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Endogenous trading constraints with incomplete asset markets ☆

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Abstract

This paper endogenizes the borrowing constraints on capital in a production economy with incomplete markets. We find that these limits get looser with income, a property that is consistent with US data on credit limits. The framework with endogenous limits is then used to study the effects of a revenue neutral tax reform that eliminates capital income taxes. Our results illustrate that it is very important to take into account the effects of tax policies on the limits. Throughout the transition, these effects can be big enough to change the overall conclusion about the desirability of a tax reform.

JEL classification: E23; E44; D52

Keywords: Endogenous borrowing constraints; Incomplete markets; Production; Tax reform

1. Introduction

This paper endogenizes the borrowing constraints on capital holdings in an infinite horizon incomplete markets model with production. This is done by introducing the possibility of default on financial liabilities. In particular, we assume that households can break their trading contracts every period. In this case, individual liabilities are forgiven and agents are excluded from future

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trade forever. The endogenous trading limits are then set at the level at which households are indifferent between honoring their debt and defaulting.

Recently, models with heterogeneous agents and uninsurable income shocks have become one of the main economic tools to analyze important issues, such as the shape of the wealth distribution, the degree of risk sharing and the welfare implications of different economic policies. One of the appealing features of these models is that they are able to generate a realistic wealth distribution. However, the fact that there is a significant proportion of individuals in debt in the data implies that a realistic model of incomplete markets should also be able to generate enough borrowing. Clearly, these two aspects are interrelated through the borrowing constraints, since they are one of the key determinants of the (equilibrium) level of debt and, in general, of the wealth distribution in these type of economies. In the present paper, we determine these constraints endogenously and we calibrate the model so that the distribution of assets and the amount of debt matches the one in the data.

The first important advantage of our approach is that we are able to provide a characterization of the endogenous borrowing limits that we can compare to the behavior of credit limits in the data. First, we show analytically that the level of debt which makes individuals indifferent between defaulting and paying back is monotonically increasing with individual labor income if the income shocks are i.i.d. Moreover, this relationship between income and debt limits also holds in our calibrated economy, which assumes persistent income shocks. At first sight, this result might seem surprising, since a higher level of income increases the value of the outside option and therefore the incentives to default. Notice, however, that income also increases the value of paying back due to the fact that markets are incomplete. It turns out that this latter gain is higher than the rise in the outside option, implying that the endogenous borrowing limits get looser with individual income. Here, we should point out that this analytical reasoning only relies on the fact that the consumption allocation does not display perfect risk sharing in equilibrium, implying that (at least in the i.i.d. case) a similar result would also hold in models with complete markets and limited commitment. Second, our analytical results for the i.i.d. case and the quantitative findings with persistent shocks show that the endogenous limits as a fraction of labor income get tighter with income. Using data from the 2004 Survey of Consumer Finances, we document that both this latter property and the fact that there is a positive relationship between income and credit limits are consistent with the behavior of credit limits in the US data. While this provides an external validation of the way we endogenize the limits, it also implies that our framework serves as a good tool for quantitative analysis.

The second appealing property of endogeneizing the borrowing limits becomes more apparent when we consider policy applications. In a framework in which the equilibrium allocations exhibit imperfect risk sharing, changes in economic policy typically affect the wealth distribution. In the presence of limited commitment, these changes also affect the relative value of default and consequently the endogenous borrowing constraints. This is particularly important in models with capital accumulation, generating quantitatively important general equilibrium effects that interact with the borrowing limits. In order to illustrate these effects, we use a calibrated version of the model to analyze the long run welfare implications of a revenue neutral tax reform that eliminates capital income taxes. We consider two variants of this reform. The first one replaces the lost revenue by simply increasing the linear labor income tax rate, while the second one achieves the same objective by making labor taxes progressive. Under such a reform, the relative value of default with respect to paying back changes directly (through taxes) and indirectly (through capital accumulation). This implies that the endogenous limits respond as well. In fact, our results show that the welfare effects and overall desirability of the particular tax reform