Chapter 6: Households

"A generation of 'new' consumers is emerging in the marketplace, and their demands are changing how society's sellers – from catalog companies to automobile manufacturers – are doing business."

Institute for the Future Report

Prologue

According to the (boldly-named) Institute for the Future, a new consumer has at least two of the following three characteristics:

- Information sophistication
- Access to information technology
- Choice in the marketplace

'Choice' in this context is just extra money to spend, access to information technology means using computers and the Internet at home and work. But what is 'information sophistication'? New consumers are 'voracious information ingesters' and 'use information in a distinct manner when making purchasing decisions.' In their report, the Institute for the Future staff explain the differences in information use. These include searching and experimenting online, of course, but also more traditional avenues such as more direct mail. Overall, they just search more, and in more varied ways. They are considerably more likely to use at least three channels of information gathering when making a purchasing decision. These channels include browsing in stores, magazines and newspapers, television ads, active requests for information from sellers and direct mail.

Are new consumers really new? Or is it just the environment and the opportunities for information gathering that are changing? Why all the fuss, if consumers ultimately are going to balance the 'bang for the buck' across all their purchases? What do 'old' consumers do when they shop? What are the various activities involved when households go shopping? In order to understand how shopping is changing, we have to know what makes up the process, and how it may differ for different kinds of products and services. Searching for price and product information, bargaining over the transaction, looking down the road at the implications for future purchasing decisions – these are all standrd aspects of shopping that need to be called out before we turn to what is new. This perspective applies as much to asset purchase decisions (houses, stocks and bonds) as it does to things that are only for current consumption – everything involves shopping.

Don't shop till you drop, read on instead!

6.1 Introduction

In the simple textbook world, households make choices among products and services based on given budgets, and well-defined options. Product characteristics and prices are known, and the buyer just balances the marginal utility per dollar spent on different products and services. This was the world that Shawn faced in Chapter 4. We did introduce some wrinkles there, the importance of time in particular, and we dealt with the time costs of shopping in a simple way.

In this chapter, we look at further complications for household purchasing decisions. For some products, such as cars and houses, households are not faced with given prices, but have to bargain with sellers (Section 6.2). In all cases, we have to search to find out about product characteristics, and learn who has a low price before making our purchasing decisions. We can gather information ourselves, using up valuable time in the process, or we can pay for the information (Section 6.3).

We also have to think about what happens down the road. Once we have selected a product, can we switch easily if it turns out not to be what we hoped, or if something possibly better comes along? The answer to this question can affect our initial choice (Section 6.4). In addition to all our current purchasing decisions, we have to manage whatever money we do not spend right away. Sometimes, this decision is tied up with our purchasing. When we buy a house, we also need a mortgage loan to finance the purchase. Search and switching costs are just as relevant for mortgage loans and financial assets as they are for houses, cars and computers (Section 6.5).

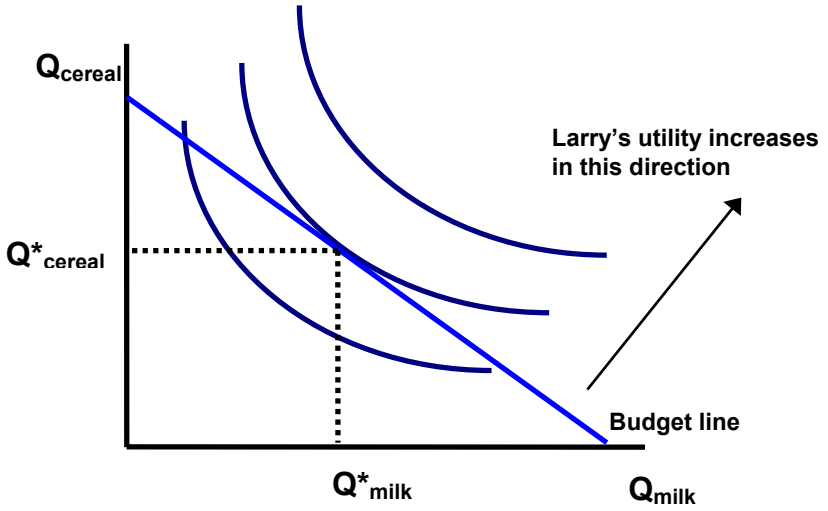
This chapter builds on the picture of household decision-making given in Chapter 4. It adds realism, in the form of complexities that make our lives as consumers harder. These complexities and their impacts help us glimpse the ways in which e-commerce may ultimately lead to the greatest changes in how we spend and save, and provide us with substantial benefits.

6.2 Cars and Houses

Lawrence Ellison, founder and CEO of Oracle (the second largest software company in the world – no prizes for guessing which is the largest) has a private jet that he likes to land at San Jose airport after permitted hours. Ellison also has several houses, and no doubt many cars. While most of us will never own our own airplane, almost everyone buys a car in his or her life, and most of us expect to buy a house. These are the largest purchases a typical household ever makes.

Buying a car has never been like going to the grocery store and picking up milk. In a grocery store prices are posted on the shelves, and the idea of bargaining over groceries would be laughed at. Shopping for groceries is like shopping for pizza and music, as in the case of Shawn in Chapter 4. You, and even Larry Ellison (let's be informal), decide how to spend your money on milk and cereal, based on their relative prices, and your relative preference between them, as shown in Figure 6.1, which is much like Figure 4.14 in Chapter 4.

Figure 6.1



Buying a car has been a bit different than this, for several reasons. First, you buy only one car at a time. You may adjust 'how much car' you buy, by choosing between different models and option packages, but there is certainly a greater degree of indivisibility in cars than in cereal (which, if you buy in bulk, does allow you to fine tune the quantity you buy). If we compare the demand curves for cereal and cars, they stack up roughly as in Figure 6.2. Figure 6.2a shows Larry's typical demand curve for cereal, which he buys in bulk, while Figure 6.2b shows his demand curve for red Ferraris (let's assume that's what he drives). His demand curve for cereal slopes downward: as the price of cereal goes up, Larry will want to buy less cereal. He may buy more milk, or Poptarts, or something else for breakfast. His demand curve for red Ferraris has a different shape: the horizontal portion reflects the maximum he is willing to pay, while the vertical portion reflects the maximum quantity he is willing to buy (one).

Figure 6.2a

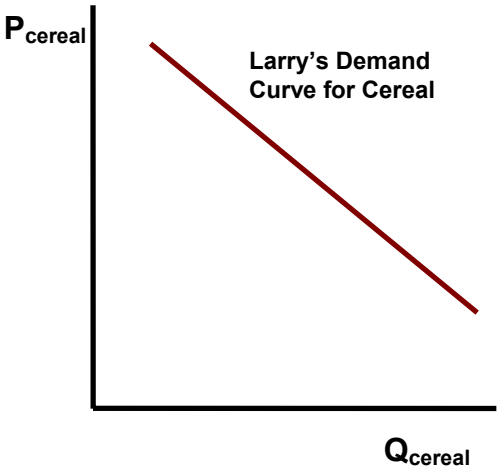
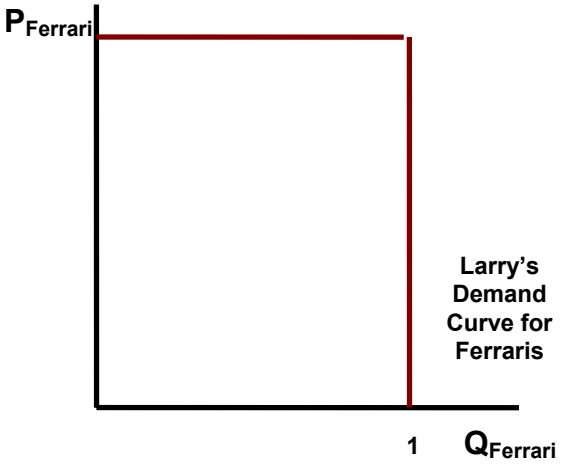


Figure 6.2b



To keep the story simple, we can assume that there is only one red Ferrari available, as a result of strong demand from successful e-commerce entrepreneurs. This is shown in Figure 6.3b, where the supply curve is also drawn in. The horizontal portion of the supply curve is the dealer's opportunity cost (what they could otherwise get for the Ferrari, and at least what they paid the manufacturer), while the vertical portion reflects the quantity available. Now when Larry is in the dealer's showroom, he faces a situation much like anyone who has tried to buy a car faces. The maximum he is willing to pay is more than the minimum the dealer is willing to accept. So Larry bargains with the dealer, as each tries to capture a greater share of the value that will be created from the transaction.

Figure 6.3a

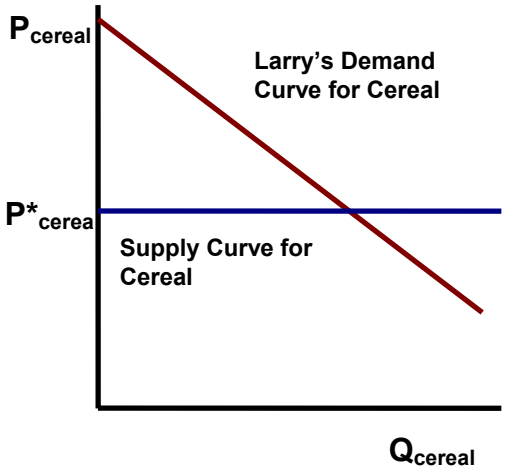


Figure 6.3b

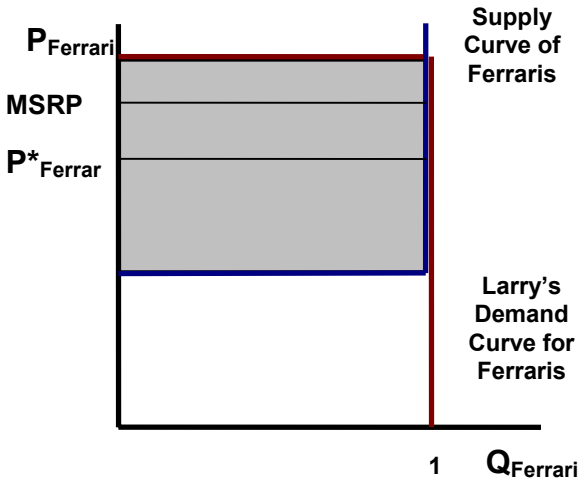


Figure 6.3b also has the levels of the manufacturer's suggested retail price (MSRP), and the negotiated price drawn in. While the negotiated price must be somewhere between the maximum Larry is willing to pay and the minimum the dealer is willing to accept, the MSRP could actually be anywhere relative to these two values – above both or below both. In Figure 6.3a, the supply curve of cereal is also drawn in. It is horizontal, at the price which is determined by market supply and market demand. The supply of cereal in the store is limited, but at a level that is much greater than Larry's demand. Hence there is a vertical portion of the supply curve for cereal when Larry is in the grocery store, but it is far to the right of the figure. In Figure 6.3a, the value created by the transaction is the triangle between the demand curve and the supply curve. If the grocery store has some pricing power, it may try to capture some of that value (see Chapter 14, on price discrimination), but doing so on cereal alone may also not be worth its while – the value of the transaction is relatively low. What matters to the grocery store is Larry's overall grocery purchases.

On the other hand, the value created by the Ferrari transaction is quite high, and therefore Larry and the car dealer have a strong incentive to invest resources in negotiation over how that value will be split. At some level, many of us have

experienced these transaction costs, and wished for a better, more pleasant way of buying a car. Now, you will have realized that Figure 6.3b is familiar. You met it earlier as Figure 5.7, where two firms were also negotiating over transacting for a fixed quantity of some input. There, too, the price was determined by the relative bargaining power and ability of the buyer and the seller, since there is no unique 'market equilibrium' price.

One of the complications we have avoided in our simple story is that there are other buyers and sellers – even for red Ferraris. In practice, Larry can leave the showroom and look elsewhere, just as the dealer can hang tough and wait for another buyer. Each will have some information about these 'outside options' that they will try to use to their advantage in bargaining. However, these complications do not change the essential, costly nature of the bargaining. In fact, informational complexity increases those costs.

Can the market for cars ever be like the market for grocery items? Probably not entirely. The level of the transaction, the difference in how often it is repeated, the complexity of the product, all are sufficiently different. However, the promise of e-commerce is that it can at least move the market for cars in the right direction, reducing the transaction costs appreciably. This idea of reducing transaction costs is part of the general promise of e-commerce, and therefore a central theme of the book.

Houses share several characteristics with cars. They are durable, and so provide satisfaction over a period of time. They must be inspected before purchase, and they consist of a complex bundle of characteristics that may not be fully appreciated even after inspection. Because they are durable, they may be sold used as well as new: in the case of houses, their much longer life means that most house purchases are not newly constructed houses. Durability also means that houses and cars may be rented or leased rather than being purchased. In the case of houses, renting is often driven by budget constraints that prevent purchase, while car renting or leasing is prompted more by short-term needs.

Houses differ from cars in several important ways. They are not transportable, and they are much more heterogeneous than cars. Their value in consumption is also determined heavily by their location – exactly the same house in two different neighborhoods can have very different values. Finally, because most houses sales are by existing owners, the typical transaction is not between a business and a household, but between two households.

The similarities between houses and cars mean that the supply-demand picture for an individual house looks like Figure 6.3b, for Ferraris, and not like that for cereal, Figure 6.3a. There is no MSRP, but the seller will make an asking price known, and that typically represents a starting point for negotiation between buyer and seller. This negotiation will normally lead to a price that splits the surplus between the buyer and the seller. Of course, if there is simultaneously another potential buyer with a higher willingness to pay, then Figure 6.3b would have to reflect that buyer's maximum value: Bill might outbid Larry. In any case, while the overall price level of houses 'on average'

will be affected by the dictates of supply and demand, buying and selling a house involves searching and bargaining, not walking into a store and buying off the shelf.

In the case of cars, dealers are still much like retailers of other products. Their wares are not on shelves, but they are in the dealer's lot, and one can go there, inspect them and buy or not. The dealer has typically taken possession of the cars from the manufacturer, and is also a retailer in that sense. The car dealer, like many other kinds of retailers, also provides service and information. We will discuss these intermediary roles in Chapter 8. The market for houses has a different kind of intermediary, the real estate agent or broker, who provides many of these specialized informational services, but without taking ownership.

Cars and houses are products whose special characteristics have led to particular forms of market organization, and in which the buyer's decision process and the mechanics of the transaction are quite different from buying cereal and milk at the grocery store. The market for every product, however, from cereal to houses, is being affected by the Internet, and we need to see where these different markets are starting from, before we can understand the changes being wrought.

6.3 Shopping Around

Everyone shops. Some people love it, and for them it is a leisure activity as pleasurable as going to a movie or playing tennis. Others view it as a chore, and a costly use of time. In Chapter 4, we emphasized the latter perspective. For those who like to go from store to store, and have the time, online shopping may have little appeal. For others, e-commerce provides a real alternative. What exactly does shopping involve?

We answered this question in brief in Chapter 4, in looking at Shawn's rather simple shopping experiences, and we will expand on those answers here. Shopping means learning about the product – in particular, its price and its physical characteristics. For those characteristics that can not be directly observed, we may substitute other information, particularly general reputational information about the product, or about the other products made or sold by that firm. When similar products are available, we perform comparison shopping, comparing the prices, observable bundles of product characteristics, and seller and manufacturer reputations before making our choices. Shopping is a sophisticated activity!

There are several traditional channels through which information is collected by shoppers. Perhaps the most pervasive method is passive reception while doing other tasks, such as listening to the radio, watching television, reading newspapers and magazines, and even while shopping, consuming and talking to other consumers. Advertising is everywhere, and we absorb a tremendous amount of product information this way. Alternatively, we actively seek out information by searching for it. We can purposefully leaf through newspapers, magazines and their advertising inserts, or through

catalogues and marketing offers that arrive in the mail.[1] We can ask our friends, neighbors and relatives. We can telephone the seller or manufacturer with specific questions. Finally, we can visit the store to gather whatever information we can. Note that, for now, we are focusing on 'traditional' methods, to the exclusion of the Internet.

So, in addition to a complex array of information, we have a variety of methods for gathering that information. Shopping seems quite complicated. There are a couple of possible shortcuts, however. First, we often rely on previous shopping and consumption experiences. If I bought a pair of shoes last year, and they were comfortable and durable, it may be a simple matter for me to return to the same store and buy exactly the same brand and size again. Certainly, much of our grocery shopping takes this repetitive form, so that the time costs of gathering information while shopping are minimized, leaving only the time costs of going to the store, and gathering items off the shelves (with a quick scan for sale prices, specials and so on!).

A second shortcut is paying someone else for the required information, or to incur the time costs of shopping. Since information is a **shareable good**, that is, one person using it does not reduce the supply of the same information available for others, the task of gathering and organizing information can often be more efficiently handled by an individual or firm who does this for a large number of buyers. Much of the direct shopping tasks are then replaced by obtaining the information from this specialized intermediary. This may not be foolproof, but it may be worthwhile on average (of course one has to shop for the intermediary!). There may be some economies in transferring the time costs of shopping as well. It may be more efficient for a single delivery person to bring groceries to a dozen apartments in one building, than for the dozen to make separate, individual grocery shopping trips. Similarly, it may be more time-efficient to order your clothes through a mail- or telephone-order catalog, and have them delivered by UPS, rather than driving to a store, finding them on a rack, and waiting in line to pay. These are really variants of the concepts of economies of scale, scope and specialization, that we discussed in Chapter 5. Another reason for transferring time costs may be that the buyer's opportunity cost of time is higher than the cost of hiring someone else to do it. This is really just like the executive hiring a nanny to look after her children, or other such examples.

We can also identify parallels with our analysis of the firm. The shopper who transfers informational and time-consuming shopping tasks is outsourcing these functions just as much as a firm does. Rather than being done (literally) in house, they are performed through market transactions. The household's shopping value chain leads to satisfaction rather than profits, but many of the same economic principles apply as for firms. This discussion and the parallels with the firm, are summarized in Table 6.1.

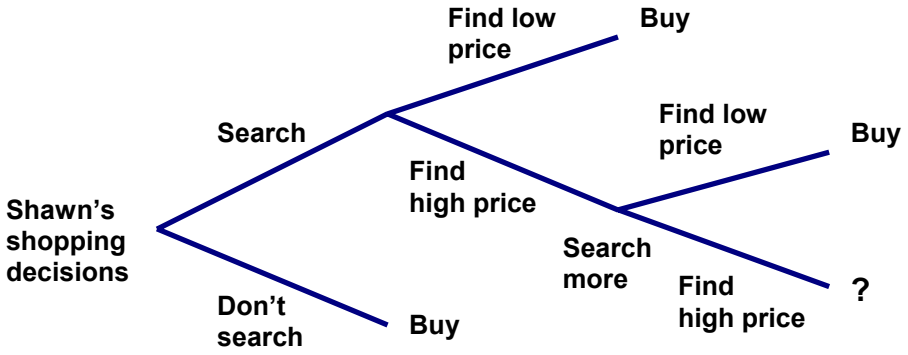
Table 6.1: Organizing Shopping

[1] Mail offers and catalogues are interactions often initiated by the seller, but their active perusal is controlled by the potential buyer. Telephone offers also fall in this category, though they are considerably more intrusive.

Information gathering	Physical transfer
In-house	In-house
In-house	Outsource
Outsource	In-house
Outsource	Outsource

Finally, it is useful to return to and illustrate the details of the information gathering process. In Chapter 4, we gave an example where Shawn chose not to search, while his friend Diamond did (Figure 4.17). There, we assumed that searching would lead to a lower price paid. We now describe how this comes about. Suppose that there are several sellers with different prices for the same product. Searching consists of calling them up sequentially, or visiting stores sequentially. Also suppose that Shawn has no information on reputations, so can not use reputation to decide where to start searching. He visits a store, observes a price, and decides to buy or not based on the price he observes. Presumably Shawn will start out with some idea of the range of prices in the market. He will compare his observation with his initial expectations, update his expectations, and then decide whether to keep searching or not. Clearly, if Shawn is lucky and visits a low-price store first, he will stop his search quickly. If not, he may keep searching till he finds a low price, or gets discouraged (revises his expectations) and buys at a high price. This process is illustrated in simple form in Figure 6.4.

Figure 6.4: Shopping as Sequential Search

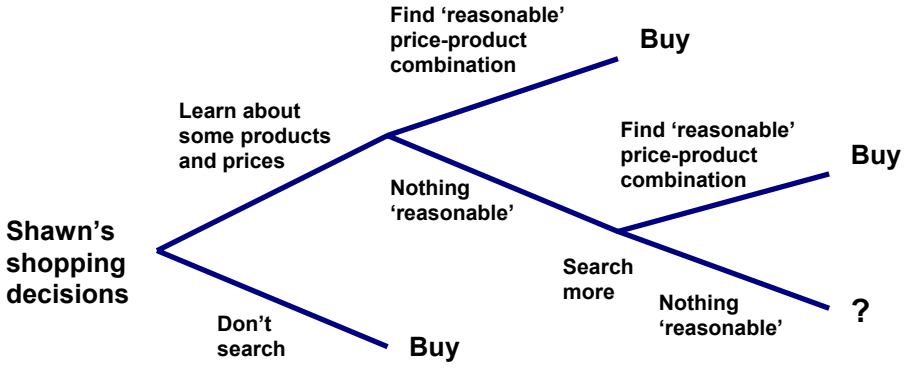


Searching for a low price is just one aspect of shopping around. Much of our search is focused on learning about product characteristics. This is particularly true for complex things such as cars and houses. In such cases, not only is there much to be learned, but the costs of a wrong decision are relatively high. For other kinds of products, such as cereal, we might learn simply by buying it once and trying it out. Such products (and services) are called **experience goods**. We discuss these and other types of

products and services in Chapter 15, in the context of marketing strategy for e-commerce. In any case, a quick trial here is easier than spending time learning about the product before purchase.

Searching for information on product characteristics will typically involve looking at more than one brand of the product, or different models within a brand. Even a department store or a specialized, 'category-killer' retailer carries only a subset of all available models and brands. Thus, sequential search may be involved here as well, if physical inspection is required, or the information is too detailed to collect from magazines or over the telephone. Gathering information by visiting stores also allows one to learn prices. Many combinations of methods are possible. One example is illustrated in Figure 6.5, below.

Figure 6.5: Comparison Shopping



We have illustrated some of the economic issues raised by shopping in a very basic way, but our discussion of traditional shopping will inform our subsequent analysis of market organization and intermediaries (Chapters 7 and 8), as well as the changes introduced by e-commerce (Part III) and their implications for strategy (Part IV). Part V will bring us to specific industries, where again, we can think of much of e-commerce as a reconfiguration of the shopping value chain! In the next section, we examine the implications of one more aspect of shopping.

6.4 Switching Costs

We noted in the last section that previous purchases provide a shortcut for search. We are familiar with the characteristics of the products and services that we have purchased and consumed in the past, and this familiarity creates an asymmetry between things we are currently using, and alternatives. In order to switch brands, we have to incur a higher search cost. This is higher cost is an example of what is called a **switching cost**. Since we rarely start out with a blank slate as far as consumption goes, switching costs are pervasive. An important and increasingly recognized component of firms' strategy is the management of consumer switching costs. We will examine this topic in Chapter 16.

Search costs are not the only kind of switching cost. Paul Klemperer, who pioneered the analysis of markets with switching costs, lists six different kinds of switching costs:[2]

1. Uncertainty about the quality of untried brands
2. Transactions costs of switching to new suppliers
3. Psychological costs of switching and 'non-economic' brand loyalty
4. Costs of learning to use new brands
5. Need for compatibility with existing equipment
6. Discount coupons for repeat purchases, loyalty programs, and similar devices

The first of these six categories encompasses search costs, though it is somewhat broader, since there are risks associated with buying something unfamiliar (e.g., the different pain-killing medicine may not suit you) that can not be completely removed by pre-purchase search. We look at the other categories in reverse order.

The last of the categories is an artificial switching cost, in the sense that is determined by the seller's pricing strategy, and is not at all inherent in the characteristics of the product. Compatibility is also substantially under the manufacturer's control, so in that sense is determined on the 'sell side' of the market. Compatibility is an important component of strategy in the information age, because information products, ranging from home entertainment devices to computers, increasingly provide greater value if they work together, that is, they are compatible. Both these categories are discussed in Chapter 16.

The complexity of information products, and the fact that they often need to work in systems, also impacts the fourth category of switching cost, the cost of learning to use new brands. Even if a new operating system is compatible with your existing computer hardware, it may require learning a new set of commands, getting comfortable with a different 'look-and-feel', and so on. Even if it is substantially similar in such respects, the demands of making it work with all your other hardware and software (ensuring compatibility) may require changes that increase the costs of learning to use it. Of course learning costs may arise independently of compatibility issues. Again, firms can have an impact on learning costs through of their product and its accompanying 'how-to' materials, so this aspect of switching costs can be a component of firm strategy.

Being familiar with using a product is close, in some respects, to being psychologically comfortable with it. The actual costs of learning may not be very high, but the thought of having to learn something new may itself be daunting. Any shift to the unfamiliar may have associated psychological costs (number 3 in our list). In other cases, the psychological cost of switching may simply come from a feeling of identification with the current brand or product. Clearly marketing and advertising strategies (Chapter 15) are important in trying not only to making the product seem attractive, to attract buyers, but also in creating the 'warm fuzzies' that make up brand loyalty. We have put 'non-economic' in inverted commas only because these kinds of psychological costs are

[2] The list is in Klemperer (1995). This is a comprehensive survey of Klemperer's work on switching costs, but its main focus is a mathematical analysis of such markets, particularly the strategic behavior of firms.

not part of the usual utility analysis employed by economists. There is no reason, however, not to include them, and more and more economic models do so. In fact, changes that might, on the surface, seem purely psychological can have physiological effects that are not unlike those caused by withdrawal of physically addictive substances.

Finally, the second category of switching cost in the list is transaction costs. These are similar to the kinds of transaction costs discussed in looking at firms. There are costs of recontracting, set-up costs of a new account, informing others of a change, and so on. For households, switching bank accounts, telephone service providers, and Internet service providers are all examples of situations where these transaction costs can matter. Firms may try to overcome this switching cost by pay households to switch, but the cost is merely transferred, not eliminated.

From the perspective of households, switching costs are not just a matter of passive responses to firms' strategic maneuvering. Households, like firms, can have active strategies for managing switching costs. In planning purchases, they can anticipate future switching costs, and make current decisions based on the impact that the resulting switching costs will have on their future options and choice possibilities. This is not always the case, since before a purchase, there may be nothing a household can do. In other situations, though, considering switching costs may matter. This can be illustrated with a numerical example.

Suppose there are two products with characteristics that are equally valued on average (this will soon be explained precisely) by Shawn's friend Diamond, but which differ in terms of switching costs, say because of complementary, compatible purchases around the product. Only one unit of the product is used at a time. There is uncertainty about the value of the product, before it is consumed. It may turn out to be worth \$800, or it may be worth \$1200. Each is equally likely, so the average value of either product is ½\$800 + ½\$1200, or \$1000. Brand X costs \$800, and has no switching cost. Brand Y costs \$750, but has a switching cost of \$300. Each product lasts one year. If Diamond is not forward-looking, she will choose Brand Y, since it has a lower price and higher surplus (worth \$250 instead of \$200).

If Brand Y turns out to have a consumption value of \$1200, then Diamond is fine (her surplus turns out to be \$450). However, suppose that after a year, she has discovered that Brand Y has a consumption value of only \$800. Buying it again for \$750 yields a surplus now worth \$50. Buying Brand X yields an expected surplus of \$200 (\$1000 - \$800) before the switching cost, but that cost is another \$300, and it makes switching uneconomical. She is locked-in to Brand Y.

Instead, suppose that Diamond chooses the higher-priced Brand X. Again, if it turns out to be worth the equivalent of \$1200 (a surplus of \$400), she has made a good decision, and can buy the same brand again. If Brand X turns out to have been worth only \$800, then switching to Brand Y yields a higher surplus, since there is no switching cost. Her expected surplus is now \$250 (since she has not tried it yet). Diamond's options are shown in Figure 6.6. The calculations are summarized in Table 6.2. Overall (assuming

that next period's surplus is not discounted because it is in the future), choosing Brand X in the first period is better. Note that, the average second period surplus from choosing Brand Y in the first period is $250, *calculated in the first period*. When Diamond actually makes the repeat purchase, she will know whether Brand Y has a high or a low surplus, but she does not know it initially.

Figure 6.6: Purchasing with Future Switching Costs

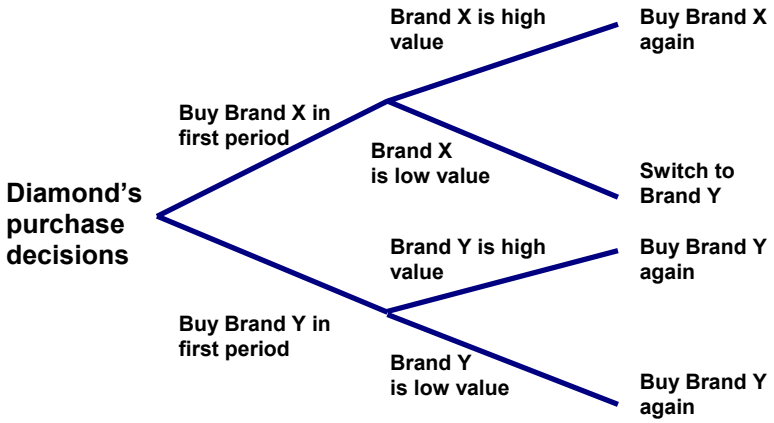


Table 6.2: Switching Costs Affect Product Choice

Choice in First Period	Average Surplus First Period	Average Surplus Second Period	Total
Brand X	$200	½$400 + ½$250 = $325	$525
Brand Y	$250	$250	$500

In the example, by looking down the road, Diamond sees that choosing Brand Y now will limit her future options because of the high switching costs involved if Brand Y turns out to be disappointing. This leads her to choose Brand X initially, even though it yields a lower average surplus the first year. In other situations, the presence of switching costs may not make a difference. Furthermore, firms may respond in many ways to such situations. For example, the seller of Brand Y could try to reduce switching costs, or lower its initial price.

Concept Check:
Suppose that Brand Y costs $725, what is Diamond's best purchasing decision? Suppose instead that the price is the same as in the original example, but the switching

cost for Brand Y is only $100. What is best for Diamond? Finally, starting from the original example, suppose that Brand X now has a switching cost of $50. How does Diamond's purchase decision change?

Clearly, switching costs make household purchase decisions more complicated. Our 'simple' numerical example is still quite involved. In practice, we may not do such explicit calculations, because the calculations themselves are time-consuming and therefore costly. However, we often do pay attention to switching costs, even informally. In particular, where we do not know about the characteristics of alternative products and services, and where the switching costs of *any* choice are relatively high, we will search more carefully than if switching costs are absent, because a mistaken choice is harder to rectify. These considerations have traditionally driven our approach to choosing services such as doctors and financial advisors. We examine the latter example next.

6.5 Financial Management

In Chapter 4, we examined some basics of financial asset choices by households, using a variation of the standard model of indifference curves representing utility or satisfaction levels. In that analysis, financial assets potentially differed in two dimensions that mattered to households: average return and risk. A choice of a portfolio was determined by what would give the household the best combination of risk and return. This analysis was on a per dollar basis – the decision on how much to save (versus how much to spend) was assumed to have been decided in advance. In this section, we enrich this picture of financial management by examining the effects of search and switching costs, and by considering how spending decisions for things such as cars and houses interact with financial management decisions.

We begin with cars and houses, because, traditionally, they have come before buying stocks in our lives. Of course that is changing, partly as a result of e-commerce. We have discussed the search and bargaining aspects of buying cars and houses. Now we look at the financial aspects. Dot.com millionaires may pay cash for their cars and houses, but most of us typically have to borrow money. Someone is willing to lend us the money if they think we can pay it back, and because if we do not, they can always take back the car or the house (it is collateral).

Borrowing to buy such durable goods makes economic sense in that it allows us to better match the stream of satisfaction that we enjoy with the payments we make. If I have enough cash to pay for a car, I could use cash up front, and avoid paying the interest on a loan. My opportunity cost of doing this is the forgone returns that I would have received if I had bought another asset, say stocks or bonds. Thus, in deciding how I pay for the car, I am making an asset allocation decision. A car is an asset that depreciates rapidly, but that does not matter, as the value of the consumption services it provides is what I care about.

Houses, again, share features with cars. They are even more clearly assets. While they age and therefore depreciate over time, this process is much slower for houses. In

addition, the land that the house sits on may increase in value, simply because land gets relatively scarcer over time (this is economic rent again). Thus a house and the land it sits on typically appreciate in value over time. A house may therefore be purchased purely as an asset, and that is what it is for a landlord. Many of us, however, are never landlords, but we purchase houses for their consumption value. The financial decisions that accompany this purchase (how much to borrow, and on what terms), however, have impacts on our overall asset portfolio, much more than the decisions that accompany car purchases.

In Chapter 4, we looked at Ernesto's decision to save for retirement. Ernesto had to save, because he would have no income once he retired. In other circumstances, however, we may be borrowers rather than savers. This is typically what we do when we buy a house, because we take a mortgage loan to do so. The economic reasoning goes back to the benefit of matching our payments better to the benefits that we enjoy. We do this when we rent a house, but in that case we are only consuming the housing services, and not making a simultaneous asset purchase. We will illustrate these issues with an example that is a variant of the one we used for Ernesto in Chapter 4 (see Figure 4.18).

Suppose Vicente is going to work for two periods – when he is young and when he is old. He earns fixed amounts in these periods, given by $\$I_{young}$ and $\$I_{old}$ (I stands for income). Let us suppose that he consumes only housing services, and suppose that these are measured in dollars per square foot. This is not how one normally thinks of rental rates for housing, because characteristics such as numbers of bedrooms and bathrooms are more important, but rental rates for office space are often quoted this way. It gives us a way of making the level of housing services variable. Let the rental rates in the two periods be $\$P_{young}$ per square foot and $\$P_{old}$ per square foot, and let Q_{young} and Q_{old} be the quantities purchased. If Vicente can borrow or lend (invest) at an interest r, then if he saves and invests \$S, his budget constraints in each period are:

$P_{young}\, Q_{young} = I_{young} - S$, and

$P_{old}\, Q_{old} = I_{old} + (1 + r)S$.

When he is young, he sets aside S and does not have it available for housing, while he has S plus the interest rS available when he is old, in addition to his income then. Now we can combine these two budget constraints into one, by eliminating S from the two equations. This gives us:

$P_{young}\, Q_{young} + P_{old}\, Q_{old} /(1 + r) = I_{young} + I_{old} /(1 + r)$.

The expression on the right hand side may be familiar. It is the **present discounted value** of Vicente's lifetime income, viewed when he is young. His income when old is discounted by the interest rate before adding to his income when young.

The nice thing about the combined budget constraint is that we can draw a two-dimensional picture (it is a straight line) and it does not matter whether Vicente is lending or borrowing when he is young. In Figure 6.7, we take advantage of this to show both possible situations. If Vicente spends exactly what he earns when he is young, then his consumption of housing services while young is exactly I_{young}/P_{young} (measured in square feet). In Figure 6.7a, Vicente is consuming less than this while young, so he must be

saving and investing. In Figure 6.7b, he is consuming more than this (his income when young is lower), so he must be borrowing.[3]

Figure 6.7a: The Saver

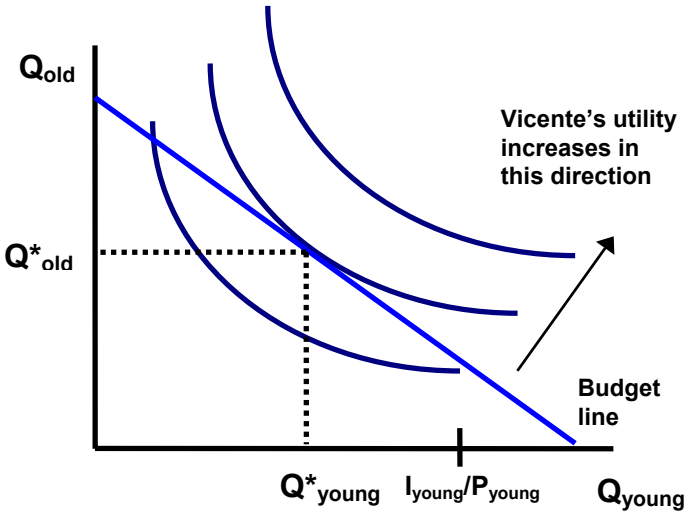
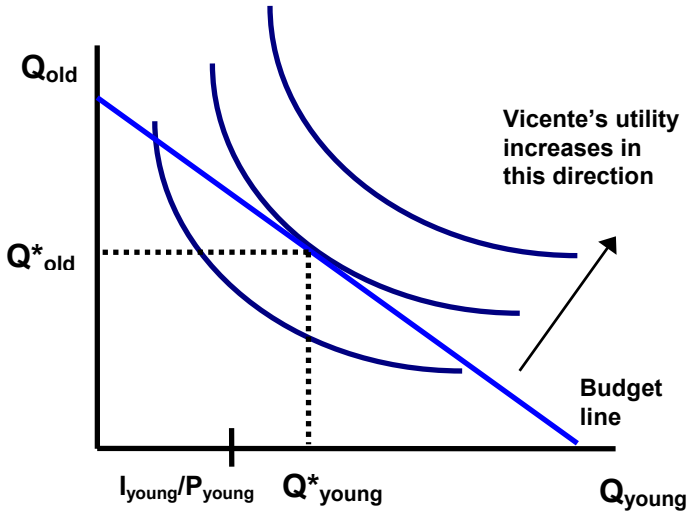


Figure 6.7b: The Borrower



Borrowing or saving allows Vicente to maintain the same consumption pattern, even when his income pattern over time is very different. Without the possibility of borrowing and/or saving, Vicente would be restricted in each period to consuming exactly what he could purchase with that period's income. In the example, Vicente is renting his housing. Depending on his income pattern, he may save or borrow. If Vicente has to buy the house, he must borrow, as we now discuss.

Suppose that Vicente must buy the house to get the stream of housing services Q^*_{young} and Q^*_{old}, represented in Figure 6.7. For this interpretation to make sense, we must assume that Q^*_{young} and Q^*_{old} are the same. Suppose that the price of the house is \$H. Then Vicente must borrow at least $\$H - \$I_{young}$. Call this amount \$M, because this is the mortgage loan that Vicente must obtain. If the interest rate is r, then he must pay back $\$(1 + r)M$ when he is old. Even if Vicente the renter were to save money for when he is old, Vicente the homeowner will borrow money. This is because the house price \$H is greater than his income when young, $\$I_{young}$, even when $\$ I_{young}$ is greater than the rental payment while young, which is $\$P_{young}\ Q_{young}$.[4]

In this simple example, there is nothing that makes renting better than buying, or vice versa. In the real world, however, many additional factors come into play. The higher search costs and switching costs associated with buying favor renting. On the other hand, the favorable terms at which one can borrow money for a house purchase, plus the very substantial tax advantages that come from the deductibility of mortgage

[3] Note that since the budget constraint in both figures is the same, Vicente's income when old must be higher in the second case, to make the present discounted value of income the same in the two cases.
[4] If markets are competitive and frictionless, then we would expect the house price \$H to be the present discounted value of the rental services, or $P_{young}\ Q^*_{young} + P_{old}\ Q^*_{old}\ /(1 + r)$.

interest payments, favor purchasing. These factors pertain to the costs of renting versus homeownership. Owning a house may also provide additional benefits: security and capital appreciation. Both of these must be valued carefully, though. Long term rental leases can also provide security, and capital appreciation must be greater than could be gotten by alternative uses of the money tied up in the house, for example, ownership of stocks or bonds.

If one does buy a house, and has to obtain a mortgage, search and switching costs enter into the process of shopping for a mortgage, in somewhat similar ways to any other kind of shopping. Mortgage rates, as well as other terms and conditions must be compared across mortgage lenders, before making the decision. In fact, an agreement to buy and sell a house can not be final until the financing of the purchase is clearly established.

To summarize, the purchase of a house has several dimensions. One is a decision about consumption of housing services. The alternative in this case is renting. Another is a decision about saving and borrowing. The third and final dimension is an asset allocation decision, where the alternative is the purchase of other assets. It may seem quite complicated, and it is. Till recently, much of the complexity was taken care of by regulation of financial markets that limited household choices. Ongoing deregulation has increased choice, and the Internet is increasing the information available to help make these complicated choices. Mortgage markets, for the financing of house purchases, will change along with the markets for the houses themselves, because of this greater availability of information.

The traditional focus on the house purchase and its financing as the single biggest financial decision by a household has been tempered by financial deregulation. We have an array of financial choices available to us as never before. As noted, much of this is driven by financial deregulation that has spurred competition, leading to discount stock brokers, the removal of barriers between stock broking, banking and insurance, and so on. The Internet is just one more aspect of change, as we elaborate in Chapter 20.

The concepts we have introduced in this chapter for household choice in general are just as relevant for financial assets as for products and services for current consumption. We shop for financial assets just as we shop for houses, cars and groceries. Search and switching costs have been important constraints on household choice in the financial sphere, in addition to the regulatory restrictions we have mentioned. We can relate this to our simple analysis of Chapter 4 (see Figure 4.19). In that analysis, we assumed that Ernesto was fully informed about the characteristics of the different stocks that he could pick from. In practice, the time dimension makes average return and risk less definite. If we are using past data, over what period should we calculate these numbers? Is this past data enough to predict future returns, or should one look at whatever information one can get on the firm's current operations?

New information arrives all the time, not just on three companies, but on thousands of them. How can one search through all this information, process it, and make

financial asset decisions in practice? At least switching costs for financial assets are lower now, so one has the possibility of correcting errors at lower cost, but clearly financial management is not easy. Not surprisingly, it provides a living for hundreds of thousands of specialists: brokers, traders, analysts, advisors, accountants, tax specialists, lawyers, and more. The flood of financial information on the Internet will not eliminate these roles, though it will surely reshape them, as all these specialists aid households in their financial management.

6.6 Conclusion

Many of the issues we have raised in this chapter require sophisticated mathematics to analyze in full detail. Yet much of the essential intuition is not difficult. Shopping is a sequence of activities, culminating in a purchase. As long as the technologies that govern the components of this sequence do not change, then it is convenient to focus only on the end result: the price paid and the quantity transacted. When the technologies are changing rapidly, then it is critical to have some understanding of the details of the 'shopping value chain'. Much of this chapter has been built around this theme. In the process, we hope we have shown that, for households, economic principles extend readily beyond choices between tacos and burgers or audio tapes and CDs. Automobiles, housing and financial services are three of the biggest sectors in the economy. Purchases by households in these areas are important for them, and for the firms that are trying to change the ways these purchases are made. The underlying economics of traditional shopping guides our assessment of possible changes.

Summary

- Transactions for high-value, differentiated products such as cars and houses involve bargaining over surplus, rather than price-taking behavior by buyers.
- Shopping involves search costs associated with learning about product characteristics and prices. This applies particularly to complex, high value goods such as houses and cars.
- Information gathering and/or physical aspects of transactions may be outsourced to specialists rather than being performed by the buyer.
- Various kinds of switching costs associated with lack of information, costs of learning to use a product, compatibility with other products, and so on, may affect current purchase decisions, as well as firms' strategies toward buyers.
- House purchases are closely linked to the financing that makes the purchase possible, and determining this financing is also subject to search and switching costs.
- Financial management by households is becoming more important, but requires processing huge amounts of information to make effective decisions.
- In general, shopping and purchasing involve a value chain of activities, the costs and benefits of which are changing with the technology of the Internet.

Questions

1. In what ways do you think (non-Internet) shopping now differs from 50 years ago? 150 years ago? 250 years ago?
2. Give three specific examples of switching costs from your own purchasing experiences. Were they the result of the nature of the product, the nature of the transaction, or something that the seller or manufacturer did?
3. What factors make house purchasing more than just an economic decision? How are the economics of house purchasing affected by other life changes? Is household financial asset management subject to the same potential complications?