Developments in Business Simulation & Experiential Exercises, Volume 8, 1981

CHIPS: A MARKETING CHANNELS MANAGEMENT GAME

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ABSTRACT

This paper describes a marketing channels management game which was developed to facilitate the teaching and learning of channel management concepts. CHIPS involves student composed teams in the management of firms which operate in the poker chip product market. Manufacturing, wholesaling, retailing, and transportation firm executives (students) make several decisions including: 1) product mix, 2) pricing, 3) inventory management, and 4) supplier/outlet negotiations. Decisions are made over seven market periods and firms are required to determine their financial position at the end of each period by developing income statements and balance sheets. CHIPS has shown itself to be flexible in terms of the number of students needed and the scheduling of market periods.

INTRODUCTION

Over the last decade, Marketing Channels courses have become standard components of many marketing curriculums. However, this increase in the frequency of marketing channels course offerings has not been paralleled by the development of texts and other teaching- learning tools. Only a handful of published materials are available to the marketing channels instructor, while the instructor of other marketing courses has a much greater choice in materials and thus, flexibility in course design and operation.

As instructors and researchers of marketing channels, we developed a game simulation called: Marketing Channels Management In a Poker Chip Industry Simulation (CHIPS). CHIPS was developed with three objectives in mind. First, CHIPS was developed with the possibility of using it as a setting for conducting marketing channels research. We also desired to build a new and fairly complex teaching-learning tool to give channel instructors more choice and flexibility in course design. Finally, we hoped that CHIPS would give other channel instructors inspiration to develop additional teaching-learning tools.

Significant progress has been made toward the research objective. This progress has been previously documented (Keyt, 1980 and Cadotte and Keyt, 1980) and will not be discussed in this paper. The purpose of this paper is to make progress toward the choice and flexibility objective and, to a lesser degree, the inspiration objective. To meet these objectives, the paper provides a detailed description of CHIPS. This description will consist of a five part summary of the CHIPS booklet consisting of: 1) the channel environment, 2) channel participants and their decisions, 3) service firms, 4) operating rules, and 5) a listing of the forms utilized.

CHIPS

Part 1. Channel Environment
The market setting for the channel simulation is the poker chip product market. The market is highly competitive in that it exhibits many of the characteristics of the economist's conception of pure competition. For example, there are no brand name poker chip manufacturers and, therefore, very little brand loyalty. For the most part, sales and market shares are determined by a firm's price in relation to the prices of other competing firms in the market. However, the market for poker chips is not entirely pure. Traditionally, there have been three classes of poker chips--blue chips, red chips, and white chips. Each product class exhibits unique market characteristics which distinguish it from the other two.

Blue chips are precision manufactured out of the finest quality plastic and, therefore, tend to be very expensive. Demand for blue chips is relatively small, accounting for only 15% of the poker chip market. However, it is relatively stable from one period to the next.

Red chips are mass produced out of good quality plastic. They tend to be moderately priced and account for a major share of the poker chip market. Red chip demand is less stable than blue chip demand. That is, demand may jump or drop by as much as 25% from one period to the next and channel members have no way to control this variability.

White chips are imported from the orient by U.S. manufacturers. They are made out of inexpensive plastic and appeal to the price conscious consumer. On the average, white chips make up approximately 55% of the poker chip market. However, demand is quite volatile and may vary by as much as 35%, up or down, from one period to the next.

Competition for the poker chip market is very active. There are four manufacturers who produce poker chips, and each is capable of manufacturing or importing all three kinds. Three wholesalers work with the manufacturers and their retail customers. All three wholesalers have traditionally handled all three classes of poker chips. Finally, there are six retailers who sell all three types of poker chips to the ultimate consumer.

In addition to the manufacturers, wholesalers, and retailers, there are three service firms. Two transportation firms handle all freight movements at negotiated rates. The last is a bank which is the ultimate supplier and market for all poker chips. The Bank will also extend a line of credit for a nominal interest rate and pay interest on money deposited with the bank.

Part II. Channel Participants and Their Decisions

The distribution channel the poker chips is composed of retailers, wholesalers, manufacturers, freight carriers, and a central bank. The market environment and decision-making structure of each are described below.

The retail market. Retailers are raced with four basic decisions in the channel simulation--product mix, price setting, inventory management, and supplier ne-

gotiation. In terms of product mix, retailers are free to choose which of the product lines they wish to carry or emphasize. For example, each retailer will start out with 25 cases (chips) of blue poker chips, 50 cases of red chips, and 160 cases of white poker chips. 1-low- ever, a retailer may wish to unload his white chips and concentrate only on the blue and red, or vice versa.

Overall market demand for each poker chip product product class will be determined largely by what the demand was for the chips during the previous period. However, market demand will not be stable from period to period but will in part be determined by the toss of two dice. The randomness in demand will be most pronounced for white chips and be least pronounced for blue chips. The specific equations which will be used to determine overall demand for each period for each product class are as follows:

$$\text{Blue chip market demand}_t =$$
$$.85 \times \text{blue chip market demand}_{t-1} +$$
$$.15 \times \text{blue chip market demand}_{t-1} \times \frac{\text{toss of dice}}{7}$$

$$\text{Red chip market demand}_t =$$
$$.75 \times \text{red chip market demand}_{t-1} +$$
$$.25 \times \text{red chip market demand}_{t-1} \times \frac{\text{toss of dice}}{7}$$

$$\text{White chip market demand}_t =$$
$$.65 \times \text{white chip market demand}_{t-1} +$$
$$.35 \times \text{white chip market demand}_{t-1} \times \frac{\text{toss of dice}}{7}$$

One of the most important, and perhaps most risky, decisions to be made by retailers is pricing. Since the market for poker chips is purely competitive within a product class, a retailer's share of the consumer market will be based solely on price. If the retailer prices the chips too high, he will only receive a small share of the market. If the retailer prices the chips too low, he will be allocated a substantial share of the market demand but may not have sufficient inventory to cover the demand. In addition, he may not be able to cover his out-of-pocket expenses.

Each retailer will establish a market price for each product class independently of the other retailers and without knowledge of what his competitors' prices will be. The retailer is free to change prices from one period to the next.

New retail prices will be kept secret until the instructor signals that new prices are to be posted. At his signal, all retailers will simultaneously display their prices on a price list sheet. With all retail prices known for each poker chip class, market shares will be computed by the bank. A retailer's market share will be determined by the following formula:

$$\text{Market share} = \sqrt{\frac{\text{Average market price} - .83}{\text{Retailer's price}}}$$

Inventory management is the third decision area which must be coordinated by all retailers. That is, retailers must decide on a continuing basis how much inventory should be on hand for blue chips, red chips, and white chips. The inventory decision is important because all sales must be made from existing inventory. If the demand for any poker chip exceeds the available supply of the retailer, the excess demand is lost to the retailer. In other words, the retailer can only sell out of current inventories. The retailer must be cautious, however, not to carry too much inventory for three reasons. First, excess inventory will reduce the retailer's

flexibility to respond to changes in market demand. Second, it may cost the retailer money if it is financed by a loan from the bank. Finally, the Internal Revenue Service will assess a 10% carrying charge for all poker chips left in inventory at the end of each market period.

The last decision area which the retailer must manage is supplier negotiation. A retailer is free to buy from any of the three wholesalers.

An integral element in the supplier selection decision will be the negotiation with suppliers regarding purchase prices and order quantities. At the wholesale level, supplier prices and order quantities are not determined by the instructor but by private negotiation between suppliers and their customers. All retailer- supplier negotiations must be conducted in writing using the negotiation memorandums.

Once the retailer and his supplier agree on a purchase price and order quantity, this agreement will be considered a contract. The order will then be shipped to the retailer, and the agreed-upon purchase price from the retailer will be collected.

Retailer-supplier negotiations are not constrained to specified time periods but may occur as frequently as the participating firms prefer. Retailers are cautioned, however, to recognize that consumer demand will occur on a regular schedule which will necessitate having sufficient inventory on hand at all times.

The wholesale market. Wholesalers in the channel simulation are faced with three basic decisions: (1) retailer negotiations, (2) manufacturer negotiations, and (3) inventory management. Retailer negotiations basically involve the process of agreeing on purchase prices and order quantities with retailers as described above. Wholesalers are responsible for transporting the freight to the retailers and normally there is no charge for this service.

Manufacturer negotiations are also similar to retailer-supplier negotiations. Wholesalers and manufacturers must agree on prices and quantities using the negotiation memorandum. once the terms of sale are agreed upon, the manufacturer ships to the wholesaler via the freight line. The freight carrier collects the purchase price from the wholesaler and returns it to the manufacturer.

Inventory management presents the same management problem for the wholesaler as it does for the retailer. Wholesalers must assess how much inventory should be kept on hand in each product class in order to insure adequate supplies for retail customers and yet avoid unnecessary inventory investments. The inventory management problem is somewhat more complicated for the wholesaler since he must maintain inventory for quick access by one or more retailers.

The manufacturer market. Poker chip manufacturers are faced with four basic decisions: (1) wholesaler negotiation, (2) freight carrier negotiation, (3) production scheduling, and (4) inventory management. Manufacturer-wholesaler negotiation is essentially the same as wholesaler-retailer negotiations. The only difference between them is the addition of freight charges which must be borne by the manufacturer in shipping to wholesalers.

In the context of the channel simulation, manufacturers are located a considerable distance from the consumer market. Therefore, manufacturers must contract with a freight carrier to move their freight to the wholesale market. Since there are no established freight rates, manufacturers must negotiate with the freight carriers regarding shipping charges and ship-

ping quantities using the transportation negotiation memorandum.

Poker chip production is also an important decision area for manufacturers since it determines how much and what type poker chips will be available to channel members and the ultimate consumers. The production decision requires two separate but related decisions: (1) capacity purchases and (2) production scheduling. In terms of the capacity purchase decision, each manufacturer will begin the simulation with sufficient capacity to produce 200 cases of poker ships per time period. If, at any time, a manufacturer wishes to expand capacity, the manufacturer will have to submit a capacity purchase order to the central bank.

The manufacturer may purchase additional capacity according to a schedule, The schedule shows small capacity purchases are very expensive on a per unit basis, while larger capacity purchases are substantially less expensive on per unit basis. The problem for the manufacturer to resolve will be to balance the lower per unit costs of larger capacity purchases against the lower absolute cost of smaller capacity purchases.

The second element of the production decision is the scheduling of the actual production. A cost-quantity schedule for each product class is presented. As might be anticipated, the cost of production on a per unit basis declines with increasingly larger production runs. Again, the decision for the manufacturer to resolve is the balancing of the economies of larger production runs against the lower absolute costs of smaller production runs. The manufacturer may elect to produce poker chips of all the same color or in any combination of blue, red, and white. The only constraint with which the manufacturer must deal is that the total number of chips produced must not exceed the plant's current capacity. -

Production runs are made once each quarter for each of the three product categories. To schedule production run, a manufacturer prepares a production order and submits it to the central bank. Production scheduled in the current period will not be available for sale until the start of the next period when it is delivered by the bank. The manufacturer must pay the bank for the inventory at the time it receives the inventory from the bank.

The fourth decision area which concerns manufacturers is inventory management. In the same fashion as retailers and wholesalers, manufacturers must decide how much inventory to have on hand in each product class in anticipation of wholesaler demand. The inventory decision is compounded by the one period delay in the production of poker chips. Thus, manufacturers must schedule production in the current period in order to have sufficient inventory on hand next period to meet actual demand.

The transportation market. Two transportation companies operate within the live channel simulation--Pony Express and Star Trek. Their function is twofold. First, they are responsible for moving all freight between the manufacturers and their wholesale customers. Second, they collect payment for the poker chips from wholesalers in behalf of manufacturers (all freight is shipped cash-on-delivery or C.0.D.).

As a matter of procedure, whenever a manufacturer elects to ship freight to a wholesaler, the transportation firm prepares the transportation report for all freight to be shipped to the wholesale market.

The Internal Revenue Service taxes all freight movements according to a schedule plus a drop charge of $100. The interstate charges represent a tax on line haul movements between manufacturers and the wholesale markets. The drop charge represents a tax on all drop points for freight movements. (Note, wholesalers pay no freight charges on any poker chips they personally deliver to retailers. It is assumed they have their own private truck fleet for local delivery.)

The Internal Revenue Service computes its interstate tax based upon the total number of poker chips reported on the transportation report. The drop freight tax is then computed based upon the number of individual wholesale establishments receiving shipments. All taxes are to be paid to the Internal Revenue Service before any freight is delivered and should accompany the bill of lading and the transportation report.

The transportation firms have two major decisions to make throughout the channel simulation: (1) rate negotiation and (2) freight consolidation. Each firm must set shipping rates through a process of negotiation with manufacturers. Transportation firms are free to charge whatever rate they can fairly negotiate from individual manufacturers. However, they must set their freight rates so as to meet their out-of-pocket expenses (taxes) and provide a reasonable profit. The transportation negotiation memorandum must be used for all transportation negotiations.

One method for the transportation firm to enhance their profit potential and/or lower the rates they charge to manufacturers is to consolidate shipments moving to the wholesale market. That is, freight carriers can effectively reduce their expenses by delaying the delivery of freight until they have more than one shipment to move. The incentive to consolidate shipments is due to the structure of the tax table and the single drop charge which provide for a lower per chip tax with larger shipping quantities.

Part III. Service Firms in the Distribution Channel

The two service firms in the channel simulation are the central bank and the Internal Revenue Service. The bank is a regulated monopoly for the purpose of facilitating channel exchanges. The bank performs six tasks or functions as follows:

1.   The bank serves as the consumer market for poker chips. That is, the bank is the purchaser of all poker chips from the retailers as determined by overall market demand and individual market shares.

2.   The bank serves as the source of poker chips for all manufacturers. Manufacturers purchase poker chips from the bank based upon available capacity and desired production schedules.

3.   The bank serves as the purchaser of last resort. If any member of the channel decides to liquidate any part of its inventory, the bank will buy the poker chips at one-half the seller's purchase price. The seller's purchase price will be determined by his earliest purchase of the poker chips in question (First- in-Firs t-out inventory valuation).

4.   The bank serves as a lender to all channel participants. Any member of the channel can approach the bank for a loan for purposes of financing inventory, production, etc. The bank will lend in total up to 100% of the borrower's equity (common stock plus retained earnings). The bank charges 10% interest per period for all money on loan. Interest on loans is payable at the end of each market period.

5.   The bank serves as a depository for all excess cash

which other members of the channel might accumulate. The bank will pay 5% interest on all money per period it receives from channel members.

6. The bank collects three types of market information which channel members can purchase for a small tee. Specifically, the bank will sell retail price and market share information for any period for $150. In addition, it will sell market demand for each color chip for any period for $100. Finally, it will sell information on total production for each color chip for any period for $100. All information is at least one period old since it is based upon transactions in earlier periods.

The central bank earns an income by loaning money to channel members at an interest rate above the rate it pays for the money on deposit. In addition, the bank earns money by selling the market information to which it has access by virtue of its position as the buyer and seller of all poker chips. The bank must understand that all teams will not recognize the value of its financial services or the information it has to sell. Therefore, the bank will have to promote its services to the other members of the channel in order to maximize its return on investment.

The Internal Revenue Service is operated by the instructor, and its purpose is fourfold. First, it will assess transportation taxes on all freight moved by the transportation firms. Second, the Internal Revenue Service will assess an inventory carrying tax on all poker chips held by manufacturers, wholesalers, and retailers at the end of each market period. Third, the Internal Revenue Service will authorize all production capacity expansions. Manufacturers wishing to expand capacity purchase order to the Internal Revenue Service together with the appropriate purchase price. The Internal Revenue Service will then forward a memorandum to the bank authorizing the expansion of capacity. (Note, the bank cannot accept production orders in excess of existing capacity. In order to allow sufficient time to process the paperwork, capacity expansion purchases should be made at least 5 minutes ahead of the production purchase.) Finally, the Internal Revenue Service will be responsible for auditing all companies to determine if they are correctly using the appropriate forms.

Part IV. Simulation Operating Rules

The operating rules for the channel simulation are relatively simple and include the following:

1. The channel simulation will be divided into seven market periods of approximately 50 minutes each. Each market period will begin with the tossing of the dice to deter-mine market demand for the period. (The first two market periods will be 70 minutes each in order to give all the teams a chance to get a reel for the Market.)

2. Manufacturers must purchase the poker chips which they ordered from the bank during the previous period within 10 minutes after the start of the market period.

3. New market prices must be submitted to the bank within 20 minutes after the start of the market period. Any retailer not submitting a price list at the specified time will lose the opportunity to sell its poker chips during the current market period (any chips not sold will be taxed by the Internal Revenue Service at the end of the market period).

4. Within 30 minutes after the start of the market period, the bank will inform each retail team

of the quantities of each type of poker chip it will purchase at the Stipulated price. Each team will have 10 minutes to prepare its order and return to the bank for the exchange of poker chips for money.

5. Each manufacturer must submit its purchase order no later than five minutes before the end of the market period.

6. The price-quantity negotiations and sale of poker chips between channel members may occur at any time dur- ing a market period. Channel members are cautioned, however, to watch the clock since all buying and selling should be coordinated with sales in the consumer market.

7. Capacity and production purchases by manufacturers may occur only once during each market period and purchase will not become available until the start of the next period.

8. All negotiations between channel members must be done on the appropriate negotiating forms. All negotiations must be dated in terms of the market period and time which it is sent. All negotiating forms must be turned In to the Internal Revenue Service at the end of each market period.

9. Student teams are required to allocate the responsibilities of buying, selling, marketing research, and accounting to different team members in order to facilitate decision making and avoid being caught short by the clock. It is also necessary to elect a president who can allocate tasks and make quick decisions during the simulation. The assignment of team responsibilities should be done prior to the first market period. The team members and their tasks must be recorded on the channel strategy analysis form along with the strategy of the team for that session.

10. It is necessary for each student team to have at least one calculator in order to facilitate the calculation of prices, breakeven points, costs, etc.

11. At the end of each 50-minute market period, there will be a 10-minute "cooling off" period. During this time, all transactions and negotiations will be temporarily interrupted, and an accounting will be made of the firm's performance during the previous market period. Each firm should prepare an income statement and balance sheet for the period. In addition, the firm's accountant should estimate its inventory carrying charge and pay appropriate tax to the Invernal Revenue Service. The income statement, balance sheet, and inventory tax form must be turned in to the Internal Revenue Service before the start of the next market period.

12. The instructor cannot force a potential buyer to buy poker chips or a potential seller to sell poker chips if either party decides to cancel a previously agreed upon contract. However, the instructor will enforce a penalty clause in a contract. A contract will be considered to be concluded when both firms agree to a specific price and quantity. This agreement will be shown by the initials of each company on the appropriate negotiating forms.

13. Before the start of the first period of the channel simulation, all manufacturers are to turn in purchase orders to the bank. The poker chips will be ready to be picked up from the bank within five minutes after the start of the simulation.

14. Transportation firms must prepare a rate schedule before the start of the first period. The schedule need not be distributed to the manufacturers but should

be used for negotiating purposes.

15. Manufacturers should have established price points (less transportation charges) before the start of *the* first market period in order to facilitate negotiations with wholesalers.

16. On the channel strategy analysis form, each firm must indicate their buying and selling strategy for each session. At the end of the session, each firm should review their strategy and events in the session. This review must be reported on the appropriate section *of* the channel strategy analysis *form.* The channel strategy analysis form must be turned in at the end of each session.

17. At the end *of* each simulation session, each student team must turn in all poker chips and the notebook. The poker chips will be distributed at the start of the next simulation session.

Part V. CHIPS Forms

The final section of the CHIPS booklet contains a series of forms needed by the channel firms. These include:
1. income statements
2. balance sheets
3. inventory position forms
4. production capacity increase forms
5. production order forms
6. retailer price lists
7. inventory tax sheets
8. loan applications
9. negotiation forms
10. transportation reports
11. channel strategy evaluation forms

Flexibility of CHIPS

CHIPS has shown itself to be a flexible reaching-learning tool. It has operated with over a hundred students and less than fifty. The degree of complexity has also been modified by eliminating the transportation firms and by having the instructor and one graduate assistant operate the central bank. In all cases, students feedback toward CHIPS has been highly positive.

Summary

This paper has described a marketing channels management game simulation called CHIPS. CHIPS simulates the poker chip product market and requires channels management decision making from student composed manufacturers, wholesalers, retailers, transportation firms, and a central bank. CHIPS has proven to be flexible in terms of the number of students necessary and in changes in the complexity of the poker chip product market.

REFERENCES

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