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How important is variability in consumer credit limits? [☆]

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ABSTRACT

Using a large panel this paper first demonstrates that individuals gain and lose access to credit frequently. The estimated credit limit volatility is larger than most estimates of income volatility and varies over the business cycle. Within a model, variable credit limits create a reason for households to hold both high interest debts and low interest savings at the same time. Using the estimated credit volatility, the model explains why around one third of American households engage in this credit card puzzle. The approach also offers an important new channel through which financial system uncertainty can affect household decisions.

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1. Introduction

Three quarters of households in the United States hold a credit card. For the majority of these households the available credit is larger than their checking and savings accounts combined. In the short term, credit is the primary determinant of how much households in the United States can spend, not income or savings.

Yet this credit is extremely volatile. Using a large panel from the credit reporting agency Equifax, I show that Americans frequently lose access to credit and that credit limits on credit cards often increase and decrease. Credit limit volatility is substantially larger than standard estimates of income volatility. Moreover, in any given quarter 2.7 percent of individuals lose access to credit card borrowing entirely. Aggregate movements in credit limits and debt are large as well, as noted by Ludvigson (1999). For example, in the last quarter of 2008 one fifth of credit card holders had at least one credit card account closed, and overall credit limits fell by a quarter from 2008 to 2009.

Does this volatility affect household decisions? To answer this question I build a model of consumer decisions in which the credit limit can vary unexpectedly. While the typical model of consumption over time assumes that credit limits are fixed, the relatively minor change of allowing limits to vary affects consumer decisions substantially.

The key modeling insight in this paper is to consider the ability to borrow as part of a portfolio of assets that households use to smooth consumption. The value of this asset depends on whether it will be available when needed. Savings in a bank or under a mattress can be used in an emergency. The ability to borrow is much less certain. A lost wallet, identity theft, or the uncertainties of dealing with a large company that can alter the line of credit at any time mean that it is possible to lose

[☆] I conducted some of this work while I was a visiting scholar at the Consumer Payments Research Center at the Federal Reserve Bank of Boston. The views expressed in this paper are the author's and do not necessarily reflect the official position of the Federal Reserve Bank of Boston or the Federal Reserve System.

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access to credit unexpectedly. If consumers face uninsurable income or consumption shocks—times when their income goes down significantly or their need to spend goes up—the risk of being unable to borrow when times are bad creates a reason to hold low-interest savings while carrying expensive debt as a precaution against being unable to borrow. The savings act as insurance so that even in the worst case when the consumer cannot borrow, she can still consume.¹

This modeling approach has two important implications. First, it explains the so-called “credit card puzzle.” Around a third of households in the United States both carry large revolving credit card debt at high rates of interest and hold liquid assets which pay low or no interest. As suggested by Gross and Souleles (2002), such behavior seems very odd: Why not pay off the debt, which costs 14 percent per year, with the savings, which yield close to zero? The costs of not doing so are meaningfully large; for those that carry both credit card debt and liquid savings, the interest on the debt that could be paid off devours around 0.6 percent of monthly income.² Survey evidence suggests that many households are intentionally borrowing and saving at the same time (see Section 5). Moreover, holding both debt and savings at the same time seems to be common among the poor all over the world (Collins et al., 2009, p. 49).

Using the estimates of credit limit volatility from the panel, I calibrate the model so that households hold as much credit card debt as they do in surveys. Doing so requires households to be fairly impatient, since credit card debt is expensive and American households hold a lot of it. I then examine how the households divide up their portfolio of credit and savings. The resulting distribution closely matches the joint distribution of savings and debt in the data. In particular, about the same fraction of households hold debt and savings at the same time in the model as in the data. A critical component of the calibration is heterogeneity in risk aversion. A large fraction of United States' households hold approximately zero savings while holding substantial debt—a decision the model suggests is quite risky—and so to obtain the full range of behavior it is necessary to have some people willing to take those risks.

The model offers some simple predictions of who will borrow and save at the same time. Those who are more worried about the future tend to save more and so are less likely to need to borrow. If they have enough bad shocks that they want to borrow, however, they are much more likely to keep some savings for precautionary purposes. Comparing across households using multiple rounds of the Survey of Consumer Finances, I find support for these predictions. I also examine some of the other explanations for the puzzle (Telyukova and Wright, 2008; Lehnert and Maki, 2002; Bertaut et al., 2009; Laibson et al., 2000) in light of the cross-sectional and time-series evidence.

The second implication of allowing credit limits to vary is what happens during times of financial crisis. Since credit makes up approximately two thirds of the resources available for immediate consumption of the average household, it is the single most important factor in determining the short-term budget constraint of households. Within a precautionary model such as the one introduced in this paper, credit is wealth in the short term since it can help smooth consumption. An increase in the chance of losing credit makes this wealth less valuable while a decrease in the credit limit reduces this wealth directly.

Financial uncertainty and credit reductions can thus directly affect consumer decisions even without affecting income or employment. Following the financial crisis of 2008, commercial banks reduced credit card limits overall by more than a quarter. During the worst two quarters, close to 20 percent of individuals lost a credit card account, including those with the best credit scores (see also the estimates in Jambulapati and Stavins, 2013). My estimates suggest that, after adjusting for age and risk, credit card limits declined nearly continuously from the end of 2008 through 2013. Using the calibrated model, I examine the effect of an increase in the probability of losing access to credit such as occurred in 2008–2009. With credit less valuable for consumption smoothing, consumers almost immediately “rebalance” their portfolios by increasing both savings and debt. Consumption declines slightly to accommodate the higher interest payments, but a pure increase in volatility has a relatively small aggregate effect. Coupled with a decline for all consumers in available credit, the effects are more dramatic: an immediate fall in consumption of around 2 percent following the reverse of the path shown by Fulford (2013a) for an increase in the credit limit. The fall in available credit reduces debt and so mostly cancels out the increase in debt from rebalancing the portfolio. While this paper focuses on consumers, doing so likely understates the impact of credit volatility, since firms use short-term credit as well, and, faced with adjustment costs, may behave in similar ways.³

A central contribution of this paper is to estimate the credit volatility faced by individuals. There has been a great deal of work estimating and considering how income volatility affects consumer decisions, but this paper is the first to estimate credit volatility at the individual level and show how it varies over time. The key findings are that the short-term variance in credit limits is larger than most estimates of income variance, the long-term variance is much larger than the comparable long-term income variance, and individuals are much more likely to lose access to credit than to have no income. The

¹ See Carroll (2001) for a view of the development of and evidence behind precautionary models. A few of the key papers in a large buffer stock and precautionary savings literature are: Schechtman and Escudero (1977), Deaton (1991), and Carroll (1997). Fulford (2013a) examines the short and long-term consequences of a permanent change in the liquidity constraint. Ludvigson (1999) examines stochastic credit limits, although explicitly restricts the analysis to exclude borrowing and saving at the same time, suggesting that to do so is a “challenging direction” for research (p. 436).

² These calculations are made using the Federal Reserve 2007 Survey of Consumer Finances. See the section on the SCF for more detail. Zinman (2007) examines the distribution of the costs of the credit card puzzle or those who “borrow high and lend low,” and finds that few households pay more than \$10 per month.

³ Firms use short-term credit as working capital to smooth inventory, meet unexpected demand, and make payroll, and the possibility of losing credit may cause them to adjust in similar ways. The buffer-stock theory of inventory is closely related to the consumer's problem (Deaton, 1991; Deaton and Laroque, 1992). Credit constraints can cause fluctuations in inventories (Kashyap et al., 1994). Moreover, small businesses often use the personal credit of their owners as well (Zinman, 2009) as is true across the world (Collins et al., 2009).

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