

# Perspectives on Research Issues In Consumer Behavior

Based on the speech President Santomero delivered to the Conference on Consumer Transactions and Credit, March 22-23, 2001

BY ANTHONY M. SANTOMERO

**I**n this issue's *Third Dimension*, President Santomero discusses the subject of consumer financial assets and its omission from the research agenda of the academic community. He also presents a list of issues that need to be studied to further our understanding of this rapidly growing part of the financial landscape.

Generally, economic forums have tended to ignore the broader issues in consumer credit, preferring to focus on the valuation of more standard corporate financial claims. When the consumer is discussed, it is typically consumer consumption and savings decisions that are studied and analyzed. This neglect of consumer credit seems remarkable, given that debt owed by households represents over 25 percent of total credit market debt outstanding; that consumer credit, excluding mortgages, makes up over 10 percent of commercial bank credit; and that the outstanding volume of consumer credit, including mortgages, exceeds the volume of U.S. government debt.

There is no single reason for the omission of consumer financial assets from the research agenda of the academic community, but I can offer a few rationalizations. The first is that macroeconomists – even those who specialize in monetary theory – have had little interest in the detailed behavior of asset choice at the consumer level. They prefer to concentrate on consumption theory and the associated

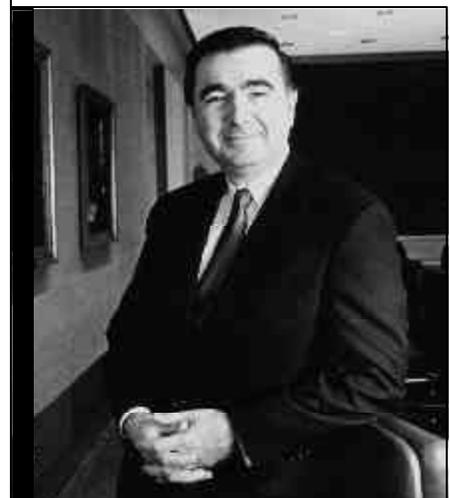
empirical tests of these theories, rather than analyze the allocation of savings and wealth dynamics. Second, specialists in finance have tended to concentrate on firm-level behavior because firms are viewed as more rational players than consumers and firms' behavior is of more economic value. Asset sizes are bigger; representative agents are more easily modeled; and market discipline seems to force the decision maker closer to the optimal economic choice.

Only recently has this begun to change. With the emergence of the asset-based security markets, financial theorists and empiricists have begun to examine the behavior of financial assets that have resulted from the aggregation of consumer debt. This is most obvious in the mortgage market, where the emergence of various types of securitized mortgage instruments fostered research on their valuation and time-series dynamics. This interest has recently been expanded into other types of asset-based securities, such as CARDs, CARs, and CLOs. In each case, to analyze the underlying asset, the researcher has to examine optimal

decisions of a representative agent and the impact of aggregating individual claims on instrument behavior.

Another development that has helped spur interest in the micro-economics of consumer financial decisions is the intellectual shift that has taken place in macroeconomics toward a well-specified microeconomic foundation for macroeconomic theories. It is now acknowledged that to understand consumption and savings decisions on the macro level, we must model the behavior of individual agents. And this interest in microfoundations has been accompanied by the development of new data sets, such as the Federal Reserve's triennial Survey of Consumer Finances, the Consumer Expenditure Survey, and the Panel Study of Income Dynamics, that present information at a disaggregated level to allow for testing of these micro theories.

Yet, despite recent interest in consumer debt instruments, there is



**Anthony M. Santomero**, President,  
Federal Reserve Bank of Philadelphia

much work to be done. This conference is just the first of many efforts that we at the Federal Reserve Bank of Philadelphia plan to make to advance the consumer credit research agenda. We hope to shed light on the state of research and to spotlight areas of potential future contributions.

In my comments I will try to put the current literature on consumer finance into context and explain why consumer credit should have a place in academic research between standard macro modeling and the valuation of standard financial assets. I will also try to set out a list of issues that must be studied to further our knowledge and understanding of one part of the financial landscape that continues to grow at double-digit rates.

### CONSUMPTION THEORY AND THE RESEARCH QUESTIONS IN MACROECONOMICS

I'll begin with the standard view of consumer choice presented in macroeconomic theory. From the traditions of classical macro theory to the work of Keynes, standard macroeconomic models involved the representative economic agent who maximizes an expected utility function that summarizes well-behaved preferences, in a world with positive marginal productivity and a fixed discount rate. The agent's choice is constrained by a multiperiod budget or endowment sequence. Nearly all of us as graduate students could write down this problem's multiperiod first-order conditions and the appropriate transversality conditions associated with optimal behavior. The representative agent maximizes expected utility by equating marginal utility across periods, subject only to a borrowing and lending condition that bounds the problem. Such models yield paths of consumption and savings over time that achieve maximum expected utility subject only to the aggregate interest rate, which itself can be solved

for simultaneously in a general equilibrium setting.

Once consumption behavior had been characterized, economists turned to characterizing savings behavior in a world where the agent's life span is uncertain. Here, the profession's attention centered on models that featured various types of risk aversion and their impact on both wealth accumulation and decumulation. This work proved central to understanding the role of pensions on intertemporal consumption behavior and remains an important part of our understanding of life-cycle savings behavior. The credit market imperfections leading to liquidity constraints and the significance of the bequest motive in driving savings decisions have been studied.

On the public policy stage the research offers important insights into the debate over both Social Security and the entire area of private pension programs. Others have also used it to

relegated to macrofinance theorists, who began where the monetary theorists left off. In these macrofinance models the representative consumer maximizes his expected utility, which is represented by a concave function of exogenously given wealth. The models are usually single period. Multiperiod considerations are sometimes addressed with some intertemporal endogeneity, leading to some of the rich models of asset choice in a multiperiod consumption framework.

Still, we are a long way from a sophisticated model of households' ultimately joint decisions about how much to save, how to divide savings among different types of assets, how much to borrow, and what types of debt to incur. The characteristics of the specific assets are typically not modeled beyond the first two moments of their underlying distributions. Uncertainty is characterized only in this most general way, usually by reference to normality and stationarity. Anything more specific

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understand the effects of the private sector's evolution to defined contribution plans and their associated actuarial risks to covered workers. Some have even discussed and modeled the role of inflation uncertainty in this multiperiod asset-choice problem.

However, few researchers studying this problem attempted to explain the specific portfolio of risky assets that should be selected by economic agents over their life cycle or the appropriate vehicles to use to accumulate debt during periods of excess consumption. These issues were

is relegated to applied finance and its interest in state-dependent payoffs and their effect on valuation and time-series dynamics.

In short, the detailed payoff patterns associated with the debt instruments issued by the agent were entirely too mundane for the theorists' consideration. So, a student of consumer credit and consumer choice was sent to the applied finance literature for the modeling and valuation of real consumer debt instruments.

To some extent, the underdevelopment of this line of research

probably reflects the relative simplicity of most U.S. households' portfolios before the 1990s. But an explosive period of financial innovation in the last two decades and the rapid growth in consumers' wealth in the 1990s have introduced many more households to many more financial options. For example, today an increasing share of household wealth is held in financial assets, and a smaller share is invested in the household's primary residence. More households participate in equity markets, with equity making up over half of households' financial holdings.

These changes in the structure of household portfolios can be attributed to the stock market boom of the 1990s, the relatively slower growth in housing prices during the same period, a highly competitive mutual fund industry, and demographic factors. While the shift in household portfolios in the 1990s has been dramatic, what might be more surprising is that the shift hasn't been even larger. Households still seemingly prefer relatively simple and safe portfolios.

Exactly why this is the case, however, is unclear, for as noted above little economic research has centered on consumer asset choice. Still less has investigated the characteristics unique to each financial product available to smooth consumption over a multiperiod uncertain horizon. To learn more about these issues the researcher is directed to the field of finance.

## **FINANCE AND THE VALUE OF CONSUMER FINANCIAL CLAIMS**

Interestingly, applied finance is up to the task of modeling consumer assets. Its general theoretical construct of stochastic behavior, using expected present value in a state-contingent framework, is well suited for the underlying uncertainty associated with consumer credit. With the rise of discrete-time models and binomial tree modeling techniques, the standard

financial valuation techniques can be applied to consumer debt instruments characterized by time-specific default probabilities and multiperiod cash-flow uncertainty.

But, as indicated earlier, consumer assets do tend to have small market values, and the field was traditionally viewed as extraordinarily "unsexy." As a result, the new techniques being applied to analyze corporate finance instruments have only rarely been applied to consumer debt, and there has been little interest expressed by the research community in understanding the nuances of the individual consumer markets. As a result, the characteristics and time-series price dynamics associated with different types of consumer debt instruments have never been seriously investigated.

This void in the literature is important. Consumer debt of various types exceeds total U.S. Treasury debt, and it is likely to be the only liquid market of the early 21st century. The economics and finance profession has been slow in concentrating on both the theoretical and empirical issues surrounding these instruments – with one exception, the mortgage market.

Residential mortgages currently account for the majority of consumer debt, with an outstanding value of over \$5 trillion, and represent the only area of consumer debt that has received significant attention. Fostered by the development of various types of mortgage pass-through instruments, a large literature developed about their valuation. The aggregation of individual instruments added scale but also complexity. Prepayment risk, default modeling, and state-dependent cash flows led to the development of a rich literature.

Interestingly this literature has not crossed over to other areas of consumer debt, even as the percentage of consumer debt represented by mortgage assets continues to decline. In

fact, there is very little in the literature on various types of asset-backed securities, in spite of their growing importance, and we know little about the difference in yields across various types of asset-backed securities.

## **ADDRESSING THE VOID IN THE LITERATURE**

How can this seemingly important void in the literature be addressed? The research plan is fairly straightforward if one proceeds from first principles. The securitization vehicle can be understood as the aggregation of individual economic decisions made by a series of representative agents. Using consumption theory in a stochastic environment, one could model cash-flow dynamics, including default and prepayment variation. Present value valuation techniques could then be applied to the underlying aggregation, subject to the subtle but important covenant constraints that differentiate each instrument.

Collateral, recourse, and seniority become key elements in the distinction between repayment timing and ultimate default probabilities associated with different consumer debt types. Issues of adverse selection, switching costs, borrower heterogeneity, and liquidity constraints also come into play, making the pricing of consumer debt instruments, such as credit cards, not a trivial exercise. However, with sufficient care, the techniques applied to mortgage debt, which were derived from multiperiod consumption behavior, could be applied to CARs, CARDs, and CLOs. Price dynamics would follow directly.

Any such effort would immerse the research in the public policy debates that dictate terms and conditions. Just as "due on sale" clauses substantially altered mortgage dynamics in the 1970s, and regulations surrounding adjustable rate mortgages altered the valuation of these instruments substan-

tially, consumer protection policies have substantial implications for consumer credit instruments. For example, bankruptcy regulation alters repayment probability and valuation, as do access to collateral, privacy rules, and public disclosure regulation. All of these policies alter credit risks and credit spreads.

The public debate surrounding these consumer protection attributes would be enhanced by both the estimation and discussion of the implied costs of such regulations. The beneficial effect of the consumer rights acquired through such legislation must be weighed against the implied cost to the lender and the derived increase in credit spreads to the entire consumer class.

### THE UNFINISHED AGENDA

There is much to be gained from the application of standard economics and finance to the valuation of consumer debt instruments. By modeling the uncertain cash flows and creditor rights associated with different debt instruments, we can obtain proper pricing and risk assessment. This will also facilitate arbitrage across markets and reaffirm the law of one price across various types of instruments subject to similar uncertainty.

Such research will also illuminate the current policy debate regarding debtor versus creditor rights at the basis of various types of consumer right proposals. Valuation techniques can derive the costs of such legislation against which the benefits can be contrasted.

### THE FEDERAL RESERVE BANK OF PHILADELPHIA'S ROLE

This is a rich agenda that all of us share as researchers. And the Fed has

a unique role to play, as both a center of financial knowledge and a supporter of various types of economic research. The Fed has traditionally devoted significant resources to banking and financial market research, at a number of the Reserve Banks.

We here in Philadelphia have a particular interest in this area. The Third District is the home of the credit card industry, with approximately 40 percent of all consumer credit cards emanating from the state of Delaware.

To underscore our interest in this area and to address what we see as a mandate to understand this industry, we have established a Payment Cards Center within the Bank to investigate issues central to this part of the financial services sector. The value of various types of consumer debt instruments and their relative values under different

public policies, including but not limited to bankruptcy rights, collateral access, and various types of consumer protection legislation, are clearly crucial issues, and they definitely belong on the Payment Cards Center's research agenda.

Payments issues, as well, are on the Center's agenda. Clearly these too are central to understanding the payment cards industry and the evolving financial services sector. Just as one can tie the study of consumer debt instruments to a traditional literature,

the study of consumer transactions media finds a historical precedent in the traditional theory of money demand. The traditional theories of money demand — for example, the Baumol-Tobin inventory model — weren't specific about the medium used for transactions. And, as we know, financial innovations and deregulation effectively destroyed the empirical relationship between money and income.

We need to develop new theories if we hope to explain the economic rationale for and the impact of various transactions media, like credit cards, debit cards, and smart cards, which are much more complicated than our traditional characterization of money. Debit cards and smart cards are relatively new developments, but there is much we still do not know about credit cards, which have been around

**By modeling the uncertain cash flows and creditor rights associated with different debt instruments, we can obtain proper pricing and risk assessment.**

for years: why do so many consumers, even wealthy ones, borrow at the high rates on credit cards? Given the large number of credit card issuers, why are credit card rates so high and sticky? Why was there a large increase in delinquencies and bankruptcies when economic conditions were so favorable? A well-developed theoretical framework for solving these and related puzzles is a pressing task, which promises an interesting and rich research agenda. 