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Household debt and labor market fluctuations

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ABSTRACT

The co-movements of labor productivity with output, total hours, vacancies and unemployment have changed since the mid 1980s. This paper offers an explanation for the sharp break in the fluctuations of labor market variables based on endogenous labor supply decisions following the mortgage market deregulation. We set up a search model with efficient bargaining and financial frictions, in which impatient borrowers can take an amount of credit that cannot exceed a proportion of the expected value of their real estate holdings. When borrowers' equity requirements are low, the impact of a positive technology shock on the marginal utility of consumption is strengthened, which in turn results in lower hours per worker and higher wages in the bargaining process. This shift in labor supply discourages firms from opening vacancies, reducing the impact of the shock on employment. We simulate the effects of an increase in both the loan-to-value ratio and the share of borrowers in total population. Our exercise shows that the response of labor market variables might have been substantially affected by the increase in household leverage in the US in the last twenty years.

1. Introduction

Recent research has revealed significant changes in the co-movements and volatility of most labor market variables since the early eighties. In particular, Galí and Gambetti (2009) and Galí and van Rens (2010) highlight the following facts:

- The correlation of labor productivity with both output and labor input has experienced a sharp decline.
- The volatility of hours, in relative terms, has risen.
- The volatility of real wages, relative to that of output, has increased.

Additionally, Barnichon (2009) emphasizes the following correlations:

- The correlation between labor productivity and unemployment has increased from negative to positive.
- The correlation between labor productivity and vacancies has shifted from positive to zero.

In addition, these facts coexist with a positive correlation between total hours worked and output.[1] All this empirical evidence poses a challenge for macroeconomic models that rely on structural stability to produce testable implications and policy recommendations. Do these variations stem from variations in the data generating process of exogenous shocks, or are they rather the consequence of the many changes that have taken place in most markets during the postwar era?

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[1] We thank an anonymous referee for pointing us out to check this feature in our setting.

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Galí and van Rens (2010) provide an explanation of most of these changes on the basis of increased labor market flexibility in the US, that they parameterize as a reduction of hiring costs in a model with two labor inputs: hours and effort.[2]

In this paper we turn our attention to another well documented structural change that has taken place over the last twenty years: the process of financial deepening favored by the worldwide reduction in interest rates and the numerous reforms in regulations. The effects of financial conditions on the real economy has attracted increasing attention since the works of Bernanke and Gertler (1995) and Kiyotaki and Moore (1997). Here, we focus on the reorganization of the housing finance system in the US that took place in the early 1980s as a consequence of the Monetary Control Act of 1980 and the Garn–St. Germain Act of 1982. This change brought about a substantial reduction in the required home equity for indebted households, which was followed by a borrowing boom.[3]

The importance of the financial liberalization in the mortgage market has also been studied by Iacoviello and Neri (2010) to explain the strengthening of the link between the fluctuations in house prices and consumption. In a similar vein, the papers by Campbell and Hercowitz (2005, 2009) relate the Great Moderation to the aforementioned changes in the financial sector.[4] To explain the reduction in the volatility of output, these authors argue that productivity shocks generate smaller labor supply responses by collateral constrained households in the presence of lower equity requirements. In fact, this mechanism is also present in our paper, although we will subject it to further scrutiny, since we are interested in a broader number of facts involving other labor market variables. For this reason we will need to depart from the Walrasian labor market model, assumed by these authors.

We develop a tractable search and matching model with efficient bargaining over wages and hours[5] with two types of households: patient and impatient. Due to the presence of underlying friction in the credit market, more impatient consumers are restricted to the amount they can borrow by the expected real value of their real estate. We follow a methodological strategy akin to that of Galí and van Rens (2010) and investigate how changes in some key parameters, such as the loan-to-value ratio and the proportion of borrowers in the economy, help in making the model predictions consistent with all the facts described above. We see our results as complementary to those of Galí and van Rens (2010), since the most likely explanation of these facts would involve a combination of both mechanisms: increased labor market flexibility and financial deepening. Although both types of institutional changes give rise to qualitatively similar results in explaining some of the labor market facts mentioned above, the transmission mechanism is different.

Our paper departs from previous research in different aspects. First, with respect to our focus, we aim to connect all the facts listed above to the changing volume of household indebtedness in the economy. As far as we know, this link has not been previously established in the literature. Second, while we allow for changes in the intensive margin of borrowing (loan-to-value), we also consider the extensive margin, defined as the number of borrowers over the total population. Third, by building our model on a search and matching framework, we are able to explore the connections of household indebtedness with variables such as unemployment and vacancies that are not present in frictionless labor markets.

The main result of the paper is that increasing household borrowing is sufficient to explain the observed changing pattern of second moments described above and also generates a positive comovement between hours and output. This happens regardless of whether leverage is increased through changes in the intensive or extensive borrowing margin, although a high loan-to-value is required to match the evidence relative to some other moments. In our model financial deepening affects consumption and labor supply decisions simultaneously. The reduction in equity requirements eases borrowing constraints and facilitates the access to consumption by impatient households after a technology shock. This drags down the marginal utility of consumption, thus affecting the bargaining process as a negative labor supply effect that reinforces the fall in hours per worker and the upward pressure on wages. This reduces the surplus of successful matches, thereby discouraging vacancy posting and augmenting the (negative) impact of the shock on employment. Although, on impact, total hours worked fall with a technological shock, they recover afterwards following the pattern of output and become positive after a few quarters, so that the correlation between output and hours is positive.

This effect is further amplified by the incentive of impatient consumers to use the bargaining process to smooth consumption over time, to compensate for the presence of the financial constraint. In doing so they take advantage of the fact that a match today continues with some probability in the future, yielding a labor income that in turn will be used to consume tomorrow. Therefore, they use the margin that hours and wage negotiations provide to them to improve their lifetime utility by narrowing the utility gap with respect to patient consumers.

The larger the loan-to-value ratio, the more negative the response of total hours is, thus increasing its volatility relative to output and reducing its correlation with labor productivity. Additionally, as borrowers' restrictions ease, lenders find it optimal to increase the amount of loans by deviating resources away from consumption and investment. This dampens the

[2] Because of the features of their model, they cannot address issues regarding unemployment and vacancies.

[3] Although we focus in the US, the phenomenon of legislative changes in financial and/or mortgage markets, followed by an increase in household debt to GDP ratio, extends to other many countries. Ahearne et al. (2005) documents deregulation measures in the mortgage market during the 1980s in thirteen developed countries, excluding the US, and Debelle (2004) shows how household indebtedness rose substantially during the 1980s and 1990s in eight of these countries.

[4] Smith (2009) shows that the conclusions reached by Campbell and Hercowitz are robust to changes in the exact details of how housing, housing debt and mortgage financing are modeled.

[5] Dromel et al. (2010) use an equilibrium matching model with exogenous wage and credit market imperfections to study the persistence of unemployment, but their modeling strategy is otherwise quite different to ours.