

eCommerce and eDistribution: Understanding The Role of Power When Selecting Alternatives Channel Strategies¹

Eric K. Clemons

Bin Gu

Michael C. Row

**Information: Strategy and Economics
The Wharton School**

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Abstract

In a wide range of industries alternative electronic distribution channels may permit customers to deal directly with manufacturers and primary service providers, effectively disintermediating wholesalers, retailers, and agencies. In some cases manufacturers or primary service deliverers will be able to implement strategies to interact with and sell directly to their customers, while in other industries existing intermediaries will be able to withstand attempts to bypass them. Two illustrative industries — consumer packaged goods and air travel — are compared. Simulation models are used to examine alternative strategies for channel participants in both industries. Simulation, particularly the philosophy of Industrial Dynamics, is employed in order to observe the dynamic behavior of complex systems, where the strategies of consumers, producers, and intermediaries interact in complex and non-linear ways. The critical aspects of the system, including consumer preferences and brand strength, channel power and channel conflict, and the role of customers' speed of adoption, are borrowed from the marketing literature. We conclude that consumer packaged goods manufacturers will for a variety of reasons continue to find it difficult to disintermediate major retailers; in contrast, airlines have found that the power structure of their industry supports either disintermediation of agencies or dramatic reduction in commissions paid to them. Strategic responses for the weaker channel participants in both industries are explored. While we focus here on exemplars where the end-consumer of the good or service is an individual, this does not mean that the analysis applies solely to business-to-consumer channels. Indeed, the most attractive customers sought by airlines were corporate travelers, and the attempted disintermediation of retailers and of wholesalers of industrial components can be addressed with the same simulation models.

KEYWORDS: Online Sales, eCommerce Strategy, Channel Conflict, Electronic Distribution

¹ This paper reports on a research project that has been ongoing since 1992, funded by Unilever, Rosenbluth International, Continental Airlines, Marriott Hotels and Resorts, and Six Continents Hotels and Resorts. It includes a study of the role of information in changing the balance of power in grocery retailing and distribution, the changing balance between new entrants and established players in newly vulnerable markets based on their different ability to exploit information-based strategies, and channel encroachment by primary producers and service providers upon their traditional intermediaries. All have been published previously, but they have not previously been fully integrated.

1. Introduction

1.1. Context — Strategic Empowerment

The recent emergence of eChannels offers the possibility of dramatic transformations of the current distribution systems for many goods and services. Sellers may have the ability to monitor buyers' behavior, offering them better service, or a better match with their shopping preferences. The development of electronic channels may also result in significant changes in power among participants in the distribution system. Along with a change in power we would historically anticipate a change in profitability; thus, the emergence of eChannels can be expected to alter the profitability of traditional distribution. However, the profound change in the roles and profitability of intermediaries in some industries has not proceeded as anticipated.

We originally constructed the model in the mid 1990s in response to inquiries from the Chairman's office at both Unilever and British Airways. In some sense this fortuitous event greatly facilitated development of our research, since these represent two extreme points on a continuum of industries². Our original predictions, supported by unfolding events, were that manufacturers of consumer packaged goods would make no serious progress towards direct distribution, while travel agencies would soon be rendered irrelevant, either being disintermediated functionally or suffering drastic cuts in commissions. The results appeared plausible and demonstrated internal consistency or *face validity*; our initial findings for consumer packaged goods sales and distribution were published in 1998 [17]. With the anecdotal evidence available to complement and support our modeling efforts, we believe that our simulations represent accurate predictions of market evolution in the industries in which we have applied them, increasing our confidence in its use in other industries.

1.2. Overview

Do manufacturers and primary service providers such as airlines and insurance companies really need to implement online sales strategies immediately? Can they risk doing so? Can manufacturers and primary service providers launch or even announce their intention to launch direct distribution channels that will compete with the established retailers and agencies who are currently responsible for the bulk of their sales, or will the real and immediate risk of retaliation from these intermediaries outweigh any hypothetical and future gain? It is these questions of risk and reward, strategic intent, timing and implementation that we seek to address.

1.2.1. When must you plan an attack? Manufacturers with low brand loyalty are especially vulnerable to manipulation and exploitation from online retailers. The hypothetical example we find most effective is an online retailer of consumer packaged goods like paper towels or disposable diapers, where most consumers lack any strong preference. The physical retailer generally feels constrained to carry

² The sense in which these two industries represent extreme points will be explored in more detail throughout the paper. In brief, one industry (travel) has products that are easy to describe while the other does not; one industry (travel) has simple logistics for the distribution of a non-physical product (ticket) while the other does not; one industry has a small set of highly active and highly profitable customers who represent a significant segment of the industry's total profits (travel) while the other does not; and one industry exhibited rapid online adoption (travel) while the other did not.

all major brands, to satisfy those consumers who may indeed have a preference for Bounty over Brawny, or Brawny over Viva. As long as the brands are available to show to any customer, they are available to show to all customers. Unlike the physical retailer, the online retailer can reconfigure his display (or virtual store) at will, and unlike the physical retailer, the online retailer has a detailed record of the shopping history of all customers who have purchased from him before. An online consumer with a preference for Bounty will see Bounty and an online consumer with a preference for Brawny will see Brawny; however, an online customer with no preference is likely to see whichever brand is most profitable for the retailer. It is only a small step from a retailer's ability to engage in *differential presentment* (showing consumers with preferences their preferred brands and showing consumers without preferences the retailer's preferred brand) to the retailer's ability to demand rebates from the manufacturer³.

1.2.2. When can't you plan an attack? When customers are extremely loyal to current intermediaries, and show only minimal interest in new distribution channels, any attempt by manufacturers to bypass the existing channel and sell directly to consumers is likely to be dangerous. Consumers' loyalty to retailers like Wal-Mart, and the slow adoption of home grocery shopping alternatives offered by online sites like PeaPod, WebVan, and NetGrocer [7], suggest that manufacturers' attempts at bypass are likely to be risky. Consumers' adoption may be slow, but retaliation from retailers is likely to be immediate. Punishment can take many forms, but the most common include:

- **Book-aways** — influencing consumers to purchase a competitor's products through stronger recommendations, most effective against airlines and other producers of goods and providers of services where consumers lack strong brand loyalty.
- **Reduction of promotional efforts** — influencing consumers by reducing a product's shelf space, end caps, and special displays, most effective in the grocery industry.
- **Repricing** — By increasing the prices charged for one manufacturer's products, the retailer can move market share to the manufacturer's direct competitor, while still capturing some of the sales from the manufacturer's most loyal customers. Again, this is most effective in the grocery industry.

³ *Differential presentment* represents a powerful new tool that can be exploited by online retailers in their competition with manufacturers, and which partially explains the reason why traditional consumer packaged goods companies were initially exploring ways to bypass traditional retailers. When some consumers have strong brand preferences traditional, physically-based retailers must stock and display any products that at least some consumers prefer. This represents a form of free access to shelf real estate for manufacturers, since their products are being shown to all customers, including those who may not actually want them. With differential presentment an online retailer, informed by the frequent shopping history of a customer from both online and offline shopping, can present the individual customer's preferred brand to any customer with a preference. Similarly, the online retailer can withhold presenting any specific product to an individual customer that he knows is indifferent within a category, without risk of alienating the customer. This ability to dynamically reconfigure presentation for each customer is not possible in a physical store, and it gives the online retailer great power to demand concessions from manufacturers with weak brands.

1.3. Modeling Methodology

We choose to use simulation in place of closed form analytical techniques. This choice is not due to personal preferences, but rather is dictated by the nature of the problem we are addressing. As we explore in section 2.1 on channel structures, the equilibrium behavior of even the simplest multi-level retailing channels is difficult to predict when channel participants independently pursue profit maximizing objectives. Perhaps more importantly, we are less concerned here with the presence of equilibrium solutions and comparative statics than we are with dynamic behavior and the possible transition paths that may lead to these equilibria. Some observed behaviors of channel participants, whether the firm, its established channel partners, or the firm's direct competitors, may be less than fully optimal for them; these actions result from some combination of bounded rationality and response to short term (or local) conditions. Some decisions may produce short term losses that may be too severe to be borne, even if the resulting longer term outcome may be optimal for the decision maker. This is true if the implications for short term profits and market share would be seen by the management team, by financial analysts, or by investors, as unacceptable; again, this is applicable to the behaviors of all channel participants. This loss of will needed to stay with a better long term strategy despite short term stress is highly subjective. There is no fully objective way of incorporating "flinching" at the intermediate costs in the derivation of closed form solutions; rather, it would need to be assessed at each step of the way by decision makers using our iterative models of dynamic channel behavior. We say more about the simulation in section 3, and in the technical appendix.

Our decision to use simulation methodologies instead of solving for closed form solutions was made for reasons that we feel were compelling but that may require reiteration:

- As shown by Schmalensee and others during the 1980s [52], closed form equilibrium solutions to channel design optimization problems may not always exist, or may be solvable only under some restrictive sets of conditions. We are interested in the most general distributions of customer preferences and customer profitability, including joint distributions on customer profitability, customers' product preferences, and customers' channel preferences. This degree of generality is best addressed through simulation.
- We are interested not in the nature of steady state disintermediation but in the transition paths that determine whether or not this equilibrium can be reached. This analysis of dynamic trajectories is, once again, best done through simulation.
- We assume that no competitive channel strategy will remain unaltered through its implementation, and that strategic decisions such as pricing will be reevaluated, based on actions taken by allies, direct competitors, and intermediaries, and strategies will be changed as they evolve. Once again, the analysis of dynamic strategies is best examined through simulation.

We believe, as do other proponents of simulation, that without aids to intuition problems with a large number of feedback loops and intuition are too complex to solve by inspection and too complex for intuition to offer reliable guidance. Simulation is especially appropriate when it is necessary to observe dynamic behavior and to perform sensitivity analysis (e.g., [26], [27], [42], [53]). Perhaps the most critical form of sensitivity analysis is sensitivity not to changes in parameter values, but to changes in decision makers' strategies, perceptions, and preferences. As is well-known, the solution of problems with a high degree of non-linearity may require moving away from a local optimum to achieve a global optimum; that is, actions must be taken that will make things worse before they can be made better. The situations in which firms find that they **must** consider a channel bypass strategy and they risk severe punishment for attempting to bypass their traditional intermediaries are of precisely this form. Such situations require an especially difficult and courageous set of decisions for which closed form mathematical analysis is largely inappropriate for analyzing the behavior of human actors (see, for example, Arnold's analysis of the adoption of *perestroika* [3]). And yet, it is also well known that human decision makers have great difficulty following the implications of their decisions in non-linear environments with multiple feedback loops (e.g., Forrester on System Dynamics, [29])⁴. That is, not only is it difficult for organizations to follow such strategies even if the need is clear to decision makers [2], the complexity of the analysis and of the dynamic behavior of channel systems over time assures that the need will not be clear. Simulation provides an environment in which decision makers (or, in our case, research scientists) can see the implications of their actions in the context of the actions of other channel participants and can explore strategies and observe their implications over time.

1.4. The Role of Marketing Science

A small set of concepts has been borrowed from marketing science, as described in more detail in section 2. In particular, the concepts of brand strength, channel power, and rate of consumer adoption all drive the selection of parameters to be included in the simulation model. We clearly believe that these concepts are as valid online as off, or they would not be useful and we could not make predictions based upon them. Just as clearly, we believe that their interaction is complex, non-linear, and non-intuitive, and that this complexity justifies the construction of new models for analysis.

1.5. Structure of the Paper

Section 2 begins with a review of relevant literature in channel power, brand strength, and newly vulnerable markets. Section 3 presents our analytical model. Section 4 shows the results of our model when it is used to analyze straight-forward attack by airlines on the agency system and by consumer packaged goods manufacturers on

⁴ This may be best said in Forrester's own words: "The computer model shows how detailed structure and policies of a system often lead to puzzling behavior. The dynamic behavior of a system is controlled by a set of reinforcing and stabilizing feedback loops. ... Relatively simple systems, let alone those with interesting real-world complexity, are usually too difficult and non-intuitive for our unaided brains to deal with effectively. Understanding real-world complexity requires simulation models of the actual system to give us a manageable laboratory from which to build understanding." <http://www.nuengr.unl.edu/cet/contacts/Spring03/Feature4.html>

the grocery retailing channel. Section 5 uses the model to explore more complex strategies and to offer strategic recommendations to travel agencies and manufacturers, the parties most at risk in their evolving distribution channels. Section 6 summarizes recent experience, section 7 provides some guidelines for the formulation of strategy, and section 8 provides a summary and conclusions.

2. Literature Review

Our analysis of channel encroachment and dynamic channel strategies draws on three related bodies of work:

- Channel power, the ability to extract economic rents by influencing the behavior of channel allies such as producers, distributors, or retailers, has been studied extensively. It seems likely that powerful channel participants should be able either to invade others' turf, or to protect their own roles from encroachment.
- Brand strength, the ability to persuade consumers that your brand is different, worth searching for, and worth paying a premium to obtain, should in some way correlate with increased channel power.
- The theory of newly vulnerable markets explores conditions under which an apparently mature, slow growth industry may be vulnerable to attack by new entrants with a different pricing strategy and a different customer focus. This theory is applied effectively to explain and predict bypass, disintermediation, and attack upon traditional distributors.

2.1. Channel Power

Power has been defined as the ability to influence the decisions of others [31]. There are many different perspectives to look at power, including sociological, psychological, interpersonal, and organizational. Power, and the resulting ability to influence behavior of channel participants and retain economic rents, is central to our analysis of dynamic channel strategies.

Penrose [47] conceptualized the firm as a bundle of **strategic resources**. Pfeffer and Salancik [48] built on this view when they proposed that power relationships can be viewed in terms of resources and interdependencies. Typically, each party has some resources, but requires access to other resources to accomplish its objectives. A producer requires access to customers. A retailer requires access to products. Dependence on those external resources increases with how critical they are to accomplishing one's objectives and how unique those resources are. Vertical integration occurs when key strategic resources cannot be acquired in the factor markets and cannot be cost effectively contracted for in the product markets [50], [54]. Online distribution can be thought of as altering the relative values of strategic resources in the channel. Physical distribution systems may in some industries become less critical (e.g., store-front agencies for retail travel). eCommerce can also increase the value of information and the customer interface. Traditionally, the customer interface has been a critical resource in delivering physical goods. With the Web, these resources become even more critical, since for the first time, information

about individual customer behavior can be tracked, including not just what they buy, but what they look at and don't buy and how what they purchase may change over time. However, control over this information may shift from the physical store to the operator of the online distribution system.

Inherent in the resource dependence view of channel strategy is the idea that power is essentially a bargaining concept. More precisely, power is not always reflected in outright and visible conflict, like a price war, though it can be. Power can be exhibited simply by making demands, and having your opponent capitulate and accept your demands. In some sense this is captured in the concept of Nash bargaining, in which the outcome of a hostile negotiation is determined by power, and by each party's next best alternative to a negotiated agreement. A branch of research has taken this further by using game theoretic models to explore channel interactions (e.g. [40], [43], [45], [8], [44]). This work has shown that different bargaining structures can affect the level and division of channel profits. Of course, none of this work has been applied to the study of manufacturers' attacking their channel partners through direct distribution, or the possibility of retribution that could result, simply because this form of conflict and the resulting bargaining situations were not possible previously.

The simplest possible definition of channel power in the context of our work would be the ability of the distribution channel to force its suppliers to avoid any attempt at online distribution, but this is an absolute concept, and difficult to operationalize realistically. We take the traditional concept of channel strength, the ability of one channel to charge a price premium relative to another channel [4], and incorporate it in our model in a way that determines an agency's or a retailer's ability to force compliance in suppliers. The closest we have found to a directly comparable use of power in traditional retailing is a manufacturer's willingness to tolerate activities from a powerful channel partner that it would not tolerate from a competing manufacturer [22], quite possibly due to fear of the channel partner's power and ability to impose penalties in response to the manufacturer's actions.

2.2. Branding

In most situations, products are not perceived as pure substitutes in economic terms. Many customers will have some preference for Coke relative to Pepsi, or for Tylenol relative to Bayer, and this preference will be manifested in terms of price paid or quantity purchased. Brand is a significant strategic resource of providers and an important source of power in the distribution channel. Strong brands are important to retailers for attracting customers and, conversely, not including a strong brand may drive traffic away to competitors. Moreover, strong brands can justify a price premium over competitive products [41].

Channels also can be branded and differentiated. A particular store may be preferred by a customer because of its location, prices, selection, service, etc. As with products, channels may differ on these dimensions and different customers may value each of these dimensions differently. Product preferences and channel preferences are countervailing forces in a channel. A strong channel preference increases the power of the channel while a strong product preference increases the power of the producer.

2.3. Newly Vulnerable Markets

The theory of newly vulnerable markets has three essential components [10], [12].

- Newly easy to enter
- Attractive to attack
- Difficult to defend

We explore the roles of each of these factors in turn.

Newly easy to enter: A market can become vulnerable if it is newly easy to enter, as a result of regulatory change (regulatory change in Europe increased the vulnerability of financial institutions previously protected by national borders), technological change (cellular telephony increased the pressure on Bell operating companies by offering alternatives to their local service based upon traditional land lines), or consumer preferences (as consumers become more net-savvy online shopping may threaten established mall operators and the owners of large physical stores).

Attractive to attack: Markets are attractive to attack if they exhibit extreme differences in profitability between the best and the worst customers in a market. This is most frequently due to uniform pricing in the presence of great differences in customers' cost to serve, although other forms of simplistic pricing can produce similar effects. This difference in profitability, due to simplistic pricing, is equivalent to massive cross-subsidies of the worst (least profitable, or "kill you") accounts by the best (most profitable, "love 'em") accounts, which we have described as money pump between different customer segments. The most publicized example of an industry vulnerable to attack due to simplistic pricing has been credit cards [18]. We view these cross subsidies as indicative of a vulnerable market, much as Baumol viewed the presence of cross subsidies as indicative that a market was not contestable, but rather was operating under conditions that allowed it to earn monopoly profits [5], [6], [46]. Baumol uses cross subsidies as indication of the existence of some form of entry barrier, allowing monopoly rents to be earned somewhere; in contrast, we use the presence of cross subsidies, after entry barriers have newly been eroded, as an indication that these rents are now at risk. Baumol focused on cross-subsidies between different products (operating systems and browsers for example); while our work here focuses principally on cross-subsidies among groups of consumers.

And difficult to defend: Of course, without some barrier to prevent incumbents from immediately replicating the strategy of the attackers, there would over the long term be no profits for the attackers to capture; profits would be competed away as more accurate pricing eliminates transfers and cross subsidies. There are many potential barriers to defenders' rapid replication, including regulatory restrictions on incumbents, fixed commitments to existing customers to maintain current prices, and investments in inappropriate systems or physical infrastructure.

3. Formal Modeling

3.1. Intent of the Model

Our intent is to provide a **quantitative** model that enables us to support qualitative **analyses**. For simplicity, the model addresses an industry with two major competitors, initially labeled **yours** and your **competitor's**. The industry has a current, **traditional distribution channel** (think of this as mass merchandisers like Wal-Mart in shelf-stable consumer goods) and may be vulnerable to attack from a new, alternative, online channel, operated either by one or more manufacturers, by a third party, or by current retailers in the traditional distribution channel.

Planning effectively and making informed decisions, whether as manufacturers or as retailers, requires understanding their game-theoretic implications. For each decision you reach or “move” you make, other parties will respond with decisions and moves of their own. The model is structured to support analysis of the outcomes that will result from different combinations of moves by each party.

3.2. Structure of the Model

Our simplified model of the distribution channel assumes without loss of generality that there are two competing brands for the single product being studied. (When running the simulation model we have found that it is helpful to let one brand represent yours; the other represents all those that are not yours.) The model assumes an existing channel (mass merchandisers like Wal-Mart or Home Depot for consumer goods or traditional travel agencies for air travel ticket distribution).

We next describe the structure of the simulation model. The individual parameters, such as brand strengths, channel strengths, adoption rates, and cost structures, are described later in this section. The basic idea of the model is quite simple, as described below:

- There is an initialization phase, in which all consumers in a universe of potential customers are initialized with a brand preference, a channel preference, and an online shopping history.
- The model iterates over time, period by period:
 - At the start of each time period, each producer of goods or services makes a *channel strategy decision* (sell online, promote online without selling, or ignore the online alternative) and a set of *pricing decisions* (selling price to the retailer, selling price online if online retailing will be attempted).
 - At the start of each time period, the traditional retailer makes a pricing decision for each product, deciding whether to treat producers equally, or whether one is to be rewarded or one is to be punished.
 - Within each time period, the model iterates over all customers. Each customer with a history of online shopping scans the four alternatives (Product A online, Product B online, Product A through the traditional retailer, Product B through the traditional retailer) choosing whichever of the four provides the greatest utility. Some customers without a history of online shopping are considered for first time online shopping, with the

fraction considered based on the rate of trial of the new channel; these customers are treated exactly as other customers experienced with online shopping except that their channel preference for traditional shopping is usually higher. Those customers who do not yet shop online compare only the price of Product A and Product B in the traditional retailer. Revenues are calculated for producers, retailer, and for the online channel, based on sales as they occur. Both fixed and variable costs are deducted from revenues, to calculate profits. And consumer histories are updated, to reflect any online purchase experience. This is to represent the fact that getting the first online purchase from each consumer is usually the most difficult, and that experienced online shoppers are less likely to require incentives for shopping online than first time users are.

Again, the structure of the model is described in more detail in Appendix I. The principal thing that simulation offers us is that it lets us take simple, intuitive, and measurable concepts, like consumer's preferences for a specific brand or their rates of trial of a new channel, combine them in demonstrably reasonable ways, and observe how they interact. This lets us estimate the impact of alternative strategic decisions. The individual pieces are simple and were measurable at the time; the interactions are complex, and the results of the model were initially considered quite controversial but are now observable and measurable as well. The structure of individual parameters of the model is now described below.

3.2.1. Brand Strength. As we use the term **brand strength** in the model, it describes the distribution of consumers willing to pay a price premium for your brand or your competitor's, plotted roughly as a pdf over price. This appears to be a very standard definition of brand strength [1]. While mathematical tractability of closed form analysis requires some fairly simplistic assumptions about the distribution of consumer preferences underlying brand strength [49], our use of simulation allows us to model any distribution appropriate to a specific industry. If all consumers were strongly loyal to one brand or the other, willing to pay either an additional $x\phi$ for your brand or an additional $x\phi$ for your competitor's (i.e., $-x\phi$ for yours), and if consumers were equally divided between the two brands, then the distribution of brand strength would show all of the probability concentrated equally at $-x\phi$ and $x\phi$. (This is shown as twin spikes in figure 3.1.) If consumers' preferences are uniformly distributed between the two brands, and between the two price extremes, then the graph would be a line of constant height between $-x\phi$ and $x\phi$. (This is shown as a flat line in figure 3.1.) If most consumers are brand-neutral, but some have a preference for your brand and others have preferences for competitors, and if the number of consumers having stronger preferences decreases linearly as the strength of the preference increases, then there will be a graph that goes up linearly from $x\phi$, peaks at 0, and then falls off linearly until reaching $-x\phi$. (This is shown as an inverted **V** in figure 3.1.) These and a limited number of other standard forms are available for easy use when running the model, though any functional form can be used in place of our standard representations of brand strength.

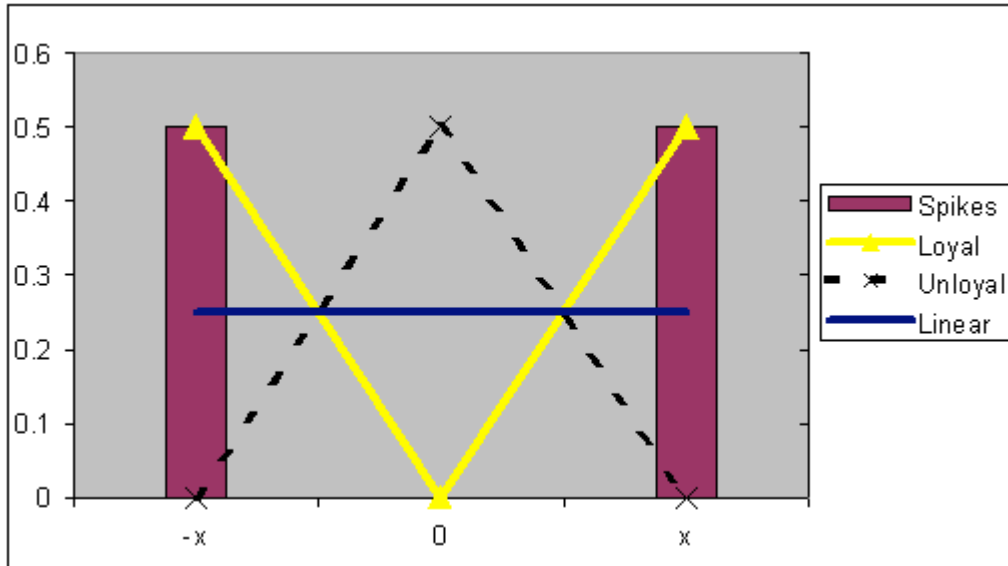


figure 3.1.—Several of the model’s standard pre-defined functional forms for brand strength, with symmetric distributions.

The general functional form captures the shape of the distribution of brand preferences; two other parameters are essential. One is the relative **strength** of consumers’ preferences. If your most loyal consumers were willing to pay $2x\text{¢}$ for your product while your competitor’s most loyal customers are willing to pay only an additional $x\text{¢}$ for theirs, then your brand preference strength is double that of your competitor; however, if your competitor has twice as many loyal consumers, then your brand preference share is only half as great. Figure 3.2 illustrates this.

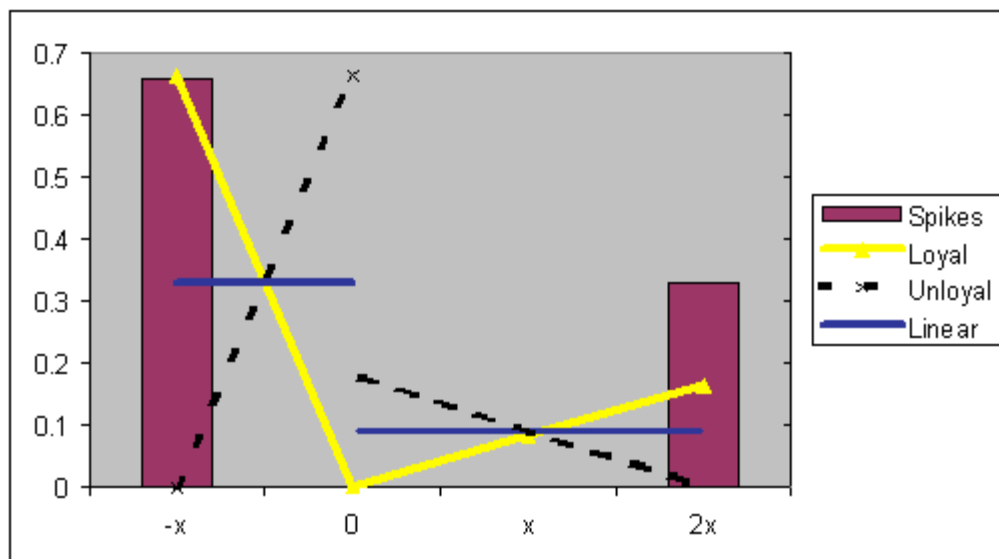


figure 3.2.—Several of the standard pre-defined functional forms for brand strength, with asymmetric distributions.

Brand strength is vitally important to the analyses supported by the model because it affects or determines two critical strategic decisions.

- The manufacturer's flexibility when setting the price for its product in new channel
- The manufacturer's ability to retain its market share in the traditional distribution channel when undergoing attempted punishment by the existing retailers

If consumers believe that a brand is significantly better than its competitor, the manufacturer can sell it through a new, alternative channel and consumers will adopt the new channel and purchase the product. If they feel that the brand is not significantly better, however, the manufacturer will need to provide significant incentives (discounts, free shipping, or other benefits that ultimately translate into some discount) in order to attract customers to the new and unfamiliar mode of shopping. The stronger the customers' preferences for a manufacturer's brand, and the greater the manufacturer's share of these loyal customers, the less the manufacturer will need to rely on price discounts in order to launch the new channel.

If customers believe that a manufacturer's brand is significantly better than its competitor, this also limits the existing channel's ability to punish the manufacturer for direct distribution and bypass. If many customers will insist on buying the product, then any attempt by retailers to punish the manufacturer by removing the product from their shelves will simply drive customers more quickly to the manufacturer's online shopping channel; conversely, if consumers are generally indifferent, then retailers can safely punish the manufacturer for attempting to bypass them, pulling its product off their shelves or raising the price they charge consumers.

We assume that consumers' brand preferences have been established through decades of use, experience, and exposure to advertising and promotional efforts, and that they are not readily changed during the period under analysis. That is, the effects of product advertising campaigns are not included in this preliminary modeling.

3.2.2. Channel Strength. In the model, **channel strength** is treated in a manner analogous to the treatment of brand strength. Just as brand strength measures the price premium that a customer is willing to pay to purchase one brand or the other, channel strength measures the price premium that a customer is willing to pay in order to shop in one channel or the other. Again, this is a fairly standard treatment of channel strength [36]. Initially, no customers are assumed to have any preference for online shopping; rather, some may be indifferent while others may have a preference for traditional shopping. The preference for traditional shopping can be viewed as the discount that must be offered, *all other things being equal*, to persuade the customer to shop online. As before, the shape of the distribution can be selected from a set of alternatives, and the relative strengths and sizes of the peak can also be specified. Each consumer's channel preference will change over time, based on each consumer's shopping experience; with successful online shopping experience, consumers' resistance to the use of online channels is eroded.

There is one additional factor that affects the degree of customer preference for traditional channels. There is some minimum choice set (that can be specified each

time the model is used) that the “prototypical consumer” requires in order to have a truly satisfying shopping experience. That may range from a choice among several alternative manufacturers’ clubs at a golf pro shop or a selection among several styles of shoes at a single manufacturer’s boutique, to several tens of thousands of SKUs at a moderate sized grocery store. In the model, the user specifies the size of choice set required and the size of choice set actually offered; the size of choice set offered can be viewed as representing the size of the consortium of manufacturers backing the online channel, or the number who have agreed to have their products represented. The actual size of the customer’s channel preference premium for the traditional channel is the premium described in the paragraph above times the ratio of desired choice set divided by actual choice set.

Channel strength is critical to our analysis because it determines the following:

- The size of the discount that must be offered to attract customers to the new channel for the first time
- The number of customers who will actually require a discount
- The number of partners or other sources of SKUs that need to be recruited

Thus, channel strength determines the expected difficulty in attracting a significant following to a new eChannel, including the expected direct promotional expense (that is, discount) required for attracting each individual customer for the first time. Brand strength interacts in a favorable (offsetting) way with channel strength. If your brand commands a \$1.00 premium but your new channel requires a \$1.50 discount, on balance a brand loyal customer can be attracted for only a 50¢ discount. In contrast, if your brand commands a 50¢ premium and your new channel requires a \$1.50 promotional subsidy to attract trial, then your brand loyal customers will shop online for a promotional discount of \$1.00. The greater your brand premium among loyal shoppers and the greater your share of loyal customers, the less expensive it will be for you to overcome any specified level of preference for existing channels and the easier it will be to attract share to your eChannel.

3.2.3. Percentage in Play. The **percentage in play** represents the fraction of customers who can under even ideal circumstances be attracted to your new channel in a single period. In an insurance setting, for example, only a limited number of customers have policies that are “up for renewal” in any given period. Of those, most will simply renew without thinking about calling agents or getting competing quotes; from the small group actually rethinking their choice of insurance carrier only a small fraction would have been considering online purchase when it was first introduced. In contrast, a significantly larger number of retail investors or travelers are considering trading or flying in any given month, and of those, a larger fraction might be willing to consider any alternative that offered a significant advantage in speed or cost.

The model requires percentage in play because it directly affects the following:

- Your ability to attract new online customers quickly, even under the best of circumstances — If most customers are not buying your product at this time or not reconsidering their purchase decisions then any discount, no matter how steep, will be insufficient to attract their business. Repeat

customers are easy to retain, as they do not need to overcome resistance to the use of the new channel.

- Your ability to attract share to your new channel before you are punished by traditional channel — Even if your targeted customers do not notice or respond to your online channel, your agent force will notice and will respond forcefully and rapidly. You may find that this response is immediate, costly, and damaging over the long term.

3.2.4. Cost Structure. Finally, the model requires some measure of market size and costs. In particular, it needs to incorporate your fixed and variable costs, your competitor's fixed and variable costs, and the current channel (retailer's) fixed and variable costs. This is critical because cost structures determine the impact of shifting market share between manufacturers and between channels:

- The nature of fixed and variable costs, for you, competitor, and retailer, determines impact of loss of share on each party.
- The nature of fixed and variable costs determines the scale of operations needed before the eChannel can become competitive on costs.

3.2.5. Decision Variables — Things you can do: These decision variables in the models represent the strategic choices you can make, the actions you can take, and the things you can choose to do:

- You can **Do Nothing, eBrand, or eAttack**; that is, you can ignore eCommerce and not take even the first steps towards implementing an eCommerce strategy, such as creating a website; you can create a website to increase brand loyalty and the visibility of your brand, by providing information that supports sales, service, and customer awareness and “bonding”, but avoid any direct sales activities; or you can launch a channel that sells in direct competition with your existing intermediaries. The eBrand strategy also has the advantage of increasing customers' awareness of your website without actually offending retailers or inviting retribution; thus it may be an early stage in a “stealth strategy,” leading to faster consumer adoption of online shopping after transition to an eAttack strategy.
- You can get “neutrals” to join your market; so that a number of non-competing brands will distribute through your eChannel, which increases the number of SKUs you offer and decreases consumers' initial reluctance to try the new online channel. That is, you can negotiate with them so that they undertake the same eCommerce strategy that you do. This would increase economies of scope and reduce distribution costs, while making the channel more attractive to consumers.
- You can get your competitor to join your market. This precludes the traditional retailer from targeting you or your competitor for retaliation, since presumably the retailer cannot drop all branded products in a single category.

- You can set your wholesale price to traditional retailers, where a low price may encourage more sales by reducing the cost to consumers, or may increase the retailer's promotional efforts for your products.
- You can set the price you offer your eCustomers in your new eDistribution channel. Some discount will almost certainly be required initially, to encourage consumer trial of the new channel.

3.2.6. Decision Variables — Things your competitor can do: These decision variables in the models represent the strategic choices that your competitor can make, which correspond directly to the choices that you can make:

- Competitors can **Do Nothing, eBrand, or eAttack.**
- Competitors can get “neutrals” to join their market.
- Competitors can induce you to join their market.
- Competitors can set their wholesale price to traditional retailers.
- Competitors can set the price they offer eCustomers in their new eDistribution channel.

3.2.7. Decision Variables — Things the retailer in the traditional channel can do: The operator of the traditional mass merchandiser can take the following actions:

- The retailer can set prices for your product
- The retailer can set price for your competitor's product
- The retailer can use prices to influence consumers' choices among competing products. This is done to maximize the retailer's own profits, to impose a degree of pain on manufacturers that they wish to discipline, or both.

3.3. Using the Model

Use of the model is straightforward. The user enters parameters that describe the consumers in the market (number of consumers, their brand preferences and channel preferences) and the firms (the fixed and variable cost of manufacturers and the retailer). The user then chooses values for strategy variables (whether his firm wishes to do nothing, shift to eBrand, or shift from eBrand to eAttack, and if attacking, what price to offer in the eChannel). Finally, strategic responses from the competitor (to enhance sales and profits of his brand) and from the traditional retailer (to preserve profits, protect his channel, and discipline and punish any attacker) can be entered. In general, we find that when examining a brand strategy, it is useful to explore an option, then explore the actions that competitors could take as their most effective response, and then explore responses to these responses. This can be done systematically, in a manner approaching a game-theoretic minimax analysis, or in a more ad hoc fashion.

4. Results of the Model

4.1. Newly eVulnerable markets:

An attack on an existing distribution channel can be seen as vertical encroachment into a previously mature and stable market, and thus it can be analyzed with our theory of newly vulnerable markets. Admittedly the new entrant is an old and established industry player, but one that is a new entrant in the particular portion of the industry value chain that it is attempting to attack. When an existing primary producer attempts to bypass its distribution channel and distribute directly to the consumer, it is both a horizontal play (Unilever competing with Wal-Mart for retail customers) and a vertical play (Unilever in some sense attacking its largest US distributor). The possibility of counter-attack as a new form of defense (Wal-Mart promoting competitors' products ahead of Unilever's) must be incorporated into our model of newly vulnerable markets if it is to analyze channel conflict effectively. Once again, we would anticipate successful attack if the eVersions of the following three criteria are satisfied:

(1) **Newly easy to enter** — Improvements in technology make online shopping easier or a change in consumer preferences makes online shopping more attractive; and the product that is to be sold online can be described with relatively simplicity and with a high degree of unambiguous and objective detail, making the design of the user interface relatively straightforward.

(2) **Attractive to attack** — Not only is the diverse customer base characterized by a mix of profitable and unprofitable accounts, but there is a visible "customer profitability gradient." As we have seen, the first makes it possible to succeed with a small number of highly profitable customers, without requiring enormous scale, while the second makes it possible to identify and target these customers successfully.

(3) **Difficult to defend** — As with other forms of market entry, encroachment is generally difficult if the established players are able to counter the new entrants' attack by replicating their strategy. However, an alternative form of defense is available when the attacker attempting to encroach upon an existing channel is currently dependent upon that channel for distribution of its goods or services. If the attacker faces rapid and plausible punishment from retailers, agents, or distributors when the attacker attempts to bypass the existing channel, then an effective defense is readily available.

4.2. An Airline as Attacker

To analyze airlines' threatened attack on the established travel agent distribution system, we examine the applicability of our three criteria for assessing newly eVulnerable markets:

(1) **New easy to enter** — *eReach* is relatively straightforward; reaching potential customers with an online service and describing flights to potential customers in complete, simple, and unambiguous detail can be done simply with a limited amount of information. Existing reservation systems already provide the relevant information online (i.e., carrier and flight number, departure and destination cities, departure and arrival times, class of service, fare, and seat locations). With the advent of electronic ticketing *eDistribution* — ticket delivery — has become trivially simple, as in many cases there is no longer a ticket to deliver.

(2) **Attractive to attack** — In air travel there clearly are profitable and unprofitable accounts. For the agency system, unprofitable accounts largely include the segment of leisure travelers who require considerable amounts of advice and coaching, precisely those consumers that airlines originally intended the agency system to serve. Customers who want to book a full fare round trip for a business meeting in Chicago are relatively easy to serve. Customers who want to book a vacation in Disney World, want all of their hotel and park ticket options described, and then want the cheapest possible airfares, are far less attractive, both to the agency system and to the airlines considering direct distribution. As significantly, the customer profitability gradient is extremely visible, as frequent flyers are known to the airlines and must identify themselves with photo IDs before each flight.

(3) **Difficult to defend** — If we assume that airlines would initially target the most attractive customers, those who both paid higher airfares and had reservations and ticketing needs that were easier to serve, and if airlines were able to provide adequate incentives to these travelers for adoption of direct distribution, then the airlines' moves towards direct distribution would be relatively safe from punishment. That is, airlines could achieve rapid adoption of their desired customers, and would assure that the customers who remained with the traditional agency system represented a significant service expense but a small source of revenues and an even smaller source of profits. Moreover, if we assume the presence of even a slight ability to influence passengers' selections of carriers and to divert even a small number of these additional, highly profitable travelers to their own flights, then direct distribution would represent an increase in an airline's revenue rather than a loss; this would make punishment even less effective. Finally, since the customer segment targeted for online distribution can be served by the airlines at a price somewhat less than full 10% commission on full fare tickets, the airlines distribution costs and total expenses are reduced even as revenues from additional sales increase.

Channel conflict in air travel is shown in figure 4.1. The bottom (x) axis denotes the 20 periods for which the simulation was run. In period 1 both airlines rely on traditional travel agent distribution, and all three (both airlines and the agency system) are profitable. In period 2 Airline-1 (A1) launches an electronic market, attempting to bypass the agency system. The channel retaliates immediately, shifting as much market share as possible to Airline-2 (A2). Airline-1 suffers an immediate loss of profitability, while Airline-2 benefits at its expense. However, as more and more customers adopt online shopping for air travel, and as Airline-1 targets business travelers and induces them to adopt online shopping for air travel more rapidly than the population as a whole, Airline-1 and its electronic market rapidly overtake the profitability of Airline-2. The traditional agency system, left with a dwindling number of customers, many of whom are price sensitive leisure travelers who are also labor-intensive for the agency system to serve, is seriously damaged.

As shown in figure 4.1, in steady state direct ticket distribution represents an increase in profits for the airline that attacks (A1 in the graph below), a reduction in profits for the airline that does not attack (A2), and a significant loss in profits for the agency system (TA). Even this illustration somewhat overstates the risk to the carrier; that is, since the attacking airline enjoys an advantage relative to airlines that do not launch

direct distribution, other carriers can be expected to follow rapidly. Once all carriers have adopted online distribution it makes little sense for agencies to attempt to punish them for doing so; consequently, it is realistic to conclude that direct distribution is indeed safe for airlines, and that no plausible threat of punishment or immediate defense is available to the agency system.

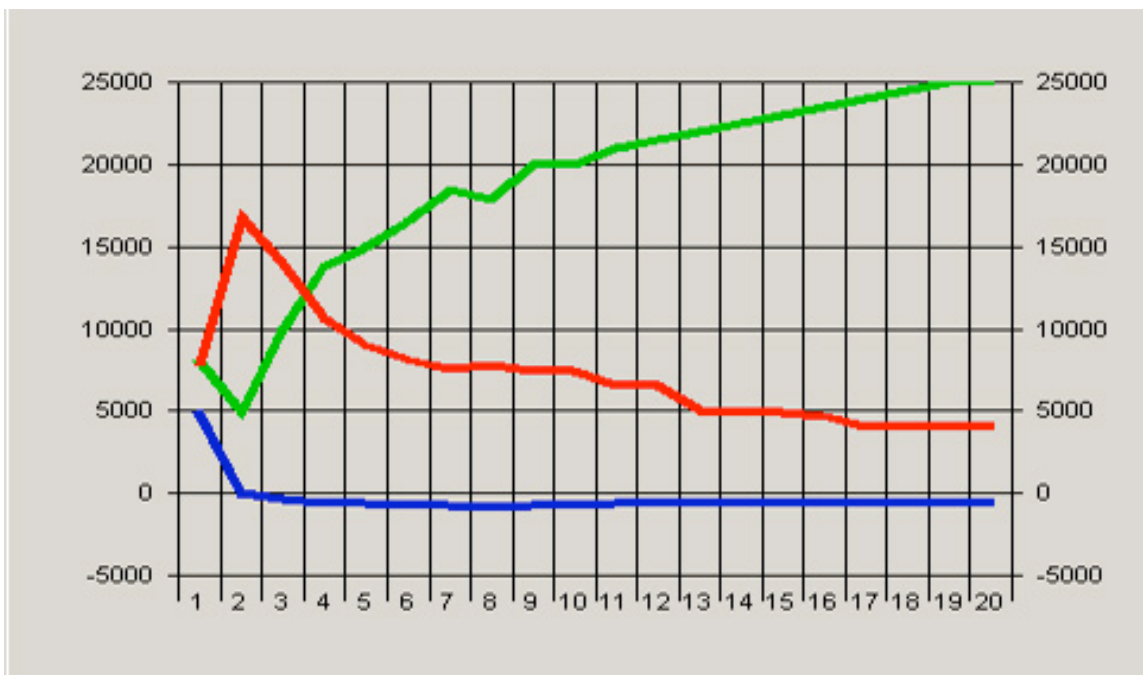


figure 4.1: Limited risk associated with properly timed attack in air travel. The attacking aggressive airline (green line) does well over time, while both the competing, passive airline (red line) and the travel agency (blue line) suffers. The intuition behind this is simple: if travelers are ready to accept online booking without a travel agent, then the agency system suffers. Assuming some bias in the electronic distribution system in favor of its own, then competitors suffer as well. Competitors' loss of volume and the agency system's loss of commissions are both reflected as increases in profits for the attacker. The model is run with in-play ratio of 20%. Brand strength takes the form of Loyal with peak values of \$40 for both brands. Channel strength takes the form of Spike with peak value \$0 for the agents and \$40 for the eChannel. Retaliation is immediate. Only one company attacks. Fixed costs for distribution through the eChannel are \$10,000 and variable costs are \$1.00 per ticket. Fixed costs for airline operation are \$2.3 million and variable costs are \$0.00 per ticket. Both airlines charge a fare of \$1000 for business class and \$300 for coach class. Before the attack, the agent receives a commission of 10% the airfare. After the attack, the fares remain the same, however the airline stops paying commissions regardless whether it is sold online or through the agent. In return, the agent retaliates by attempting to move brand-indifferent passengers to the competing airlines, with a 50% success rate.

4.3. Consumer Packaged Goods Manufacturer as Attacker

The same analysis of newly eVulnerable markets can be used to examine the possibility of direct distribution by consumer packaged goods manufacturers:

(1) **Newly easy to enter** — Will consumer packaged goods manufacturers begin direct distribution of their products to consumers? First, coming up with the

necessary user interface for *eReaching* customers will be far more complex for grocery sales than for business travel reservations. Describing a chocolate chip cookie is different from describing a head of lettuce, which is different again from describing paper towels or canned soup. The set of attributes is large, and for many products the descriptions are subjective (what is a ripe cantaloupe or an attractive cut of fresh tuna?). Likewise, eDistribution will be more complex than for travel. Unlike eticketing for air travel, physical products must actually be delivered, generally at a time and place convenient for the consumer, and often quite rapidly and with careful control of temperature and other conditions during shipment. Thus, there will be a real and significant fixed cost per delivery; without a sufficient number of products to offer economies of scope, distribution costs will be extraordinarily high and will reduce or eliminate consumer adoption of this new channel unless the channel operator is willing to sustain large losses by subsidizing logistics. And finally, without a large number of products from a range of manufacturers, the site will not be attractive to many consumers. Consumers do not shop for paper towels, or for baby shampoo, in isolation. A reasonable range of products must be offered, requiring close cooperation among a large number of manufacturers. Without this distribution costs will be prohibitively high (as is the case even in products with strong brand loyalty like J & J baby shampoo. Likewise, without a broad range of products on offer, the customers' rate of adoption, or in-play ratio, will be much too slow, prolonging the period of vulnerability to attack by traditional intermediaries. Getting cooperation, especially in the presence of strong U.S. concern with collusion among manufacturers as the principal focus of Sherman Act anti-trust policy, greatly complicates entry.

(2) **Attractive to attack** — In contrast with air travel, there is much less variation in profitability of purchases by individual consumers, and where such differences do exist they are known, if at all, only to retailers. The customer profitability gradient for consumer packaged goods is neither pronounced, with sharp difference between *love 'ems* and *kill yous*, nor is it visible to manufacturers.

(3) **Difficult to defend** — The final criterion we need to assess is traditional retailers' ability to defend themselves when attacked by manufacturers. It would appear that they have two means of defense; they can punish manufacturers who attempt to bypass them long before customers have changed their shopping behaviors, and they have superior information on customers' shopping histories and can develop online channels of their own, often more effectively than manufacturers could.

Retailers selling shelf-stable consumables do not appear vulnerable to disintermediation from the manufacturers who provide the products they sell. A manufacturer threatening Wal-Mart in detergent or Home Depot in do-it-yourself home repair products could expect a rapid reduction in promotional support from these retailers. This could be as simple as reducing their shelf facings and aisle cap displays, or reducing their spending on cooperative advertising. Other actions, more subtle, could include raising the price charged for the manufacturer's brands; this would not markedly reduce the sale of these products to customers loyal to these brands nor cost the store their sales, and it might actually increase the store's profits

from these sales. It would, however, drive numerous brand-indifferent customers to competitors' brands, and thus retailers could significantly harm manufacturers who threatened them. This ability to punish is directly related to the speed with which customers either adopt online shopping or remain loyal to their existing distribution channels; prior analysis of ease of entry, and recent data on actual consumer adoption of online shopping in these categories [7], both suggest that consumer adoption has been slow and that retailers' ability to punish is very real. Figure 4.2 illustrates the risk of being the first attacker; notice how much wealth is transferred from the attacker's brand (B1) to the brand that takes no action (B2), and notice how little improvement the attacker is experiencing over time.

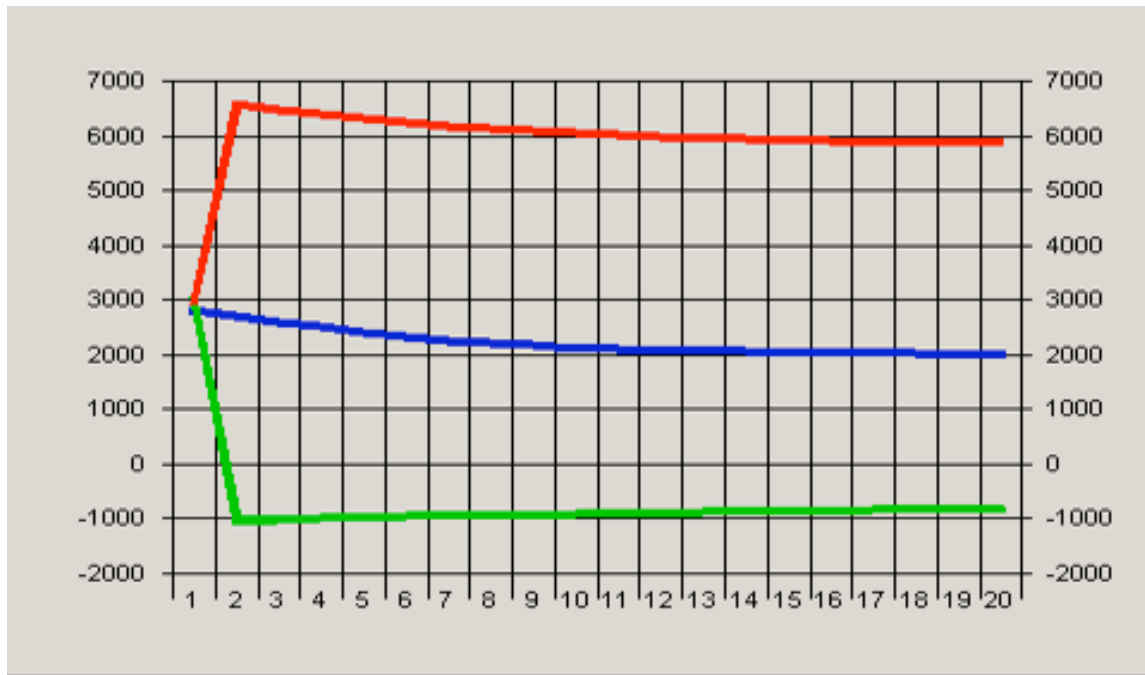


figure 4.2: Extreme risk associated with first attack in consumer packaged goods. The aggressive firm (red line) does badly for the 20 quarters shown and beyond, as retaliation by retailers shifts wealth to the passive firm (green line). The model is run with in-play ratio of 5%.

Brand strength takes the form of Loyal with peak values of \$0.15 for both brands. Channel strength takes the form of Spike with peak value \$0.80 for the retailer and \$0 for the eChannel.

Retaliation is immediate. Only one company attacks. Fixed costs associated with distribution through the eChannel are \$200 and variable costs are \$0.20 per purchase. Fixed costs for the companies associated with manufacturing are \$2,000 and variable costs are \$0.30 per unit sold.

The wholesale prices are \$1.00 per unit for both companies. Before the attack, the retailer charges a 40% mark-up, resulting in retail prices of \$1.40 per unit. After the attack, the retailer retaliates by raising retail price of the attacker a further 30%. The retail price for the attacking company is therefore \$1.70, compared with that of the competitor of \$1.40. The eChannel retail price of the attacking company is set to be the same as the wholesales price of \$1.00.

While the risk of early attack might suggest that consumer packaged goods manufacturers should take no action, inaction also creates risks. As we discussed in section 1.2.1, sometimes the manufacturer must be aware that the risks of doing nothing are also unacceptably high, since this will allow merchants to capture too much power when they launch their own online distribution channels. This is

illustrated in figure 4.3 below. Note that in this graphic both manufacturers lose wealth (B1 and B2), which is transferred to retailers (retailer profit), and which may ultimately be competed back to consumers.

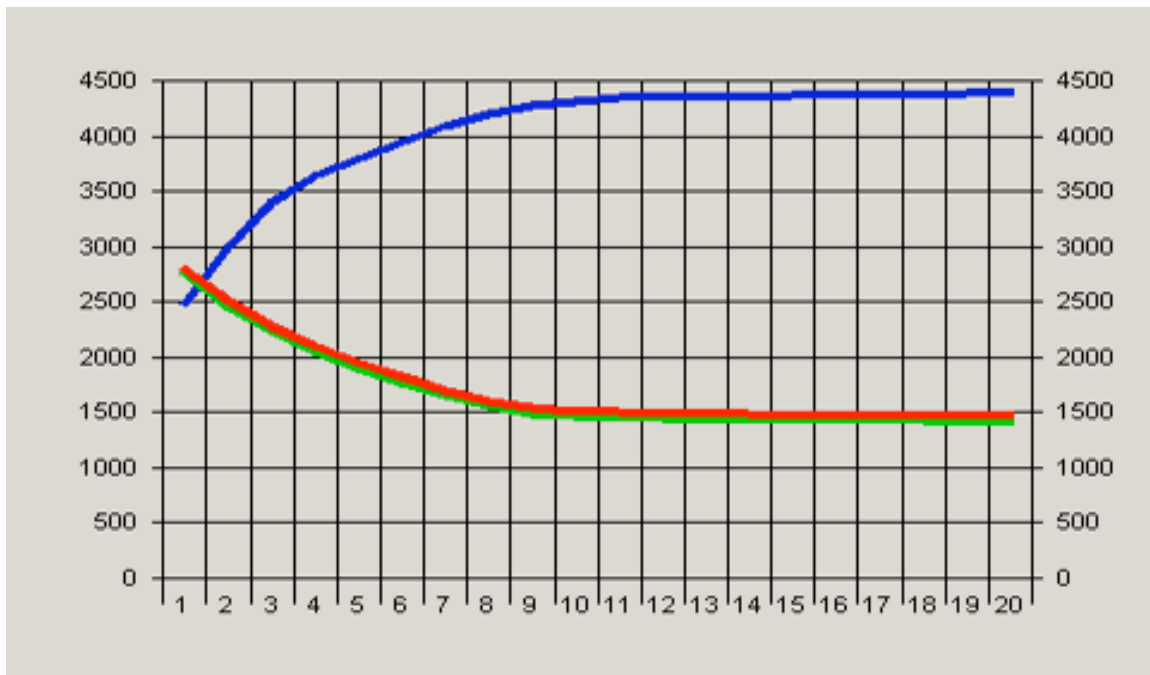


figure 4.3: The risk of allowing eChannel to be controlled by other parties; here the retailer does well (blue line) while both manufacturers suffer (red and green lines). The model is run with in-play ratio of 5%. Brand strength takes the form of Loyal with peak values of \$0.15 for both brands. Channel strength takes the form of Spike with peak value \$0.80 for the retailer and \$0.00 for the eChannel. The traditional retailer sets up the eChannel in addition to the brick-and-mortar stores. Fixed costs for distribution through the eChannel are \$200 and variable costs are \$0.20 per purchase. Fixed costs for the companies associated with manufacturing are \$2,000 and variable costs are \$0.30 per unit sold. The wholesale prices are \$1.00 per unit for both companies. Before launching the eChannel, the retailer charges a 40% mark-up, resulting in retail prices of \$1.40 per unit. After launching the eChannel, the retailer selectively manipulates the eChannel. Customers who prefer brand 1 get brand 1. Customers who prefer brand 2 get brand 2. Customers without a preference get whichever brand pays a premium to the retailer to be included in the eChannel. Over time this results in a transfer of \$0.20 from manufacturers to the retailer for sales to brand-neutral customers. This is, of course, the manufacturers' nightmare scenario.

Thus we find that the manufacturer may be unwilling to risk an outright eAttack on the existing retail distribution channel because of the fear of punishment, and yet may fear new entrants' presence in online retailing because of their ability to manipulate customer behavior and extract profits.

5. Findings and Strategic Recommendations

The overview of our findings, both for travel agents and airlines and for consumer packaged goods manufacturers and retailers, presented in section 4, is consistent with the evolution of the industry. Moreover, it is consistent with our original predictions [17], and with the study of information and channel power in the consumer packaged goods distribution system [16]. We see that travel agents have already seen a

reduction in their power and profitability, and that consumer packaged goods manufacturers have not yet found a counter to the threat posed by increasing consumer preference information in the hands of downstream channel participants. While these results may appear obvious today, they were most definitely not obvious at the time, as evidenced by the belief of Wall Street investors and CEOs of traditional firms that eCommerce was going to transform and even cripple retailers [21], [28], [34], [35], [37]. However, while none of these findings violates intuition, the complex interaction of different environmental factors and different strategies is not obvious through casual inspection, as will become clear in the specific scenarios below.

Of greater interest, naturally, than our ability to use the model to interpret the past is the confidence that a history of successful prediction gives us to use the model to interpret the future⁵. Indeed, we have used the model to explain the evolution of strategies in other industries. Insurance companies when faced with online attackers had to consider carefully the impact of retaliation from their agency force when developing a counter-strategy. Likewise, when traditional full service brokers were first attacked by online trading systems, they had to defer their response until their own brokers were willing to accept online [15]. In order to increase our confidence in future predictions, we first explore the model's ability to explain behaviors that can already be observed. We therefore focus below on showing what the model is able to do, by examining alternative scenarios that are already being faced by a wide range of manufacturers of retail consumable products, from paints and do-it-yourself supplies to all manner of grocery items, household supplies, and health and beauty aids.

5.1. Sometimes you can't win

If consumers' brand loyalty is sufficiently weak, and the rate at which consumers are willing to consider adoption of eChannels is sufficiently low, no manufacturer's first mover attack on the distribution channel can succeed. We model this here as channel attack with an in play percentage of only 5%, as shown in figure 5.1 below. While consumers' response is slow, the traditional retailer's punishment of the attacker is immediate. The attacker (Manufacturer1, with brand B1) offers deep discounts in order to encourage customer's initial trial of online shopping. The attacker sustains losses during the early periods, when it is being punished by the retail channel at the same time that it is deeply discounting products on its own channel. Moreover, the actions of the retailer, promoting the competitor's product (brand B2) while discouraging purchases of B-1, shift significant sales from B1 to B2; not only is Manufacturer1 losing profits and revenue, they are being shifted to its direct competitor. When Manufacturer1 stops discounting (period 8) it earns a bit more on

⁵ While successful prediction at one time is not proof that a simulation will offer valid predictions in the future, it is certainly encouraging. There is a standard sequence of validation stages, from testing individual components and then establishing **face validity** of the model as a whole (is it consistent and does it appear to make sense) through to a strong form of **external validity** (has it offered valid predictions) [fishman2]. This is described well by Emshoff and Sisson [x]: "A common method for validating is to compare the output of the simulation model to historical data under similar environmental conditions." "However, the ultimate validation of any model is how well it predicts the future; a simulation model must at some point undergo such a test." We are pleased that our model has exhibited a strong form of external validity.

each sale through its channel, but it stops the growth in trial and channel share that were produced by promoting its online channel. A longer period of promotion would result in higher rates of consumer adoption, but at the cost of extending the period of losses. Under the conditions modeled here, being the first attacker is simply too risky and too expensive. Interestingly, while online attack fails in this scenario, the assumed brand loyalty in this scenario is comparable to that assumed in the successful attack by airlines upon the agency system. This supports our statement earlier that the interaction among environmental factors and strategic decisions is too complex to assess simply by inspection and by reliance upon intuition.

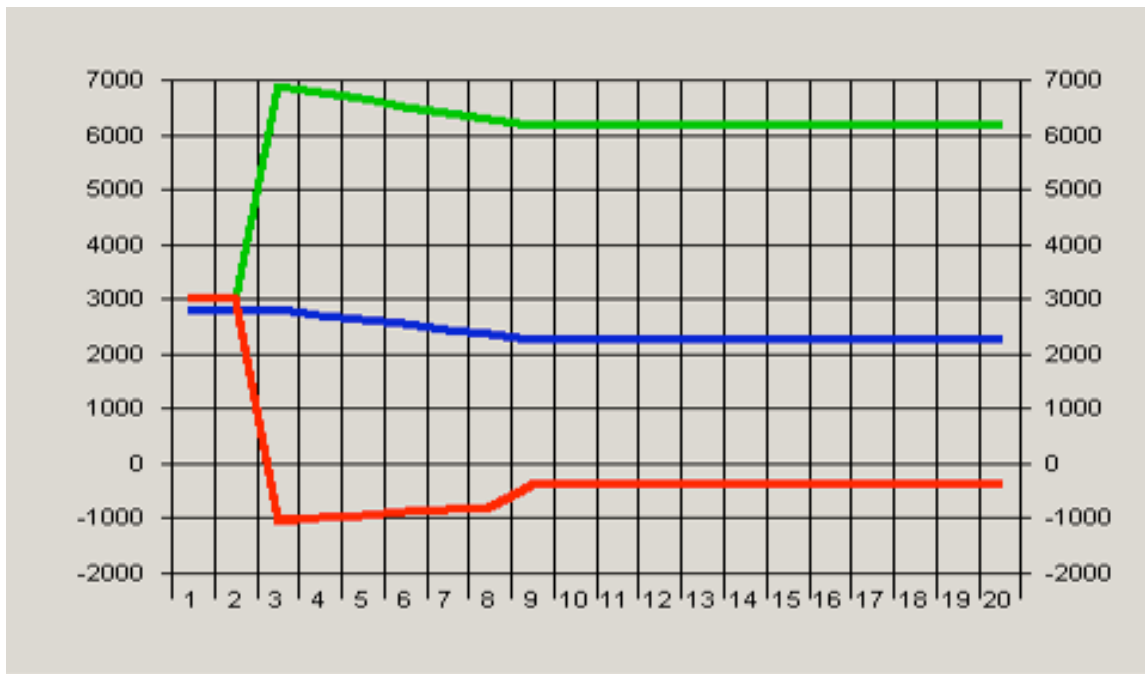


figure 5.1: **Sometimes you can't win.** The attacker sets online prices low to encourage consumers' adoption, but market conditions are such that adoption is still too slow and losses are too great to be endured for long. The aggressive manufacturing firm suffers (red line) as retaliation from the retailer shifts wealth to the passive manufacturer (green line). The model is run with in-play ratio of 5%. Brand strength takes the form of Loyal with peak values of \$0.15 for both brands. Channel strength takes the form of Spike with peak value \$0.80 for the retailer and \$0 for the eChannel. Retaliation is immediate. Only one company attacks. Fixed costs for distribution through the eChannel are \$200 and variable costs are \$0.20 per purchase. Fixed costs for the companies associated with production are \$2,000 and variable costs are \$0.30 per unit sold. The wholesale prices are \$1.00 per unit for both companies. Before the attack, the retailer charges a 40% mark-up, resulting in retail prices of \$1.40 per unit. After the attack, the retailer retaliates by raising retail price of the attacker a further 30%. The retail price for the attacking company is therefore \$1.70, much higher than that of the competitor of \$1.40. The eChannel retail price of the attacker is initially set to the wholesale price of \$1.00 during the promotion periods, after which the price is raised to \$1.30.

5.2. And sometimes you can win

With sufficient brand loyalty and sufficiently high consumer adoption, first mover attack can be safe and even profitable. In this case, with a much higher in play percentage (20%) and higher brand loyalty, first mover attack can succeed; this is shown in figure 5.2. Under these conditions only a short promotional period is required to attract

consumers to the new online channel. While the cost of this promotion produces losses, the loss-making period for B1 is short enough to be survived. Significantly, since share is being captured rapidly and punishment is not effective, no wealth is being transferred to the competitor through increased sales of its brand B2. Additionally, the retailer's profits decline rapidly. When the promotional period ends and the system enters to its new equilibrium, Manufacturer1 is in the strongest position, far more profitable than it was under the old equilibrium, Manufacturer2 is less profitable, relative both to Manufacturer-1 and to its profitability in the previous distribution regime, and the retailer has lost enough share to result in significant reductions in its profitability going forward. Manufacturer1 enjoys higher profits than Manufacturer2, in part because its direct distribution allows it to retain as revenue for itself that portion of the retail price that had previously represented gross margins for the retailer. As importantly, by capturing consumers through direct distribution Manufacturer1 has achieved immunity from the form of retailer extortion that was shown in figure 4.3.

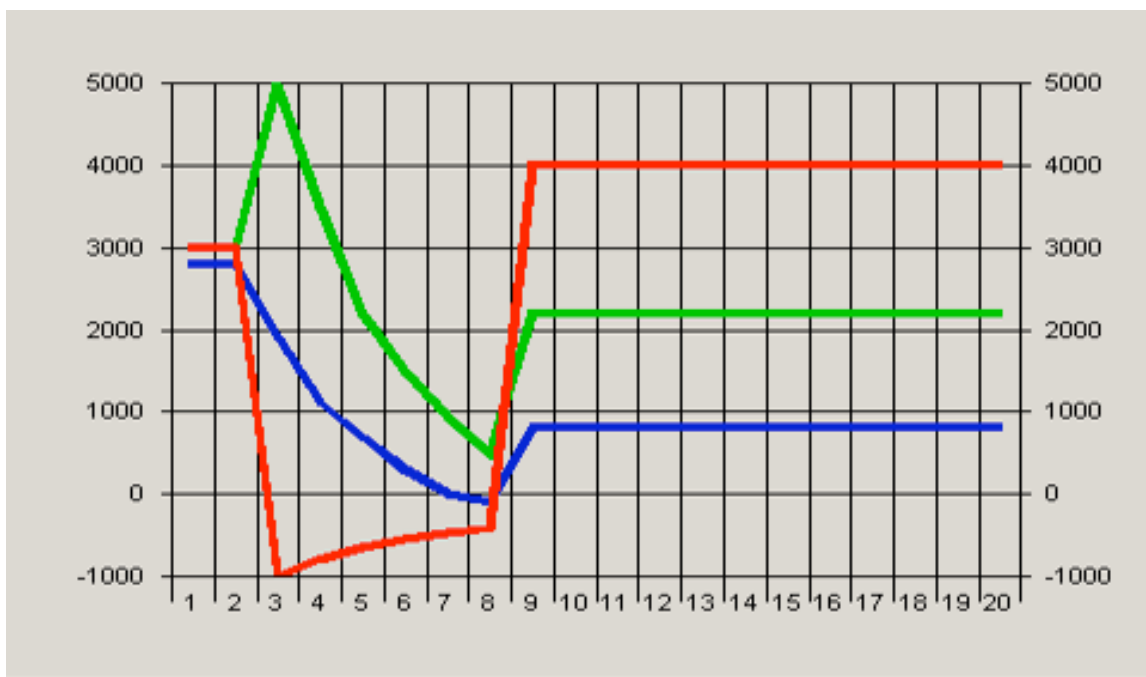


figure 5.2: **Sometimes you actually can win.** The aggressive manufacturing firm was able to set prices low enough to encourage rapid adoption by consumers (between periods 3 and 8), shortening the period in which retailer could effectively retaliate. After sufficient consumer adoption, the aggressive firm reset prices to a higher level (starting in period 8), recovering losses and producing sustained profits relative to competitors. The aggressor (red line) shows initial losses, and then a long period of sustained profits. The passive firm (green line) has initial gains, but losses out to successful online attack. The retailer (blue line) is the biggest loser. The model is run with in-play ratio of 20%. Brand strength takes the form of Loyal with peak values of \$0.15 for both brands. Channel strength takes the form of Spike with peak value \$0.80 for the retailer and \$0 for the eChannel. Retaliation is immediate. Only one company attacks. Fixed costs associated with distribution through the eChannel are \$200 and variable costs are \$0.20 per purchase. Fixed costs associated with production for the companies are \$2,000 and variable costs are \$0.30 per unit sold. The wholesales prices are \$1.00 per unit for both companies. Before the attack, the retailer charges a 40% mark-up, resulting in retail prices of \$1.40 per unit. After the attack, the retailer retaliates by raising retail price of the attacker a further 30%. The retail price for the attacking company is therefore \$1.70, much higher than that

of the competitor at \$1.40. The eChannel retail price of the attacker is initially set to the marginal costs of \$0.30 during the promotion periods, after which the price is raised to \$1.30.

5.3. Cooperative Strategies And Inter-Industry Alliances May Prevent Punishment

If you and your principal competitor were able to coordinate your channel attack, the initial losses you sustained during the promotional period would be lower because the retailer's ability to punish you would be reduced; that is, the retailer can retaliate against either you or your competitor, but not both, since refusing to carry either manufacturer's detergent, or either's paper towel, is usually not a reasonable option. In this scenario (shown in figure 5.3) both manufacturers begin online distribution at the same time. The cost of promoting their new channel reduces their profits, but since neither can be directly punished by the manufacturer neither loses sales to the other and neither becomes unprofitable during the promotional period. When promotion of the new channel ends and the associated costs no longer are being absorbed both manufacturers return to a high level of profitability, while the retailer's remaining market share has become so low that future profits are virtually eliminated. As significantly, with online distribution both manufacturers are safe from the form of retailer extortion shown in figure 4.3.

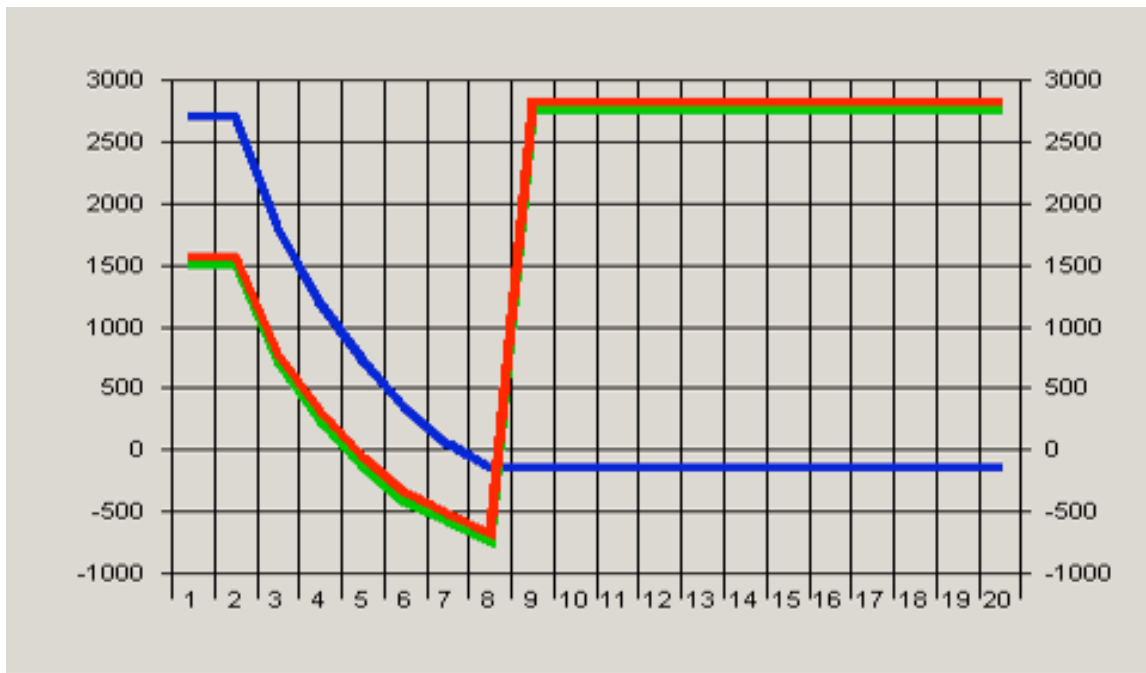


figure 5.3: **And with a little help from your friends** (actually, your enemy, but with a common interest in resisting retailer eCommerce dominance) ... If both manufacturers attack simultaneously, direct distribution can be accomplished without significant pain to either. Both manufacturers (red and green lines) suffer losses during the period when prices are set low enough to encourage consumer adoption, since during this period prices are too low to generate any profits. Likewise, both do well during the period of higher, steady state pricing. The big loser is the retailer (blue line). The model is run with in-play ratio of 20%. Brand strength takes the form of Loyal with peak values of \$0.15 for both brands. Channel strength takes the form of Spike with peak value \$0.80 for the retailer and \$0 for the eChannel. Retaliation does not occur

because both companies attack. Fixed costs for distribution through the eChannel are \$200 and variable costs are \$0.2 per purchase. Fixed costs associated with production for the companies are \$2,000 and variable costs are \$0.30 per unit sold. The wholesales prices are \$1.00 per unit for both companies. Before the attack, the retailer charges a 40% mark-up, resulting in retail prices of \$1.40 per unit. After the attack, the retailer keeps retail prices unchanged. The eChannel retail prices of both companies are initially set to the marginal costs of \$0.30 during the promotion periods, after which the prices are raised to \$1.30.

5.4. Of Course, Betrayal of Allies May Be Even Better

However, if both manufacturers agree to attack, it is still in the best interests of either to delay implementing their direct distribution agreement. By deferring implementation, Manufacturer2 assures that its competitor will be punished by the retailer; sales of its own brand B2 will increase, while sales of its competitor's B1 will be reduced; this is shown below in figure 5.4. After the attacker has invested in training consumers to shop online, then the second manufacturer can launch its own distribution channel with a fast follower strategy.

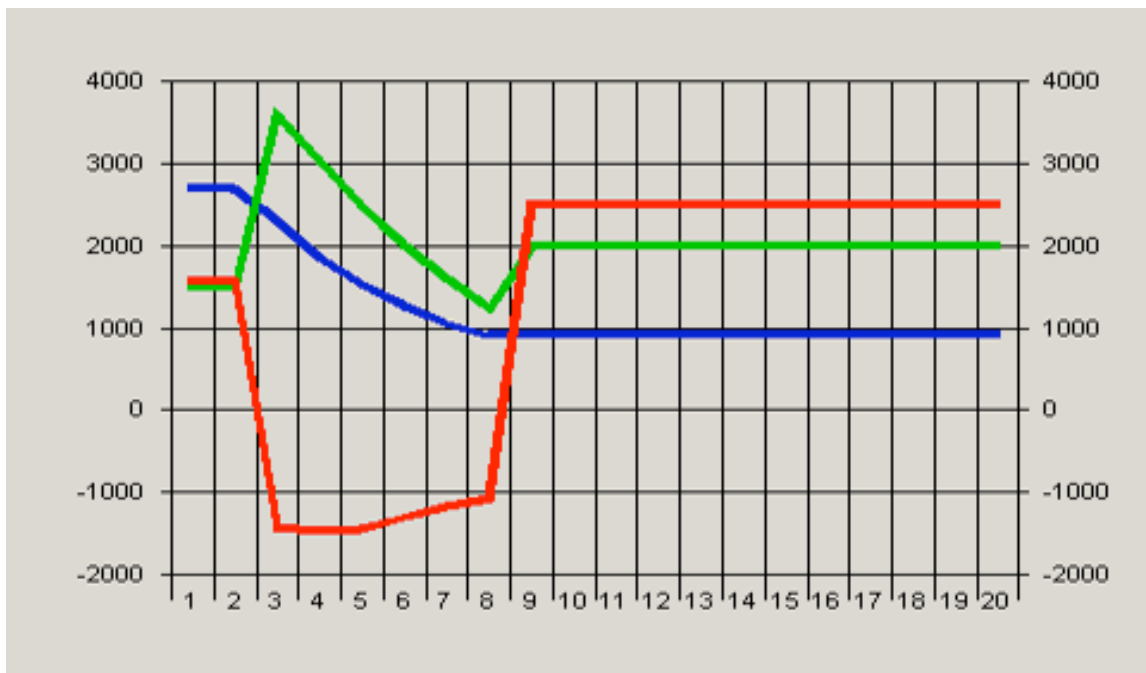


figure 5.4: **Of course, with friends like these ...** The trusting manufacturer launches the initial attack (red line) while the alleged ally manufacturer reneges on its promise to coordinate its attack and waits until a safer time to enter direct online consumer sales. Retaliation by the retailer against the attacking manufacturer damages this firm (red line) while it shifts wealth to the non-attacking firm (green line). The attacker does succeed in attracting customers to its eChannel, and when the price in this channel is raised after period 8 the attacker does have higher profits than the passive firm (comparing red line and green line). The model is run with in-play ratio of 20%. Brand strength takes the form of Loyal with peak values of \$0.15 for both brands. Channel strength takes the form of Spike with peak value \$0.80 for the retailer and \$0 for the eChannel. Retaliation is immediate. Fixed costs for distribution through the eChannel are \$200 and variable costs are \$0.20 per purchase. Fixed costs associated with production for the companies are \$2000 and variable costs are \$0.30 per unit sold. The wholesales prices are \$1.00 per unit for both companies. Before the attack, the retailer charges a 40% mark-up, resulting in retail prices of \$1.40 per unit. After the attack from the first firm, the retailer retaliates by raising retail price of the attacker a further 30%. The retail price for the attacking

company is therefore \$1.70, much higher than that of the competitor of \$1.40. The eChannel retail price of the attacker is initially set to the marginal costs of \$0.30 during the promotion period, after which the price is raised to \$1.30. The second company opens its eChannel at the end of the promotion period, with eChannel retail price set at \$1.30. After the attack from the second firm, the retailer revises retail prices for both companies to \$1.40.

We next examine a small set of mini-cases to confirm how the evolution of online shopping, both in these industries and others, is consistent with the principles used and the predictions offered above.

6. Recent Experience

This brief section focuses on our experience with corporate eChannel strategy as it has evolved in the past decade, and on mini-cases that relate to the predictions that we have made for disintermediation. The mini-cases highlight the role of in-play ratio and timing, and the closely related role of fear of retribution. The critical role of retribution in structuring the eCommerce disintermediation strategy of manufacturers and primary service providers was evident from the inception of this research. Indeed, the work was initiated by requests from the chairman's office of one of the largest airlines in the world and one of the largest consumer packaged goods companies in the world, when both men wanted to know if it would be safe for them to attempt to bypass their traditional intermediaries.

We begin with a short set of mini-cases that support the significance of retribution:

- General Motors and Ford found that customer adoption of online automobile shopping was very slow. This should not have been surprising; customers use the net to determine a fair price for a car, but they want to test drive the car and they want to be assured that they have a dealer who will provide them with reliable service. However, any attempt at online sales, in direct conflict with their dealers, runs the risk of alienating dealers, which could induce mega-mall auto dealers to steer customers to competing marques. Both GM and Ford have dismantled their online sales operations and GM at least has terminated the employment of the president of its online division [20], [25].
- A European agricultural chemical distribution company, which for legal reasons must remain nameless here, met with the manufacturers that represent its principal suppliers. It informed them that, ultimately, sale of chemicals to large agricultural coops would ultimately occur without the need for a distributor. It then informed them that the first of its suppliers that attempted a bypass strategy would be shut out of its market and driven to bankruptcy. The distributor was not convinced that it could save itself, but it was convinced that it could destroy the first attacker. The manufacturers understood the threat and none has attempted a bypass strategy yet.
- Home Depot has enormous market share in the retailing of a wide range of do it yourself home repair tools and products. It quietly informed the manufacturers that are its suppliers that while it was still determining its own online strategy it had completed its analysis of their; they were not going to have one. Any manufacturer that attempted to bypass Home Depot

would find that Home Depot would move as much business as possible to the manufacturer's direct competitor. Several manufacturers that supply Home Depot have discussed this with us anonymously, but none was willing to be publicly cited. [33]

- Bausch and Lomb, one of the leading manufacturers of disposable contact lenses, refuses to sell its lenses online for fear of alienating optometrists. Optometrists perform the eye examinations and then prescribe and sell lenses; if Bausch and Lomb were to compete with them for the lucrative business of refilling prescriptions, optometrists would prescribe and sell competitors' lenses. Indeed, fear of retribution has not only prevented Bausch and Lomb from selling online; it led them to sue other parties to block them from sell Bausch and Lomb lenses online. While more than two thirds of the states now require that optometrists and ophthalmologists release prescriptions to contact lens wearers, to facilitate their ordering lenses from any source they wish, and while numerous online retailers now offer contact lenses over the internet, Bausch and Lomb still carefully avoids even the appearance of channel conflict with eye care professionals who prescribe their lenses. A careful search of their website reveals the only mechanism they provide for ordering lenses online is to order from a retailer.
- Similarly, Merck, the pharmaceutical company, relies upon physicians to prescribe its products and in some cases, like vaccines, to administer them



directly. Merck's online sales strategy has had to be carefully balanced to avoid any perceived threat by physicians.

- Patek Philippe, manufacturer of some of most expensive watches in the world, has an elegant and informational website. It appears self-evident that no one would buy a \$50,000 wrist watch without seeing it first, and assessing appearance, quality, and comfort, and thus a company like Patek Philippe could not exist without a network of jewelry stores that display its products [11]. Consequently, their website is careful to do nothing to offend its retailers, and, indeed, does not compete with them in any way. Patek Philippe will help you find a retailer. It will explain to you the importance of buying only from an authorized retailer. But they will not even send you a catalog themselves; there is no bypass here. (c.f, <http://www.patek.com/retailers/fullindex.htm>.)

It is probably significant that the only players in the US that have attempt to launch online retailing systems that compete with traditional retailers have been either third

party players like webvan or netgrocer, or subsidiaries of the retailer itself, such as Wal-Mart and Home Depot. These are precisely the players who are safe from retribution from traditional retailers; traditional retailers may view new online stores as competitors, but they cannot punish them the same way that they can punish a Lever Brothers, a Procter and Gamble, or a J & J for opening online distribution.

Finally, it is extremely useful when we can find related events that offer pair-wise comparisons. The comparing the results of two different attacks on the traditional agency system is extremely instructive. In 1992, American Airlines attempted to end the practice of negotiating fares with individual travel agencies. The practice of negotiated fares made the largest agencies even more attractive, since they were able to demand lower fares from the airlines and thus able to offer lower fares to customers than could smaller competitors, and American feared the power that this concentration could represent. However, agencies were able to understand the attack and they countered immediately, running *book away* events that rewarded their individual agents for putting as few passengers as possible on American flights. This punishment was so effective that American quickly had to back down. In contrast, in 1995 Delta Airlines slashed commissions paid to US travel agents, capitulating them at the smaller of 10% or \$100. Delta's action was seen as safe, because the savings on commissions paid, and the ability to sell online to frequent flyers, more than offset any risk of punishment. Indeed, this was seen as such an attractive business proposition by so many airlines that rather than being able to retaliate against Delta, the agency system found that Delta's move was almost immediately followed by all major competitors. Indeed, ticket capitation and the slashing of commissions moved on, dropping from a \$100 cap to a \$50 cap, from 10% commission, to 8% and then 5%, reaching their current levels of \$0 and 0% on domestic flights. While the first part of this, American Airlines' experience with channel retribution, is of course not an online experience, it does serve to underscore the importance of channel retribution in this industry and it does underscore the importance of understanding the complex interaction of many factors before offering predictions.

7. Guidelines for Formulating Strategy

7.1. Factors Influencing Strategic Analysis and Predictions

We are interested in developing understanding that helps a firm determine its best strategy for direct distribution. We seek to understand what factors determine the power of channel participants, and thus determine when a firm should consider direct distribution, who to bring in as partners, and what actions to take to prepare. Understanding this will help apply our results to other competitive scenarios and to other industries.

We have seen that the following factors are significant to our analysis of channel power and channel strategy:

- **Brand strength.** A stronger brand will result in consumers seeking out the product if it is dropped from retailers' shelves and will speed adoption of an electronic channel if it is offered; a manufacturer with a weaker brand is more easily punished by retailers if a bypass strategy is attempted.

- **Strength of the existing channel.** The stronger the existing channel and the greater consumers' preferences for their existing retailer relationships, the harder it is to induce customers to try online shopping.
- **Need for a broad bundle of goods or services to attract consumers.** If consumers require a full range of choices among products and services in order to make their selections, then making a new online channel attractive to consumers will require coordination among a number of manufacturers.
- **Speed of adoption.** Rapid adoption will reduce the length and severity of the retailers' possible retaliation against an attacker who launches an online distribution channel, reducing the attacker's strategic vulnerability.
- **Presence and visibility of a strong customer profitability gradient.** A strong cpg that is also visible to manufacturers or to the producers of primary services will enable them to accelerate adoption of their new channel by their most profitable customers, reducing punishment by retailers.
- **Visibility of brand preferences.** If customers' brand preferences are visible to retailers, this greatly increases the possibility of effective punishment by retailers.

7.2. Strategic Check List

The following presents an outline of decisions that must be made to determine a channel strategy, structuring the questions that must be asked by a firm contemplating a new channel strategy and the most effective order for asking them:

Is there a clear, present need for a channel strategy based on bypass and disintermediation of current retailers? That is:

- **Can you safely ignore the threat?** If so, then there is no pressure to act immediately.
- If not, then **can you safely attack?** If you are going to need to attack, can you do so now?
- If not, then **can you safely wait for a better time?** If you are going to need to attack, and you cannot attack now, is it safe to wait?

If there is a real need for an immediate, active, online distribution strategy that attacks your current retailers, and it is not safe to launch such a strategy, what are your options?

- **Can you change something and improve your position alone?** Can you reduce or eliminate your risk through some actions that you can take without the cooperation of others?
- If not, then **can you improve your position with participation of neutrals?** Can bringing neutrals into your electronic channel make it more attractive to consumers and speed their trial and adoption, limiting the retailers' ability to retaliate against you?

- Alternatively, **can you improve your position with participation of your competitor?** If you and your direct competitors coordinate your attack on the current distribution channel, can you escape punishment by retailers?

Can we impose some structure on the concept of “change something”? What else can a firm change in order to reduce the possibility of punishment by retailers?

- **Percentage in play:** Is it possible to influence the saliency of channel selection to consumers? Can you use the net to create a powerful and attractive website for future eDistribution efforts?
- **Rate of adoption:** Is it possible to provide sufficient promotional price discounts for your own brand, or for your online channel, to speed up consumers’ trial of online shopping and their ultimate adoption of it? Can you counter the strengths of the traditional channel, by increasing trust in your product or in your new distribution channel, perhaps through stronger guarantees or other forms of consumer protection?

8. Conclusion

8.1. Extensions and Directions for Future Research

The models presented here were developed to address two extremes among products, which helped highlight significant differences and facilitated our analysis and our development of models. Predictions that we originally published in 1992 and 1998 [16], [17] have, indeed, been supported by unfolding events.

The following extensions to our model represent promising areas for related, future research

- **Extension to other industries.** How effective would the same form of analysis be when applied to different industries that were less extreme, such as securities trading or insurance sales? Additional work provides some explanation for why online securities trading was first offered by discount brokers and only later by full service firms. [15].
- **Modeling channel conflict in pure information goods.** Pure information goods such as music, news, and video are increasingly being transformed by technology and are increasingly available in digital form over the web. To what extent can the record industry bypass traditional retailers with online distribution, and to what extent can top musical acts bypass the record labels and reach out to sell directly to their audience and their fans? [13].
- **Modeling channel conflict in more complex bundled products, or more service-intensive products.** Complex service-intensive products like personal computers would initially have seemed inappropriate for online distribution, but a limited number of manufacturers like Dell and Gateway have been able to create and sustain channel loyalty. How does this generalize to other expensive and service intensive products, such as automobiles?

- **Modeling channel conflict in goods that require initial inspection. Some expensive items like luxury goods require initial inspection** and comparison by potential purchasers, but since the items are branded and reproduced to very high standards once a customer makes a selection and notes the manufacturer, model, and style number, any retailer will provide an equivalent product. High end watch manufacturers refuse to allow their goods to be sold over the net at present, to avoid losing retailers, since they understand that most sales are the result of the consumer's first viewing the watch in a jewelry store. Once the consumer decides on a particular watch it can be bought online; however, without a traditional retailer network of jewelry stores for initial inspection there might be no online sales. [11]
- **Modeling strategic options.** Some multi-stage strategies are essential because of strategic uncertainty. Only events unfolding over time can reveal the true state of these uncertain variables, but some early stage strategies are better than others for exploiting the opportunities that may arise later. This may allow quantification of strategic alternatives through the application of real options theory. [14]

8.2. Summary of Research Contribution

Channels are indeed experiencing a significantly higher degree of conflict than in the recent past, not because channel members' incentives have shifted or diverged, but rather because channel participants now have more options, more capabilities, and more possibilities to encroach upon each others' roles. In particular, the downstream distribution channel can be simplified, as wholesalers and retailers are put at risk by technologically enabled direct distribution.

Our findings can be summarized as follows:

- Unlike new entrants in direct distribution that were not previously represented in any portion of the current distribution channel, established manufacturers who launch online retail channels have much to lose as a result of retaliation from traditional retailers, who presently represent a significant portion of their sales to consumers. This is illustrated in sections 4.4 and 5.2.1.
- However, established manufacturers also have much at risk if they do not act, allowing traditional retailers or new entrants to seize control of new online distribution channels, with their superior ability to influence the purchasing decisions of consumers without strong brand preferences. This is illustrated in section 4.3.
- It is the established manufacturers who risk their market share by attacking too early, and, conversely, who risk their profits by not developing an online channel in time.
- And thus it is established manufacturers and service providers who find that their profits are at risk, and thinking before acting is not a luxury, or a sign of cowardice or of difficulty in responding in *net time*.

8.3. Limitations of the Methodology

The limitations of simulation methodology are well-known, ranging from knowing how to deal with transient behaviors to difficulties in determining when steady state behavior has indeed emerged. Other limitations should be treated explicitly here. While all modeling methods have limitations, those of simulation may make it easiest to introduce undetected biases, or make it most difficult for other investigators to replicate unbiased results.

Of course, all modeling techniques have limitations. Classic models of market competition by Salop and Hotelling (e.g., [51]) assume that customers preferences are uniformly distributed and that all suffer equal and linear disutilities with poor product fit with their idealized desires, even though both assumptions are demonstrably false. Even the most basic models of the physical sciences are dependent upon their own assumptions, but their assumptions are generally quite explicit. Newton's model of mechanical systems is nearly perfect, ignoring the very small (quantum mechanics) and the very massive / very fast (relativity), where quantum mechanics and relativity kick in. Even the general theory of relativity and the theory of quantum mechanics have their own limitations, namely their inability to coexist. Early models of the universe are contradictory because at the instant of the Big Bang the universe was both very small and very massive, and the models provided by the two theories are in direct conflict. Physics is still trying to resolve this with something more intuitive than 11-dimensional string theory.

However, the limitations of closed form analytical systems are usually quite clear from the assumptions stated by the authors, or at worst can be deduced the assumptions **not** stated by the authors. The limitations of simulation and its domain of applicability can often be detected only by reading the code.

Moreover, the restrictive assumptions — the dreaded “assume without loss of generality” of closed form modeling — are usually dictated by the needs of getting mathematical tractability, and usually follow some well-defined conventions. For example, “assume without loss of generality that there are two firms, and that they follow a sequential decision making regime as described by Stackelberg, and that their competition lasts exactly two periods, but that neither party knows in advance that this is a two period game.” In contrast, almost anything can be modeled with equal facility using simulation, and thus any choice of assumptions, of parameter values, of probabilistic distributions, or of strategies followed over time, really needs to be explicitly stated and carefully justified.

As a by-product of the third point above, simulation may be seen as more arbitrary and more subjective, and thus more dependent upon irreproducible and idiosyncratic skills of the modelers. Whereas modeling assumptions that lead to closed form solutions are often seen as brilliant if they lead to tractability, even if they are somewhat unrealistic, any and all assumptions used in simulation need to be justified, lest they be made simply to influence the results obtained by the model.

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Appendix I: Technical Notes

We explain below the structure and algorithm used in the simulation process. The simulation models a market with two firms and one retail distributor. Before the advent of the Internet, the firms can only reach customers through the distributor, which charge a mark-up in its retail price. The Internet provides the opportunity for the firms to bypass the distributor and reach customers directly. To do so, the firms however face potential retaliations from the distributor. The purpose of the simulation is to provide firms a tool to consider potential impacts of their Internet strategies. The simulation software was developed in Microsoft Visual C++ and used by the Concours Group in its consulting services.

The simulation is developed for two industries: airlines and groceries. The retailer in air travel is a traditional travel agent, and the retailer in grocery sales is a traditional grocer store. In most cases, the two industries share common structures. However, a major difference between the airlines and groceries can be found in their pricing structure. In the grocery industry, retailers determine retail prices, while in the airline industries, airlines determine retail prices. To accommodate these differences, some of the inputs and structures are unique to individual industries.

Inputs:

- M : total market size. The total market size is measured as number of potential customers.
- PDF_b, PDF_c : distribution functions of brand strength and channel strength. The two functions describe the distribution of brand strength in the overall market. As described in section 3, we predefined four distribution functions in the simulation software.
- s_{bj}, s_{ck} : market share of brand j and market share channel k .
- c_{vbj}, c_{vck} : variable costs of brand j and variable costs of channel k .
- c_{fbj}, c_{fck} : fixed costs of brand j and fixed costs of channel k .
- p_{wj} : wholesale price (unique to the grocery industry) of firm j 's product
- p_{ej} : online price (unique to the grocery industry) of firm j 's product, if it opens an online store
- p_{rj} : retail price (unique to the grocery industry) of firm j 's product
- f_{bj} : business fare (unique to the airline industry) of airline j
- f_{lj} : leisure fare (unique to the airline industry) of airline j
- m_j : commission rate for the travel agent of airline j
- a : in-play ratio

Firms Strategies: each of the two firms can engage in the following strategies:

- **eBrand:** it uses the net to increase consumer familiar with its website and the use of an eChannel without engaging in retail sales that compete directly with traditional distribution.
- **eSales:** it sets up an eCommerce sales operations and engages in retail sales that compete directly with the traditional channel.
- **eNothing:** it does nothing.

Retailer Strategies: the retailer follows a simple retaliation strategy such that if a single firm competes with it by engaging in eSales the retailers raises its price of goods from the firm engaged in eSales by r (in percentage).

Consumer Strategies: the consumer seeks to maximize his utility each time he makes a purchase. Thus the consumer scans all available purchasing options (i.e., brand 1 online or through traditional channel, brand 2 online or through traditional channel), and chooses the one that is most attractive. For the purposes of this simulation we assume that the attractiveness of each option is the explicit price being charged, adjusted by the appropriate brand premium and adjusted by the appropriate channel preference. If brand 1 is preferred by \$0.50 but online

shopping is viewed as \$1.50 less attractive than an adjustment of \$1.00 must be made when comparing buying brand 1 online vs brand 2 through a traditional retailer. Note that our use of a simplistic additive linear utility function ignores the complexity available through other marketing analysis techniques such as conjoint analysis [will reference Analyzing Decision Making: Metric Conjoint Analysis. by Jordan J. Louviere]. We use this simple functional form because (1) it seems adequate to the task, in that preferences for brand and preferences for distribution channel appear orthogonal and (2) we have no available data that would support any other form of analysis.

Algorithm: the simulation software engages in the following steps.

1. Create M consumers with different brand preference t_{bij} , channel preference t_{cik} and inplay status given PDF_b , PDF_c and s_{bj} , s_{cj} , a.
- 2. Iterate for each time period**
 - a. Determine the channel strategy of both producers (manufacturers or airlines)
 - b. Determine the pricing strategy of each producer and of their retailer (grocery store or travel agency)
 - c. Iterate for each consumer by doing the following:**
 - i. Determine if the consumer is already experienced with the eChannel, either through use of an eBranding site or through online shopping, or if the customer is in play for this period.
 - ii. If the consumer is not experienced with the eChannel and is not in play this period,
 1. then he can only purchase from the distributor ($k=1$). He faces two options: either purchase product from firm 1 or from firm 2. The utility of purchasing product from firm j from the distributor is therefore is $u_{ij} = t_{bij} + t_{ci1} - p_{ij}$
 2. Consumer will choose the product that yields the higher utility
 - iii. If the consumer is experienced or in play, but both firms choose eNothing,
 1. then he can only purchase from the distributor ($k=1$). He faces two options: either purchase product from firm 1 or from firm 2. The utility of purchasing product from firm j from the distributor is therefore is $u_{ij} = t_{bij} + t_{ci1} - p_{ij}$
 2. Consumer will choose the product that yield the higher utility
 - iv. If the consumer is experienced or is in play, and one of the firms chooses eBrand,
 1. then he can only purchase from the distributor ($k=1$). He faces two options: either purchase product from firm 1 or from firm 2. The utility of purchasing product from firm j from the distributor is therefore is $u_{ij} = t_{bij} + t_{ci1} - p_{ij}$
 2. Consumer will choose the product that yields the higher utility
 3. Consumer status will be permanently set to reflect experience with online shopping.
 - v. If the consumer is experienced or in play, and one of the firms chooses eSales (e.g. firm 1),
 1. then he can only purchase from either the distributor or the online store. He faces three options: purchasing firm 1's product from the distributor, purchasing firm 2's product from the distributor, or purchasing firm 1's product from the online store. The utility of purchasing product from firm j from channel k is therefore is $u_{ijk} = t_{bij} + t_{cik} - p_{ij}$
 2. Consumer will choose the product that yield the higher utility

- 3. Consumer status will be permanently set to reflect experience with online shopping.
 - vi. Firm profits and retailer profits are calculated after each purchase.
 - vii. End iteration on each customer**
- d. End iteration on each time period**