstein LG (1992) "Stochastic differential utility." *Econometrica* 60(2):353–394.

Epstein LG, Zin SE (1989) "Substitution, risk aversion, and the temporal behavior of consumption and asset returns: A theoretical framework." *Econometrica* 57(4):937–969.