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Precautionary savings or working longer hours?

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Abstract

This paper quantifies the macroeconomic implications of the lack of insurance against idiosyncratic labor market risk. I show that in a model economy calibrated to observed individual level data, households make ample use of work effort as a consumption smoothing mechanism. As a consequence, aggregate consumption is 0.6% lower, work effort is 18% higher and labor productivity is 12% lower than they would be in a complete markets setting. Not surprisingly, the welfare benefits of moving towards complete markets are very large. Accounting for the whole transition to the new complete markets steady state I find the welfare costs of market incompleteness above 16% of individual lifetime consumption.

JEL classification: E21; D31; J22; C68

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1. Introduction

Empirical evidence reveals a very low cross-sectional correlation between hours of work and wages. If individuals perceive wage differences to be permanent, then the lack of correlation between hours and wages just tells us that preferences are such that the substitution and the income effect compensate each other. However, several studies show that a big fraction of the cross-sectional dispersion in wages is due to non-permanent stochastic factors.[1] According to this, even if the income and substitution effects compensate each other, we would expect individuals to take advantage of better labor market opportunities and work more when more productive and

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[1] For instance, Card (1991), Flodén and Lindé (2001), French (2003) or Heathcote et al. (2004).

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enjoy leisure when less. This substitution of work effort across periods is limited by two different factors. First, the available financial technology to transfer resources from high wage to low wage periods, and second, individual preferences for both smooth consumption and smooth leisure. In particular, if there existed assets whose payment was contingent on the wage perceived by individuals, then the substitution of work effort across periods would depend only on individuals preferences.

The purpose of this paper is to assess quantitatively the macroeconomic implications of the lack of markets to insure against idiosyncratic labor market risk. I use a standard dynamic general equilibrium model with heterogeneous agents where households take consumption/saving and labor/leisure decisions. Key parameters as the intertemporal elasticities of substitution for consumption and leisure are inferred from household level data. Then, I quantify the effects of market incompleteness on the aggregate amount of hours worked, labor productivity, aggregate capital, aggregate output, aggregate consumption and individual welfare.

I find that the quantitative effects of market incompleteness are very big. For an economy calibrated to both aggregate and individual level data from the US, the lack of a financial technology to insure against labor market risk changes dramatically the labor supply of households. Within the model, the lack of cross-sectional correlation between hours and wages is interpreted as households using labor supply as a mechanism to keep a smooth pattern of consumption. This is reflected in the labor productivity. In the calibrated incomplete markets economy, labor productivity is 19.3% lower than in the complete markets economy when holding capital fixed and 11.5% lower when allowing capital to adjust. In addition, work effort is much higher in the incomplete markets economy: the lack of state contingent bonds is responsible for 18% of the observed work effort.

The reason for these results is as follows. Under complete markets, households substitute leisure across different states, working long hours when their market productivity is high and working few or none hours when their market productivity is low. State contingent assets allow consumers to transfer resources between states and keep the marginal utility of consumption equal across states. In contrast, in the incomplete markets world households are not so willing to substitute labor across states precisely because the ability to transfer resources between states is limited. In the steady state equilibrium, a large fraction of low productivity workers are also asset-poor. This type of households will supply many hours in spite of not being very productive because their marginal utility of consumption is very high. At the same time a large fraction of high productivity workers are asset-rich. This type of households will not supply many hours of work because their marginal utility of consumption is very low. Ultimately, the total amount of labor measured in efficiency units is low, the work effort high and the labor productivity low.

Notice therefore that the mechanics driving the quantitative results of the paper is that households make ample use of their labor supply as a self-insurance mechanism in absence of state contingent assets. Do they rely more in precautionary savings or in working long hours? For the benchmark economy I find that precautionary savings are equal to 18.6% of aggregate capital whereas the share of hours worked in the incomplete markets economy in excess of the amount of hours worked in the complete markets economy is 15.2%. With a somewhat more persistent wage process these figures become 3.7 and 20.7%. Therefore, a salient quantitative result of this paper is that households seem to be using their work effort as a self-insurance mechanism at least as much as they do with savings if not more, the exact measurement depending on the persistence of the non-deterministic component of the wage process. This is consistent with empirical evidence. For instance, Parker et al. (2005), using data from self-employed individuals in the PSID, find increases in hours of work as a response to increases in uncertainty.