Journal of Economic Dynamics & Control 67 (2016) 22–39

Contents lists available at ScienceDirect

Journal of Economic Dynamics & Control

journal homepage: www.elsevier.com/locate/jedc

# Learning and the dynamics of consumer unsecured debt and bankruptcies

Matthew N. Luzzetti [a], Seth Neumuller [b,*]

[a] Deutsche Bank Securities Inc., 60 Wall Street, New York, NY 10005, United States
[b] Pendleton East, Department of Economics, Wellesley College, 106 Central Street, Wellesley, MA 02481, United States

ARTICLE INFO

*Article history:*
Received 18 September 2015
Received in revised form
8 February 2016
Accepted 24 March 2016
Available online 1 April 2016

*JEL classification:*
G21
E44
D84
E51

*Keywords:*
Unsecured debt
Bankruptcy
Adaptive learning

ABSTRACT

During the Great Moderation, the consumer unsecured debt-to-income ratio nearly doubled and the personal bankruptcy filing rate more than quadrupled. This historically tranquil period ended in 2008 with a severe recession and a protracted credit crunch. We develop a theory of learning in which consumers and lenders adjust their beliefs about the riskiness of the economic environment over time in response to the realized sequence of aggregate shocks and then embed it into an otherwise standard quantitative model of consumer default. Simulations of the model suggest that learning can explain as much as half of the recent boom and bust cycle in consumer unsecured debt and a modest fraction of the rise in bankruptcy filings prior to 2005.



*"One cannot look back at the Great Moderation today without asking whether the sustained economic stability of the period somehow promoted the excessive risk-taking that followed." — Ben Bernanke (July 10, 2013)*

## 1. Introduction

The time period between 1984 and the start of the 2008–2009 recession was fundamentally different than any other during the post-World War II era. Commonly referred to as the Great Moderation, this period was characterized by a marked decline in the volatility of macroeconomic variables and recessions that were relatively mild and infrequent. During this same period, the U.S. economy experienced an unprecedented boom in consumer unsecured debt and a substantial increase in the consumer bankruptcy filing rate, a trend which only reversed upon implementation of the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) of 2005 (see Fig. 1).[1] This historically tranquil period ended abruptly in 2008 with a severe recession and a protracted credit crunch.

* Corresponding author. Tel.: +1 781 283 2669.
*E-mail addresses:* matthew.luzzetti@db.com (M.N. Luzzetti), seth.neumuller@wellesley.edu (S. Neumuller).
[1] See Li et al. (2011) for a detailed discussion of the impact of the BAPCPA of 2005 on the consumer bankruptcy decision.

http://dx.doi.org/10.1016/j.jedc.2016.03.007
0165-1889/

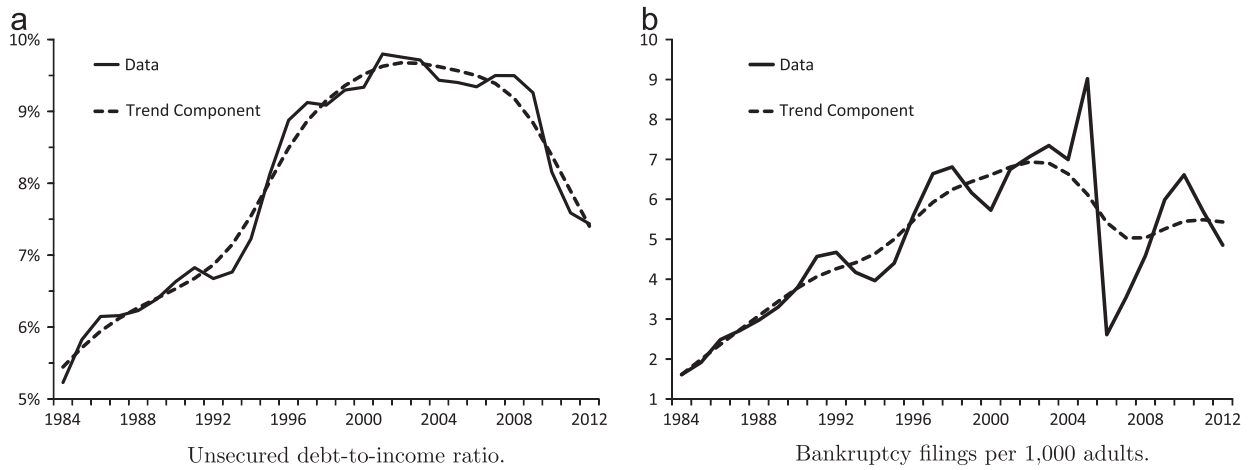


**Fig. 1.** Dynamics of unsecured debt and bankruptcy filings over the 1984–2012 period. Hodrick–Prescott trends constructed using a smoothing parameter of 6.25. In panel (a), data from 1984 through 1998 is taken from Livshits et al. (2010). After 1999, data is the sum of revolving debt and a constant fraction of non-revolving debt from the Federal Reserve (G.19) divided by disposable income from the NIPA tables. In panel (b), data represents non-business bankruptcy filings reported by the American Bankruptcy Institute divided by the civilian non-institutional population from the BLS.

The decreased frequency and severity of recessions during the Great Moderation coincided with a reduction in individuals' beliefs about the riskiness of the macroeconomic environment.[2] Table 1 reports the average subjective probability of a recession during expansionary periods from the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters. The average four-quarters ahead forecast fell from 23% during the recovery from the severe recessions of the early 1980s, to 17% between the 1990–1991 and 2001 recessions, and finally to 13.9% in the years leading up to the financial crisis, representing a 40% overall decline during the Great Moderation. Similarly, survey data collected by the University of Michigan reveals that the net percentage of consumers believing that the unemployment rate would rise over the next year declined steadily during the Great Moderation, with the survey index falling from an average of 90 between 1983 and 1990, to 83 between the 1990–1991 and 2001 recessions, and finally to 81 in the years leading up to the financial crisis. Following the Great Recession, professional forecasters raised their expectations about the likelihood of a recession four-quarters ahead to 15.0%, while the net percentage of consumers believing that the unemployment rate would rise over the next year increased to an average of 92, completely reversing the decline in this index observed during the Great Moderation.

These data suggest that subjective beliefs about the riskiness of the economic environment may vary systematically in response to the realized history of macroeconomic shocks, which could have important implications for credit market outcomes.[3] For example, a reduction in beliefs about the probability of a recession may induce lenders to extend credit at more favorable terms and consumers to borrow more in response to a lower precautionary savings motive. Conversely, an increase in the perceived likelihood of a recession could lead to a credit crunch as lenders raise credit spreads to protect themselves against a higher anticipated charge-off rate and consumers deleverage and increase precautionary savings.

Motivated by this data, we develop a theory of learning in which consumers and lenders adjust their beliefs about the likelihood and persistence of recessions over time in response to the realized sequence of aggregate shocks. We then embed our theory of learning into an otherwise standard quantitative model of consumer default and investigate its implications for the observed trends in consumer unsecured debt and bankruptcies. Simulations of the model imply that learning can explain as much as half of the recent boom and bust cycle in consumer unsecured debt and a modest fraction of the rise in bankruptcy filings prior to 2005.

Our benchmark model of consumer default borrows heavily from the frameworks studied by Fieldhouse et al. (2014) and Luzzetti and Neumuller (2015). Each period, consumers receive an idiosyncratic stochastic endowment of the homogeneous consumption good. The volatility of persistent idiosyncratic endowment shocks is counter-cyclical and transitions between recession and expansion are governed by a first-order Markov process. Markets are incomplete as the only assets available are one-period, non-contingent, pure discount bonds that are bought and sold by risk-neutral and competitive financial intermediaries. Consumers have the option to declare bankruptcy and therefore cannot commit to repay their debt obligations. Intermediaries take default risk into account when pricing debt contracts. Bankrupts have their debt discharged in

[2] Academic economists did not begin to look for potential shifts in macroeconomic volatility during the Great Moderation until the mid-to-late 1990s (see Kim and Nelson, 1999 and McConnell and Perez-Quiros, 2000). In the wake of the Great Recession, academics are once again questioning if the underlying shock process that drives short-run fluctuations in economic activity has changed (see, for example, Clark, 2009).

[3] This observation is consistent with mounting empirical evidence that the expectations of economic agents are heavily influenced by recent experiences. Malmendier and Nagel (2011) use the Survey of Consumer Finances to argue that households adjust their willingness to take on financial risk based on realized returns. In related work, Malmendier and Nagel (2013) use the Reuters/Michigan Survey of Consumers to show that consumers place more weight on recent experiences relative to those that occurred in the distant past. Gallagher (2014) examines the effect of floods on beliefs about flood risk and finds that insurance take-up spikes following a flood.