

# The Federal Government Promotes Minority Consumer Outreach

Juanita Yates, Associate Director<sup>1</sup>

America's strength is rooted in its diversity, a fact to which our long history bears witness and to which our nation's motto provides testimony: *E pluribus unum* (One from Many). According to Census Bureau projections, by the year 2000, more than a quarter of all Americans will be African Americans, Hispanics Asians and Native Americans.

In recognition of the rapidly growing minority population, the United States Office of Consumer Affairs (USOCA) sponsored a National Symposium on Minority Consumer Issues at the White House during our 1990 celebration of National Consumers Week. More than 100 leaders of minority, civic, fraternal, educational, consumer and religious organizations participated. The Symposium was designed to identify government and private sector resources; provide current information on consumer legislation and regulations; provide consumer education publications and other materials; and encourage citizen participation in rulemaking which impacts on consumers.

In response to the Consumer Federation of America's 1990 Consumer Competency Survey which found disturbingly low levels of essential consumer knowledge among minority citizens, USOCA renewed its efforts to address the marketplace concerns of minority communities, who have traditionally been underserved by conventional consumer education methods.

During 1991, USOCA convened two meetings with representatives of national and community based minority organizations or CBO's, to identify major issues of importance to minority consumers and recommend strategies for improving the delivery of consumer information to African American, Hispanic, Asian and Native American communities.

My office prepared a report on the meetings

with a list of the issues and strategies raised by the minority leaders. However, their message to us was clear; we were not doing enough to break barriers of language and culture. The participants called upon government officials, educators and business and industry leaders to become sensitive to their varied interests, educational needs, lifestyles, expectations and cultural diversity.

In short, the minority leaders told us to build coalitions and work cooperatively with churches, schools, and community based organizations that are already in place. They also said that we should use minority-oriented media and information dissemination specialists with special insight and sensitivity to ensure that a program or message is relevant and addresses the needs and problems of minority consumers.

## Initiatives for Minority Consumers

One of the major recommendations was that we convene Minority Consumer Dialogues in major cities around the country with the assistance of local agencies which actually resolve consumer problems. The Dialogues could give the CBO's more information on getting their constituents' consumer problems resolved. At the same time, agency managers could learn from the CBO leaders how to serve minority communities more effectively. This problem-solving approach could create the confidence and cooperation essential to improving consumer education in minority communities.

I am pleased to report that our first Dialogue will be held April 23 in San Francisco. Our cosponsors will be the California Department of Consumer Affairs, Consumer Federation of America, and Consumer Action of San Francisco. In this Dialogue, the community leaders will set the agenda. Our invitation included a proposed list of issues and asked CBO leaders to rank the issues in

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<sup>1</sup>Special Concerns United States Office of Consumer Affairs

order of importance to their communities. We encouraged them to add to the list if necessary. The results will tell us which complaint-handling agency representatives to invite.

Our goal is to create a partnership between the CBOs and the agencies. The minority consumer groups will convey to the regulators how they can better communicate with their communities. And the agency managers can explain how the CBO's and their constituents can get effective assistance from their agencies. Every community is different, of course, but we hope to adapt this same "model" approach in convening other Dialogues.

Our other initiatives for minority consumers include:

- Producing and distributing radio consumer information spots targeted to minority communities. Radio offers an inexpensive way to reach some minority populations which we have found are not reached effectively by the print media.
- With input from minority affairs contacts in each of the Federal agencies, USOCA is compiling a list of minority-oriented radio and television stations and newspapers and magazines located around the country. We will send them our publications, newsletters and public service announcements. We will also share the list with other Federal agencies.
- The problems minority consumers experience with financial services is an especially timely issue and one of major importance to USOCA. Although other Federal agencies-- and the Congress, as well-- are grappling with the heavy burden of reforming and restoring the nation's banking system, USOCA is concerned about the impact of the situation on consumers. We have held discussions with leaders in the banking industry, with Federal regulators, and with consumer groups on how to educate consumers, about the financial services marketplace, especially minority consumers. We believe that consumer education can play a beneficial role for minority consumers who as a group, experience a high rate of loan denials. We are, therefore, exploring opportunities to work with government, the private sector, and community organizations in launching an education campaign designed to help educate

minority consumers on the criteria banks use for approving loan applications, and how to position one's financial situation most favorably before making a loan request.

### Federal Agency Outreach Activities

Although USOCA has additional initiatives in this area, I want to briefly share with you some of the minority consumer outreach activities in other Federal Agencies. I know that all of you are familiar with the Consumer Information Center in Pueblo, Colorado which distributes more than 200 Federal Government publications. More than 100 of the publications are available in Spanish. These are listed in a special catalog, La Lista, which is disseminated throughout the Hispanic community.

### FTC

At the Federal Trade Commission, the staff from headquarters and the 10 regional offices regularly sponsor conferences, conduct workshops and accept invitations from community-based organizations to speak at functions. In addition, public service announcements and publications are distributed to minority newspapers, magazines, and radio and television stations. The FTC's jurisdiction over alcohol and tobacco advertising is limited. However, because of targeting to minority communities, the FTC staff scrutinizes the advertising and promotion of alcohol and tobacco very carefully, giving particular attention to ads or promotional activities that are aimed at children.

A major goal of the FTC is to educate consumers, especially low income consumers, about fraudulent telemarketers who rob their unsuspecting victims of more than one billion dollars a year.

Last year the FTC developed a video news release and educational campaign addressing credit repair scams. This spring the FTC will target fraudulent weight loss programs in a video news release. These are among the issues that the FTC believes will have a significant impact on minority consumers.

### FCC

The Federal Communications Commission continues to actively encourage minority small business entrepreneurs to consider opportunities to invest in the communications market. Through

conferences, workshops and other forums, minority business leaders are being advised to look beyond traditional broadcasting station and consider such business opportunities as wireless cable and radio and information services. The FCC also provides technical assistance and counseling to minority leaders and students.

Many of you may already be familiar with the two FCC programs that assist low-income telephone subscribers, Lifeline and Link-Up America. Lifeline provides subscribers with lower monthly rates when states and local telephone companies offer matching discounts. There have been 2.6 million subscribers since 1985. Link-Up America helps make telephone service available to people who can't afford all of the costs. Low income citizens may receive a 50 percent reduction on the total service connection charge. Link-Up was developed with national support from AARP, CFA and the U.S. Telephone Association. Both programs have been adopted by most states. The programs are funded by long distance carriers through the Universal Service Fund, which reimburses local telephone companies.

### CPSC

Statistics show that a third of all children who suffocate to death in plastic bags are minorities and a disproportionate number of minority children die from drowning in five-gallon buckets. The Consumer Product Safety Commission has launched a pilot project on School and Daycare Safety. The project will evaluate the Commission's effectiveness in disseminating practical information on how to prevent needless injuries suffered by children in the daycare environment and in the home.

Working with the National Council of Negro Women and other organizations, CPSC is encouraging public/private partnerships to get working smoke detectors in every home.

Several CPSC publications, including those on smoke detectors and home safety, are available in Spanish.

### **Getting The Message Out**

With the myriad problems facing many minority consumers, government officials and educators must help them recognize that consumer

information about product safety, telemarketing fraud, credit repair scams, and food and nutrition labeling is crucial.

These and other consumer issues do impact heavily on their lives. The effective delivery of this information continues to be our greatest challenge. The video news release for television generally reaches targeted audiences, including non-reading consumers or those who get most of their information from television. Radio has also been identified as the major source of information for many minority communities. But clearly, you as educators remain the ultimate resource for delivering information. It is an established fact, and especially true with minority students, " When you educate a child, you've educated a family."

We in the Federal Government are looking to you to help us educate minority families.

## Cultural Diversity and Consumer Literacy: Tapping America's Resources

Eileen Hemphill, D.C. Department of Consumer and Regulatory Affairs<sup>1</sup>

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In April of last year, President Bush and the nation's governors called for a national revolution to improve American education. By the year 2000, "every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship." This goal, one of six national education goals outlined in America 2000, also effectively summarizes the outcomes expected from consumer education efforts. It has sweeping implications for all Americans. For culturally diverse and minority populations, its realization is particularly challenging and critical to a healthy nation.

### A Word About Definitions

What do we mean by "consumer education?" At one time, not unlike the consumer movement itself, the term was most often associated with a "middle class" life style of spending and consumption for enhancement purposes. In this mind-set, consumer education was an unimportant luxury. It was not related to daily life or survival skills, nor inclusive of culturally diverse or minority persons.

Today we have grown to recognize the fundamental importance of consumer education and its capacity to empower all consumers, including the more vulnerable among us. Minority and culturally diverse consumers need and want to know how to get their money's worth and generally improve their quality of life. Our responsibility as consumer educators is to equip them with the knowledge and skills needed to make good decisions in the marketplace, manage their resources effectively, and understand their rights

and responsibilities.

What is in a name becomes a critical factor because labels have the ability to turn us "on" or "off." "Consumer education" is an amorphous term to most people. In fact, we have found severe misconceptions and limitations placed on the need for and value of consumer education because it is misunderstood. This deterrent to demand for instruction in consumer skills also surfaced at a day-long roundtable on the consumer literacy needs of our nation's youth convened last fall by the Consumer Federation of America, U.S. Office of Consumer Affairs, and the American Express Company. As its summary report suggests, renamed "life skills" or "consumer literacy," consumer education might be better received by communities and their boards of education.

"Diverse" is another critical term.

Contrary to popular belief, there is no monolithic Hispanic population in the United States. There are Puerto Ricans, Mexicans; there are Hondurans, Nicaraguans, Guatemalans, Columbians, and so forth.

Similar ethnic sub-groups exist within Black and Asian populations. Each group is unique and special, and efforts to reach them must respect their diversity, i.e., contrasts in interests, culture, values, and lifestyles. In culinary parlance, America is more a Mulligan stew than a melting pot.

By the year 2000, according to Census Bureau projections, more than a quarter of all Americans and a third of all children will be Hispanic, Asian, African American or Native American. It is entirely possible that by the middle of the next century, the average U.S. citizen could trace his or

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<sup>1</sup> President,  
National Coalition for Consumer Education  
Director, Consumer Education,  
D.C. Department of Consumer and Regulatory Affairs

her heritage not to Europe, but to Africa, Asia or Latin America.

### **How Have Culturally Diverse and Minority Persons Fared as "Educated Consumers"?**

Not very well. Studies of adults and teens have documented that individuals from culturally diverse and minority populations scored the lowest on tests of consumer literacy (Blacks, Hispanics and the poor). The 1990 Consumer Competency Survey jointly sponsored by the Consumer Federation of America (CFA) and TRW Information Systems found disturbingly low levels of essential consumer knowledge among minority citizens. A nationwide test of the consumer knowledge of high school seniors jointly sponsored by CFA and the American Express Company in 1991 found they are virtually unprepared for the many critical purchasing decisions they will need to make after they graduate from school. Even more alarming was that the lowest scores of all were in financially-related areas (checking, banking, credit and auto insurance).

In this highly technical information age, many minorities and culturally diverse individuals still do not possess the fundamental skills needed to wade through constant "buy, buy, buy" messages and make choices that promote financial and physical fitness for themselves and ultimately for society. For mainstream consumer literate America, these results reflect basic "quality of life" components. For minority and ethnic persons lacking basic consumer knowledge, they are critical factors in a vicious cycle of poverty and abuse.

As the world moves toward a consumer driven economy, it continues to look to the United States as an example of free choice -- in the marketplace and in other areas. How our culturally diverse populations are faring within our economic system has profound implications for the future. After all, people are the most important resource and the real source of our strength as a nation.

### **What Are The Unique Barriers To Consumer Literacy Facing Culturally Diverse and Minority Consumers?**

Barriers that must be overcome include

communication, cultural, life-style, educational, legal, health, and technological. As lengthy as this list is, it is by no means exhaustive. But for each barrier there is opportunity.

#### Communication Barriers

Language: This area holds the most promise and opportunities for immediate gains. For example, we could:

- Survey and identify the specific language needs of targeted audiences.
- Write and design materials to specifically incorporate the literacy level, images, interests and language of targeted audiences.
- Build in translation opportunities, both in terms of staff and programs.
- Establish partnerships and linkages with community service providers known and trusted by the client target group.

Visual vs. Written Learning: Reports from researchers, teachers, and others connected with marketing verify that we live in a visual society, with decreasing reliance on the printed word. Today messages are mass communicated through carefully constructed images which are widely marketed to sell products, services, ideas and life styles. Our challenge is to market consumer literacy messages aggressively through the use of strong visual images that stand out from the other information people are bombarded with every day.

#### Cultural Barriers

Understanding and embracing cultural diversity and the population mix of America is a critical success component. In this regard, each individual has a role to play, beginning with an examination of one's own values. After all, we are smart, educated, worldly, successful -- and too often presumptuous. For example, did we assume that success is defined by our standards alone? Do we value family and the quality of life but show conflict in our personal and professional choices and decisions? The point is this: In order to deal

successfully with cultural differences, we must be willing to scrupulously examine our own value systems and approach diverse and minority populations from a "give" and "take" perspective.

Representatives from the target group must be involved from the inception of programs. As teachers and learners, consumer education professionals must utilize the numerous resources (values, beliefs, inner strength and survival skills) of the audience being served. Programs must be developed around the principle: "If you tell me, I will forget, if you show me, I will remember, if you involve me, I will understand." Surely, we want culturally diverse and minority populations to remember critical information and understand how to use this information to their advantage.

### Life-style Barriers

Life-style factors play an important role in the capacity of minority and ethnic groups to become consumer literate. Like most of us, they face competing demands for time and attention. However, individuals unable to cope with the world of consumption in making sound purchase decisions for basic goods and services have an added handicap. The problem is particularly acute in low-income households where survival is the most pressing concern. In developing practical routes to consumer literacy for culturally diverse and minority audiences, we must examine this area closely and give consideration to:

- A new definition of family
- Single parent homes
- Poor nutrition
- Financial worries (shelter, food, health care)
- Access to transportation
- Weak or non-existent family support systems

### Educational Barriers

Notwithstanding the awesome task ahead of us, we can be comforted by the encouraging amount of progress that is being made in this area. This conference, with its wealth of presenters from throughout the U.S. and elsewhere, is a testament to much of that valuable work.

A further example, in addition to the test of high school students referenced earlier, is the 1990 National Survey on the Status of Consumer Education in U.S. Schools, Grades K-12, conducted by the National Coalition for Consumer Education (NCCE). Released by the NCCE on its 10th anniversary, the survey revealed that only 31 states have a consumer education policy and indicated an extensive awareness among educators of the need to teach consumer-related subjects in our schools. The most frequently mentioned subject was financial planning and management. Here again, the priorities which teachers expressed in the survey, were substantiated by the subsequent test of high school students.

To ensure consumer competency for all students, we must focus on policies, legislation and other routes to institutionalize the teaching of consumer skills. This competency must be viewed as a required part of the students' educational experience on par with math, science, and other subject matter identified in the national education goals of America 2000. Adult community and workplace education is also a priority. We should not overlook the fact that most new immigrants are adults. Many enroll in classes to learn English as a second language. Others pursue vocational instruction. This presents a prime opportunity to increase the consumer competency of these adults through continuing education programs.

As noted earlier, the roundtable on consumer literacy found the term "consumer education" a deterrent to public demand for instruction in consumer skills and suggested alternate language to increase interest in and develop advocates for teaching consumer competency. Clearly, the lack of consumer know-how is part of the much broader problem of lack of literacy and basic mathematics and reasoning skills. Society, however, is much more aware of the crisis in general literacy than the deepening problem of inadequate consumer skills.

### Legal Barriers

Some of the unique problems confronted by this population will require legislative and/or legal redress. For example:

- Issues related to money "handling" - check cashing fees, minimum amounts required

for bank accounts, and the need for more clearly explained credit and finance disclosures.

- Citizenship status which impacts an individual's willingness to complain or confront authorities and can result in monetary losses through unrealized legal redress for damages, and a lower standard of living. Citizenship status also negatively impacts census figures and the subsequent allocation of federal and state funds earmarked for programs that serve these special groups.
- Interest rates and usury laws (the only institutional sources of credit available to many of these consumers are high interest finance companies and neighborhood merchants).
- Territorial ratings from auto insurance companies, which charge high premiums for persons in these target groups.

#### Health Barriers

A prerequisite to the success of any venture is a foundation of good health. This was clearly recognized in the America 2000 education strategy, which states as its first goal "All children in America will start school ready to learn." Our quest for consumer literacy for culturally diverse and minority populations must begin at the same place.

**Nutrition:** Currently, consumers spend one-fourth of all income in food stores and restaurants. Advertising and marketing of food products is a multi-million dollar business. How nutritional dollars are spent becomes a critical question, particularly for our target group with low consumer literacy and multiple health problems related to nutrition. The ability to make rational consumer decisions concerning nutrition and health requires specific consumer information and skills.

**Access to Health Care:** Low and marginal employment levels, coupled with the high cost of health care, render a significant portion of culturally diverse and minority populations vulnerable to poor or non-existent health care.

Preventive health care becomes even more remote in families struggling for basic survival.

#### Technological Barriers

We are witnessing the laying in of hundreds of thousands of miles of fiber optic cable which will drop the bottom out of the costs of communication. The problem will not be the cost of telephoning; the problem will be promoting and finding the uses at the end of the telephone line.

In this decade, over 90 percent of adults will have access to a computer through home, office or school situations. Currently, there are 9,000 radio stations, 2,000 magazines. Cable offers a choice of 30 to 60 channels. Time Warner is starting a test of 150 channel cable, including 55 pay stations, and the equipment can take up to 600 channels. A staggering amount of choices.

The phenomenal boom in information technology provides an opportunity as well as a challenge to insure that these groups keep pace in a manner which best serves their needs.

#### **What Does Consumer Illiteracy Cost?**

Quantifying economic losses to society from the lack of consumer knowledge may be what is needed to move consumer education from "nicety" to "necessity." What are the costs? What do we lose?

#### Economy Suffers

First of all, we run the risk of losing a healthy economy because there is a direct connection between our ability to make economically efficient choices in the marketplace and the state of our economy. As just one example, Blacks spend more than \$250 billion a year on goods and services and Hispanics spend \$170 billion. Add to this the increasing buying power of the Asian community (\$38 billion) and we all lose when purchasing is not driven by literate consumers.

Decreased competition among American businesses impacts our ability to produce world-class quality goods and services at a low cost. This contributes to loss of market share at home and internationally, and ultimately, to a worsening of

our trade deficit. Consumers suffer, businesses are less competitive, our economy is less robust, our international competitiveness suffers, and our standard of living continues to fall.

#### Health Care Costs Escalate

Inadequate skills and knowledge about consumer nutritional choices are linked to many health-related problems and result in substantial losses when we factor in lost production time and long term care. According to Healthy People 2000, the U.S. Department of Health and Human Services' strategic plan for improving the nation's health, consumer food consumption choices are associated with 5 out of 10 leading causes of death in the U.S. The Surgeon General's Report on Nutrition and Health found that for 2 out of 3 Americans who neither smoke nor drink, food choices may shape their long-term health prospects more than any other personal choice.

#### Consumer Frauds Increase

As the consumer world expands, so must our defenses. For example, Americans lose an estimated one billion dollars yearly to fraudulent telemarketers, and anyone with a telephone is fair game for these fly-by-night con men.

#### Employees Require Retraining

Literacy and basic skills are required of good workers, as well as good citizens and good consumers. Enormous sums are spent on remedial training of workers by businesses, non-profit organizations and government agencies.

#### Consumer Debt Rises

Until recently, consumer debt had been growing steadily each year for the past 30 years. In 1990, personal bankruptcies hit an all time high of over 900,000. Now American consumers are paying off old debt at a rate faster than their accumulation of new debt. Bad debt impacts more than the individual. In 1988, it cost each U.S. resident \$250 in higher prices.

#### Waste

Billions of dollars are being wasted by uneducated consumers on the useless products and services of inefficient companies. To be competitive in the global market, U.S. businesses must be competitive at home. Skilled consumers promote true competition in the marketplace.

#### Brain Drain

Last, but not least, when individuals are not consumer literate, we lose critical thinkers. Individuals who approach the marketplace equipped to mentally challenge and sort options are a national treasure whose value cannot be overrated.

#### **Where Do We Go From Here?**

As bleak as the list of "losses" is, there is an equally challenging list of opportunities to turn this situation around. For example:

- The emerging geriatric Americans are the most prosperous, highest income, best educated and most interventionist group the world has witnessed to date. In the 1988 election, while 12.4 percent of the population was over 65, 19.4 percent of the voters were over 65. Business is on notice about this powerhouse, but think of the potential for consumer education. Enormous information, education and wealth is in these hands. We need to identify ways to link these resources with needs of culturally diverse and minority populations.
- Teenagers, particularly in single parent homes, are assuming more and more of the responsibility for family income -- groceries, transportation, entertainment and telephone. In 1990, teenagers spent an estimated \$79 billion on products and services in the marketplace. How this money is spent or misspent becomes an issue of enormous importance, and consumer education is the key.
- The Advertising Council creates over \$1.2 billion of free advertising a year for worthy causes. Consumer education needs a chance to compete with the sophisticated

education coming from advertisers, using their tools of the trade. Advertisers can accomplish things that the best-intended pamphlets and press releases cannot, because they are expert at making information interesting. They make it dramatic, give it a human value, bring it to life where people really do live, not where we expect them to live, or want them to live. Advertisers help it stand out from all the other information they are bombarded with every day. Perhaps consumer education needs a massive media campaign to raise the consciousness level of U.S. citizens.

- As consumer education professionals, we must listen to consumers -- really listen to them. Encounter them directly in groups, person-to-person, off the beaten track. Find out what is really in their minds and in their hearts. With a better understanding of their culture, values, and life-style, we can begin to aggressively target these underserved consumer segments.
- Consumer education organizations must reflect cultural diversity in their staffing patterns. This sensitivity should also extend to finding creative and consistently reliable ways to obtain input from the diverse populations we seek to serve.
- Corporations have long recognized the advantages of dealing with well-informed customers. Now they are increasingly aware of the profitability of marketing to minority and culturally diverse audiences who have substantial buying power. More recently, business itself has taken steps to educate consumers. The establishment of a one million dollar Credit Education Fund underwritten by AT&T and managed by the National Coalition For Consumer Education is a notable example. In 1990, its first year of operation, grants helped fund projects targeted for minority and special needs populations including migrant farm workers, low-income minorities, and mentally handicapped adults. Second-year grant recipients will be announced during National Credit Education Week in April 1992. As research has shown, there are

benefits that come from dealing with an educated consumer and benefits that occur when a corporation uses its resources to initiate an aggressive consumer education program.

- To address the needs of minority consumers and culturally diverse consumers, we must become familiar with their local and neighborhood leaders. These community service providers with formal and informal ties to the community are known and trusted by their constituencies. Through these linkages, we gain greater credibility and access to the populations we want to reach.
- Because education policy is developed at the state and local levels, we must develop advocates there and ensure that all voices are heard on the critical importance of consumer education. Properly challenged and motivated, state and local minority leaders can become powerful consumer advocates and partners in consumer education.

### Conclusion

We have the advantage of knowing now that the United States stands at the brink of an ethnic revolution. Realizing that diversity will be our reality, we have the opportunity to make it our strength. We will need to go in many directions -- all leading to the goal of creating an inclusive society where cultural and economic differences pale as we provide realistic and tangible vehicles which enable culturally diverse and minority groups to function effectively in an increasingly complex marketplace.

There is an urgency for each of us to commit to a national goal of consumer literacy for all by the year 2000. This goal will not be fulfilled by telling minority and ethnic persons what is good for them, or protecting them against what is bad, and then going to sleep. It requires a system that is wide awake, wide open -- a system that allows what we think we know to be challenged, to be questioned, and encourages the discovery and distribution of new and better answers.

In a poet's words, we have promises to keep.  
And miles to go before we sleep.

## Mental Accounting and Saving Behavior

Jing-jian Xiao, University of Rhode Island<sup>1</sup>  
Geraldine I. Olson, Oregon State University<sup>2</sup>

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This study tested the validity of the mental account assumptions by utilizing a stock adjustment model. Data from 1983 and 1986 Surveys of Consumer Finances were used and the tobit results supported the hypotheses developed on the basis of mental account assumptions.

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The life-cycle hypothesis has been dominant in the modeling of savings behavior and inspired numerous empirical studies. However, the results of these studies have not been satisfactory, especially when using microdata (Courant et al, 1986). As an improvement of the traditional life-cycle hypothesis, Shefrin and Thaler (1988) proposed a behavioral life-cycle hypothesis, incorporating several socio-psychological features into the traditional model. Using their model, they proposed several directly testable hypotheses, and cited dozens of empirical but indirect studies to suggest that abnormal saving behaviors, as viewed by the traditional model, could be reasonably explained by this behavioral version (Shefrin and Thaler, 1988; Thaler, 1990).

Mental accounting is one of the socio-psychological features incorporated into the traditional life-cycle hypothesis by Shefrin and Thaler. The purpose of this paper is to examine the validity of the mental accounting concept. Here the components of household asset portfolios refer to differentiated mental accounts which are designed to represent relatively discrete objectives for saving. Specifically, this study attempts to conceptually define and operationalize mental accounts, and to investigate the validity of the

mental accounting concept by identifying own-adjustment and cross-adjustment characteristics of these mental accounts.

### Mental Accounts

The mental account is a critical concept in the behavioral life-cycle hypothesis. Because of the existence of mental accounts, the assumption of fungibility of family saving, suggested by the traditional life-cycle hypothesis, is relaxed.

Originally, mental accounting was proposed as a decision-making pattern by psychologists when they were researching decision behavior (Kahneman and Tversky, 1984). Shefrin and Thaler (1988) also proposed three mental accounts when presenting their behavioral life-cycle hypothesis: a current income account, an asset account, and a future income account.

Mental accounts as used in this study are basically adapted from Shefrin and Thaler's framework, but they are constructed in a somewhat different way. Mental accounts are hypothesized as a reflection of consumers' financial needs, with the unique characteristics of various financial needs manifested as a series of mental accounts. A conceptualization of financial needs may be derived from information obtained through consumer surveys. In this study, questions included in the Surveys of Consumer Finances (SCF) were utilized.

The respondents of the SCF were asked "what are the most important reasons for savings?" Common answers were the following: retirement,

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<sup>1</sup> Assistant Professor, Human Development, Counseling, and Family Studies

<sup>2</sup> Associate Professor, Human Development and Family Science

emergencies, children's education, ordinary living expenses, purchase or travel plans, better life, and so on. One usual way to categorize these needs is to consider the time dimension. Savings put in checking accounts may always be used to meet consumer's daily living expenses, but many other financial needs vary with time. Saving for retirement may be a long-term plan for young consumers but a shorter-term plan for middle-aged consumers. Saving for children's education probably depends on the children's ages and number. Saving for emergencies is hard to classify either in a present, short-term, or long-term category. If we knew exactly when the event would happen, it would not be called an emergency. Thus, it is difficult to categorize financial needs into a uniform conceptual framework based on time frame alone.

Maslow (1955) has proposed a hierarchy of needs. He identifies five ascending needs: physical, safety, belongingness and love, esteem, and self-actualization. Comparing Maslow's needs hierarchy with consumers' reported financial needs from the SCF, a good match is found. Thus it seems reasonable to consider consumer's financial needs as a special form of Maslow's needs hierarchy.

Maslow (1955) also proposes the dynamic nature of human needs. He writes that "the most basic consequence of satiation of any need is that this need is submerged and a new and higher need emerges". Katona (1960, p.131) agrees with Maslow's notion but adds that "need is not necessarily a higher need". This suggests the two-way movement of needs, from lower- to higher levels, or in a reverse direction.

In summary, these financial needs could be characterized as: 1) hierarchical; 2) dynamic; 3) increasing or decreasing in numbers (or levels); 4) moving up to a higher-level need after the lower-level need has been met, or down to a lower-level need if that lower-level need has failed to be sustained. Different mental accounts may roughly correspond to these hierarchical needs, which implies that, along with an increase of income, consumers will move to higher levels of needs, and tend to have a wider variety of financial assets.

Based on Maslow's theory, as adjusted to family financial needs, and considering simplicity of variable specification for empirical study, all these needs are categorized into three mental accounts. These mental accounts are called ACCT1, ACCT2, and ACCT3, corresponding roughly to: 1) survival needs, 2) security needs, and 3) social/developmental needs.

ACCT1 is characterized as meeting daily and emergency financial needs, ACCT2 as meeting future financial needs, and ACCT3 as meeting social and personal developmental needs. Saving for emergencies is put in ACCT1 because the consumer is hypothesized as risk averse, preparing for an emergency that might happen at any time. Saving for a better life is put in ACCT3 because the consumer is assumed to put money into this account after he/she has put enough money into the first two accounts.

The rest of this section discusses marginal propensities to consume from mental accounts. Shefrin and Thaler (1988) identified three mental accounts; a current income account (I), an assets account (A), and a future income account (F). Their hypothesis states that the aggregate consumption function must incorporate at least three different income or wealth measures corresponding to the three mental accounts. That is,  $C=f(I,A,F)$ , where I, A, and F stand for their aggregate counterparts. The model suggests that,

$$1 \approx \partial C / \partial I > \partial C / \partial A > \partial C / \partial F \approx 0. \quad (1)$$

This MPC hypothesis makes two points. The first suggests the existence of a MPC hierarchy. Consumers are assumed to consume more from current income accounts than from the assets account, and to consume the least from the future income account. This assumption will be held in this study. The second point made by inequality (1) is that, over a given time period, consumers consume almost all of the current income account, but hardly consume from the future income account. This notion may be reasonable, because their future income account covers savings in pensions and payments to social security. However, it is less realistic in this study since the range of assets covered is narrower than that defined by Shefrin and Thaler, and corresponds

most closely to their current income and assets account. Thus the assumption about marginal propensities to consume from three mental accounts in this study is weaker than theirs. Assume that the aggregate consumption function is,  $C=f(ACCT_i)$ , where  $ACCT_i$  ( $i=1,2,3$ ) are mental accounts. And assume that a MPC hierarchy exists in such a manner,

$$\frac{\partial C}{\partial(ACCT_1)} > \frac{\partial C}{\partial(ACCT_2)} > \frac{\partial C}{\partial(ACCT_3)}. \quad (2)$$

Inequality (2) suggests that the marginal propensities to consume (MPC) from  $ACCT_1$ ,  $ACCT_2$ , and  $ACCT_3$  are different. More specifically, the MPC from  $ACCT_1$  is the largest, the MPC from  $ACCT_3$  is the smallest, and the MPC from  $ACCT_2$  is somewhere in between.

Saving is the complement to consumption, keeping income and wealth constant. Different marginal propensities to consume from various mental accounts imply that saving situations in these mental accounts would be different, and the saving increments for  $ACCT_1$ ,  $ACCT_2$ , and  $ACCT_3$  would be the smallest, in between, and the largest, respectively.

### Hypotheses

All assumptions about the consumer in a utility model are held. The consumer is informed, rational, and utility maximizing. At a given income level, consumers purchase various financial products. The purpose of purchasing these financial products is to pursue desirable characteristics embedded in these products. The characteristics of these financial products match the properties of their discrete mental accounts. Consumer save in their various mental accounts to meet different financial needs. Based on the above notion, a stock adjustment model could be developed.  $Q_k^d$  is denoted as the desired stock of item  $k$  in year  $t$  by an individual family. In most aggregate time series models,  $Q_k^d$  is specified to be a function of the rates of return for all stocks in the portfolios and permanent household income. But in disaggregated models, such as the one estimated here, it is virtually impossible to calculate rates of return for each household's portfolio of stocks

(Zick and Gerner, 1987). To solve this problem, Bryant (1986) assumes that prices, interest rates, and other economic conditions (e.g., credit restraints) vary with a household's demographic characteristics. In addition, based on the behavioral life-cycle hypothesis, family characteristics will influence decision makers' self-control process. Consequently, related family characteristics will have effects on the desired stock of household assets (here referring to mental accounts).

Assuming that the linear relationship between the desired demand for mental account  $k$  in period  $t$  and its influencing factors exists, it follows that,

$$Q_k^d = \beta_k D_k + e_k \quad (3)$$

where,  $Q_k^d$  = the desired demand for mental account  $k$  in year  $t$ ,

$\beta_k$  = "long-run" or "equilibrium" effects of the family characteristics (exogenous variables) on demands,

$D_k$  = exogenous variables (family characteristics, including family income) determining desired demand<sup>1</sup>,

$e_k$  = a vector of random error terms.

Equilibrium effects refer to the effects of certain family characteristics as exogenous variables on the desired demands of mental accounts. It should be noted that the assumption expressed implicitly is that these family characteristics remain the same during the period.

Assuming that disequilibrium exists in terms of the desired stock and real stock of mental account  $k$ , that the family always adjusts real stocks of portfolio components toward the desired state, and that the stocks of portfolio components interact with each other, the difference of the real stock of mental account  $k$  between two points of time will reflect the changing state of the disequilibrium. Specifically, the following equation postulates,

$$(Q_k - Q_{k(t-1)}) = \alpha_{kk}(Q_k^d - Q_{k(t-1)}) + \sum \alpha_{kj} (Q_j^d - Q_{j(t-1)}) + v_{it} \quad (4)$$

where  $Q_k$ ,  $Q_{k(t-1)}$  = real stocks of mental account  $k$  in period  $t$  and  $t-1$ <sup>2</sup>,

$\alpha_{kk}$  = the parameter reflecting own adjustment of mental account  $k$ ,

$\alpha_{kj}$ =the parameter reflecting cross adjustment between mental account k and j,

$Q_{kt}^d, Q_{jt}^d$ =the desired stocks of mental account k and j in year t,

$Q_{j(t-1)}$ =the real stock of mental account j in period t-1,

$v_{it}$ =a vector of random error terms.

Equation (4) implies that the difference in real stocks of mental account k between period t-1 and t reflects both the difference of the desired demand of mental account k in period t and the real stock of mental account k in period t-1, and the differences of the desired demand of mental account j in period t and the real stock of mental account j in period t-1. To put it in another way, the savings in one mental account over a period are affected by both the adjustment of this mental account and the adjustment of other mental accounts. The  $\alpha_{kk}$  is called the own-adjustment coefficient, which reflects the degree of own-adjustment of one mental account. If, for instance,  $\alpha_{kk}=.6$ , then 60% of the gap between the desired demand in period t and the real stock in period t-1 in terms of mental account k closed because of the change of real stocks of mental account k during period t-1 and t.  $\alpha_{kj}$  is called the cross-adjustment coefficient, and it reflects the interaction between mental accounts. More specifically, it measures the extent to which the adjustment of one mental account effects the adjustment of another mental account. If  $\alpha_{kj}$  is positive (negative), it indicates that the adjustment of mental account j has a positive (negative) effect on the adjustment of mental account k. If the effect is positive, it displays the idea that both adjustment processes are complementary, while if the effect is negative, it suggests that the two processes are competitive<sup>3</sup>.

Why do disequilibria between the desired stocks and the real stocks of mental accounts exist? Bryant (1987) suggests that the reason is because of transactions costs and household inertia. The stock adjustment model does not answer why families always proceed with an adjustment process, but previous studies imply that this process is on-going. Also, the stock adjustment model does not give any hint about the direction of own- and cross-adjustment. Thus without considering other theoretical frameworks, the understanding of stock adjustment of household assets is incomplete.

The mental account assumptions can fill the gap left by the stock adjustment model. Incorporating the hypothesis into the stock adjustment model, several things become clear. Desired stocks of mental accounts could be viewed as financial goals of families. The reason that families adjust their stock of household assets is that they attempt to meet their financial needs. In addition, based on the mental account assumptions, several specific predictions about own- and cross-adjustment coefficients can be made.

(1) An own-adjustment coefficient could be viewed as the speed of adjustment of the desired stock and the real stock of one mental account, and it could be positively related to the marginal increment of savings in that mental account. Recalling the discussion about the different marginal increments of savings in various mental accounts, the relationship between own-adjustment coefficients of three accounts could be:

$$\alpha_{ACCT1} < \alpha_{ACCT2} < \alpha_{ACCT3} \quad (5)$$

This is the first hypothesis.

(2) Cross-adjustment coefficients reflect the interactions between mental accounts. The interaction could be understood as the psychological influence on saving behavior. If the self-control assumption (Thaler and Shefrin, 1981) holds, the extent to which families save depends on the psychological cost needed in exercising willpower. If the degrees of exercising willpower are different when saving in different accounts, the psychological influence of saving in one mental account would be different from that in another account. Considering the existence of a mental account hierarchy, the influence of saving in one account on another account will be different from the impact given by the other account, which depends on the relative positions of these two accounts in the mental account hierarchy. For example, a family saving in ACCT1 will exercise larger willpower than when saving in ACCT2. If this family could save a certain amount money in ACCT1, it would save more in ACCT2, over a period of time. This is the situation when the adjustment process is complementary. If the adjustment is competitive, it implies changing needs of the family over one period of time. Since

ACCT<sub>i</sub> is more basic than ACCT<sub>j</sub> ( $i > j$ ,  $i, j = 1, 2, 3$ ), ACCT<sub>i</sub> is more competitive when it affects ACCT<sub>j</sub> than ACCT<sub>j</sub>'s effect on ACCT<sub>i</sub>. Assuming that the cross-adjustment coefficient is positively related to these interactions, the relationship between cross-adjustment coefficients should be expected as:

$$|\alpha_{ACCT_{i \rightarrow j}}| > |\alpha_{ACCT_{j \rightarrow i}}|, \quad i, j = 1, 2, 3; \quad i < j. \quad (6)$$

This is the second hypothesis.

### Methodology

Because the household's desired holdings of any stock at a point of time are not observed, estimation of the adjustment process can be done only after substituting the determinants of the demand for desired stocks directly into the stock adjustment equation. Substituting equations (3) into equations (4) yields,

$$(Q_{kt} - Q_{k(t-1)}) = \alpha_{kk}(\beta_{kt}D_{kt} - Q_{k(t-1)}) + \sum \alpha_{kj}(\beta_{jt}D_{jt} - Q_{j(t-1)}) + v_{it}. \quad (7)$$

Reorganized (7), it becomes,

$$(Q_{kt} - Q_{k(t-1)}) = \tau_{kt}D_{kt} - \alpha_{kk}Q_{k(t-1)} - \sum \alpha_{kj}Q_{j(t-1)} + v_{it}. \quad (8)$$

A censored sample is one where the value of the dependent variable, corresponding to some observable values of independent variables, is unobservable (Judge et al, 1980, p.615). The sample used in equation (14) is a censored sample, since dependent variables in it are dollar values of various financial assets, and some families in the sample do not possess certain kinds of assets.

In stock adjustment model literature, estimations of parameters are conducted by using Ordinary Least Square (OLS) procedure, but this is not appropriate in the context of this study since application of OLS procedure to a censored sample produces biased and inconsistent estimators (Judge et al, 1980, p.615). An appropriate way to estimate parameters of a linear equation with a censored sample is using a tobit model (Maddala, 1983).

The tobit model was originally proposed by Tobin (1958) as a hybrid of probit analysis and multiple regression to deal with censored samples. In order to use the tobit model, equation (8) can be rewritten as:

$$Q_{kt} = \tau_{kt}D_{kt} + (1 - \alpha_{kk})Q_{k(t-1)} - \sum \alpha_{kj}Q_{j(t-1)} + v_{it}. \quad (9)$$

In the form of the tobit model, equation (10) can be expressed as:

$$Q_{kt} = \begin{cases} \tau_{kt}D_{kt} + \alpha_{kk}'Q_{k(t-1)} + \sum \alpha_{kj}'Q_{j(t-1)} + v_{it} & \text{if } Q_{kt} > 0 \\ 0 & \text{otherwise} \end{cases} \quad (11)$$

where,  $\alpha_{kk}' = 1 - \alpha_{kk}$ , and  $\alpha_{kj}' = -\alpha_{kj}$ . Parameters  $\tau_{kt}$ ,  $\alpha_{kk}'$ , and  $\alpha_{kj}'$  in equation (11) can be estimated by using the maximum likelihood procedure (Maddala, 1983, pp.151-156). Parameters of each tobit equation will be estimated separately.

The data are from the Survey of Consumer Finances (Avery et al, 1987). This data set includes two surveys conducted in 1983 and 1986 by the Survey Research Center of the University of Michigan, and consists of 3,665 and 2,822 area probability samples, respectively. In this study, only families of single adults with or without children, or couples with or without children are included in the sample analyzed. In addition, only single persons without marital changes, or married couples who retain marital status between 1983 and 1986 are chosen. A final sample of 2,419 is used in this study. The cleaned and imputed data file was used, and the sample was unweighted.

Statistical analyses include the following steps. The sample is first stratified into three income levels. Then intangible household assets are grouped into three mental accounts, and dependent and independent variables are specified. Finally, a LIFEREG procedure of SAS was used to estimate parameters of equation (11).

To investigate different saving patterns among families at various income levels, observations in the sample are stratified according to their 1985 annual family incomes. The three income categories selected are: 1) \$19,999 or less, 2) \$20,000-\$49,999, and 3) \$50,000 or more.

Mental account variable ACCT1 includes dollar values of checking, statement savings, passbook, share draft, other savings accounts, money market accounts, and certificates of deposit. ACCT2 includes values of individual Retirement and Keogh Accounts, employer-sponsored profit sharing, thrift and other savings plans, trusts, managed investment accounts, notes and land contracts owed to the household. ACCT3 includes values of savings bonds, municipal, corporate, and all other bonds, publicly traded stock, including stock in mutual funds, but excluding money market or IRAs. Mental account variables with 1986's values are dependent variables, and those with 1983's values are independent variables used in the stock adjustment model.

### Results

Relative to the other income groups, low-income family units in this sample are likely to be female-headed, older, unemployed, retired, single, have less than a high school education, and have much lower assets and debts. High-income families appear to be male-headed, middle-aged, working, married with/without children, college educated, and have much higher assets and debts. Middle-income people are likely to have the same characteristics (sex, age, working status, life cycle stage, household size, and education) as high-income people, but have much lower assets and debts, on average, than the rich.

Estimates of own-adjustment coefficients and cross-adjustments of mental accounts for low-, middle-, and high-income subsamples and for the total sample can be found in Table 1.

#### Own-adjustment coefficients

Generally speaking, the first hypothesis is strongly supported by the findings. The first hypothesis suggests that a previous period mental account would influence its present period counterpart in such a manner that the gap between the desired demand and the real stock of the mental account is filled by a certain percentage, which is indicated by the corresponding own-adjustment coefficient. The results from the total sample and three subsamples are consistent with the hypothesis. During a three-year period, families in the total

Table 1  
Own- and Cross-adjustment coefficients

	ACCT1	ACCT2	ACCT3
<b>Total Sample (n=2419)</b>			
ACCT1 <sub>83</sub>	.14*	.98*	.79*
ACCT2 <sub>83</sub>	-.08*	.55*	.02
ACCT3 <sub>83</sub>	.03*	-.10*	.69*
<b>Low-income Sample (n=786)</b>			
ACCT1 <sub>83</sub>	.11*	-.002	-.04*
ACCT2 <sub>83</sub>	-.15 +	.87*	.002
ACCT3 <sub>83</sub>	.001	-.08*	.96*
<b>Middle-income Sample (n=966)</b>			
ACCT1 <sub>83</sub>	.45*	-.05 +	-.18*
ACCT2 <sub>83</sub>	.01	.81*	-.21*
ACCT3 <sub>83</sub>	-.10*	-.07*	.88*
<b>High-income Sample (n=667)</b>			
ACCT1 <sub>83</sub>	.09*	1.50*	1.69*
ACCT2 <sub>83</sub>	-.09*	.20*	.03
ACCT3 <sub>83</sub>	.03*	-.12*	.40*

\* p < .05 + p < .1

sample have filled the gaps between desired stocks and real stocks for ACCT1, ACCT2, ACCT3 by 14, 55, and 69 percent, respectively. The situation of the low-income group is similar, in that gaps in ACCT1, ACCT2, and ACCT3 are filled by 11, 87, and 96 percent. The corresponding figures for middle-income families are 45, 81, and 88 percent. The high-income group shows the same pattern. The own adjustment coefficients in ACCT1, ACCT2 and ACCT3 are 8, 20, and 40 percent, respectively.

#### Cross-adjustment coefficients

The second hypothesis implies that the absolute values of cross-adjustment of ACCT<sub>i</sub> to ACCT<sub>j</sub> are larger than those of ACCT<sub>j</sub> to ACCT<sub>i</sub> (i, j = 1, 2, 3; i < j). This assumption is completely supported by the results from the middle-income sample. In this subsample, ACCT1 and ACCT3, ACCT2 and ACCT3 are seen to be competitive, since the corresponding coefficients are negative. The effect of ACCT1 on ACCT3 is eighteen percent, while the effect of ACCT3 on ACCT1 is only ten percent. Similarly, ACCT2's influence on ACCT3

percent. Similarly, ACCT2's influence on ACCT3 is 20 percent, while ACCT3's effect on ACCT2 is only seven percent. Interactions between ACCT1 and ACCT2 are not statistically significant.

In the low-income group, only the result from one of three pairs of mental accounts are consistent with the second hypothesis. ACCT1 and ACCT3 act in a manner consistent with the hypothesis. However, the pairs of ACCT1 and ACCT2, and ACCT2 and ACCT3 show a pattern opposite to the one predicted by the hypothesis. It implies that the poor treat these mental accounts in different ways than do the middle class.

Situations in the high-income group are different from either the middle class or the poor. First of all, ACCT1 and ACCT3 are complementary. ACCT1 has a much larger positive impact on ACCT3 than that of ACCT3 on ACCT1, which is consistent with the second hypothesis. Secondly, ACCT1 has a positive effect on ACCT2, while ACCT2's effect on ACCT1 is negative. Finally, ACCT3 affects ACCT2 negatively, while ACCT2 hardly influences ACCT3. The latter two situations are not consistent with the hypothesis. At minimum it suggests a different saving pattern of the rich compared to the low and middle income classes. It may also suggest that ACCT2 and ACCT3 are not as mutually exclusive for the rich as for the middle class, and that more information is needed about the actual financial needs being met by various financial instruments, especially for the high-income group. Situations in the total sample show the same patterns as that of the high income group which is probably caused by the fact that the rich hold the largest portion of assets in terms of both ownerships and dollar values.

In summary, the estimates of cross-adjustment coefficients in the middle-income group are very supportive of the second hypothesis, while those of the low and high income offer only partial support to the hypothesis. This situation strongly suggests that compositions of mental accounts of families at different income levels are not necessarily the same as was assumed in this study.

## Conclusions

First of all, the first hypothesis based on mental account assumptions is confirmed by own-adjustment coefficient estimates of the total sample and all subsamples. This indicates that consumers may divide their paper assets into some hierarchical accounts. They tend to save the most in the account at the least basic level, and save the least in the account at the most basic level over a period of time.

Secondly, the second hypothesis based on mental account assumptions is partly confirmed by cross-adjustment coefficient estimates. Especially, the behavior of middle-income families is consistent with the hypothesis. However, behaviors of the low and high income families only partly support the hypothesis. The supported assumption implies that assuming the interactions between mental accounts are complementary, if a consumer can save a certain amount in an account at a more basic level, one will save more in any account at a less basic level, because saving in a more basic level account requires one to exert a larger amount of willpower. On the other hand, if the interactions between mental accounts are competitive, an account at a more basic level will be more competitive than an account at a less basic level. The different behavior patterns shown in the low-income group and the high-income group imply that their mental account hierarchies, the assumption regarding required willpower, or the specific definitions of these mental accounts may differ from those of the middle income group. If mental account assumptions are valid, many implications could be developed and they would be meaningful for family finance educators, financial service and counseling marketers, and public policy makers.

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## Endnotes

1. Time as an influential factor is not included explicitly here. However, a time constraint is implicitly addressed in some family characteristics. For example, a couple with children will have less time spent for portfolio purchasing than another couple without a child, *ceteris paribus*.
2. In this study, three years are treated as one period, i.e.  $t=1986$  and  $t-1=1983$ , because only these two years' data are available in the data set used. Considering three years as one period will simplify the model specification. This treatment can be found in a previous study (Zick and Gerner, 1987). Actually, considering three years as three periods will be more accurate and more realistic. To do this, the model specification will be much more complicated but is possible. However, an estimation difficulty will be caused since usable longitudinal data in three consecutive years are not available.
3. Cross-adjustment coefficients might be negative, which suggests possible transfers between mental accounts, but savings in these accounts are usually increasing in absolute terms, perhaps at different rates. Transfers between mental accounts imply financial needs of families are changing.

The Life of the Wife:  
The Demand for Life Insurance

Robert O. Weagley, University of Missouri, Columbia  
John G. Taylor, University of Missouri, Columbia<sup>1</sup>

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The demands for the total face value of individually purchased life insurance on the life of the wife and its components of permanent and term insurance were each positively related to education, homeownership, total person-years of financial dependency, and employment status. Greater income increased the demand for permanent insurance and greater net worth, non-significant to total life insurance demand, decreased the demand for permanent and increased the demand for term life insurance. Finally, age was positively related to permanent and negatively related to term life insurance demands.

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Given the increasing incidence of two income earner couples in the United States and the growing dependence of families on a second income, the role of wife's earnings has become increasingly important in determining the family's need for life insurance. While research has examined the effect of the wife's employment on the total household demand for life insurance and, in particular, its effect on the demand for life insurance on the life of the husband, research has not attempted to understand the factors which affect the demand for life insurance on the life of the female spouse. It is the purpose of this paper to examine that topic.

Historically, attention focused on the life of the husband as he was the sole breadwinner and, hence, his income was perceived to be all that needed to be insured. There was little attention paid to the wife's economic contribution as a homemaker and the additional costs he would face should his spouse die and leave him with the extra burdens of child care and housekeeping. The increasing dependence of families on the second income of the wife is

changing this financial decision. In many households, the wife earns as much as, or more than, the husband and in many others their level of living is dependent on her earnings as well as his.

#### Literature

Early research focused on the premium amounts paid by individual and families as the dependent variable (Hammond, et. al., 1967; Duker, 1969). While the levels of premium may be of interest to the life insurance industry, the premium merely represents the cost paid for an unknown quantity of insurance. Without information on both the amount of life insurance in force and the type of life insurance, whether a term or a whole life product, the premium expenditure is an unreliable measure of life insurance demand. Rather it is simply a measure of life insurance premium expenditure. Nonetheless, Hammond (1967) explored life insurance premium expenditures and found that they were positively related to income, net worth, life cycle, occupation, and education.

Duker (1969) was the first to examine the life insurance expenditures of working-wife families. Utilizing the 1959 Survey of Consumer Finances, he concluded that "the working wife may constitute more than an additional source of income. She is also an alternative (to the husband) source of income, and, as such, she approximates an insurance policy."

Not until 1972 (Berkeson, 1972) was the face amount of life insurance examined as a dependent variable, and then the research was limited due to its reliance on samples of young married couples utilizing surveys of college classes. The total amount of life insurance purchased was found to be

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<sup>1</sup> Associate Professor and graduate student,  
Department of Consumer and Family Economics

positively related to number of children, income, and birth order of husband, and negatively related to age.

Anderson and Nevin (1975) examined the amount and type of life insurance held by a sample of young married couples. Using Multiple Classification Analysis, they concluded that the household income, expected household income, net worth, husband's insurance before marriage, and wife's insurance before marriage were positively related to life insurance demand. In contrast to other studies, education was found to be negatively related to insurance demand.

Ferber and Lee (1980) employed a sample collected in 1968 of 149 couples from Decatur and Peoria, Illinois to examine the acquisition and accumulation of life insurance in the first eight years of marriage. They reported that a couple is more likely to purchase life insurance if family income is greater, they are homeowners, the husband is highly educated and acts as family financial officer. In the first two years of marriage, the purchase of life insurance is positively affected "by the presence of a comprehensive budget, by a lower family income, by the husband employed in a managerial or clerical profession, by the husband being satisfied with life, and by a less educated wife". By the final span of marriage analyzed - six to eight years after marriage - the couples were found to purchase larger amounts of life insurance if they had fewer children, larger net assets, a large stock of life policies, a favorable attitude toward saving, if the wife is working and if the husband is dissatisfied with life.

In 1983, Art Goldsmith set out to show that households with a more educated wife substitute her human capital skills for term life insurance on the husband. Tobit analysis demonstrated that the lack of human capital development in the wife resulted in the purchase of more life insurance on the life of the husband. Moreover, if the wife was employed in the labor force, the face amount of life insurance held declined. Moreover, life insurance demand was found to be negatively associated with networth.

In summary, past research has found

conflicting results and has sometimes employed unreliable dependent variables. For example, networth, education, and the presence of children have been found to both increase and decrease life insurance demand depending on the study and dependent variable. The studies reviewed have either used premium expenditures as a dependent variable which, given the diversity of insurance products, is an inappropriate measure of insurance demand, or have summed the face values held of both term and whole life products as the measure of life insurance demand. Such a summation would be incorrect, given the pure insurance nature of term life insurance and the mix of savings and insurance contained in whole life insurance. It is not clear that the factors which create a demand for life insurance protection are the same as those factors which create a demand for the tax deferred savings feature of whole life insurance products.

#### Conceptual Framework

To understand life insurance demand one need only think about a needs-based life insurance planning worksheet found in most introductory personal finance texts (for example, Gitman and Joehnk, 1990). The factors which affect demand change over the life cycle. During childhood and single adulthood there is typically little need for life insurance as there is no one that is dependent on the young life for income and financial support. However, following marriage and, particularly, following the birth of children there is an increase in the demand for life insurance as the number of financial dependents and total person-years of financial dependency increase. In addition, early in the family life cycle, household indebtedness is typically high and life insurance to repay existing installment loans, mortgages, and personal loans is necessary. As the children age, there is a reduced need for life insurance but, in the face of inflation, life insurance demand may remain high. Once the children become independent a household will experience a reduced demand for life insurance as there are fewer people dependent on the household income and the investment portfolio will be more adequate as a replacement for income lost through death.

The scenario sketched out above is a standard approach to the demand for the insurance protection offered through life insurance. It does not,

however, represent other factors which might affect the demand for other features of a life insurance contract. Whole, or permanent, life insurance products typically offer the consumer a fixed premium payment for life which purchases them a face value of the contract, which includes a savings, or cash value, portion. The money held in the cash value portion of the policy earns interest without incurring a current tax liability. Later in life, the cash value can be annuitized to help pay for retirement income needs or, should the insured die first, the cash value is merely paid as a part of the face value and no income taxes are due. Given this, the relationship between age and the demand for permanent insurance may be different from the general demand for life insurance discussed above. In fact, the increasing premiums of term life insurance as one ages and the retirement savings aspect of permanent life insurance, would imply that a larger amount of permanent life insurance would be demanded, *ceteris paribus*, by older consumers while age would be negatively related to the demand for term life insurance.

Other life cycle factors can be expected to be related to the demand for life insurance on the life of the wife. The number of years for which the household is responsible for dependents should be positively related to the demand for life insurance. This would be expected to be particularly true for the demand for pure life insurance protection (term) as opposed to permanent life insurance products, in which savings is a characteristic of the product.

The complexity of the life insurance market makes the decision of the type of insurance to purchase difficult. Often, households do not purchase an insurance contract; rather, they are sold an insurance contract. Insurance salespersons tend to promote permanent life insurance products (with their greater commissions). As such, the choice to purchase either term insurance instead of whole-life insurance is dependent on the customer's knowledge of insurance products. One would expect that better educated consumers to be more knowledgeable about market alternatives and less likely to purchase permanent life insurance products on the life of the wife.

The employment status of the wife could be

expected to influence the demand for life insurance. Theoretically, the greater the employment of the wife, the more likely the family will be dependent on her income to maintain their level of living.<sup>1</sup>

Given the likelihood of a homeowner having a mortgage on their home, it is expected that homeownership households would have greater life insurance demand. This would be particularly true for term insurance products as mortgage life insurance is a form of term insurance.

The economic factors of income and networth have been stated to be particularly important to the demand for life insurance. This should be no less true for the demand for life insurance specifically on the life of the wife. It would be expected that income would be positively related to the demand for life insurance protection since the greater the income, *ceteris paribus*, the greater the need for insurance to protect that income. This relationship should hold true without regard to the type of insurance analyzed.

The relationship for networth is not as clear as the relationship for income. One might expect that greater levels of networth would decrease the demand for life insurance on the life of the wife as the wealth could be annuitized as a substitute for her lost income. However, this assumes that there is no motive to bequeath wealth to later generations as well as assuming that all insurance policies are alike. The tax-deferred earnings aspect of permanent life insurance policies might be expected to be demanded by those of higher income or wealth in order to accumulate greater wealth with taxation being deferred. In addition, greater wealth creates the potential for estate tax liability. Permanent, whole-life insurance products would provide estate liquidity at death. Therefore, the effect of networth on the demand for life insurance on the life of the wife remains an empirical question.

Income and networth may also display a non-linear relationship to insurance demand. Von Neumann and Morgenstern (1947) proposed that the relationship between income (wealth) and utility was a non-linear convex utility function. They proposed such a utility function for the average

consumer who wants certainty rather than uncertainty. This desire for certainty, allows an insurance market to exist. A further implication of von Neumann and Morgenstern is that those with lesser non-human wealth would demand more insurance, *ceteris paribus*, than those with greater non-human wealth, because the latter would be more likely to self-insure. Their hypothesis argues for both a linear and squared term for both income and wealth in the empirical model.

#### The Sample and Empirical Model

The data for this analysis were taken from the 1984 U.S. Ownership Study conducted by the Life Insurance Marketing Research Association (LIMRA). The study contains information on demographics and incidence and amount of insurance owned by 8,401 persons. From this, a sample of 1,071 married couple households were selected in which the husband was employed full-time and there existed information on each of the variables included in the statistical model.

To establish refined, empirically based insights into the demand for life insurance, three dependent variables measuring life insurance demand on the life of the wife were chosen for analysis: total face value of all life insurance, total face value of permanent life insurance, and total face value of term life insurance. In order to compare the potentially different effect of each independent variable on each dependent variable, each dependent variable was posited to be a function of the same vector of independent variables. Given the large proportion of the sample of wives that did not have any life insurance, Tobit analysis was used to test the previously stated hypotheses. Table 1 contains both a list of the independent variables with their measurement defined and mean value and a list of the dependent variables with the percentage of the sample that had non-zero observations.

It will be noted that the average income and average networth of the sample of households is greater than that of the U.S. population in 1984. Median income is \$26,250 while median networth is \$65,297<sup>2</sup>. The average age of the wife is 39.75 years, while the measure for education of the head of household (the husband) was an average category score of 4.44 on a scale of 7 with 4 representing completion of high school. Eighty

percent of the sample were homeowners - an indication of why the average level of networth was so high. On average, the households had 11.81 years of total dependent years remaining in the household. This variable existed in the data as was calculated as the sum of all children's years until reaching the age of eighteen. Forty-four percent of the female spouses worked full-time and thirteen percent worked part-time with 43% not being employed outside the home.

With respect to the dependent variables it can be seen that 39.31% of the sample had some form of life insurance on the wife. On average, including the observations that had a value of zero, there was \$8,604 of life insurance on the wife. Permanent life insurance was held by 31.65% of the sample with a zero-mean holding of \$3,607 of life insurance, while only 9.71% had term insurance with a zero-mean value of \$4,987.

#### Results

The normalized coefficients for the estimated Tobit equations are presented in Table 2.<sup>3</sup> The discussion will proceed independent variable by independent variable, while noting differences in results for each demand equation for each dependent variable.

Age was estimated to weakly (.10 level) but positively affect the total demand for life insurance on the life of the wife. However, when separate equations for each type of life insurance, permanent and term, are estimated the results differ. As would be expected, the demand for permanent life insurance, similar to the total demand for life insurance, increases with age. On the other hand, the demand for term life insurance decreases, *ceteris paribus*, with age. These contrary results would indicate that permanent insurance coverage is maintained as either a retirement savings vehicle or to provide for estate liquidity as people age. Most importantly, the price of term insurance increases with age and, given the term insurance equation results, it appears that consumers react to the increase in price, as well as the possible decrease in insurance need, by purchasing less term insurance.

Greater household income was estimated to

increase the demand for life insurance on the life of the wife for both total life insurance and permanent life insurance. However, the equation for permanent insurance had a significant coefficient for the square of income, which supports the conclusion that the demand for insurance increases at a decreasing rate. Income was a nonsignificant factor to the demand for term life insurance. In total, it appears that income increases the demand for the tax deferred savings feature of permanent insurance products as well as total life insurance demand; however, term insurance demand is not affected by household income.

The variable measuring the networth of the household indicates that total life insurance demand is not significantly related to the level of networth. This is interesting since it is clear that household wealth could be used as a substitute for life insurance proceeds should the wife die. Therefore, greater levels of networth should reduce life insurance demand. It is interesting, however, that when the life insurance holdings are divided into permanent and term life insurance holdings, the coefficients on the networth variables become weakly significant and, when compared across equations, opposite in sign. Greater networth decreases the demand for permanent life insurance on the life of the wife at a decreasing rate. Interpretation of these results would indicate that wealthier households do not perceive the advantages of saving in the form of cash value life insurance, while households with lesser wealth demand greater permanent life insurance, possibly sold to them as a vehicle to acquire greater wealth. Households with greater wealth, *ceteris paribus*, purchase greater amounts of term insurance on the life of the wife at a decreasing rate. These results might indicate a bequest motive among wealthier households.<sup>4</sup>

Holdings of total life insurance on the wife is significantly positively related to the level of education of the head of household. This would indicate that there is greater recognition of need on the part of the household the greater the level of education. In addition, to the extent there is, on average, matching in the marriage market by levels of education, and to the extent that income is correlated with education, this result may be measuring some of the human capital contribution

of the female spouse. However, the results indicate that this demand is not for permanent life insurance but, rather, for term life insurance. Perhaps it is the case that households with greater education know more about insurance products and saving media, or can more easily learn about them, and that knowledge results in their purchasing term insurance.

Homeownership is positively related to the demand for life insurance for total, permanent life, and term life insurance products. Two factors would explain this result. First, the ownership of a home is typically coincident with home mortgage debt which increases the demand for life insurance. Secondly, homeownership indicates a greater need for home maintenance and, hence, a greater value to the time of the homemaker.

The greater the number of remaining years of support of dependents is, as expected, positively related to the demand for life insurance on the life of the wife; the relationship holds for both types of life insurance. The greater the need for support, the greater the insurance to cover that need.

The employment status of the wife is related to insurance demand. Interestingly, a wife who works part-time has significantly more total life insurance than a wife who does not work. Employment status is not significantly related to the demand for permanent life insurance on the life of the wife. However, employment status greatly affects the demand for term life insurance. For wives who work either part-time or full-time there is a greater demand for term life insurance than if they do not work in the market. As the dependent variables are a measure of the amounts of individually purchased life insurance, this result is not due to the availability of life insurance through their place of employment nor as a fringe benefit. Therefore, it is a reflection of the need to insure her greater financial contribution or, possibly, to insure the greater needs (in terms of consumption standards) that led her to the workforce.

#### Conclusions

What do the results suggest about the demand for life insurance on the life of the wife?

First, financial variables do play a role, albeit

weak, in determining the demand for life insurance. Greater income increases that demand for life insurance, as there is likely to be a higher level of living to be protected. Also, a higher income makes it possible to purchase more financial security, just as it makes possible the purchase of a higher consumption level. However, with respect to wealth the relationship is not as clear and consistent. Wealth decreased the demand for permanent life insurance while increasing the demand for term life insurance. Reasons for this have been discussed above. The results point to a possible specification error in other life insurance work, in which the total demand for life insurance (all types summed) is the dependent variable. To a point, the demand for permanent insurance decreases, while the demand for term increases with wealth. These disparate relationships need to be explored to help financial planners, insurance salespersons, and consumers understand the products that may, on average, be most satisfactory while simultaneously improving the marketing efficiencies of life insurance companies.

Other socio-economic variables are also significant. While homeownership and total remaining dependent years were consistently positively related to demand for insurance on the life of the wife, education was not significant to the purchase of permanent life insurance products. This may indicate that permanent life insurance products are sold to, rather than sought by, consumers and that every educational level is susceptible to such marketing efforts.

Finally, employment status does have an effect on life insurance demand. This was particularly true for the demand for term life insurance products; market employment was found to increase the demand for term life insurance.

This research sheds some light on the demand for life insurance on the life of the wife; however, it by no means answers all relevant current questions. The data are from 1984 and much has changed in both the life insurance market and the employment/education status of women. These results should be re-examined with a more contemporary data set. It is conceptually clear that the market earnings and value of other economic contribution of the wife are what life insurance

insures - not total household income. From an empirical perspective, it is unfortunate that there was not information on the level of earnings of the wife to use as an independent variable in this analysis. However, the research does control for employment status of the wife, which may proxy much of the information that would be contained in a measure of the wife's income.

Perhaps most important in this research is the apparent deficit in life insurance on the life of the wife in the sample. While it is the historical case that the husband was the primary breadwinner, it is increasingly the case that the goals of the family are dependent on both spouses' earnings. To the extent the employment of one spouse is seen as adequate to meet the financial needs of the other spouse, the family may be overlooking the lower level of living that may await the family should the spouse die. Given this, a family goal centered approach in the family's own planning, in the sale of life insurance, or in the counseling of financial planning clients, would be beneficial to both parties involved in the transaction.

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#### Endnotes

1. It would be desirable to consider the income of the wife, either relative to that of the husband or in absolute value. However, the data to be analyzed

do not contain information on her income separately from that of the household. They do report whether she is employed full-time, part-time, or not employed which can be expected to proxy her financial contribution to the household.

2. Household income and net worth were reported as categories. These were converted to dollar figures by taking the midpoint of the range of each category and assigning that value to each category. For the top, open ended category, a Pareto distribution estimation technique was employed (Miller, 1966). The medians were calculated by assuming a uniform distribution across the category containing the 50th percentile household and interpolating the value.

3. Since the purpose of the paper is to test hypotheses with respect to the effect of the independent variables on the demand for life insurance, only the normalized coefficients with their respective standard errors will be presented. In addition, it should be noted that, given the econometric specification, the existence of multicollinearity may exist. If so, the standard errors of the coefficients may be biased upwards and the probability of a Type II error enhanced results in a more conservative test of the hypotheses.

4. A suggested interpretation by a colleague is that the direction of effect may be the opposite. That is, those households who purchase term life insurance rather than permanent life insurance have greater wealth as a result, because of the lower premiums for a given amount of insurance and the potentially greater gains from alternative savings/investment media. Such a simultaneous decision has not been explored.

Table 1: Variable Definitions and Means/Medians

Variable	Definition	Mean/Median
AGE	Age of the wife in years	39.75
INCOME	Income of the household	\$26,250 (median)
INCSQR	Income Squared	
NETWORTH	Networth of the household	\$65,297 (median)
NETSQR	Networth squared	
EDUCATION	Education of the husband	4.44
HOMEOWN	1 if homeowner, 0 if not	.80
TOTDEP	Total number of dependent years for the household	11.181
FULLTIME	1 if wife works full time	.44
PARTTIME	1 if wife works part time	.13

Dependent Variable	Mean	Percentage non-zero
Total Life Insurance	\$8,604	39.31 %
Permanent Life Insurance	\$3,607	31.65 %
Term Life Insurance	\$4,987	9.71 %

Table 2: Normalized Coefficients, Tobit Equation Results, Amount of Life Insurance on the Life of the Wife (N=1071)

Independent Variable	Dependent Variables		
	Total Life Insurance	Permanent Life Insurance	Term Life Insurance
AGE	.6486E-02* (.4399E-05)	.1341E-01**** (.4617E-02)	-.1801E-01*** (.7202E-02)
INCOME	.7175E-05* (.5471E-05)	.1235E-04** (.5767E-05)	.6893E-05 (.8495E-05)
INCSQR	.7919E-12 (.3952E-10)	-.6452E-10* (.4214E-10)	-.1976E-11 (.5857E-10)
NETWORTH	.1983E-07 (.5702E-06)	-.9499E-06* (.6042E-06)	.1221E-05* (.8309E-06)
NETSQR	.1479E-13 (.3581E-12)	.6710E-12** (.3798E-12)	-.7082E-12* (.5186E-12)
EDUCATION	.7792E-01**** (.2707E-01)	.2667E-01 (.2851E-01)	.9354E-01*** (.3943E-01)
HOMEOWN	.2762**** (.10472)	.1691* (.1091)	.3386** (.1672)
TOTDEP	.1158E-01**** (.3381E-02)	.5009* (.3634)	.1545E-01**** (.4520E-02)
FULLTIME	.7957E-01 (.8395E-01)	-.3234E-01 (.8797E-01)	.2811** (.1294)
PARTTIME	.2088** (.1126)	.8697E-01 (.1190)	.4543**** (.1610)
CONSTANT	-1.6580	-1.6531	-2.0970
Log-likelihood	-5421.18	-4251.01	-1536.53
X <sup>2</sup> <sub>9 d.f.</sub>	74.65****	33.28****	72.89****

Standard Errors in Parentheses  
 \* significant at the .10 level  
 \*\* significant at the .05 level  
 \*\*\* significant at the .01 level  
 \*\*\*\* significant at the .005 level

## The Demand for Consumer Installment Credit : Stock Adjustment Model

Hyuncha Choe, Purdue University<sup>1</sup>  
Dixie P. Johnson, Purdue University<sup>2</sup>

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The analyses of the demands for consumer installment credit of homeowners and renters were performed using a stock adjustment model with four year panel data from the 1983 and 1986 Surveys of Consumer Finance. More than 80 percent of consumer installment credit was own-adjusted during this period of time. The adjustment process of consumer installment credit depended on the disequilibrium in other portfolio components. However, neither credit card debt nor house value had any effect on adjustment in consumer installment credit for all sample groups.

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### Introduction

From 1983 to 1985 consumer installment credit outstanding increased almost 15 percent per year. While the growth rate of consumer installment credit after 1986 went down to 7 percent, the installment debt to income ratio was approaching 19 percent (Avery, Elliehausen, and Kennickell, 1987). Although consumer installment credit has increased substantially, households with consumer debt were likely to hold liquid assets and had sufficient liquid assets to repay all their outstanding consumer debt (Sullivan, 1987). This finding is consistent with Tobin's hypothesis (1957) that rational households are likely to have optimal levels of both debt and liquid assets at the same time.

In 1986, the majority of credit users had financial assets greater than consumer debts. This fact implies that the change in consumer credit

should be carried out in the context of the consumer portfolio decision (Avery, Elliehausen, and Kennickell, 1987). That is, the changes in installment credit stock are interrelated to the adjustment mechanisms of other portfolio components in disequilibrium since there are lags in the adjustment process of capital accounts because of transactions costs, household inertia and the nature of capital accounts.

Therefore, the purpose of this study is to examine the adjustment process of consumer installment credit as each component of household portfolio and economic and socio-demographic aspects of households change. This study is set in a portfolio context which includes house value, mortgage debt and credit card debt as well as other components of the debt portfolio with a four year reinterview panel.

### Previous Research in Consumer Installment Credit Use

Consumers often make decisions to save or borrow in order to rearrange consumption between various time periods because of inconsistency of income stream over their life cycle. If the utility from current consumption with credit is greater than the costs of credit, consumers are likely to borrow to get higher utility by increasing current consumption.

One area of study concerning consumer credit use of individual household unit has emphasized the

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<sup>1</sup> Doctoral Candidate,  
Department of Consumer Sciences and Retailing.

<sup>2</sup> Associate Professor,  
Department of Consumer Sciences and Retailing.

factors associated with the demand for consumer credit from the point of the stock at a moment in time (DeLuca, 1985; Hira, 1990; Hunter, 1966; Jensen and Reynold, 1986; Lansing, Maynes, and Kreinin, 1957; Sullivan and Warden, 1986; Watts and Tobin, 1960). Other studies have focused on consumer credit in the consumer portfolio context from the point of flows over a period of time (Bryant, 1986a; Bryant, 1986b; Dunkelberg and Stafford, 1971; Motley, 1970; Tobin, 1957; Watts and Tobin, 1960).

Since the first empirical work of changes in consumer credit with panel data (Tobin, 1957), Watts and Tobin (1960) studied both stocks and flows of the capital account of the household. The results supported their hypothesis that a rational household tended to maintain a certain balance in their capital account between liquid assets and debts. But because the analysis was based on one-period cross-section data and limited in its ability to provide generalizations about the dynamics of capital account changes in response to altered external or life cycle situation, they recommended the use of panel study.

Motly (1970) estimated household demand for assets - money, saving deposits, debt and real estates - with a short-run adjustment model using quarterly aggregate data. The own-adjustment coefficient of debt was 0.496 and the cross-adjustment coefficients were negative as expected. With this result, he suggested that the demand for any asset should be treated within a competitive process of adjustments; these adjustments were viewed as mutually interdependent.

An empirical study of the use of consumer installment debt in the framework of a stock adjustment model of behavior was carried out by Dunkelberg and Stafford (1971) using a two year (1967-68) reinterview panel. The estimated own-adjustment effects of installment credit was about 0.5, which meant that 50 percent of the gap between the desired and actual stock of installment credit was reduced in a given year. One of the limitations of this study was that house value and mortgage debt, which have a much longer adjustment period, were excluded from the analysis since the data were only a two year reinterview panel.

Bryant (1986a) investigated both consumers' assets and debts in a portfolio context. The short-run effects of exogenous variables and partial adjustment coefficients of owned housing, home mortgages, cars, car debts, and other debts were calculated using panel data from the 1977-78 Survey of Consumer Credit. Unfortunately, consumer credit card debt, which played a great role in consumer borrowing, was not included in the model.

Bryant (1986b) estimated short-run effects and partial adjustment rates of holdings of owned housing, cars, consumer durables, liquid assets, home mortgage, store debts and loan debts for poor rural wage-working black and white households with data from the 1970-1973 Rural Income Maintenance Experiment. But this study was limited to rural households.

These previous empirical analyses of the consumer demand for assets and debts using a model of the short-run adjustment process were restricted by one or two year panel data. This restriction does not allow researchers to include portfolio components of household value and mortgage debt, which have a much longer adjustment period than the other components of the debt portfolio. In addition, consumer credit card debt, which plays a great role in consumer borrowing today, has not been considered in the consumer installment credit adjustment process. Thus, this study is set in a portfolio context which includes house value, mortgage debt and credit card debt as well as other components of the debt portfolio.

### The Model and Variables

The household is likely to maintain balance between debts and assets as any other component in the household portfolio changes. Theoretically, the desired demand for assets and debts is determined by market rates of return; that is, interest rates, and income. But the information on rates of return for each component in the household portfolio is not available in the study with disaggregate data. Instead, based on previous studies (DeLuca and Bowers, 1985; Hira, 1990; Hunter, 1966; Jensen and Reynold, 1986; Lansing, Maynes, and Kreinin, 1957; Sullivan and Warden, 1986; Watts and

Tobin, 1960), it is assumed that the desired demand for assets and debt of a household unit at the period of  $t$  is determined by characteristics of the household. The functional form of this relationship is:

$$S_{ijt}^* = \alpha_x X_{it} + e_{it} \quad (1)$$

where,  $S_{ijt}^*$  is the household  $i$ th desired demand for assets and debts in year  $t$  ( $j$ = consumer installment credit(D), non-installment consumer debt(ND), household durables(HD), liquid asset(LA), credit card debt(CD), house value(HV), mortgage debt(MD), and net worth (NW)).  $X_x$  is a vector of exogenous variables determining  $S_{ijt}^*$ .  $\alpha_x$  is a vector of long-run effects of  $X_x$ . And  $e_x$  is a vector of random error term.

However, households are not able to adjust their debt holdings in the short-run and some divergence exists between actual and desired stock of debt due to the adjustment lags. The general stock adjustment model assumes that actual net changes in  $j$ th stock of debts and assets in the period between  $t-1$  and  $t$  is a sum of fixed proportions of the changes of stocks required to bring the stock to its desired level (Deaton and Muellbauer, 1981).

In the household portfolio context, the annual change in the level of consumer installment credit will be the sum of the partial response to disequilibria in each component of the portfolio. Thus, an adjustment process of consumer installment credit can be expressed as follows:

$$S_{idt} - S_{id(t-1)} = \beta_{dd} (S_{idt}^* - S_{id(t-1)}) + \sum \beta_{dj} (S_{ijt}^* - S_{ij(t-1)}) + r_{it} \quad (2)$$

where,  $S_{idt}$  and  $S_{id(t-1)}$  are the household  $i$ th actual holdings of consumer installment credit in year  $t$  and  $t-1$ .  $\beta_{dd}$  is the own-adjustment rate of consumer installment credit.  $\beta_{dj}$  is the cross-adjustment rate of assets and other debts ( $j \neq d$ ). And  $r_x$  is the vector of random error term.

Substituting equation (1) into equation (2), the following empirical model is constructed for four year panel data:

$$S_{idt} - S_{id(t-1)} = \gamma_x X_{it} + \gamma_{dd} S_{id(t-1)} + \sum \gamma_{dj} S_{ij(t-1)} + v_{it} \quad (3)$$

where,  $\gamma_x$  is the matrix of short-run effects of exogenous

variables (income related variables, household size, age, education, sex, marital status, and race of household head, region of residence, employment status variables, and attitudinal variables).  $\gamma_{dd}$  and  $\gamma_{dj}$  are the matrix of coefficients on the lagged assets and debts holdings. And  $v_x$  is a vector of random error term. It is the case that  $\beta_{dd} = -\gamma_{dd}$  and  $\beta_{dj} = \gamma_{dj}$ .

The variables used to estimate the empirical model are defined as follows. The dependent variable, change in consumer installment credit, is the change in the amount outstanding on regular payment consumer loans for auto, home improvement, major durable, and personal expenses between 1983 and 1986. As economic variables, income, income squared, and negative income change are used. Because of the non-linear relationship between use of installment debt and income (Dunkelberg and Stafford 1971; Lansing, Maynes, and Kreinin 1957), a squared term is included.

For socio-demographic characteristics, household size, age, sex, education level, race, and marital status of household head as well as region and employment status are included. Household size and age of head are used as a proxy for the life cycle variable. Two variables, number of earners and changes in the employment status of household head and wife, are included as employment status variable in the model. The reason for including the change in employment status variable is that this short-run adjustment of labor force participation could be an alternative to borrowing (Dunkelberg & Stafford, 1971).

The economic and socio-demographic variables are from 1986 data and the attitudinal and lagged stock variables are from 1983 data. The attitude toward credit is from 1983 because this variable is not available from 1986 and, this basic attitude has not changed substantially during the last three decades (Pearce 1985).

Because 1983 data do not contain the data for stock of consumer durables, the gross amount spent on the purchase of cars, furniture, appliances, recreation items or additions and repairs to home between 1983 and 1986 is used. The coefficient for this variable will be interpreted as the short-run effects of durables purchased.

All variables for capital accounts of 1983 were

adjusted using the 1986 consumer price index.

### The Data and Analysis

To estimate equation (3), the data are taken from a four year reinterview panel, the 1983 and 1986 Surveys of Consumer Finances, sponsored by the Board of Governor of the Federal Reserve System and six other federal agencies. The use of panel data allows researchers to examine the changes in consumer debt in response to changes in income and socio-demographic aspects of households and disequilibria in the portfolio of the households.

Among a sample of 2,822 households for 1986, the sample used for this study excludes high-income respondents (359 cases) and duplicate households (41 cases). A total of 31 households with heads aged 24 and under in 1986 is excluded because this group is inappropriate for analysis of changes between two periods. This age group is unlikely to represent the population of households of their cohort (Avery and Elliehausen, 1988). Those who did not report complete answers to the dependent and independent variables used in this study in either 1983 or 1986 are also excluded. After these adjustments, the final sample consists of 2302 households.

All of the data have been weighted. The use of the weight is recommended for analysis involving changes for individual households between 1983 and 1986 (Avery and Elliehausen, 1988).

Since homeowners and renter households are not a homogeneous group due to the significant differences in economic and socio-demographic characteristics, it is believed that not only the slope and intercept parameters are distinct but also the error variances are different as well (Pindyck and Rubinfeld, 1981). Watts and Tobin (1960) also suggested that major decisions about households' capital accounts were affected by homeownership. Thus the sample used in this study was separated into two groups by the status of homeownership in the 1986. There were 1784 homeowners and 518 renter households in the sample.

Table 1 showed the summary statistic for socio-demographic characteristics and financial status of

the sample households - by

Table 1

### Weighted Descriptive Statistics for Sample Households<sup>a</sup> - Total and by Homeownership, 1986

Variables	Total	Home-owner	Renter
Consumer installment debt (\$)	2171.92 (1931.28) <sup>b</sup>	2418.77 (2176.32)	1652.03 (1415.21)
Total household income (\$)	28490.33 (26968.25)	32334.48 (30918.68)	20394.40 (18648.52)
Liquid assets(\$)	16173.55 (11818.98)	20331.67 (15258.36)	7416.42 (4576.55)
Credit card debt(\$)	669.77 (378.96)	741.22 (430.29)	519.28 (270.86)
House value(\$)	50177.42 (44557.49)	74003.00 (62260.46)	0.00 (7274.47)
Mortgage debt(\$)	13550.47 (10744.46)	19984.59 (14343.67)	0.00 (3164.43)
Non-installment debt(\$)	387.24 (981.65)	447.69 (935.86)	259.93 (1078.07)
Net worth(\$)	101743.61 (89448.02)	137349.07 (118822.99)	26757.38 (27583.40)
Durables purchased(\$)	7725.55	9349.75	4304.93
<b>Socio-demographic variables</b>			
Household size(person)	2.73	2.82	2.55
Age of head(years)	49.80	52.33	44.45
Education(years)	12.29	12.38	12.11
Sex (Female: %)	24.88	19.44	36.35
Marital status(Married: %)	62.82	73.14	41.08
Number of earners(two: %)	31.76	35.29	24.32
Race (Non-white: %)	18.31	12.66	30.21
Region (North-central: %)	26.51	28.21	22.96
(South: %)	35.17	36.26	32.89
(West: %)	18.78	16.83	22.88
Homeownership(Owner: %)	67.80	100.00	0.00
Employment status of head			
(Employed: %)	62.21	61.62	63.45
Employment status of wife			
(Employed: %)	42.63	47.27	32.85
<b>Attitudinal variables</b>			
Attitude towards credit			
(Positive attitude: %)	44.73	42.90	48.59
(Negative attitude: %)	23.27	22.11	25.73
Number of observations	2302	1784	518

<sup>a</sup> Means and percent of total sample in each group

<sup>b</sup> 1983 values in parentheses(in 1986 dollars)

homeownership. The average outstanding consumer installment debt of homeowners is \$2176 in 1983 and \$2419 in 1986 compared with \$1415 and \$1652 of renters. In 1983 renters had more non-installment debt(\$1078) than homeowners(\$936) while in 1986 this declined to \$260(renters) and

\$448(homeowners). Average household income of renters is about two-thirds of that of homeowners in both years. Homeowners have 3 times more liquid assets and 5 times greater net worth than renters in 1986. Renters are more likely to be female-headed, unmarried, younger, non-white, and less than one earner households. More wives are employed in homeowners' households than renter households.

Since there is no truncation problem in the dependent variable, which has continuous negative and positive values, as well as no autocorrelation in the residuals and no significant multicollinearity between independent variables, equation (4) is estimated using the ordinary least square for the total sample and for the two groups, homeowners and renters.

To test the null hypothesis that the set of coefficients in the homeowners equation is identical to the set of coefficients in the renters equation, a Chow test is employed using the F statistic (Chow, 1960). The null hypothesis is rejected at the 5 percent level of significance. The test result indicates that it is incorrect to assume equal coefficients and error variances between homeowners and renter households.

### Empirical Results

Table 2 and 3 summarize the regression results of equation (3) for three separate sample groups of a total of 2,302 households, 1,784 homeowners, and 518 renters, respectively. The results of the F-test for the model show that all equations are statistically significant at the .01 level. Each model explains about from 19 percent(renters) to 47 percent(homeowners) of changes in consumer installment debt holdings between 1983 and 1986. The low value of R<sup>2</sup> of renters may be due to more homogenous characteristics of these households than homeowners.

#### The Own- and Cross- Adjustment Effects

The estimated own- and cross-adjustment rates of consumer installment debt are presented in Table 2. The own- adjustment rates for the total sample and the two subgroups, homeowners and renters, are highly significant and positive. This positive relationship indicates that as the gap between desired and actual stock of consumer installment

debt increased, the more likely are the households to use installment credit.

The own-adjustment rate of consumer installment debt for total households is .844; .817 for homeowners and .937 for renters. These rates are interpreted as follow : 84.4 percent of any differences between the desired and actual stock of consumer installment debt of total households were closed in the last four years. These own-adjustment rates are much higher than those of Dunkelberg and Stafford (1971) using a two year panel. The fact that renters have higher own-adjustment rate than homeowners means that renters adjust faster than homeowners to desired level of consumer installment credit holdings. This result also indicates that the own-adjustment effect is a more important part of the equilibrating process for renters than for homeowner households.

Table 2  
Weighted Stock Adjustment Rates of Consumer Installment Credit

Portfolio components	Total	Homeowners	Renters
Installment debt	.844*** (29.83) <sup>a</sup>	.817*** (34.99)	.937*** (10.03)
Liquid assets	.007 (1.44)	.007** (2.17)	-.003 (.09)
Credit card debt	-.200 (1.37)	-.174 (1.56)	-.206 (.33)
Mortgage debt	.007 (.94)	.013** (2.19)	-.032 (.74)
Non-installment debt	-.020 (1.11)	-.032* (1.81)	-.017 (.36)
House value	.002 (.68)	-.001 (.21)	.021 (.92)
Net Worth	.002** (2.18)	.003*** (4.14)	-.001 (.35)

\*\*\* significantly different from zero at .01 level

\*\* significantly different from zero at .05 level

\* significantly different from zero at .10 level

<sup>a</sup> t-values in parentheses

The estimated cross-adjustment rates show that the adjustment process of consumer installment debt depends on the disequilibrium in other portfolio components. For total households and homeowners, adjustment in consumer installment debt depends on the disequilibrium in net worth. The positive net worth estimates indicate that net worth is a complement for the use of consumer installment credit.

Homeowners' adjustment effect in the stock of consumer installment debt is highly dependent on the disequilibrium in liquid assets, mortgage debt,

non-installment debt, and net worth. It is found that homeowner households with high initial holdings of liquid assets and net worth stock try to reduce further use of installment debt. As expected, there is a trade off between changes in consumer installment credit use and stock of credit card debt and non-installment debt. The cross-adjustment rates of credit card debt and non-installment debt are negative, which means the competitive relationship with installment debt and that of mortgage debt are unexpectedly positive.

**Table 3**  
**Weighted Short-Run Effects of Exogenous Variables on the Change in Demand for Consumer Installment Credit**

Independent Variables	Total	Homeowners	Renters
<b>Economic variables</b>			
Income	.003 (.31) <sup>a</sup>	.001 (.17)	.07 (1.07)
Income squared	-3E-9 (.23)	5E-10 (.05)	-8E-8 (1.19)
Negative income shock	8.83 (.03)	-86.74 (.39)	478.99 (.58)
<b>Socio-demographic variables</b>			
Household size	82.22 (.78)	99.33 (1.09)	9.70 (.03)
Age	-9.98 (1.05)	-13.62 (1.54)	-17.74 (.65)
Education	52.29 (1.11)	50.58 (1.26)	43.00 (.29)
Sex (female)	-141.30 (.33)	266.07 (.59)	-489.09 (.49)
<b>Region</b>			
(north-central)	306.85 (.86)	9.76 (.03)	1034.67 (.94)
(south)	-268.49 (.79)	-207.94 (.71)	-386.88 (.38)
(west)	-368.71 (.95)	-456.83 (1.33)	-338.46 (.31)
<b>Marital status</b>			
(married)	-235.46 (.53)	-787.58 <sup>*</sup> (1.82)	111.06 (.09)
<b>Race</b>			
(non-white)	-224.49 (.65)	144.17 (.44)	-673.96 (.72)
<b>Number of earners</b>			
(two)	688.16 <sup>**</sup> (2.11)	540.88 <sup>**</sup> (2.08)	606.80 (.52)
<b>Employment status change of head</b>			
	1949.72 <sup>***</sup> (3.67)	893.20 <sup>*</sup> (1.75)	3208.27 <sup>**</sup> (2.42)
<b>Employment status change of spouse</b>			
	986.74 <sup>***</sup> (2.90)	463.95 <sup>*</sup> (1.64)	2238.47 <sup>*</sup> (1.98)
<b>Attitudinal variables</b>			
Positive attitude	-329.84(1.18)	-283.83(1.22)	-402.06(.45)
Negative attitude	-5.66(.02)	-347.51(1.25)	861.29(.82)
Durables purchased	.19 <sup>***</sup> (14.33)	.20 <sup>***</sup> (20.20)	.110 <sup>*</sup> (.74)
constant	337.77 (.33)	892.17 (.98)	282.910 (.09)
Adjusted R <sup>2</sup>	.33	.47	.19
F-value	45.62 <sup>***</sup>	64.37 <sup>***</sup>	5.86 <sup>***</sup>

<sup>\*\*\*</sup> significantly different from zero at .01 level.

<sup>\*\*</sup> significantly different from zero at .05 level.

<sup>\*</sup> significantly different from zero at .10 level.

<sup>a</sup> t-values in parentheses

For homeowners, consumer installment debt and mortgage debt adjustments are complements.

Neither credit card debt nor house value have any effect on adjustment in consumer installment debt for all sample groups. The adjustment in consumer installment credit using house value seems to take a longer time than expected.

#### Short-Run Effects of Exogenous Variables

Among 15 exogenous variables, only durables purchased and variables measuring employment status have statistically significant effects on the use of consumer installment credit in all three equations for the total, homeowners, and renter households.

Durables purchased has significant positive impact on changes in the holdings of consumer installment credit. A dollar increase in the amount spent for durable goods purchased induces \$.19, \$.20, and \$.11 increases in the consumer installment credit holdings of total, homeowners, and renters, respectively. The lower estimate for renters indicates that they are less likely to use installment credit for purchasing durables than homeowners.

Both employment status changes of head and wife have strong positive effects on the change in installment credit holdings for all sample groups. For households where head is employed in 1986 but was unemployed in 1983, holdings of consumer installment credit increase by \$1949.72 for total households, \$893.20 for homeowners, and \$3208.27 for renters. When the wife participated in the labor force in 1986 (but not in 1983), holdings of installment credit increase by \$986.74 for total, \$463.95 for homeowners and \$2238.47 for renters.

These results suggest that the levels of installment credit are significantly affected by the supply side of consumer credit. Jappelli (1990) found that employment status related factors explained 16 percent of credit rationing, a constraint regarding credit use.

For renters, the effects of employment status change of household head and wife are much larger than for the homeowners. Among many factors

affecting lenders' decisions on granting credit, employment status may be a more important factor for renters than homeowners.

The positive relationship between changes in installment credit use and wife's labor force participation is similar to Rosett's (1958) but is not consistent with Dunkelberg and Stafford's (1971) finding.

Number of earners in the households has significant positive effect in equations for total and homeowner households. Among the total sample, two-earner households hold \$685.16 more consumer installment credit than others. Two-earner homeowner households hold \$540.88 more installment credit than other homeowners. Number of earners is not significant for renters.

For homeowners, marital status shows significant negative effect on the change in the use of installment credit. Married homeowners decrease in the credit obligations by \$787.58 compared with non-married homeowners.

In contrast to other studies (Bryant 1986a; Bryant 1986b), this study found that income related variables do not have any significant effects on the change in the use of consumer installment credit. This result may be due to the inclusion of the durable goods purchased variable.

### Conclusions

The findings of this research show that more than 80 percent of consumer installment debt is own-adjusted during the period of time studied. Almost all divergences between desired and actual level of consumer installment debt in renter households are direct adjusted within this period of time. The own-adjustment effect is a much more important part of the equilibrating process for renters than for homeowners. These findings may be due to the lack of income and other stocks of capital accounts among renters.

For homeowners, the adjustment process in the stock of consumer installment debt is highly dependent not only on disequilibrium in itself but also on disequilibria in liquid assets, mortgage debt, non-installment debt, and net worth. This

implies that the demand for any capital accounts should be estimated in the context of consumer portfolio decision.

The spending for durable goods purchased has encouraged the use of consumer installment credit between 1983 and 1986. Homeowners are more likely to use consumer installment credit to finance the purchase of durable goods than renters.

The positive effects of changes in employment status of household head and wife indicate that the labor force participation induces the use of consumer installment credit. These positive effects are especially strong in the renters equation. This finding further implies that renters are more likely to be credit rationed than homeowners in the credit market.

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## The Value of Time in Household Work: Estimates from the NLS Data

Karen A. Duncan, The Ohio State University<sup>1</sup>

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The reservation wage procedure was used to estimate the value of time in household work. These estimates were compared to those obtained by the housekeeper cost method and to reservation wage estimates obtained in a previous study. The reservation wage estimates for nonemployed wives were much larger than those for employed wives.

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Interest in placing a value on the productive activities of households dates back to the early part of the century. Kinsey (1986) notes that one of the early reasons for estimating the value of home produced goods and services was "to document how much household production increases the welfare both of individuals and of nations" (p. 187), often with the aim of trying to add the value of household production to the gross national product (GNP) (Gauger, 1973). Because household work does not show up in the national income and product accounts unless the household hires someone in the marketplace to perform the work, economists have long recognized that the GNP underestimates the value of the goods and services produced by a society (Gauger, 1973). Further, society's tendency to value only that on which it can put a dollar value leads to the societal perception of household work as valueless (Hefferan, 1982; Walker, 1980).

A review of the various methods of valuing home production is found in Kinsey (1986). The procedure of choice is the reservation wage method: an opportunity cost measure of household work corrected for self selection bias. Hence, it has important statistical advantages over other methods of valuing time in household work. In this paper, the reservation wage procedure will be used to estimate the value of time in household work. The research replicates the earlier work of Zick and Bryant (1983) on more recent and representative data from the National Longitudinal

Surveys. The estimates obtained will be compared to those obtained using the housekeeper cost method and to the reservation wage estimates obtained by Zick and Bryant (1983) in constant 1987 dollars.

### Methods of Valuation

Unlike market cost methods, opportunity cost methods of valuing the time in household work have a sound theoretical basis. Opportunity cost measures are based on the theoretical argument that, at equilibrium, households allocate the time of members in activities so that the marginal value of time is equal in all activities. The opportunity cost of time in household work is valued at the cost of the next best alternative given up, namely market work. Other advantages of this approach are that the estimates obtained are the values that households would place on the household work (Zick & Bryant, 1983) and that it is the preferred approach for measuring economic welfare (Murphy, 1982).

Opportunity cost methods value time in household work at the wage the household worker receives or could receive in the labor market. This is straightforward if the household worker also works in the labor market but problematic when the worker does not. In fact most criticisms of opportunity cost methods involve the estimation procedure (Zick & Bryant, 1990). The solution used by researchers has been to match those working full-time in the home with a group of employed individuals with similar characteristics and assign the full-time homemakers the wage of the employed group. However, this has not been a satisfactory solution because these "identical" individuals are not identical with respect to employment status. If individuals choose employment status, then this choice must be based on factors which are present, although not observable (Heckman, 1979; Zick & Bryant 1990).

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<sup>1</sup>Graduate Associate, Department of Family Resource Management

Heckman's (1976) reservation wage procedure, which corrects for this self selection bias present in the employment status decision, has been used to estimate the value of time in household work. Although computationally complex, reservation wage estimates are the values that households place on their household production; they are theoretically justified; and they are not subject to the methodological problems of previous opportunity cost measures.

### Theoretical Model

For women employed in the labor force, the opportunity cost of nonmarket time is equal to or less than their market wage rate since employed women may be paid more than the wage required to draw them out of homework. For full-time homemakers, the opportunity cost is greater than their potential market wage. That is, these women are so productive in the home that the wage required to draw them out of homework and into market work is more than the wage they could earn in the market. The reservation or shadow wage is the wage at which the individual is indifferent between time spent in market work and time spent at home. The value of household work is the reservation wage multiplied by the time spent in household work. An explication of the household production model underlying the reservation wage may be found in Bryant (1990).

Because the wage rate is estimated for nonemployed wives using the subsample of employed wives, self selection bias exists. Heckman (1979) notes that self selection bias occurs because market wages are observed only for employed women whose market wages are greater than their home wages. Thus, the first step of the procedure is to correct for the self selection bias by estimating an equation for the probability of the wife's labor force participation.

In the second step a two equation system is used to estimate the reservation wage:<sup>1</sup>

$$W = X\alpha + e_1 \quad (1)$$

$$W^* = Z\beta + H\delta + e_2 \quad (2)$$

where:  $W$  = the market wage rate

$X$  = a vector of characteristics determining market productivity

$W^*$  = the reservation wage

$Z$  = a vector of characteristics determining home productivity

$H$  = hours of market work

Two assumptions are made. First, it is presumed that  $W^* = W$  for employed wives and that  $W^* > W$  for nonemployed wives. Thus, the reservation wage for nonemployed wives is not constrained to equal the wage the individual could have earned in the labor market but rather, it represents the wage required by the individual to make her indifferent between the last hour of home production and an hour of market work.

Second, it is assumed that the market wage does not vary with the number of hours worked in the market while the reservation wage varies with the number of hours worked. Zick and Bryant (1990) note that this reflects a model where the marginal productivity of time in the home varies with the amount of time spent in household work, but marginal productivity in market work is invariant to hours worked (Zick & Bryant, 1990). The justification for this assumption is that firms pay individuals at fixed rates, that is, wages are invariant with productivity whereas this is not the case for the household.

The reservation wage is not observable, however, by equating equations (1) and (2) an estimable labor supply function may be derived:

$$H = \frac{1}{\delta} (X\alpha - Z\beta + e_1 - e_2) \quad (3)$$

After estimating (1) and (3), the reservation wage may be retrieved providing that  $Z$  does not include at least one element of  $X$  (Heckman, 1976).

### Data

The value of time spent in household production is estimated for young women using data from the 1987 survey of the Young Women's Cohort of the National Longitudinal Surveys of Labor Market Experience (NLS). Respondents in this cohort were aged 33 to 43 in 1987. In 1987, 3,639 of the

5,159 individuals in the original sample were interviewed (a retention rate of 70.5%). To facilitate comparisons with previous studies, the sample was restricted to respondents who were married and whose spouse was present and employed. These restrictions resulted in a sample size of 1,083 of which 786 respondents (73%) were employed.

In the 1987 survey, respondents in the Young Women's Cohort were asked to give the number of hours per week they spent on all household tasks. Two disadvantages of using this measure of household work time are: (1) respondents were asked to recall time for a one week block rather than using the more accurate procedure of keeping a time diary, and (2) the household work time estimate is for the respondent only.

Nevertheless, this data set does contain good measures of the market earnings of each spouse as well as other income received by the household. Further, measures of labor market experience, labor market structure, and hours worked are also available. Such variables have been important predictors of labor force participation and wage rates in past research (for example, Shapiro & Shaw, 1982; Zick & Bryant, 1983).

### Empirical Model

The equation for the probability of labor force participation is:

$$LFP = ED + WKEXP + WKEXP2 + AREA + HUSBWY + OTHERY + KIDLT6 + NUMKIDS + UNEMP \quad (4)$$

This equation is estimated on the entire population and provides the self selection correction factor or inverse mills ratio (LAMBDA) which is included as a variable in the following system of equations:

$$LNWRATE = a_0 + a_1ED + a_2WKEXP + a_3WKEXP2 + a_4AREA + a_5UNEMP + a_6LAMBDA \quad (5)$$

$$HRSMKTWK = c_0 + c_1ED + c_2WKEXP + c_3WKEXP2 + c_4AREA + c_5UNEMP + c_6HUSBWY + c_7OTHERY + c_8KIDLT6 + c_9NUMKIDS + c_{10}LAMBDA \quad (6)$$

Equations (5) and (6) are estimated on wage earners only. Definitions and descriptive statistics

for all variables in the empirical equations are presented in Table 1.

Since the market wage rate equals the reservation wage for employed women, equations (5) and (6) can be equated and solved for the reservation wage:

$$LNWSTAR = b_0 + b_1ED + b_2WKEXP + b_3WKEXP2 + b_4AREA + b_5HUSBWY + b_6OTHERY + b_7KIDLT6 + b_8NUMKIDS + b_9HRSMKTWK \quad (7)$$

and the parameters of (7) can be retrieved from the two estimable equations (5 and 6).<sup>2</sup> Note that equation (5) is the empirical counterpart of equation (1) and equation (6) is the empirical counterpart of equation (3).

The variables included in the empirical specification of the wage equation (5) were chosen to be as similar as possible to those chosen by Zick and Bryant (1983) and are in accord with human capital theory. Education is hypothesized to increase market productivity. Work experience is hypothesized to increase market productivity at a decreasing rate. In order to try to control for market characteristics that may affect wage rates, variables for urban/rural area of residence and the local unemployment rate are included in the equation.

Likewise, the variables hypothesized to affect household productivity are in accord with human capital theory and were chosen to be similar to those used by Zick and Bryant (1983). Again, education and work experience are expected to increase household productivity. Increasing income from husbands' wages and salary and from other sources is expected to increase the value of wives' nonmarket time. Both the presence of young children and an increase in the number of children present in the household are hypothesized to increase the value of wives' household work time because caring for children is considered a valuable use of time and because child care can be combined with other home production activities.

Equation (4) is estimated using the probit option in Shazam. OLS regression is used to estimate equations (5) and (6). The estimated parameters for equations (4), (5), and (6), and the

calculated parameters for equation (7) are presented in the Appendix and will not be formally discussed.

### Results and Discussion

Since family size and composition have been consistently shown to affect the time spent by women in household work, estimates of the value of time in such work are often stratified by family characteristics (Gauger, 1973; Gauger & Walker, 1980; Walker, 1980). To facilitate comparisons with Zick and Bryant's (1983) work, estimates are provided for employed and nonemployed wives by the age of the youngest child in the household.

For employed wives, the estimates of the value an hour spent in household production calculated from the NLS data are of the same magnitude as those obtained from the NE-113 Time Use data (Zick & Bryant, 1983) but are generally lower in value (Table 2). Although it is possible that wages did not keep up with inflation over the 1977 to 1987 period, it is more likely that the apparent differences in the estimates are due to differences in the data sets. The NE-113 data is a time use data set and, not surprisingly, contains better measures of time use than does the NLS data. It is also a more homogeneous data set in terms of household composition as all households in the data set are two-parent, two-child families whereas the NLS data contains a diverse array of households. Further, the reservation wage estimates from the NE-113 data were calculated for New York residents only (Zick & Bryant, 1983).

The value of an hour in household work is consistently higher for the employed than the nonemployed NE-113 wives (Table 2). However, the opposite is true for the NLS wives. Nonemployed NLS wives had much higher reservation wage estimates than employed NLS wives, indicating that the NLS wives are much more productive in the home. Although outliers can have inordinate effects when cell sizes are small, the smallest cell size among the nonemployed NLS wives was 28 and there was little change in the reservation wage estimate from cell to cell.

Table 1  
Definitions and Descriptive Statistics of Variables Used in the Model.<sup>a</sup>

Variable	Definition	Means <sup>b</sup> (Standard deviation)
<u>Dependent variables</u>		
LFP	1 = wife works in the labor force 0 = wife is a full-time homemaker	.73 (.45)
LNWRATE <sup>c</sup>	Natural log of wage rate	.00 (.62)
LNWSTAR	Natural log of reservation wage	
<u>Independent variables</u>		
ED	Wife's years of education	13.17 (2.35)
WKEXP	Wife's years of labor force experience	5.36 (5.70)
WKEXP2	Wife's years of labor force experience squared	61.22
KIDLT6	1 = child under 6 years of age present in household 0 = no child under 6 years of age present	.27 (.44)
NUMKIDS	Number of children under 18 present in household	1.74 (1.15)
HUSBWY	Income of husband from wages and salary	30,955.00 (16,533.00)
UNEMP	Unemployment rate for local labor market (x.x%)	6.440 (2.72)
AREA	1 = urban 0 = rural	.82 (.38)
OTHERY	Income of household from other sources	1,102.20 (3,963.00)
HRSMKTWK <sup>c</sup>	Weekly hours worked in market by wife during survey week	6.64 (18.99)
LAMBDA	Sample selection correction factor	

<sup>a</sup>N = 1083. <sup>b</sup>Means reported for noncontinuous variables represent the proportion of the sample with a value of 1. <sup>c</sup>For employed wives only.

**Table 2**  
**Reservation Wage Estimates of the Average Dollar Value of an Hour of Wife's Time in Household Work, by Age of Youngest Child and Employment Status of the Wife.**

Age of youngest child	NE-113 data <sup>a</sup>		NLS data	
	Employed	Not employed	Employed	Not employed
12-17	8.79	7.72	7.01 (n=210)	26.12 (n=70)
6-11	8.17	8.05	6.96 (n=254)	28.43 (n=92)
2-5	8.04	7.27	7.29 (n=134)	28.38 (n=76)
< 2	-	-	8.05 (n=54)	28.72 (n=28)
1	8.66	7.38	-	-
< 1	7.43	6.84	-	-
None	-	-	8.86 (n=134)	29.20 (n=31)
Overall	8.34	7.40	7.40 (n=786)	27.96 (n=297)

<sup>a</sup>From Zick & Bryant (1983). These numbers have been inflated by the change in the Consumer Price Index (Bureau of the Census, 1990, Table No. 762) between 1977 (when the NE-113 data were collected) and 1987.

Another notable difference in the estimates obtained from the two data sets is the relationship between the size of the wage rate and the age of the youngest child. NLS estimates of the wage rate tend to decrease as the age of the youngest child increases while the opposite is true of the NE-113 estimates (Table 2). Zick and Bryant (1983) concluded that the increase in the value of household work time with age of youngest child indicated that young children did not increase the value of home production by increasing the wife's productivity so much as they increased the wife's work load. Thus, the NLS estimates seem to lend support to the opposite side of the argument, that is, that young children raise the value of nonmarket time.

In order to compare the reservation wage estimates with valuations obtained from a market cost method, the average yearly dollar value of

household work was calculated for each household type using the reservation wage estimates and the housekeeper cost method. The average hourly wage of a housekeeper in the United States in 1987 was \$3.25, a wage rate lower than all the reservation wage estimates calculated in Table 2 (Bureau of the Census, 1990, Table No. 762). Consequently, the yearly value of household production for the various household types is higher when estimated using the reservation wage as opposed to the housekeeper cost approach (Table 3).

Using the housekeeper cost method, the average value of household production for the NLS households in 1987 is estimated at \$4,588.40; using the reservation wage estimates, the estimated value is \$15,040.80, over three times the housekeeper cost value. Again it is useful to examine the yearly values by household type. Of course, the pattern of the value of household production decreasing as age of the youngest child increases continues to hold. This relationship also holds for the housekeeper cost estimates because the same average hours spent in household work are used in both sets of calculations.

Clearly the value of work in the home when estimated using reservation wage numbers is much greater than the housekeeper cost estimates of the value for nonemployed women (Table 3). In addition, the reservation wage estimates are 37 to 47% larger than the values obtained from the housekeeper cost method for the employed women. Hence, not only is the value of time spent in household work greater in NLS households with a nonemployed wife because more hours are spent by the wife in household work, but the value of that work to the household is much greater than that which would be implied using the housekeeper cost method of valuation.

Comparing the estimated value of household production with the total family income of these NLS households is instructive. In Table 4, the value of time in household work ranges from 14 to 28% of total family income for households where the wife is employed. For households where the wife is not employed, the value of time in household work ranges from 126 to 240% of family income. Hence, for the NLS households in which

Table 4  
The Value of Time in Household Work as a Percentage of Total Family Income<sup>a</sup>

Age of youngest child employed	Value of household time <sup>b</sup>		Total family income		Value of household work time as a percent of total income	
	Employed	Not employed	Employed	Not employed	Employed	Not
12-17	7,334.60	47,668.90	44,526.00	37,840.00	16.47	125.97
6-11	8,478.20	51,140.40	45,408.00	36,624.00	18.67	139.64
2-5	10,004.80	67,746.60	45,282.00	40,909.00	22.09	165.60
< 2	12,782.20	106,582.60	45,985.00	44,310.00	27.80	240.54
None	6,779.20	46,533.10	49,934.00	29,314.00	13.58	158.74
Overall	8,481.50	59,117.30	45,962.00	37,969.00	18.45	155.70

<sup>a</sup>Total family income includes income from wages and salaries of all household members and transfer income such as public assistance.

<sup>b</sup>Using the reservation wage estimates.

Appendix

Table A  
Parameter Estimates for the Probability of Labor Force Participation

Independent variables	Coefficient (Standard error)
ED	0.069* (0.023)
WKEXP	0.385* (0.029)
WKEXP2	-0.015* (0.002)
AREA	0.149 (0.133)
HUSBWY	-1.6E-5* (3.2E-6)
OTHERY	-3.2E-5* (1.1E-5)
KIDLT6	-0.211* (0.121)
NUMKIDS	-0.120* (0.046)
UNEMP	-0.004 (0.018)
INTERCEPT	-0.443 (0.335)
McFadden's R <sup>2</sup> = .33	

\*p < .05.

Table B  
Parameter Estimates Wife's Market Wage and Hours of Market Work, and the Calculated Coefficients for the Reservation Wage Equations (Standard Errors in Parentheses).

Independent variables	Dependent variables		
	LNWRATE (std err.)	HRSMKTWK (std. err.)	LNWSTAR (std. err.)
ED	0.068* (0.009)	0.419 (0.215)	0.085
WKEXP	0.032 (0.021)	0.363 (0.629)	0.047
WKEXP2	-1.8E-4 (9.2E-4)	-0.012 (0.026)	-6.7E-4
AREA	0.178* (0.051)	-0.257 (1.099)	0.167
UNEMP	-0.003 (0.007)	0.077 (0.153)	--
HUSBWY	--	-9.1E-5* (4.0E-5)	-3.7E-6
OTHERY	--	-4.3E-5 (1.4E-4)	-1.7E-6
KIDLT6	--	0.491 (1.067)	0.020
NUMKIDS	--	-1.377* (0.413)	-0.056
HRSMKTWK	--	--	-0.040
LAMBDA	-0.424* (0.137)	-2.754 (4.509)	
INTERCEPT	0.884* (0.184)	34.692* (4.850)	2.289
Adj R <sup>2</sup>	.28	.06	
F <sub>(6,778)</sub> = 51.58    F <sub>(10,774)</sub> = 5.78			

\*p < .05.

## Demand for Small Cars in the United States

Rachel Dardis, University of Maryland<sup>1</sup>  
Horacio Soberon-Ferrer, University of Maryland<sup>2</sup>

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The purpose of this paper was to investigate the impact of household characteristics and preferences for Japanese cars on the demand for small cars in the United States. Two stage probit analysis was used to examine the impact of various explanatory variables on the purchase decision. The results indicated that preferences for Japanese cars, income, price and several household characteristics had a significant impact on the probability of purchasing a small car. The results of this study provide support for freer trade in automobiles and higher gasoline taxes as energy conservation strategies.

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### Introduction

The needs for energy conservation in the United States in recent years has increased due to environmental and oil dependency concerns. Fossil fuel burning causes environmental pollution, ozone depletion and may play a major role in global warming while oil imports account for a significant portion of the U.S. trade deficit. Individual consumers could alleviate some of these problems by changing their consumption patterns including their use of automobiles. This occurred after the energy crisis of 1973 when the demand for small cars increased due to increases in the price of gasoline and decreases in real income. Congress also introduced corporate average fuel economy standards (CAFE) in 1975 which became effective in 1978.

The situation changed in the 1980s due to declines in gasoline prices and the belief that the energy crisis had passed. In 1985 Robert Crandall stated that "the societal case for increasing energy

conservation" appeared rather weak (Crandall et al. 1986, p. 139). The CAFE was reduced while the market share of mid-sized and large cars increased. Few changes occurred in the 1986 to 1990 period in spite of continued interest in energy conservation, a cleaner environment and lower oil imports. According to Samuelson (1991), Americans are in favor of these goals but were unwilling to make any sacrifices for them while the politicians continue to ignore the problem.

The purpose of this study was to investigate the demand for small cars in the United States in 1986 and the awareness/responsiveness of different households to the need for energy conservation. The year 1986 is the most recent year for which data on durable goods are available. Consideration was given to the preference for Japanese as opposed to U.S. automobiles in the analysis since the demand for small cars may reflect the demand for Japanese cars. The results of this study should be of use to analysts of consumer behavior as well as to energy industry analysts who are concerned with the need for energy conservation and the development of appropriate energy conservation strategies.

### Sample and Variables Selected

The sample was new car purchasing households in 1986. The analysis was confined to U.S. and Japanese cars since only twelve households purchased European and other foreign cars. The origin of the car was based on company ownership and management due to the globalization of production facilities in recent decades. Thus, cars which were produced by Japanese companies such as Honda were classified as Japanese cars irrespective of whether they were produced in Japan or the United States

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<sup>1</sup>Professor

<sup>2</sup>Assistant Professor

$$y_1^* = \alpha_1 y_2^* + \beta_1' X_1 + U_1 \quad (1)$$

$$y_2^* = \alpha_2 y_1^* + \beta_2' X_2 + u_2$$

where  $y_1 = 1$  if  $y_1^* > 0$ ,  $y_1 = 0$  otherwise

$$y_2 = 1 \text{ if } y_2^* > 0, y_2 = \text{otherwise}$$

The first equation is used to calculate the probability of purchasing a Japanese car while the second equation is used to calculate the probability of purchasing a small car.

In the first stage we estimate the following equation

$$y_1^* = \Pi_1 X + v_1 \quad (3)$$

where  $X$  includes all the exogenous variables in the system. In the second stage, we estimate  $y_2^*$  using predicted values for  $y_1^*$  in equation (6). Both equations are estimated using maximum likelihood probit analysis.

The set of  $X$  variables in equation (3) included all variables previously discussed under the demand for small cars as well as a new variable, origin of disposed-of-stock. It was hypothesized that households that disposed of Japanese (American) cars would be more likely to buy Japanese (American) cars.

The results of the probit analysis were used to estimate the probability of purchasing a Japanese car for each individual in the sample. This was the predicted value of  $y_1^*$  which was then

used as a variable in estimating the probability of purchasing a small car. In addition, the effects of various independent variables on purchase probabilities for small cars were investigated as follows. A purchase probability for a representative household was first obtained based on average values or modal values in the case of categorical variables. These variables were then changed in order to estimate the impact of such variations on purchase probabilities.

## Results

A total of 267 household purchased new cars in 1986. Purchases included 141 small American cars, 84 small Japanese cars and 142 large American cars. No large Japanese cars were purchased. There was no difference between the two groups of households with respect to income while there were differences with respect to purchase price and some household characteristics. Higher purchase prices were paid for large cars. The heads of large car purchasing households were more likely to be older, male, married, and less educated than the heads of small car purchasing households. There were few differences with respect to employment status of spouse, race, and location.

The results of the probit analysis for Japanese cars are given in Table 1. The likelihood ratio statistic, which is given at the bottom of the table, indicates that the model is significant in explaining the probability of purchasing a Japanese car. It should be emphasized that the sole purpose of this analysis was to estimate the probability of purchasing a Japanese car which was used as one of the variables in the second stage of the analysis.

The results of the probit analysis for small cars are given in Table 2. Again, the likelihood ratio statistic indicates that the model is significant. The likelihood ratio index, which serves as a goodness of fit measure, is satisfactory and close to the upper bound. In the case of categorical variables such as sex and region the omitted category is enclosed in parenthesis. The

TABLE 2  
Estimated Coefficients from Stage 2 Probit Analysis: Probability of Buying a Small Car<sup>a</sup>

Variable	Coefficient	t-ratio
Constant	0.313	1.109
Prob (Japanese)	1.906	5.986**
Disposable income	0.053	4.170**
Purchase price	-0.156	-15.257**
Age (30-54)		
Under 30	0.529	4.596**
Over 54	-0.194	-1.579
No. of children	0.144	3.352**
No. of adults	0.311	7.645**
Female (male)	0.564	4.953**
Not married (married)	-0.419	-3.021**
Working spouse (no spouse, or does not work)	-0.399	-3.630**
Black (non-Black)	-0.969	-2.753**
Purchase price * Black	0.088	3.684**
Education (not a high school graduate)		
High school graduate	0.516	0.408
Beyond high school	0.246	-0.189
Occupation (not working or retired)		
Professional, clerical	0.563	4.248**
Blue collar	0.948	6.380**
Location (urban West)		
Urban Northeast	-0.087	-0.646
Urban Midwest	-0.016	-0.119
Urban South	-0.094	-0.710
Rural	-0.054	-0.333
Net stock	-0.142	-3.226**
Likelihood Ratio Statistic	415.55**	
Likelihood Ratio Index	0.35	

<sup>a</sup>Reference groups for dummy variables are given in parentheses.

\*Significant at 0.05 level.

\*\*Significant at 0.01 level.

TABLE 3  
Sample Probability Calculations

Household Type	Probability of Purchasing a Small Car
Representative Household	0.67
Changes to representative household	
Disposable income (+\$10,000)	0.68
Price (+\$1,000)	0.63
Under 30	0.88
Over 54	0.58 <sup>a</sup>
Number of children (+1)	0.72
Number of adults (+1)	0.80
Female	0.84
Not married	0.57
Working spouse	0.54
Not a high school graduate	0.60 <sup>a</sup>
High school graduate	0.64 <sup>a</sup>
Blue collar	0.80
Not working/retired	0.40
Urban Northeast	0.75 <sup>a</sup>
Urban West	0.81 <sup>a</sup>
Disposed of Japanese stock	0.87 <sup>a</sup>
Disposed of U.S. stock	0.56 <sup>a</sup>
Net stock (+1)	0.57

<sup>a</sup>Only reflects change in probability of purchasing a Japanese car.

TABLE 4  
Comparison of Actual and Predicted Probabilities

	Actual	Predicted	
		Small	Large
Small	225 (61%)	200	25
Large	142 (39%)	50	92
Total	367	250	117

Proportion predicted correctly 0.79.

Proportion predicted by chance  $C_{PRO} = (0.61)^2 + (0.39)^2 = 0.52$ .