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I

Consumer Sensitivity to Finance Rates

Introduction

Students of consumer response to variation in the terms of credit have generally assumed that finance rates are of little or no consequence to borrowing decisions.[1] This assumption has not been based upon direct empirical evidence that consumers are unresponsive to variations in rates, but on fragmentary indirect evidence and general plausibility.[2] A number of authors have shown that consumer demand for credit and for durables purchased on credit is significantly related to the average

[1] The term finance rate as used here is identical in meaning with interest rate as customarily used by economists. To many people, the interest rate is the price paid for riskless funds, disregarding costs associated with risk or with servicing the loan. The finance rate is the price charged for a loan to a specified borrower under specified conditions. It is composed of "pure" interest, a risk premium, and servicing costs including normal profits. Thus business loans generally carry finance rates moderately higher than the pure interest rate, because the risk is small and servicing costs negligible relative to the size of loan. Consumer loans, on the other hand, generally carry finance rates considerably higher than the interest rate, largely because the cost of servicing is very high per dollar of loan.

[2] One reason consumer finance rate response has received little attention is that basic data on finance rate levels have not been available, and it was widely thought that these rates were fairly stable. The formation of a statistical series measuring new automobile finance rates between 1924 and 1962 uncovers considerably wider variation in finance rates than hitherto had been assumed. During that period, for example, rates ranged from 17 per cent in 1932 to 11 per cent in 1951 among a sample of large sales finance companies. The series itself shows several marked changes in the level of rates (see Robert P. Shay, "New-Automobile Finance Rates, 1924-62," New York, National Bureau of Economic Research, Occasional Paper 86, 1963).

size of the monthly payments on instalment contracts.[3] Since finance charges usually constitute a small fraction of total outlay on consumer credit contracts, even a large change in finance rates will have a relatively small impact on the size of monthly payments—other things the same—while a comparable change in contract maturity will tend to have a much stronger effect on the size of monthly payments. In addition, the notion that most credit users do not possess accurate information about rates, which is supported by fragmentary evidence,[4] strengthens the supposition that consumers are insensitive to finance rates.

Since 1939, the share of instalment credit outstanding held by financial institutions which offer relatively low-cost credit shows a marked gain, while institutions that, on average, offer credit at higher cost have suffered relative losses. The persistence of the gains of commercial banks and credit unions, particularly, suggests that there is considerable long-run demand elasticity with respect to rates for particular financing institutions. For this and other reasons, we concluded that further investigation of rate elasticity might be fruitful.

The aim of this study is to extend previous analyses by an empirical investigation of consumer response to finance rates. In Section I, we develop a model for analysis of consumer borrowing decisions, then test the empirical implications of the model with experimental data derived from a consumer survey. In Section II, we investigate consumer knowledge of finance rates and discuss its relation to consumer borrowing decisions.

[3] Daniel B. Suits, "The Demand for New Automobiles in the United States 1929-1956," *Review of Economics and Statistics*, Aug. 1958, p. 273; and Marc Nerlove, "A Staff Memo on Dr. Suits' Testimony," *Hearings* before Senate Subcommittee on Antitrust and Monopoly, 85th Cong., 2d. sess., on S. Res. 57 and S. Res. 231, Administered Prices, Part 7, Appendix, pp. 3998-3999. Avram Kisselgoff, *Factors Affecting the Demand for Consumer Instalment Sales Credit*, Technical Paper 7, New York, NBER, 1952. Kisselgoff's analysis of the role of finance rates and other credit terms in borrowing decisions was preceded by an earlier work by Gottfried Haberler, *Consumer Instalment Credit and Economic Fluctuations*, New York, NBER, 1942.

[4] Jean M. Due, "Consumer Knowledge of Instalment Credit Charges," *Journal of Marketing*, Oct. 1955, p. 164; G. Katona, statement submitted to *Hearings* before Senate Subcommittee on Banking and Currency, 86th Cong., 2d sess., on S. 2755, Consumer Credit Labeling Bill, pp. 805-808; and Mors, "Consumer Credit Finance Charges."

Analytical Framework

Investment theory traditionally places heavy stress on the role of interest (finance) rates as a regulator of the demand for capital assets. The theory is customarily put in terms of the relation between the net rate of return expected from investment and the rate of interest, that is, the cost of funds. When the former exceeds the latter, allowing for risk and uncertainty, the investment is profitable and will be undertaken. If the interest rate were to rise, some investments would no longer yield a net return over cost and are not undertaken; and vice versa if the rate falls.

Attempts have been made to measure the sensitivity of investment decisions to interest rates; the earliest of these empirical studies resulted in the conclusion that relatively few such decisions are influenced by market interest rates.[5] These results were regarded by many as inconclusive either because of deficiencies in method or because of the special characteristics of the period studied. Later postwar studies have led to the conclusion that interest rates are somewhat more important.[6] There is now general agreement that the possible influence of interest rates and other conditions of borrowing on the postponement or acceleration of investment decisions is especially in need of further study.

The traditional framework has not been applied to analysis of consumer investment in durable assets, possibly because consumer durables are not regarded as being "productive" in the usual sense. It is true that purchase of assets like houses, cars, and appliances does not ordinarily offer a prospective financial return to the buyer as does the purchase of industrial plant or equipment. The household anticipates yields from capital goods measured in terms of "utility" or satisfaction, while the firm anticipates yields measured as a dollar rate of return on investment. The expected productivity of business investment in capital assets can be readily calculated in terms of changes in costs and rev-

[5] Early studies to test this hypothesis in the 1930's were: Hubert D. Henderson, "The Significance of the Rate of Interest," *Oxford Economic Papers*, Oct. 1938; and J. Franklin Ebersole, "The Influence of Interest Rates upon Entrepreneurial Decisions in Business," *Harvard Business Review*, Autumn 1938.

[6] See John R. Meyer and Edwin Kuh, *The Investment Decision*, Cambridge, Harvard University Press, 1957: and Martin J. Bailey, "Saving and the Rate of Interest," *Journal of Political Economy*, Aug. 1957.

enues, at expected market prices, resulting from the investment, while changes in costs and returns on investment in household assets may have no equivalent market price. Yet there is usually a market price for a commercial service that provides a close substitute for the services provided by a consumer durable good. There is clearly an analytical parallel between measuring the return on household investment in durable goods as the expected flow of saved costs of rental services and measuring the return on laborsaving industrial equipment as the expected flow of saved labor costs. We see no substantive difference between the purchase of a fork lift designed to save X man-hours worth Y dollars per year for Z years and the purchase of a washing machine designed to save a man-hours worth b dollars per year for c years. The values of X, Y, and Z can be estimated directly from the market, that of the a, b, and c, estimated indirectly as the discounted total costs of purchasing an equivalent flow of rental services in the market.[7]

If one thinks of the purchase of consumer durable assets as investments yielding imputed returns, it follows that the cost of borrowing funds should play a role in such investment decisions. The prevailing view among those concerned with consumer behavior is that such purchases, with the possible exception of housing, are quite insensitive to borrowing costs.[8] As noted earlier, this view is based on two supports: (1) the fact that consumers generally do not know the level of rates

[7] The analytical resemblance is overdrawn in one respect. If laborsaving machinery is introduced by a firm, its costs will fall, output will expand, and the market price of output will decline, other things being the same. The firm may disregard the reduction in market price in estimating its probable net return because changes in the firm's output may have negligible effects on market output and price. However, if a household buys a laborsaving durable asset like a washing machine, the relevant market price for the equivalent laundry services is the same as the current price only if the household's consumption of services is unchanged. If the household expands consumption greatly—a common outcome—the price at which the expanded level of consumption would be worth buying is the relevant price, and it might be considerably lower than the current market price of services. If so, the return on the asset would be overstated by our suggested procedure.

[8] See Haberler, *Consumer Instalment Credit*, p. 100; Kisselgoff, *Factors Affecting the Demand*, p. 18; and Reply of Chairman William McChesney Martin, Jr., Board of Governors, Federal Reserve, to questions by the Subcommittee on General Credit Control and Debt Management, Joint Economic Committee, 1952, Part 1, p. 414.

they actually pay; (2) the fact that finance charges constitute a small fraction of the monthly payments on short-term credit contracts.

The importance of the first point depends on the reasons underlying consumer ignorance. It is possible that market finance rates are so much lower than "real" borrowing rates that changes in market rates are largely irrelevant to consumer borrowing decisions. This argument is developed later.

The second point presupposes that the size of monthly instalment payments is the relevant price. If so, consumers would be relatively unresponsive to changes in the finance rate on a 24-month washing machine credit contract, relatively responsive to a change in rate on a 20-year house mortgage. Even though rates are typically much higher on short-term than on long-term credit contracts, debt repayment dominates the size of monthly payment on the former but not on the latter. However, this argument neglects the fact that the forgone yield on owner's equity should be added to market finance charges as an element of interest costs. If loan size is smaller than purchase price or if contract maturity is less than the service life of the asset, the market finance charge does not cover the total cost of time and risk associated with ownership of the asset. Only when the downpayment is zero and repayment of principal exactly matches depreciation (e.g., as in a rental agreement) does the ratio of finance charge to monthly payment size correctly measure the cost of capital.

An analysis of consumer investment decisions in terms of a net yield–borrowing cost framework requires consideration of the institutional characteristics of the markets in which consumers borrow. As in any credit transaction, lenders are basically concerned with the borrower's willingness and ability to repay. Debt can be repaid only by withdrawals from current and future income or by liquidation of assets. From the lender's point of view, a borrower with sufficient assets is the better risk, especially if the assets can be easily liquidated and are pledged as collateral. Similarly, a borrower with relatively large current income or relatively favorable income prospects, other factors being the same, is the better risk.

Consumers willing to pledge highly liquid or easily marketable financial assets—savings accounts, life insurance policies with cash surrender values, and marketable securities—can usually obtain funds on a single-payment basis, since the lender can liquidate the assets to obtain repayment. For borrowers unwilling or unable to pledge such

assets, lenders will generally offer credit only on an instalment basis, with scheduled monthly or weekly repayments to be completed within a fixed period. Since debt repayment under these conditions depends mainly on saving out of future income, and since both the borrower's future income and his ability to save are uncertain, lenders usually protect themselves against loss by limiting both the total amount and the maturity of the credit contract.

The fact that most consumer instalment credit is used to purchase durable goods provides the lender with an additional means of reducing the risk of loss by default, a lien on the goods purchased. Under these conditions, lenders normally anticipate repayment from current or future income, as in unsecured lending, but are in a position to grant more liberal credit terms or accept weaker credit risks because of the added security provided by the lien.[9]

In sum, therefore, the ability to borrow on a single-payment basis depends in the first instance upon the borrower's ability and willingness to pledge a sufficient amount of liquid assets as loan collateral. Instalment credit meets the needs of credit buyers who are either unable or unwilling to meet this requirement. For these borrowers, most of whom are unlikely to have financial assets in excess of transactions or precautionary balances, ability to borrow depends mainly on income prospects, also on collateral value if the credit is secured by the pledge of the durable goods purchased. Previous performance in meeting instalment payments (including mortgage payments) weighs heavily as evidence that a prospective borrower is both willing and able to repay.

Thus, it is true that, relative to current and prospective income, households can utilize instalment credit more freely when they simultaneously acquire and pledge consumer durable goods. They must also liquidate debt in relation to the rate at which the collateral depreciates in the market. The markets for many used consumer durables are highly imperfect, not only because of strong consumer preference for newness per se, but also because of steady technological improvement and uncertainty about quality and prospective maintenance cost. Uncertainty, in turn, is due to the great variation in expected service life of used consumer durables even of the same make and model year, to say nothing of the variation due to make and age. Finally, many such markets

[9] Repossession and liquidation is a rather costly procedure which often yields the lender less than the outstanding loan balance. For this reason—with minor exceptions involving credit abuses—lenders are reluctant to resort to the procedure unless prospects for eventual repayment appear to be slim.

are also imperfect in the sense of being "thin"; used assets are frequently passed on to relatives, friends, or neighbors for nominal prices. Except automobiles, relatively few used consumer durables find their way to an organized market.

The upshot is that loan repayment usually must be completed in a period considerably shorter than the useful service life of the asset, forcing the borrower to build or maintain equity whether he wants to or not.[10] Consequently, most consumers cannot finance the purchase of durable assets by simply changing their pattern of consumption, i.e., by consuming the services of the durable asset (plus interest) instead of an alternative set of goods or services. Instead, they must either reduce total consumption or liquid assets, or both, during the repayment period, at the same time building equity in the durable asset. In general, the restraints on consumer ability to incur debt and the rate at which debt must be liquidated have the practical consequence that many—perhaps most—credit-using households would prefer a higher (average) debt level than they actually have, given the finance rate on their outstanding debt. The basic constraint is probably the obligation to liquidate over a fixed and relatively short period, since most consumers can readily incur new debt by purchasing additional assets. In addition, of course, borrowers may have to meet a downpayment requirement before being granted credit for the purchase of durable goods. In the United States, this requirement is typically satisfied by the trade-in value of an older durable being replaced. Any downpayment constraint is primarily a barrier to credit purchase in general rather than a limitation on the average amount of debt obtained on a credit purchase.[11]

It should be recognized that, in principle, consumers can maintain debt at a higher average level than permitted by the customary repayment period if they are willing to borrow supplementary funds from lenders requiring no collateral; in this way the net repayment schedule can be adjusted to any desired rate. This option is costly, however, and

[10] Since some downpayment is normally required on instalment credit purchases, the borrower usually begins with some equity.

[11] In the United States, as we noted earlier, downpayment requirements are not a major barrier to increasing debt, mainly because most credit purchases are replacements of old durables, and the trade-in value of the replaced durable generally suffices for the downpayment. In other countries, where a relatively larger fraction of purchases represent net acquisitions, downpayment requirements may be a more important constraint.

is generally regarded as inferior to the alternatives of reducing consumption or liquid assets, or both.[12]

These relationships can be formalized by utilizing the analytical apparatus developed by Fisher and extended recently by Hirschleifer and others.[13] In Appendix A, we develop the Fisher and Hirschleifer analysis and extend it to cases of special relevance here. In general terms, because of the existence of market imperfections consumers are confronted with a supply schedule of funds that consists of a set of "steps." The purchase of capital assets may be financed on instalments with funds borrowed from the primary sources—banks, sales finance companies, or selling agents—all of whom typically require the pledge of the assets as collateral. (1) Bank or sales finance company credit for high-unit value goods carries a finance rate in the neighborhood of 9-20 per cent per annum. (2) Credit from retailers has somewhat higher rates, 15-25 per cent. If consumers wish to maintain their debt at a higher average level than that imposed by the customary repayment schedule, they must use secondary sources that are willing to make loans without a lien on the asset purchased, for example, bank personal loans, check-credit plans, or personal finance company loans. (3) Bank plans usually carry a rate of 9-18 per cent but are widely available only to good credit risks. (4) Personal finance company loans are readily available at rates as high as 42 per cent. In addition to these alternatives, consumers may borrow from themselves, as it were. For example, assets may be liquidated, the cost varying between the market yield on liquid assets and the subjective rate of return that such assets yield as a contingency reserve. Or consumption may be reduced during the repayment period; that is, as investors in durable assets, consumers may choose to borrow from themselves by postponing consumption, the cost varying according to the borrower's rate of time preference for present versus future consumption.

The borrowing rate influencing consumer decisions about investment in durable assets is evidently the rate at the equilibrium borrowing position, i.e., the point at which the marginal rate of return from investment in capital assets is equal to the borrowing rate. The equi-

[12] We infer that the supplementary borrowing option (except borrowing from friends and relatives) is generally inferior because most households actually select the other options.

[13] J. Hirschleifer, "On the Optimum Investment Decision," *Journal of Political Economy,* Aug. 1958; I. Fisher, *The Theory of Interest;* New York, Kelley, 1961, Chaps. X-XIV.

librium position may involve only market borrowing from primary lenders or from both primary and secondary lenders, or borrowing from both the market and from oneself. If the repayment schedules of primary lenders permit an allocation between current and future consumption such that the marginal rate of time preference and the market borrowing rate can be equalized, the finance rate actually paid in the market is the real borrowing cost. If the repayment schedule does not permit equalization of the two rates (because the repayment schedule requires foregoing an excessive amount of current consumption), either the finance rate charged by supplementary lenders, the subjective yield on liquid assets, or the rate of time preference is the relevant borrowing rate. The outcome depends on the credit buyer's choice (1) of borrowing from supplementary lenders in order to stretch out the repayment schedule,[14] (2) of giving up liquid assets in order to reduce scheduled payments, or (3) of giving up current consumption in order to meet the payments. Let us call the relevant borrowing rate for a given consumer his marginal borrowing cost.

For the empirical analysis, it will be useful to classify consumers as either "rationed" or "unrationed." Those whose marginal borrowing cost is equal to (or less than) the going finance rates of primary lenders are called here unrationed. They can borrow additional amounts at rates about equal to the marginal rates they are paying the primary lenders. All households that choose to accept less than the maximum amount of credit available from primary lenders clearly fall in this category, along with households that prefer to pay cash and not borrow in the market at all. On the other hand, consumers whose marginal borrowing cost is in excess of the going rates of primary lenders are here called rationed.[15] Defined in another way, rationed consumers are those whose average outstanding debt to primary lenders is less than the amount they would prefer, given the rates charged, and unrationed consumers are those whose actual and preferred debt levels are the same.

It should be noted that any given consumer may be rationed, as

[14] One possible reason for supplementary borrowing is to obtain the required downpayment. See p. 12.

[15] Those whose equilibrium situation involves passing up investment opportunities with a higher yield than some actually undertaken, or whose equilibrium marginal time preference rate is lower than the yield on some investment opportunities (consumers with preferences including U_2 in Figures 5 and 6 of Appendix A), are clearly in the rationed category.

we use the term, and still have a lower equilibrium marginal borrowing cost than some unrationed consumers have. What we have called the going rates of primary lenders vary widely: the variation may be due either to market imperfections of several kinds, i.e., location, law, and buyer ignorance, or to variations in lender estimates of the risk associated with a particular borrower or class of borrowers. Thus, business executives are generally eligible for bank credit on lenient terms, while unskilled workers may be unable to obtain credit from banks unless they are willing to accept short-maturity credit contracts and pledge assets in which they have substantial equity. To obtain a given level of debt and contract maturity, the first group may have to pay only 9 per cent at commercial banks, while the second may have to pay 20 per cent or more on credit obtained directly from sellers.

However, even borrowers in the best credit-risk class may be unable to obtain longer contract maturities simply by offering to pay more than the going rate at the primary credit sources, since these lenders generally offer maturities only up to a prevailing institutional norm. Some primary lenders may refuse to give the customary maximum maturity to weak classes of borrowers, and these borrowers may be able to get the maximum from other lenders by paying higher rates. Most lending institutions, however, will not extend terms beyond the prevailing limit even if offered compensation for the increased risk in the form of higher rates. Thus any borrower who prefers a longer maturity than the prevailing norm will be rationed, as we use the term, regardless of the level of rates he pays in the market. It is conceivable that some high-risk borrowers will be unrationed, while having both higher equilibrium marginal borrowing costs and higher market borrowing rates than those of some rationed borrowers in a low-risk classification. If financing institutions offered a continuous schedule of alternative contract maturities and corresponding rates, available to different classes of borrower, there would be no rationed consumers.

If this analysis is correct, a lengthening of customary maximum maturities would increase the demand for credit by rationed consumers but not by unrationed ones. Since the latter are free to choose any convenient maturity, changes in their demand would arise only because of changes in finance rates, prices, incomes, or tastes. Longer maturities would result in increased demand by rationed consumers, because that would reduce the marginal borrowing cost and increase the present value of the yield on the asset. Thus longer maturities enable maintaining

debt at higher average levels, given the primary finance rate, and make less necessary resort to secondary credit sources or reduction of consumption or liquid assets, or both, in order to purchase the durables.

Assuming that changes in monetary conditions affect primary loan rates but not the rates of secondary or marginal credit sources,[16] the analysis suggests that unrationed consumers, whose marginal borrowing cost is equal to or less than the going finance rates of primary lenders, would react more strongly than rationed consumers to a change in rates. For unrationed consumers, higher market interest rates necessarily mean that their marginal borrowing cost schedule has shifted upward; they must either pay more to borrow in the market or give up higher (subjective) yields on their own liquid asset. But this is not always the case for rationed consumers. Those already using secondary credit sources may be able to increase debt at an unchanged marginal borrowing cost. Those who meet the larger monthly payments by forgoing more consumption or liquidating more assets will have higher marginal borrowing costs, and in some cases the new borrowing cost will exceed yields from assets. Some rationed consumers would therefore choose to forgo credit purchases because of the increased rates of charge at primary credit sources.

Very high marginal borrowing costs are consistent with the fact that credit is used extensively for the purchase of durable goods in the United States. For many households, the net yield from consumer durable assets, measured as the saving in current costs of the equivalent service, is large. For example, an automobile costs about $2,500 and lasts perhaps ten years. Including operating expenses (but excluding the owner's labor input), the cost of using an automobile may be something like $800-$1,000 per year for owners of new cars, somewhat lower for owners of used cars. The cost of equivalent services can only be estimated; if taxicabs, planes, trains, and buses were used for all kinds of transportation, including commuting, the cost of traveling 10,000 miles per year, alone or with a family, would be much more, perhaps about $1,300-$1,500 per year. A similar computation suggests that the cost of owning laundry equipment is perhaps $150-$200 per year while the cost of equivalent service is probably about $400 per year for households

[16] These finance rates normally approximate legal ceilings.

with young children. In both these illustrative cases, the estimated net yield on the asset is over 30 per cent per year.[17]

Further, it can be argued that the gross return from purchase of a household durable on instalment credit involves not only the saved costs but also the value of a tied-in service—being forced to save via debt repayment. Consumers who know that voluntary saving is difficult or impossible for them may find required periodic repayment the easiest and safest way to use resources. There is ample evidence that many consumers do make such arrangements to protect themselves against their own bad habits, and that they are willing to pay for the service. Examples are Christmas clubs and "lay-away" financing—arrangements whereby consumers give up the yield on liquid assets in return for the service of being prevented from spending their own money!

This argument, basing durable goods investment decisions by consumers on a comparison of net yield with marginal borrowing cost, can be contrasted with an alternative argument either implicit or explicit in most authors' discussions of consumer response to changes in credit terms. The alternative argument is essentially that consumer demand for durable assets is primarily a function of the size of required monthly payments. Since monthly payment size is regarded as the price of the asset, longer maturities with lowered monthly payments amount to lower prices. A change in finance rates influences demand only insofar as it changes monthly payments, holding loan size, downpayment, and maturity constant. Let us label this the monthly payments model.[18]

[17] Imputed costs covering time spent in operation and maintenance of "owned" equipment are not likely to affect the results. In some cases there is no difference or the difference favors ownership: less time is spent in operating owned washing and drying machines than in using a laundromat; and operation of one's own automobile may have a positive value as a consumption good in itself.

[18] The clearest statement of the monthly payments model is perhaps that in Kisselgoff, *Factors Affecting the Demand,* p. 18:

". . . Furthermore, experience indicates that the elasticity of demand for instalment sales credit with respect to finance rates is very low. This unresponsiveness may be partly attributable to the fact that many credit users are not wholly aware of what they are paying . . . but it is due mainly to the fact that the cyclical changes that are likely to occur in finance charges . . . [have] very little effect on the amount of the required monthly payments."

Haberler (*Consumer Instalment Credit,* pp. 87-89) presents a somewhat more general argument, and distinguishes the situations faced by households confronted with perfect and imperfect capital market. Haberler's argument is close to ours, since our definitions of rationed and unrationed consumers can be thought of as corresponding in general with markets in which consumers are faced with, respectively,

Both models have empirically observable implications, some of which are in direct contradiction. The marginal borrowing cost model predicts that a rise in finance rates, if restricted to primary lenders, will reduce the borrowing of unrationed consumers but have little or no effect on the borrowing of consumers subject to rationing. It also predicts that a simultaneous increase in finance rates and lengthening of maximum maturities will restrict the borrowing of unrationed consumers, but will increase that of rationed consumers, provided that monthly payments fall as a consequence. On the other hand, the monthly payments model predicts that all classes of consumers will increase borrowing if maturities are lengthened, irrespective of rate changes, provided that monthly payments decline on balance; and all will borrow less, irrespective of rate changes, if maturities are shortened, provided that monthly payments increase on balance.

In addition, the monthly payments model predicts that the elasticity of demand for credit with respect to changes in finance rates can be measured indirectly by the elasticity with respect to changes in minimum monthly payments. If consumers respond only to changes in monthly payments, and if a 100 per cent increase in rates increases monthly payments by 10 per cent (other things being the same), the elasticity of demand for credit with respect to rates must be one-tenth the elasticity with respect to payments. The numerator of the elasticity quotient is the same, but the denominator is 10 times as large for rate elasticity as for payments elasticity.[19] The marginal borrowing cost model predicts that the reactions of rationed consumers will show this relationship, but that unrationed ones will show a greater relative response to finance rates.

The marginal borrowing cost model thus predicts that consumer response to changes in finance rates will depend on the relative importance in the population of unrationed consumers (those free to

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imperfectly and perfectly elastic supply schedules for borrowed funds.

The judgments made by both Kisselgoff and Haberler about the importance of monthly payments and the unimportance of finance rates neither has—nor claims to have—firm empirical support.

[19] The monthly payments model should be recognized as logically untenable in the form presented here. For example, it implies that consumers are completely indifferent to loan maturity, that a "price" of $20 a month for one year is the same as a price of $20 a month for ten years. It also implies the unlikely situation in which every consumer would borrow at the maximum maturity—hence minimum monthly payment—obtainable, although a large proportion of instalment contracts are in those terms.

equate primary source finance rates with net yields from durable assets) and rationed consumers (those whose marginal borrowing cost is substantially higher than the primary source rate and hence largely unaffected by changes in that rate). If the entire population consists of rationed consumers, the elasticity of demand for consumer credit with respect to primary finance rates would be close to zero. If the population includes some unrationed consumers, elasticity will be a larger (negative) number than would have been true if only rationed consumers were included.

The monthly payment or credit-terms model on the other hand, predicts that the separate elasticities of the demand for credit with respect to finance rates and contract maturities are a function of the proportionate effect of changes in each on the size of monthly payment. The elasticity of demand with respect to finance rates, according to this model, is a function of the proportionate change in monthly payments resulting from the change in finance rates, downpayment (loan size) and maturity held constant.

To set up an empirical test of these alternative models is a difficult task. The contract maturity variable has a prominent role in both; if changes in maturities dominate time series, these data will be of little help in choosing between the alternatives. Cross-sectional data might be useful since there appear to be persistent differences in the average finance rates charged by primary lenders in particular market areas. Automobile rates seem to be relatively high in the West, for example, and relatively low in the Northeast and North Central States.[20] We have not attempted to exploit cross-section data for our purposes, largely because we have a readily accessible alternative, a body of experimental data which was explicitly designed for the purpose of testing these models.[21]

[20] It is not clear whether these differences are wholly offset by compensating differences in risk.

[21] To be precise, the experimental question was designed as a test of the monthly payments model. We developed the marginal borrowing-cost model on the basis of some suggestive relationships found in the data.

Design of the Experimental Data

The basic sample for this experiment consists of some 16,000 member-subscribers to Consumers Union of the United States, a product testing and rating organization. These households were the surviving respondents of a consumer panel which originally numbered about 24,000; a questionnaire was mailed in April 1960 to some 16,000 of those households which had received and answered three previous mail questionnaires—in April 1958, October 1958, and April 1959.[22] The general format for the 1960 survey was about the same as the others, with these differences: it was about 50 per cent longer, requested much more quantitative detail about the household's asset structure, and included an array of questions dealing with the use of credit.

One question asked prospective borrowers to indicate their preferences among a set of hypothetical financing arrangements. Survey questions of this kind are dangerous, mainly because it is doubtful that the respondent would act exactly as he talks. From such evidence, forecasts of the future behavior of consumers cannot be made with any degree of precision, although the pitfalls can be minimized.

Since it was clear that reactions to hypothetical alternatives could not be interpreted as if they were reactions to real alternatives, we rely exclusively on comparisons involving differences in the reactions of randomly selected groups to alternate hypothetical circumstances. That is to say, we argue that, although one cannot infer precisely what respondents will actually do from what they say they "will do if," one can make legitimate inferences about differences in actual behavior from differences in what alternate groups of respondents say they "will do if." The logic of the argument implies that the real difficulty with hypothetical constructs is that the level of the response is biased; if one asks how many will buy apples if the price is 20 cents a dozen, the fraction that says yes may be a poor estimate of the fraction that will

[22] The response rates for the previous surveys, and the characteristics of the Consumers Union sample, are discussed in F. Thomas Juster, *Anticipations and Purchases*, a National Bureau study, in press. In general, the Consumers Union sample analyzed in this paper consists of households that, relative to the population, tend to be younger and to have larger incomes, asset holdings, and stocks of durable goods.

actually buy. But if one sample is asked about prospective purchases if the price were 20 cents, another if the price were 30 cents, and a third if the price were 50 cents, we would expect the smallest fraction to respond affirmatively in the last group and the largest in the first group, and would infer that the lower price has attracted more buyers although we would have little confidence in the implicit estimate of price elasticity.[23]

If the incomes of the buyers in the sample were known, a similar procedure could be used to estimate income elasticity. We argue that neither the price nor income elasticity estimates obtained from this procedure are quantitatively reliable, since we have no way of knowing whether people underestimate or overestimate their willingness to make decisions on hypothetical transactions. However, we expect that the difference or ratio of the two will yield valid inferences about whether price or income elasticity was larger, and how much larger. This research procedure involves some drastic assumptions, but we believe it to be a better way of making estimates than any practical alternative involving the same outlay of time and money. It is even possible that the procedure is the best of the practical alternatives, regardless of cost.

The sample was divided into sixteen randomly selected groups, hereafter referred to as variant groups or variants, shown in Table 1. Each variant group was given a different set of hypothetical credit contracts. Most of the sixteen sets contained four different contracts, hereafter referred to as financing alternatives or simply alternatives. The prospective purchase was the same for all sixteen variant groups, an automobile costing $1,500 after allowance for the trade-in. With the exception of four variant groups (1, 3, 5, and 7), the finance rates were

[23] Note that this procedure prevents respondents from "learning while answering," which would necessarily have the effect of forcing price elasticity to be negative and income elasticity to be positive. A series of survey questions that asked a respondent how much he would buy if the price were X, how much if the price were $X + \Delta X$, and so forth, is bound to show that people, on the average, buy more when the price falls and less when it rises even if the actual elasticity within the specified price range were zero. Otherwise, someone would have to report that he prefers higher-priced apples to identical but lower-priced ones. Our procedure minimizes the information obtained from any one respondent and is thus capable of showing elasticities of any size or sign.

TABLE 1

ALTERNATIVE FINANCE PLANS FOR SPECIFIED VARIANT GROUPS

If your family has ever used instalment credit in purchasing a car or might do so in the future, please indicate your preference among the following sets of financing arrangements. Make your choices on the assumption that you are interested in buying a car that, after trade-in allowance, would cost $1,500.

Please show preferences by marking 1, 2, 3, etc. alongside financing arrangements that would be acceptable to you, taking into account your present financial situation.

Please mark "X" alongside all *financing arrangements that are* not *acceptable to you, that is, arrangements that would discourage you from buying.*

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Interest Charge, % per year*	*Please Mark Choice Here*
NONE	$127.70	12	4%	—
NONE	67.70	24	8%	—
NONE	49.40	36	12%	—
NONE	41.50	48	16%	—

0-1

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Interest Charge, % per year*	*Please Mark Choice Here*
NONE	$135.80	12	16%	—
NONE	72.90	24	16%	—
NONE	51.90	36	16%	—
NONE	41.50	48	16%	—

0-2

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Interest Charge, % per year*	*Please Mark Choice Here*
NONE	$135.80	12	16%	—
NONE	70.30	24	12%	—
NONE	46.80	36	8%	—
NONE	33.80	48	4%	—

0-3

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Interest Charge, % per year*	*Please Mark Choice Here*
NONE	$127.70	12	4%	—
NONE	65.10	24	4%	—
NONE	44.20	36	4%	—
NONE	33-80	48	4%	—

0-4

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
NONE	$127.70	12	—
NONE	67.70	24	—
NONE	49.40	36	—
NONE	41.50	48	—

0-5

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
NONE	$135.80	12	—
NONE	72.90	24	—
NONE	51.90	36	—
NONE	41.50	48	—

0-6

(continued)

TABLE 1 (continued)

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
NONE	$135.80	12	—
NONE	70.30	24	—
NONE	46.80	36	—
NONE	33.80	48	—

0-7

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
NONE	$127.70	12	—
NONE	65.10	24	—
NONE	44.20	36	—
NONE	33.80	48	—

0-8

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
NONE	$255.80	6	—
NONE	130.40	12	—
NONE	67.70	24	—

0-10

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
$ 0	$65.10	24	—
200	56.40	24	—
400	47.70	24	—
600	39.10	24	—

0-9

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
NONE	$255.80	6	—
NONE	130.40	12	—
NONE	67.70	24	—
NONE	46.80	36	—

0-11

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
$ 0	$72.90	24	—
200	63.20	24	—
400	53.50	24	—
600	43.80	24	—

0-12

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
NONE	$255.80	6	—
NONE	130.40	12	—
NONE	67.70	24	—
NONE	46.80	36	—
NONE	36.35	48	—

0-14

FINANCING ARRANGEMENTS

Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
$ 0	$65.10	24	—
200	65.10	21	—
400	65.10	17	—
600	65.10	14	—

0-13

(continued)

TABLE 1 (concluded)

FINANCING ARRANGEMENTS				FINANCING ARRANGEMENTS			
Cash Down-payment	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*	*Cash Down-payment*	*Amount of Monthly Payments*	*No. of Months to Pay*	*Please Mark Choice Here*
NONE	$261.60	6	—	$ 0	$65.10	27	—
NONE	135.80	12	—	200	65.10	23	—
NONE	72.90	24	—	400	65.10	19	—
NONE	51.90	36	—	600	65.10	15	—
NONE	41.50	48	—				
0-15				0-16			

NOTE: The effective annual rates in the financing arrangements are as follows:[a]

Financing Alternative	Variant Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4	16	16	4	4	16	16	4	4	8	8	16	4	8	16	16
2	8	16	12	4	8	16	12	4	4	8	8	16	4	8	16	16
3	12	16	8	4	12	16	8	4	4	8	8	16	4	8	16	16
4	16	16	4	4	16	16	4	4	4		8	16	4	8	16	16
5														8	16	

[a]The rates shown are approximate. See text footnote 24 for description of the computational procedure.

the same for each of the alternatives.[24] For example, respondents receiving variant 14 were given alternatives about contract maturity, downpayment, and monthly payments, all of which contained an implicit

[24]The "true" finance rates are never, except by chance, exactly the same as the rates built into the alternatives, for two reasons. (1) The procedure for obtaining the numbers used in the survey schedule involved: specification of the general characteristics of each financing alternative—downpayment, finance rate, and contract maturity; calculation of the monthly-payment size needed to satisfy these general characteristics; and rounding of the monthly-payment size. For two variants, we set the monthly payment size and calculated contract maturity, to the nearest whole month. (2) For calculation of either monthly payment amounts or contract maturity corresponding to any given interest rate, we used the constant ratio formula, $i = \frac{24D}{P(n+1)}$, to estimate the number of dollars (D) in the finance charge. A more accurate, but cumbersome, procedure would have been to compute the monthly payment from the theoretically correct annuity or present-worth formula,

8 per cent finance rate. Variant group 15 received the same kind of alternatives except that the implicit finance rate was 16 per cent.[25]

as shown below. The notations for both formulas follow:

r = effective interest rate per month (per cent)
i = effective interest rate per year (per cent)
R = amount of each equal monthly payment (dollars)
P = principal amount of loan (dollars)
n = number of monthly payments to discharge the debt
D = finance charge (dollars)

The effective monthly interest rate corresponding to any given annual interest rate is given by rearranging the customary formula,

$i = (1 + r)^{12} - 1$, to solve for r;
$r = \sqrt[12]{1 + i} - 1$

Given the effective monthly rate, r, the monthly payment can be calculated from the annuity formula,

$$R = \frac{Pr\,(1 + r)^n}{(1 + r)^n - 1}$$

Consequently, if one goes back and recalculates the true rates that correspond to the alternatives shown on the survey schedule, the results will differ from the rates shown in Table 1 and in some cases (variants 13 and 16) will be quite different. For example, the rates on variant 10, using a present worth formula with monthly compounding, range from 8.3 per cent to 8.1 per cent instead of 8.00 per cent, as we specify. Since we are interested in comparing responses to sets of alternatives with rates of (roughly) 4 per cent, 8 per cent, and 16 per cent, respectively, it makes no real difference whether the rates are actually 4, 8, and 16 per cent or 3.9, 8.2, and 15.8 per cent. Rounding—which will make the rates rough estimates regardless of the computational formula used—is essential; otherwise, respondents would look at choices marked $65.07 per month, $96.14 per month, or 17.37 months and might spend their time trying to reconstruct the arithmetic.

Finally, the rates on variants 10, 11, and 14 are all specified to be 8 per cent; however, the "true" (present worth, monthly compounding) rates on these variants are correlated with maturity because the constant ratio formula has a slight but systematic bias. Consequently, the lowest rates on variants 10, 11, and 14 are, respectively, 8.1 per cent, 8.0 per cent, and 7.9 per cent, and we use these variants to measure the response to differences in maximum maturities, hence to lower minimum monthly payments, other things equal. In the absence of any other information, therefore, the argument could be made that the pattern of preference among these variants might be due either to the fact that the minimum payments decline or that the true finance rates decline. However, the quantitative difference in preferences for several sets of other variants, with no variation except in finance rate, is clearly inconsistent with this hypothesis (for example, variants 6 and 8 or 14 and 15). Hence, we treat the observed preferences as due entirely to differences in minimum monthly payments.

[25] The alternatives could not be made absolutely identical, since the total required payment for a given loan is greater when the finance rate is 16 per cent than when it is 8 per cent. The examples mentioned are shown in Table 1.

Respondents started with the same basic problem, whether and how to finance an automobile costing $1,500 net of trade-in. They were asked to skip the question if they were nonusers of credit, that is, if they had "never used instalment credit in the past and would not in the future"; about a quarter of the respondents skipped it. Credit users were asked to rank the alternative finance plans in order of preference (1, 2, etc.) indicating by an X alternatives that were not acceptable to them.[26] Four alternatives were given in all but three of the variants—10 14, and 15, which contained 3, 5, and 5 alternatives, respectively—permitting respondents to indicate patterns like (1, 2, X, X), (X, X, X, 1), (X, X, X, X), (2, 1, 3, 4), and so forth. Nonusers of credit who followed instructions should have left the question unanswered; credit users should either have marked a preference ranking or an X beside each alternative. The distribution of responses is summarized in Appendix B.

Three kinds of comparisons were built into the sixteen sets of financing alternatives, although fortunately some originally unanticipated comparisons can also be made. First, we wanted to compare the differences in preference patterns and in the fraction rejecting all the alternatives between variants where the alternatives were the same, *mutatis mutandis*, except for differences in finance rates. Secondly, we wanted to compare differences in preferences or the rejection pattern for variants that contained the same finance rate and downpayment but whose alternatives had successively more lenient maturity arrangements and correspondingly lower minimum monthly payments. Finally, we wanted to compare differences in preference and rejection patterns for groups that received identical financing alternatives, except that the interest rate was implicit for one group and specified for the other.

The question asked of all variant groups is shown at the top of Table 1, and each of the sixteen sets of alternatives are reproduced with the variant number located as the right-hand digit (s) in the subscript under the first column (i.e. 0-1 is variant 1, etc.). Each respondent received the question and one of the sixteen sets of alternatives. As re-

[26] The intellectual antecedent of this survey design was an experiment conducted by Albert G. Hart in an economic theory class at Columbia University. The experiment dealt with construction of a community preference map and is reported in S. Rousseas and A. G. Hart, "Experimental Verification of a Composite Indifference Map," *Journal of Political Economy*, Aug. 1951. Needless to say, Hart is not responsible for any results stemming from our having borrowed parts of an experiment designed for a wholly different purpose.

spondents were given the opportunity to accept or reject all or any of them, it was possible to compute the percentage of each variant group rejecting all finance alternatives (1-A) or accepting at least one (A).[27] The average contract maturity of the preferred alternative, for those accepting at least one, was also computed for each variant group.[28] The analysis of differences between variant groups in acceptance ratios constitutes our main source of evidence. They provide a measure of the difference in the proportion of households willing to use credit because of the rate or payments differences built into the variants. The differences in average preferred contract maturity measure roughly the difference in the average quantity of credit outstanding because of rate or payment differences.

The experimental data thus have a measure of consumer response to "pure" differences in finance rates, and an independent measure of response to "pure" differences in monthly payments. Both measures are based on the response to questions involving sets of hypothetical alternatives. Both sets of alternatives are designed to approximate real alternatives, that is, they present consumers with choices based on the kind of information they actually get when they investigate a real transaction: price net of trade-in, downpayment, monthly payments, and contract maturity. In neither case was the (implicit) finance rate

[27] It is quite possible that the form of the question encouraged respondents to indicate acceptance of at least one alternative; if so, both the level of A (and probably the differences as well) would be overstated relative to a question that did not contain this particular bias.

[28] The pattern of first preferences clearly indicates that our respondents either are not very good at arithmetic or did not take the trouble to make close calculations —probably both. There are several variant groups in which the finance alternatives contain negative marginal finance rates. That is, in variants 3 and 7, respondents are given the choice of borrowing the same amount of money for a longer period and paying not only a lower rate but a smaller absolute amount. In such cases no respondent who does the arithmetic would prefer the higher rate—shorter maturity alternative *X*—to the lower rate—longer maturity alternative *Y*.

Any respondent could contract for *Y* but make payments as if he had contracted for *X*. At the end of the shorter period of alternative *X*, the respondent would have accumulated enough cash to pay off the remaining payments in full on *Y* and still have cash left over. There are numerous respondents, however, who said they preferred *X* to *Y*. While it is quite possible for respondents to say that either is acceptable, it is not logically possible to prefer *X* to *Y* if the respondent does the arithmetic. See Appendix C for further discussion.

specified for respondents.[29] Thus the estimates of both finance rate and monthly payments elasticity are subject to whatever bias exists because consumers are reacting to hypothetical rather than real alternatives. But the ratio of the two is not necessarily biased; and several writers have estimated (from time-series data) the elasticity of demand for credit with respect to changes in monthly payments, providing a link between our experimental survey data and reality.[30]

The Empirical Results

The responses of the relevant variant groups are summarized in Table 2. It shows usable responses for each of the sixteen variant groups, the fraction of each group indicating that they would accept at least one of the alternative financing arrangements (A), and the computed elasticities for comparisons involving differences in finance rates or in minimum obtainable monthly payments. Variants designed to estimate finance rate elasticity customarily provide identical downpayment, loan size, and contract maturity; the finance rate differences appear to respondents as a difference in monthly payments. The one exception is in variant 13 (4 per cent rate) and variant 16 (16 per cent rate). The rate difference here shows up as a difference in contract maturity for alternatives with identical loan size, downpayment, and monthly payments.

Table 2 also shows the elasticities predicted by the payments model, based on analysis of responses to variants 10, 11, and 14. They all contain zero downpayment, an 8 per cent finance rate, and successively longer maximum contract maturity and minimum monthly payment alternatives. Since the elasticities estimated from differences in responses between 10 and 11, 11 and 14, and 10 and 14 are not independent, we take the elasticity based on the largest payment difference (between 10 and 14) as our most reliable estimate. The payments elasticity thus estimated, –0.172, is applied to the difference in minimum monthly payments between other pairs of variants, differences that are a consequence, other

[29] In sect. II below, experimental data are also utilized; we compare responses to variants on which rates were specified for some groups but not for others. The data used here are from responses to variants without specified rates.

[30] See Kisselgoff, *Factors Affecting the Demand;* and Suits, *The Demand for New Automobiles;* see also Suits, testimony, "Administered Prices."

TABLE 2

FRACTION ACCEPTING ONE OR MORE ALTERNATIVE FINANCE PLANS FOR SPECIFIED VARIANT GROUPS, CREDIT USERS ONLY

No.	*Variant Groups*[a] Characteristics	No. of Usable[b] Responses	A	Variant Pairs	*Elasticities*[c] Computed	*Elasticities*[c] Predicted by Payments Model
		INTEREST RATE CONSTANT (8%)				
10	Maximum M = 24	261	76.6	10-11	−.058	neg.
11	Maximum M = 36	252	78.2	11-14	−.299	neg.
14	Maximum M = 48	254	84.3	10-14	−.172	neg.
		DOWNPAYMENT CONSTANT (0)				
14	(*i* = 8%)	254	84.3	14-15	−.098	−.034
15	(*i* = 16%)	252	79.0			
8	(*i* = 4%)	211	80.6	8-6	−.048	−.029
6	(*i* = 16%)	255	76.1			
		CONTRACT LENGTH CONSTANT (24 mos.)				
9	(*i* = 4%)	265	81.5	9-12	−.005	−.016
12	(*i* = 16%)	248	81.0			
		MONTHLY PAYMENTS CONSTANT ($65.10)				
13	(*i* = 4%)	246	84.7	13-16	−.036	.000
16	(*i* = 16%)	263	80.2			

SOURCE: Consumers Union—NBER reinterview sample.

NOTE: A = proportion of respondents accepting one or more of the financing alternatives; M = contract maturity in months; i = interest rate.

[a] See Table 1.

[b] See Appendix B.

[c] See footnote 31.

things being equal, of differences in the implicit finance rates.[31] If all that matters to consumers is whether they can afford the minimum payments, it will make no difference whether payments fall because the finance rate is lower or because the contract maturity is extended; hence the same payments elasticity, sampling variability aside, will apply to either case and the predicted (payments based) elasticity should be equal to the observed elasticity.

From Table 2, we chose –.172 as the best estimate of the "pure" payments elasticity obtained from choices among hypothetical alternatives.[32] This estimate answers the question, how much variation takes

[31] The calculation is as follows. The fraction accepting at least one of the alternative finance plans is 76.6 for variant 10, 84.3 for variant 14. The per cent change in quantity demanded is thus 76.6 –84.3 ÷ 84.3 + 76.6/2. The corresponding per cent change in minimum monthly payments is 67.70 –36.35 ÷ 67.70+36.35/2. The ratio of the first of these numbers to the second is –.172, which is the elasticity of demand for credit with respect to monthly payments, interest rates and downpayment held constant.

Next, we observe that 80.6 per cent of the sample would accept at least one of the alternatives in variant 8, in which the finance rate is 4 per cent; this fraction falls to 76.1 per cent in variant 6, which is identical with 8, except that the finance rate is 16 per cent. Because the finance rates are different, the minimum obtainable monthly payment in variant 8 is $33.80, for variant 6, $41.50, both for contracts with 48-month maturity. If the difference in A ratios between variants 8 and 6 is due solely to the fact that the minimum monthly payments are different, the elasticity with respect to minimum payments should be the same as computed above, that is, –.172. An elasticity with respect to payments of –.172 requires the relative change in quantity to be –.035, since the relative change in price is 41.50 –33.80 ÷ 41.50 + 33.80/2 or +.204. Finally, for the relative change in quantity to be –.035, the elasticity with respect to finance rates must be –.035 ÷ (16–4)/(16 + 4)/2, or –.029. This is the figure shown in the last column in Table 1.

[32] We have an interesting test here of whether or not respondents are treating the question seriously or simply playing games. If the latter were true the choice patterns would be random, given the rules. The rules are: (1) either a preference ranking or an x should be placed beside each alternative finance plan; (2) any number of x's can be used; (3) only one alternative can be marked with a given preference ranking, i.e., no two rankings can be identical; and (4) a lower preference ranking cannot appear unless all higher ones have also appeared. If respondents marked choices at random, variants 10, 11, and 14 would show predictable differences in the frequency of responses containing an x beside each alternative. For variant 10 the expected frequency of xxx responses, given the rules, is roughly 6 per cent. For variant 11, the expected frequency drops to less than 1 per cent, and for variant 14 to about .1 per cent. Neither the observed levels nor the differences are consistent with the assumption of random choices.

There is, however, some tendency toward what might be described as a random

response, most notably in the responses to variants 10, 11, and 14 where the numbers of alternatives are, respectively, 3, 4, and 5. Aside from sampling fluctuations, it should be observed that: at least as high a proportion of respondents accepting one of the alternatives in 10 must accept one or more of the alternatives in 11, since 11 contains every alternative in 10 plus an additional one; the groups of respondents who prefer alternatives 1 and 2 in variant 10 must be equal in size to the groups preferring alternatives 1 and 2 in variants 11 and 14, that is, the universe of respondents who prefer 12 payments to 24 must also prefer 12 payments to either 36 or 48; the group of respondents rejecting all alternatives in 10 but accepting one alternative in 11 must show a preference for the longest maturity alternative in 11 because it is the only difference between the two variants and, similarly, for the group of respondents rejecting all alternatives in 11 but accepting one alternative in 14. If the same number of respondents had returned 10, 11, and 14, the rejection and preference patterns might be something like those shown below.

			Percentage of First Preference in Alternative				
Variant	*Total Cases*	*A*	*1*	*2*	*3*	*4*	*5*
10	100	80	30	30	20	—	—
11	100	87	30	30	12	15	—
14	100	95	30	30	12	9	14

A = Percentage accepting at least one alternative.

The first preferences for alternatives 1 and 2 must be identical for variants 10 and 11, and identical for alternatives 1, 2, and 3 comparing variants 11 and 14. The number of first preferences for the longest maturity in 11 must be at least as great as the difference between 10 and 11 in the number accepting at least one alternative, and similarly for the comparison of variants 11 and 14. The first preference for the longest maturity alternative in variant 11 will generally be greater than that difference, because some people who would accept 24 months in 10 would prefer 36 months, and similarly for the comparison of 11 and 14.

In fact, however, the first preference patterns are as follows:

			Percentage of First Preference in Alternative				
Variant	*Total Cases*	*A*	*1*	*2*	*3*	*4*	*5*
10	261	76.6	4.6	23.5	48.5	—	—
11	252	78.2	3.2	20.0	39.7	15.2	—
14	254	84.3	5.5	14.2	43.3	16.2	5.1

A = Percentage accepting at least one alternative.

Both alternatives 1 and 2 lose respondents comparing variants 10 and 11. Comparing variants 11 and 14, alternative 2 has a lower frequency of respondents but alternatives 1 and 3 have higher frequencies; sampling variability may account for the difference from the predicted pattern. But it does look as if presence of more alternatives simply spreads out the first preference pattern at random to a limited extent.

place in what people say they would do as maturities are extended, other things equal?[33] The four independent comparisons of a similarly hypothetical finance rate elasticity shown in Table 2 indicate that the response to rate differences is greater than predicted by the payments model in three of the four cases, variant pairs 6-8, 14-15, and 13-16.[34] The computed finance rate elasticity in the fourth case, variant pair 9-12, though negative, is slightly less than would have been predicted on the basis of the difference in minimum monthly payments. Averaging the four comparisons: the mean predicted elasticity is –.020; the mean observed elasticity is –.047—more than double although still quite small in absolute terms.[35]

The evidence in Table 2, on the whole, suggests that the monthly payments model may underestimate consumer response to variations in finance rates. None of the observed differences are big enough to inspire much confidence in this conclusion, but we must bear in mind that neither the marginal borrowing cost nor the monthly payments model would predict that finance rate elasticity for the community as a whole is very large. The monthly payments model suggests that rate elasticity is negligible for all credit users. The marginal borrowing cost model suggests that rate elasticity is negligible for rationed consumers but not for unrationed ones, while the reverse is predicted with regard to payments elasticity. In a sample composed mainly of rationed consumers but with some unrationed ones, both models predict that finance rate elasticity will be small. They differ only in that the marginal borrowing cost model predicts that rate elasticity, though small, will be

[33] Earlier studies (Haberler, *Consumer Instalment Credit,* and Kisselgoff, *Factors Affecting the Demand*) suggest that the demand function is quite sensitive to such changes. As noted previously, we need a measure of the variation in response to differences in hypothetical maturity alternatives to serve as a bench mark against which to compare the variation in response to a similar difference in interest rates.

[34] None of the computed elasticities are significantly different from zero at the 5 per cent level; hence none of the differences between predicted and observed finance rate elasticity come close to significance.

[35] Another way of looking at the same results is to contrast the observed payments elasticity of –.172 with the mean observed finance rate elasticity of –.047. The payments elasticity is roughly four times as large; if rates were important only because of their effect on payments, the pure payments elasticity should be about 10 times the rate elasticity.

higher than suggested by the mechanical association between rates and monthly payments. That appears to be true, but the differences are barely noticeable and not statistically significant.

A stronger test of the marginal borrowing cost model requires a classification of sample households into rationed and unrationed groups. Data that confirm or deny the existence of differences in the behavior of these groups should provide a more discriminating test than the simple comparison of observed with predicted elasticities for the sample as a whole. While such a classification is not directly observable, information supplied by respondents is sufficient to permit sorting into groups consisting of those more or less likely to be rationed or unrationed. Relatively high income consumers probably tend to have marginal borrowing costs equal to the primary credit source rate on consumer loans, because they are more likely to have assets that can be used as collateral. Older consumers probably have the same, because their preferred debt level must be relatively low. It follows that relatively low income or younger households are more apt to be rationed. Other classifications according to amounts of liquid assets and according to discernible attitudes are discussed below.

The sample was first classified according to income and marital status as shown below, where R = rationed and U = unrationed.

	Income After Tax ($000's)		
Marital Status	*Under $8*	*$8-$10*	*Over $10*
Married 15 years or less	R	R	U
Married more than 15 years or unmarried	R	U	U

Consumers with after-tax incomes of less than $8,000 were considered to be rationed, those with more than $10,000 to be unrationed, and the middle group rationed if younger married but not if older or unmarried. The specific cutting points are clearly arbitrary, but the classification principle seems reasonable. Table 3 shows the distribution of rationed and unrationed respondents based on the above classification, the fraction who accepted at least one of the alternatives for each variant group, the computed elasticities with respect to change in minimum

monthly payments and finance rates, and the finance rate elasticity predicted by the payments model.[36]

As predicted by the marginal borrowing cost model, rationed consumers respond much more to differences in minimum monthly payments than do unrationed ones (an estimated elasticity of –.231 compared to –.083) while unrationed consumers are somewhat more sensitive to finance rates (a mean elasticity of –.072 compared to –.060 for the four possible comparisons, and a mean of –.134 compared to –.067, excluding the one comparison in which the sign of finance rate elasticity is positive).[37]

Further, a more demanding result predicted by the marginal borrowing cost is also observable in these data. We noted earlier that a combination of higher rates and longer maturities, minimum monthly payment declining on balance, should increase the borrowing of rationed consumers (because payments fall) but decrease that of unrationed consumers (because rates rise). A comparison of responses to variants 6, 10, 11, and 15 permit a test of these propositions.

Variants 10 and 11 both have an 8 per cent rate, variants 6 and 15 a 16 per cent rate throughout (see Table 1). In variant 10, the maximum contract length is 24 months and the minimum possible monthly payment $67.70. Variant 11 is the same as 10 except that a 36 month option carrying monthly payments of $46.80 is also available; the other two variants, 6 and 15, both offer terms out to 48 months carrying a monthly payment of $41.50. The model predicts that rationed consumers will prefer variants 6 or 15 to either 10 or 11, since the minimum monthly payment is lower despite the fact that the finance rate is twice as high. On the other hand, unrationed consumers should prefer either 10 or 11 to 6 or 15, since the finance rate is lower even though the minimum

[36] Note that the above income and marital-status classification puts roughly 60 per cent of the credit users in the Consumers Union Sample into the rationed category. A similar classification applied to the U.S. population as a whole would put a considerably higher fraction into the rationed category.

[37] None of these elasticities is significantly different from zero.

TABLE 3

ESTIMATED FINANCE-RATE AND MONTHLY-PAYMENT ELASTICITY OF DEMAND FOR HOUSEHOLDS CLASSIFIED AS RATIONED OR UNRATIONED ON THE BASIS OF FAMILY INCOME AND MARITAL STATUS

A. BASIC DATA

Variant[a]						
	Interest Rate	Minimum Monthly Payment	*Rationed Households*		*Unrationed Households*	
Number	(per cent)	(dollars)	N	A	N	A
10	8	67.70	143	75.5	99	77.8
11	8	46.80	138	79.8	87	73.6
14	8	36.35	144	86.8	88	81.8
6	16	41.50	162	78.4	70	68.6
8	4	33.80	123	79.7	66	77.3
9	4	39.10	145	86.2	90	71.1
12	16	43.80	161	81.4	82	81.7
14	8	36.35	144	86.8	88	81.8
15	16	41.50	151	80.1	83	69.9
13	4	65.10	133	86.5	88	80.7
16	16	65.10	167	82.0	78	74.4

B. ELASTICITIES[b]

Variant Numbers	*Observed*		Predicted by Payments Model
	Rationed	Unrationed	
	MONTHLY-PAYMENT ELASTICITIES		
10-11	−.152	+.150	neg.
11-14	−.334	−.420	neg.
10-14	−.231	−.083	neg.
	FINANCE-RATE ELASTICITIES		
8-6	−.029	−.099	−.029
9-12	−.048	+.116	−.016
14-15	−.120	−.235	−.034
13-16	−.044	−.068	.000
Average of four	−.060	−.072	−.020

NOTES TO TABLE 3

SOURCE: Consumers Union–NBER reinterview sample. See text for description of the rationed-unrationed classification.

NOTE: N = sample size; A = acceptance ratio.

[a] See Table 1 for complete layout of financing alternatives in each variant pair.

[b] See text for description of procedures.

obtainable monthly payment is higher. The differences in acceptance ratios are as follows:

Direction of Change: Rates Increase, Payments Fall	*Rationed Consumers*	*Unrationed Consumers*
From 10 to 6	+2.9	–9.2
From 10 to 15	+4.6	–7.9
From 11 to 6	– 1.5	–5.0
From 11 to 15	+0.2	–4.6

All but one comparison, 11 versus 6 for rationed consumers, shows a difference in the predicted direction. The comparisons involving variant 10 should provide more consistent evidence than those involving variant 11, since the magnitude of the difference in payments is greater, and comparisons here show noticeable differences in the predicted direction. We regard this as powerful evidence that the response of rationed consumers to changes in finance rates is relatively weak and their response to minimum monthly payments relatively strong, and conversely for unrationed consumers. In addition, the distinction between rationed and unrationed consumers seems to us to be crucial to analysis of consumer response to variations in finance rates.

An alternative classification of respondents based on liquid asset holdings to distinguish rationed from unrationed consumers shows similar results. In it, rationed consumers are those with less than $2,000 in checking accounts, savings accounts, and savings bonds; unrationed

are those with $2,000 or more.[38] Table 4 shows the distribution of consumers so classified, the acceptance ratios, the computed elasticities, and predicted elasticities.

The response to finance-rate differences is as predicted by the marginal borrowing cost model; the mean elasticity for the four possible comparisons is −.103 for unrationed consumers, −.012 for rationed consumers. Two of the four observations for the rationed groups show small positive elasticities, while all four elasticity estimates for the unrationed group have the appropriate negative sign. On the other hand, the monthly payment elasticities are perverse; unrationed consumers show a much stronger response to monthly payment differences than rationed consumers do, while the model predicts just the opposite. However, the perverse behavior of the payments elasticities carries little weight, in our judgment. Because of the specific cutting points selected for the liquid-asset classification, the sample sizes in the rationed group are quite small and the sampling errors correspondingly large.[39]

As before, we can also test the prediction that rationed consumers will prefer a combination of higher rates and longer maturities, payments declining on balance, while unrationed consumers will have the opposite preference. The relevant differences between variant groups in acceptance ratios are shown below; the directions of preferences are

[38] The choice of a liquid-assets cutting point provides a quite different distribution of the totals than that shown in Table 3, where income and marital status were used to distinguish rationed from unrationed. In Table 3 the ratio of rationed to unrationed consumers was about 2:1; the liquid-asset classification roughly reverses this ratio. In addition, fewer households are represented in Table 4 because information on liquid-asset holdings is lacking for some 2,000 respondents.

[39] The problem is more serious for estimates of the monthly payments elasticity than for estimates of finance-rate elasticity, since the data allow only two estimates of the former (from variants 10-11 and 10-14), and even these are not wholly independent since variant 10 is common to both. The estimated finance-rate elasticity, in contrast, is based on four completely independent estimates, hence the relevant sample size is quite large even though each of the groups involved is relatively small.

TABLE 4

ESTIMATED FINANCE-RATE AND MONTHLY-PAYMENT ELASTICITY OF DEMAND FOR HOUSEHOLDS CLASSIFIED AS RATIONED OR UNRATIONED ON THE BASIS OF LIQUID ASSET HOLDINGS

A. BASIC DATA

Variant[a]						
Number	Interest Rate (per cent)	Minimum Monthly Payment (dollars)	*Rationed Households* N	A	*Unrationed Households* N	A
10	8	67.70	62	82.3	116	80.2
11	8	46.80	57	80.7	110	83.6
14	8	36.35	56	83.9	123	91.9
6	16	41.50	69	82.6	108	73.1
8	4	33.80	50	80.0	96	77.7
9	4	39.10	48	89.6	105	79.0
12	16	43.80	61	80.3	97	76.3
14	8	36.35	56	83.9	123	91.9
15	16	41.50	77	83.1	107	77.6
13	4	65.10	58	79.3	109	86.2
16	16	65.10	73	82.2	106	78.3

B. ELASTICITIES[b]

Variant Numbers	*Observed* Rationed	Unrationed	Predicted by Payments Model
	MONTHLY-PAYMENT ELASTICITIES		
10-11	+.054	−.114	neg.
11-14	−.155	−.376	neg.
10-14	−.032	−.226	neg.
	FINANCE-RATE ELASTICITIES		
8-6	+.027	−.051	−.029
9-12	−.091	−.029	−.016
14-15	−.014	−.253	−.034
13-16	+.030	−.080	.000
Average of four	−.012	−.103	−.020

NOTES TO TABLE 4

SOURCE: Consumers Union–NBER reinterview sample. See text for description of the rationed-unrationed classification.

NOTE: N = sample size; A = acceptance ratio.

[a] See Table 1 for complete layout of financing alternatives in each variant pair.

[b] See text for description of procedures.

all as predicted by the marginal borrowing cost model.[40]

Direction of Change: Rates Increase, Payments Fall[a]	*Rationed Consumers*	*Unrationed Consumers*
From 10 to 6	+0.3	– 7.1
From 10 to 15	+0.8	– 2.6
From 11 to 6	+1.9	–10.5
From 11 to 15	+2.4	– 6.0

Some of our results suggested another possibility for classifying respondents into rationed and unrationed groups. Respondents were asked whether or not they had ever used consumer credit in the past, and whether or not they intended to do so in the future. About two-thirds of the credit-user group indicated a favorable attitude toward future use of instalment credit, while the remainder indicated an unfavorable attitude toward future credit use. In terms of the analytical model, it seems plausible that the favorable-attitude group is mainly

[40] The fact that the comparisons involving variant 11 show greater differences is due to the perverse behavior of the monthly payments elasticity for variants 10 and 11 in the rationed group. We expect that rationed consumers will have a stronger preference than unrationed ones for variant 11 relative to 10, although both groups logically must show either a preference for 11 over 10 or indifference, aside from sampling variability. Thus we ought to find that the difference in acceptance ratios between variants 11 and 6 (or 15) is algebraically smaller than the difference between 10 and 6 (or 15) for both groups, although the extent of the difference should be greater for rationed consumers. If the preferences for variants 10 and 11 are perverse, the opposite will be true, which it is for consumers classified as rationed by the liquid-assets criterion. It is true also for consumers classified as unrationed by the income and marital-status criteria. The latter difference is less troublesome, however, because we expect the true or "universe" difference in acceptance ratios between variants 10 and 11 to be relatively small for unrationed consumers, hence the odds are greater for drawing two samples with an inappropriate difference in acceptance ratios.

rationed consumers, the other group mainly unrationed. This supposition is consistent with data on mean income and age for the two groups. The favorable-attitude group is appreciably younger and had a mean 1958 gross income of about $8,500 per annum; the unfavorable-attitude group is older and had a mean gross income of about $11,000 per annum. The differences in mean holdings of liquid assets are also in the appropriate direction. Table 5 summarizes acceptance ratios and elasticities for respondents in each attitude classification.

The results show striking differences between the groups, again consistent with the marginal borrowing cost model. Compared with the rationed group, the mean finance-rate elasticity for unrationed consumers is much larger and the monthly payments elasticity somewhat smaller.[9] Mean finance-rate elasticity is actually larger than monthly payments elasticity for the unrationed group, but is less than one-fifth as large for the rationed group. The predicted difference in preferences for a combination of higher rates and longer maturities, payments declining on balance, is also evident in these data. Rationed consumers prefer variants 6 or 15 (16 per cent finance rate and 48 months maximum term) to either 10 or 11 (8 per cent finance rate and maximum terms of 24 and 36 months, respectively), while unrationed consumers express a strong preference for either 10 or 11 relative to 6 and 15.

Direction of Change: Rates Increase, Payments Fall	*Rationed Consumers*	*Unrationed Consumers*
From 10 to 6	+3.4	−15.0
From 10 to 15	+1.9	− 6.0
From 11 to 6	+2.5	−14.8
From 11 to 15	+1.3	− 5.8

Summary

In this section we have developed two models with empirically testable implications about consumer response to differences in finance rates and maturities on instalment credit contracts. One, the marginal borrowing cost model, essentially contains the other, the monthly payments model, as a limiting case, although the limiting case may be typical of

TABLE 5

ESTIMATED FINANCE-RATE AND MONTHLY-PAYMENT ELASTICITY OF DEMAND FOR HOUSEHOLDS CLASSIFIED AS RATIONED OR UNRATIONED ON THE BASIS OF ATTITUDE TOWARD THE USE OF CREDIT

A. BASIC DATA

Variant[a]						
			Rationed Households		*Unrationed Households*	
Number	Interest Rate (per cent)	Minimum Monthly Payment (dollars)	N	A	N	A
10	8	67.70	170	83.5	62	62.9
11	8	46.80	151	84.1	67	62.7
14	8	36.35	156	93.6	63	68.3
6	16	41.50	153	86.9	73	47.9
8	4	33.80	123	89.4	59	55.9
9	4	39.10	169	84.6	63	74.6
12	16	43.80	169	87.6	57	63.2
14	8	36.35	156	93.6	63	68.3
15	16	41.50	158	85.4	65	56.9
13	4	65.10	152	87.5	60	70.0
16	16	65.10	173	86.1	60	58.3

B. ELASTICITIES[b]

Variant Numbers	*Observed*		Predicted by Payments Model
	Rationed	Unrationed	
	MONTHLY-PAYMENT ELASTICITIES		
10-11	−.020	+.009	neg.
11-14	−.426	−.368	neg.
10-14	−.191	−.148	neg.
	FINANCE-RATE ELASTICITIES		
8-6	−.024	−.128	−.029
9-12	+.029	−.138	−.016
14-15	−.137	−.276	−.034
13-16	−.014	−.152	.000
Average of four	−.036	−.174	−.020

NOTES TO TABLE 5

SOURCE: Consumers Union–NBER reinterview sample. See text for description of the rationed-unrationed classification.

NOTE: N = sample size; A = acceptance ratio.

[a] See Table 1 for complete layout of financing alternatives in each variant pair.

[b] See text for description of procedures.

the situation faced by the majority of households. Our main emphasis has been on elaborating and testing the borrowing-cost model, since the alternative is tested by implication. All our empirical results are based on experimental data that measure differences in consumer responses to hypothetical alternatives. We have no illusions that this methodology is inherently sound or is bound to provide meaningful results. However, it does seem to us that it is not vulnerable to the criticism that responses are necessarily biased because real choices are not being made nor real alternatives presented.[41] We are willing, in effect, to assume that the responses can be interpreted as representing market choices among real alternatives.

The evidence is best viewed from the perspective of the more general, marginal borrowing cost, model. This model defines rationed consumers as those with average outstanding debt from primary lenders less than their preferred level of debt, given the finance rate actually paid; unrationed consumers are defined as those with actual debt from primary lenders equal to preferred debt, given the primary lender finance rate. The model predicts: (1) that unrationed consumers will respond more strongly than will rationed consumers to differences in finance rates; (2) that the response of rationed (but not of unrationed) consumers to finance rate differences will be wholly due to the fact that, other things being equal, the level of finance charges has an influence on monthly payments; (3) that a simultaneous increase in finance rates and in maximum contract maturity, minimum monthly payments declining on balance, will result in increased borrowing by rationed consumers but decreased borrowing by unrationed ones; (4) that the debt

[41] See above, pp. 20ff.

position of unrationed (but not rationed) consumers will be unaffected by lengthening of maximum contract maturity, finance rate being kept constant; and (5) that rationed consumers will respond more strongly than unrationed ones to differences in minimum monthly payments. Propositions 1, 3, and 5 are inferences from 2 and 4; if the latter are both true, the former must also be true, but the reverse might or might not be true.

When the sample is classified into groups that are "more likely" and "less likely" to be rationed, four independent tests of propositions 1 and 2, eight completely independent tests of proposition 3 — four each for rationed and unrationed consumers — and one test of propositions 4 and 5 can be constructed from the experimental data. Since we have three alternative procedures for classifying the sample into rationed and unrationed groups, the number of observations is tripled; the number of degrees of freedom is increased but not tripled, since the alternative classifications are not independent.

We have already noted that none of the observed differences in response between variant groups is statistically significant. However the large number of partly independent observations provides us with a sample of observed differences. Altogether we have 12 observations bearing on the predicted difference in finance-rate elasticity between rationed, R, and unrationed, U, consumers; 12 bearing on the predicted difference between the elasticity observed for R and that due solely to the mechanical relationship between rates and monthly payments; 24 bearing on the predicted response of R and U to simultaneous and opposite changes in finance rate and minimum payments; and 3 each bearing on, respectively, the predicted difference between R and U in payments elasticity and the level of payments elasticity predicted for U.

In our judgment the empirical results give remarkably strong support to the borrowing-cost model; of necessity, the alternative monthly payments model is inconsistent with the results. The most clear-cut evidence deals with consumer response to finance rates. In 10 of 12 observations, unrationed consumers show a stronger finance-rate elasticity of demand for credit than rationed ones do; the mean observed elasticity for these 12 cases is –.036 for rationed consumers, –.116 for unrationed ones. There is no clear indication that rationed consumers have a partial finance-rate elasticity (keeping the payments effect constant) greater than the predicted zero. Although the mean of the 12 observations shows an observed elasticity stronger than the

payments model predicts for rationed consumers, the difference is quite small, –.020 compared to –.036. Further, 6 of the 12 cases show observed elasticities weaker than predicted, hence the median difference between observed and predicted elasticities is a flat zero. The most impressive evidence, in our view, concerns the difference in response by rationed and unrationed consumers to simultaneous and opposite changes in finance rates and minimum monthly payments. In 11 of 12 tests rationed consumers preferred a set of alternatives involving lower minimum monthly payments, even though finance rates were twice as high. In 12 of 12 tests unrationed consumers expressed the opposite preference, i.e., for the set of alternatives involving relatively high monthly payments and relatively low finance rates. Thus the predicted algebraic sign of difference between rationed and unrationed consumers with respect to finance-rate elasticity appears in one form or another in 33 of 36 tests, a proportion significantly different from one-half by any reasonable standard.[42]

The predicted differences in monthly payments elasticity are not so firmly supported by the evidence. In two of the three "pure" cases, rationed consumers show a stronger response to differences in minimum payments, and the above analysis of concurrent change in rates and payments is additional evidence that rationed consumers respond more strongly to payments. However, there is no indication in the data that unrationed consumers have a zero response to differences in monthly payments, as predicted by the model. The explanation may lie in the fact that our classifications are imperfect. It is necessarily the case that some households classed in the rationed group are in fact less rationed than some classed in the unrationed group, and vice versa. Hence the differences that would be observed if the classifications were perfect are bound to be stronger than the differences observed in the classifications actually used. This possibility might be sufficient to explain the nonzero response to differences in payments for the unrationed group.

[42] The null hypothesis is that the true proportion in the universe is 1/2, that is, rationed consumers are as likely to have a larger as to have a smaller finance-rate elasticity than unrationed ones. If these cases were wholly independent—which they are not—the observed sample proportion of 33 out of 36 groups would occur less than 1 time in 1,000 in a universe where the true proportion was 1/2. Even a conservative estimate of the number of completely independent observations (say 12 rather than 36) only reduces the chance of observing a sample proportion of 1/12 to less than 1 in 100. The most conservative estimate (6 observations) reduces the chances to less than 5 in 100.

On the whole, the data offer considerable but not conclusive evidence in support of the borrowing-cost model. Some implications of the model are convincingly supported by the empirical evidence, while others are essentially not contradicted. For example, the implication that finance-rate elasticity of demand for credit is smaller (in absolute terms) for rationed than for unrationed consumers seems to us demonstrated beyond question; the implication that monthly payments elasticity is stronger for rationed than for unrationed consumers also seems reasonably well established. But the propositions that rationed consumers have a zero (partial) finance-rate elasticity and unrationed consumers a zero (partial) monthly payments elasticity, while not contradicted, are not firmly supported.[43] In sum, the evidence strongly supports predictions about differences in elasticities between rationed and unrationed households; predictions about the relative size of elasticities are not contradicted, but neither do they (nor could they) receive strong support from this experimental data.

Our results clearly indicate the necessity for qualification of the widely held view that consumer borrowing decisions are wholly unresponsive to changes in finance rates, aside from the effect of rate changes on monthly payments. This generalization appears to be valid for rationed consumers—those whose preferred and actual debt positions are different. It is not valid for unrationed consumers—those whose preferred and actual debt positions are equal. At present the majority of households in our sample, and an even larger majority of the population, are probably in the rationed category; hence, the above generalization may well be valid in the main. But several developments suggest that the future might be considerably different.

[43] One reason for caution here is that we have too few independent observations from which to estimate the monthly payments elasticity used to compute what we have called the predicted difference in response between groups to financing alternatives identical except for the level of finance rates. In principle, part of the difference observed between two such groups is simply due to the fact that higher finance rates must result in higher monthly payments, other things being equal; the payments elasticity provides an estimate of that part. Thus, our conclusion that the data are consistent with a partial finance-rate elasticity of zero for rationed consumers depends on the accuracy with which the payments elasticity has been measured. More independent observations of the payments elasticity would permit more confidence in the results. It follows, of course, that we have limited confidence in the conclusion that the predicted payments elasticity of zero for unrationed consumers is not contradicted by the evidence.

In the first place, the tendency of lenders to push out customary maximum maturities for the same quality of borrower tends to shift households from the rationed to the unrationed category. This tendency has operated strongly in the last several decades, and there is no reason to suppose that it will not continue. Our results suggest, for example, that a relative growth in credit contracts such as open-end mortgages would probably make consumer borrowing much more responsive to changes in finance rates. Second, the secular growth of incomes and wealth may also mean that the proportion of households in the unrationed classification will increase over time.[44] On both counts, we may expect consumers to be relatively more responsive to variations in finance rates in the future than at present, and also to be more responsive at present than they had been in earlier decades.

[44] If consumer wants tend to grow with income, wealth, and access to credit, as may well be the case, the net effect might be quite weak, although it should still operate in the indicated direction.