Business cycle fluctuations and household saving in OECD countries: A panel data analysis

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ABSTRACT

We investigate the cyclicality of the household saving to household disposable income ratio for a panel of 16 OECD countries over the period 1969–2012. We find evidence that the household saving ratio is countercyclical. We empirically investigate whether the determinants of saving suggested by a standard buffer stock model of saving can explain this finding. The three main determinants of household saving implied by such a model (i.e., unemployment risk, household wealth and credit constraints) have a significant impact on the household saving ratio while their combined effect completely offsets its countercyclicality. The saving regression results are robust to potential endogeneity of the regressors, to making use of a reduced sample size that leaves out the period of the Great Recession, and to the one-by-one addition of variables suggested by alternative theories that also predict a countercyclical saving ratio.

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1. Introduction

The financial crisis and the ensuing Great Recession of 2007–2009 in the US and in many developed countries was characterized by a rise in household saving to household disposable income ratios. Carroll et al. (2012) provide evidence of this for the US, Alan et al. (2012) for the UK and Mody et al. (2012) for a group of advanced countries. While there is a substantive literature on the determinants of household – or, more generally, private – saving rates of countries (see e.g., Edwards, 1996; Callen and Thimann, 1997; Masson et al., 1998; Loayza et al., 2000; de Mello et al., 2004), to the best of our knowledge, there is no direct evidence on whether household saving rates in developed economies are in general countercyclical – as the recent experience of the Great Recession seems to suggest – or rather acyclical or procyclical.[1] A sound knowledge of the cyclical behavior of the household saving ratio and of the determinants of this cyclicality is crucial to understand how recessions affect the economic environment and to understand the options that policy makers have to affect this environment. For example, as household consumption constitutes by far the largest component of aggregate

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[1] By direct evidence we mean evidence obtained from a correlation or regression analysis between *only* the household saving ratio and a business cycle indicator.

demand, the behavior of household consumption and saving over the business cycle can either magnify or dampen fluctuations in output.

The aim of this paper is therefore to investigate whether over a reasonably long time span and for a large enough group of developed economies with similar characteristics, the household saving ratio is procyclical, countercyclical or acyclical and to figure out why this is the case. To this end, we investigate the cyclicality of the household saving ratio *and* the determinants of this cyclicality in a panel of 16 OECD countries using annual data over the period 1969–2012.

We explicitly focus on the household saving ratio rather than on the broader national saving ratio which contains saving by households, businesses *and* the government. Albeit Lane and Tornell (1998) investigate the cyclicality of the national saving rate and document that domestic saving rates in the OECD are procyclical,[2] this evidence cannot tell us much about the cyclicality of the household saving ratio in OECD countries. The reason is that domestic saving rates depend on government saving rates which are known to be strongly procyclical.[3]

Our choice for annual data even though quarterly data are often used in business cycle analysis is motivated by the fact that the quality of quarterly data is still poor for many OECD countries and quarterly data are sometimes constructed artificially from annual data (see also e.g., Giannone et al., 2008). Therefore, annual data can be considered more reliable for establishing robust facts on the cyclicality of economic variables. Moreover, quarterly data for household saving and its determinants are simply not available for most OECD countries over a time span that is sufficiently long to include at least a few full business cycles. Finally, using annual data instead of quarterly data has the potential advantage that we take out the short term cycles from the data and focus on medium to long term cycles which may be more relevant for household saving decisions.[4]

The approach followed in the paper consists of two steps. First, we determine whether the household saving ratio in OECD countries is on average pro-, counter- or acyclical by regressing the household saving ratio on a business cycle indicator.[5] Following the approach of Solon et al. (1994) in their seminal paper on the cyclicality of real wages, we use the natural logarithm of real GDP as our business cycle indicator.[6,7,8] To the best of our knowledge, no systematic and thorough investigation of the cyclicality of the household saving ratio in OECD countries has yet been conducted. The goal of our study is to fill this gap in the literature.

Second, we argue that since the buffer stock saving model pioneered by Deaton (1991) and Carroll (1992) is the workhorse model of modern consumption theory, its features (i.e., a precautionary saving motive, liquidity constraints) should explain the measured cyclicality of the household saving ratio. To test this, we replace the atheoretical saving regression used to measure the cyclicality of the saving ratio by a (reduced-form) saving regression that is based on economic theory. More specifically, we add – on top of our business cycle indicator – three explanatory variables to our saving regression that are suggested by a standard buffer stock model of the type considered by Carroll et al. (2012), i.e., proxies for unemployment risk, household resources, and credit constraints. An explanation for the measured cyclicality of the saving ratio is obtained if these added explanatory variables have a significant impact on the household saving ratio and simultaneously offset the measured cyclicality of this ratio. In that case, the saving specification used to measure cyclicality has effectively been replaced by a specification with theoretical underpinnings. Contrary to many papers in the literature that deal with the impact of labor income uncertainty and wealth effects on the saving of individual households (see e.g., Gourinchas and Parker, 2001; Alan et al., 2012; Christelis et al., 2011), our approach adds to a growing literature that

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[2] Similarly, Attanasio et al. (2000) investigate for a large panel of 123 countries whether growth rates Granger cause national saving. They find a positive – albeit unstable – impact of growth on saving.

[3] We could also have used the private saving ratio, which includes both household and business saving, as it could be argued that domestic firms are often owned by domestic households so that households might "pierce the corporate veil". In reality however, business wealth is not uniformly owned by households and firms face very different tax regimes. Moreover, trends in business saving can be very different from trends in household saving. In the US, for example, the household saving ratio has been trending downward in the past 30 years while that of firms has been trending upward. What is true for trends is most likely true for business cycles as well: the cyclical behavior and its determinants are probably quite different for household savings and firm savings, notably because households and firms face very different types of risk which are not necessarily correlated.

[4] While a thorough investigation of this matter is beyond the scope of the paper, an immediate testable implication of this claim is that with the use of annual data we should be able to obtain if not more solid, then at least identical conclusions with respect to cyclicality of the household saving ratio and its determinants as with the use of quarterly data. To this end, we investigate the cyclicality of the US household saving rate using both annual and quarterly data. We find that identical conclusions with respect to the cyclicality of the US household saving rate can be drawn from using annual and quarterly data (where annual data even provides somewhat clearer results). These results are unreported but are available from the authors upon request.

[5] We note that all variables included in our saving regressions are expressed in first differences because they contain stochastic trends. In both time series and panel studies that estimate regressions for the household or private saving ratio non-stationarity issues are often neglected.

[6] Note that, strictly speaking, Solon et al. (1994) use GNP instead of GDP.

[7] We consider log real GDP rather than a filtered measure (e.g., a Hodrick–Prescott or a bandpass filter) because, as noted by Canova (1998), business cycle facts may not be robust to different detrending methods. Moreover, filtering typically implies losing data points at the beginning and/or end of the sample. This is to be avoided as the final years of the sample are of particular importance due to the Great Recession and its potential impact on the saving ratios of OECD countries.

[8] As a robustness test, we use the unemployment rate and log per capita hours of work as additional business cycle indicators. This follows the approach suggested by Solon et al. (1994) who test the cyclicality of the US real wage using the exact same variables. These results generally tend to confirm the conclusion that we obtain with log real GDP as a business cycle indicator even though we consider these variables less suitable given that in most of the countries in our sample they are lagging cyclical indicators. The results of these estimations are therefore not reported but they are available from the authors upon request.