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Tightening financial frictions on households, recessions, and price reallocations [☆]

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ABSTRACT

We explore the effects of financial shocks in heterogeneous agent economies with aggregate savings and with frictions in some consumption markets, where demand contributes to productivity. Households of various wealth and earnings levels search for goods at different intensities and pay different prices in differently crowded markets. Increases in savings arising from a financial shock that tightens the borrowing limit trigger a recession via two channels: 1) the reduction in the consumption of goods that are subject to search frictions reduces productivity and output; 2) because the poorest households are more affected by the shock, consumption tilts toward the richest households, causing an additional reduction in output and productivity. We model fixed prices in a competitive search environment and show how price rigidities dramatically exacerbate the recession.

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1. Introduction

In this paper, we build a model in which financial shocks to households generate a recession. Despite the popular press's common attempt to link the Great Recession with households' financial difficulties, the attempt to build general equilibrium models that are capable of establishing such a link has met with little success. Many papers, however, model a recession generated from increased financial frictions on the firm's side (mostly for reasons of the [Bernanke and Gertler, 1989](#) type). In this paper, we show how an environment with goods market frictions displays a recession after an increase in household financial distress. The theoretical contribution of this paper is to highlight the mechanism that starts with increased financial frictions, proceeds to reductions in consumption, and ends with reductions in productivity and employment. This entire process takes place without the need to resort to households' inability to save or to the existence of multiple equilibria.

In our economy, the onset of a financial crisis transpires in the following way. After a time characterized by a financial bonanza, many households are simultaneously holding little wealth and consuming large amounts of goods. A financial

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shock requires some households to reduce their consumption in order to satisfy the tighter financial borrowing constraint. More important, all households may want to reduce consumption as they find their current financial holdings insufficient for bearing the daily vicissitudes of life. In our model, these vicissitudes take the form of idiosyncratic earnings shocks. Hence, all households find themselves attempting to reduce their consumption and increase their savings. Although in the new steady state, consumption and output will eventually surpass that in the initial state—households will end up becoming richer—the economy experiences a recession during the early stages of the transition. Standard models do not have this property, however. Instead, employment expands immediately after the financial shock and the increase in savings. The onset of a recession requires two conditions. First, there must be some goods that cannot readily be used for saving; otherwise, the output of those goods would be saved, and a recession would never occur. The second and more interesting condition is that a drop in the prices of these goods is not sufficient to maintain their level of production.

The gist of our contribution is to show how search frictions in some consumption markets suffice to generate a recession. We postulate the existence of some consumption goods—for convenience, we refer to these consumption goods as services—that cannot be accumulated and which require the active engagement of consumers to be acquired. Specifically, the search friction requires that services must be searched for and found before they can be purchased. The drop in consumption that accompanies the financial shock translates to a drop not only in the price of services but also in the quantity purchased, because households spend less time searching for services. Hence, a recession results. The recession occurs with a reduction in labor and productivity. Note that this occurrence does not reflect measurement error in the sense of random deviation from true productivity. Instead, it is the result of applying NIPA procedures to our economy, because those procedures ignore the role of households in accessing final goods.

In our environment, households' attempts to save more directly induce a reduction in output arising from reductions in search. An additional channel also reduces consumption: the financial shock not only reduces overall consumption but also tilts it toward the wealthiest households, because the poorest households are the ones that are closest to their borrowing limits. Rich households exert less search effort per unit of consumption than poor households, thereby further reducing productivity and output.

The economy that we pose can be readily compared with the U.S. economy in all its relevant aspects, especially with respect to its income and wealth dispersion. When the financial shock hits the economy, a recession ensues. The recession is, however, relatively mild, because the reduction in the prices of services makes it attractive for the richest households to increase their consumption of services, thereby limiting the seriousness of the recession. For this reason, we explore the implications of price rigidity in this economy.

The analysis of price rigidity of goods in heterogeneous agent environments with competitive search is, to the best of our knowledge, a completely new feature, and we deem this feature to be an important contribution in and of itself. We model price rigidity as nine months of no price changes before a shift occurs toward a flexible price regime, and we find that in such an environment, the recession is about 14 times larger than it would be in an environment with flexible prices. Nonetheless, we find that to properly account for an event as large as the Great Recession, we need a much stronger saving motive for the richest households. We believe that the missing ingredient is the inclusion of housing, since housing prices are negatively affected by the financial shock. We have begun work on this topic, with encouraging preliminary results (see [Huo and Ríos-Rull, 2014](#)).

Our model is a two-good heterogeneous agent version of the [Bai et al. \(2011\)](#) search frictions environment in which there is a positive marginal need for labor when a match occurs. In our model, services cannot be used directly for savings purposes—a feature that ensures that the desire to save does not generate an expansion. The environment is built on top of a structure of the [Bewley \(1986\)–Imrohoroglu \(1989\)–Huggett \(1993\)–Aiyagari \(1994\)](#) type, with many agents and incomplete markets (how else can one talk of financial frictions seriously?). In these economies, households face uninsurable idiosyncratic risk, and they protect themselves from this risk through wealth accumulation. In particular, we are more interested in getting the total amount of wealth right than in providing an endogenous interest rate, so in this respect our work is closest in spirit to that of [Imrohoroglu \(1989\)](#).

In our environment, a market friction on services is managed via competitive search. The ability to acquire services in cheap, albeit inconvenient, markets provides households with another channel for self-insurance. In the steady state, the wealth-poor or income-poor households purchase fewer services than richer households. More important, they do so at a lower price, at the cost of exerting more search effort, which is in line with the empirical findings of [Broda et al. \(2009\)](#) and [Kaplan and Menzio \(2013b\)](#).

In the recession generated by increased financial tightness, most households cut their services consumption, and they do so by exerting less effort into search. The aggregate economy hence operates at a lower capacity. We modify the utility function used in [Bai et al. \(2011\)](#) to ensure that the response of search efforts to a negative wealth effect makes productivity procyclical. Meanwhile, households also choose to go to markets with lower prices, and as a result we observe a decline in the average prices of services. Depending on their asset position, the reactions of households to the financial shock vary quite a bit. Consequently, another contribution of this paper is to provide strong predictions about the distribution of both the amount of household expenditures and the prices faced (chosen, in fact) by different types of consumers.

This paper is closely related to the literature that attributes the Great Recession to household financial distress. [Guerrieri and Lorenzoni \(2011\)](#) study the effects of a reduction in the borrowing limit, in a way that is very similar to our baseline economy. Their basic setup is a [Huggett \(1993\)](#) economy in which households borrow from each other and aggregate wealth is zero. A tightening of the borrowing constraint induces the poorest households to increase their work effort and savings.

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