

# Globalview User's Manual

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## OVERVIEW

Each firm in the Globalview business simulation opens and operates a firm. In order to begin you must issue at least 300000 shares of stock.

The Globalview world runs on a quarterly decision making system beginning in quarter 1, year 1. Each quarter the firm must enter a set of decisions. On the decision deadline (on or before Friday 9am Pacific Standard time - unless you are running in a unique session), the decision menus are closed and the simulation is "run". This produces a set of results. The firm must read results and determine what decisions to make for the next quarter etc...

In the simulation you sell product to the retail buyer. The retail buyer is simulated and will react to economic and political events as well as specific industry factors. The retail buyer purchases product that they will then sell to the end consumer. You compete with other firms to sell your product to the retail buyer. Firms compete for this retail market share ONLY within their own market group (up to 8 firms per market group).

Firms compete across ALL market groups for NPV (net present value). A winning strategy is one that permits the firm to earn positive net income after taxes and to increase its earnings over the duration of the game. Shareholders are counting on a 20% return per year. This means that dividend payments and increases in share price must yield at least this rate of return. The measure of performance is net present value (NPV). It is used to rank firms each week - see the *Dollars and Scents Quarterly*. Increases in stock price and dividends paid to shareholders are the drivers of NPV. Profit per share and the debt-equity ratio are the two principal determinants of stock price.

In the simulation firms are allowed to make a host of contracts with one another including the sale/purchase of product (finished goods). These contracts can be made across market groups and between the introductory and advanced levels of the simulation. Goods purchased from other firms for resale to the retail market carry your private labels.

### WAYS TO POSITION YOUR FIRM:

- **Classical firm (typical firm):** firm builds a plant and produces product to satisfy retail buyer demand in its own market group. The manufacturing facility can expand as the firm grows. These firms might consider adding contract sales or opening a subsidiary later in the game to expand their market share.

- **Manufacturing Only:** firm builds and operates one or two factories which sell only to other firms. They do not sell to the simulated retail market (although they may pick up sales lost by other firms in their market group and should still set retail prices). These firms typically run medium to large plants with no expenditures on marketing. They tend to locate in low cost manufacturing areas and increase efficiencies with high tech plants. This strategy, requires a larger investment in facilities. The teams' personal sales efforts and negotiations with other firms have a large impact on success. A subsidiary can be opened during the game to provide additional market for product. The firm can also adapt to market conditions by entering the retail marketplace at any point in the simulation.
- **Distribution Only:** firm sells to the simulated retail market and has NO plant (sourcing all goods for resale from other firms). Product cost is higher than for the classical firm and product must be secured by the firm through contracts but there is no investment needed for a manufacturing plant. Firms at the introductory simulation level are all distribution only firms.

## PRODUCT?

Firms operate in the scent industry. There are two products. Products are treated as a unit. 1 unit = 1 case.

- Product 1 = aftershave = P1
- Product 2 = perfume = P2
- 

### *ESTIMATED ANNUAL DEMAND AT THE START OF SIMULATION*

	<u>NAFTA</u>	<u>EUROPEAN UNION</u>
Aftershave	100000 to 150000 units	80000 to 120000 units
Perfume	100000 to 250000 units	100000 to 250000 units

### *PRICE RANGES:*

	<u>Aftershave</u>	<u>Perfume</u>
Low end	\$85-100 per unit	\$150-185 per unit
Middle range	\$100-170	\$185-250
High end	\$170-250	\$250-350

**SEASONAL DEMAND:**

**Demand fluctuates seasonally. Quarter 4 is robust for both aftershave and perfume, while quarter 3 is low, etc...**

Quarter	<u>Aftershave</u>	<u>Perfume</u>
Q1	12.5 % of annual sales	30 %
Q2	25 %	15 %
Q3	12.5 %	15 %
Q4	50 %	40 %

**BACKORDER RATE:**

If your firm cannot supply the quantity demanded in a given quarter, some customers will be willing to accept delivery of their unfilled order the following quarter (called a backorder). The backorder rate refers to the percentage of the undelivered product that can be delivered the following quarter:

	Q1	Q2	Q3	Q4
Aftershave	75%	75%	75%	1%
Perfume	5%	75%	75%	20%

Unfilled orders that do not go into backorders are ‘lost sales’. When you cannot deliver the product demanded, the simulation automatically contacts your two closest competitors. If they have product available, they get the sales. Otherwise, lost sales are filled by importers.

**LOCATION?**

There are 2 broad retail regions in the simulation. These regions represent two markets as well as physical locations for factories and firm headquarters:

- Area 1 = The North American Free Trade Area = NAFTA
- Area 2 = The European Union = EU

There are 2 additional plant location options that give you added benefits/risks: locating in Mexico (becomes your area 1 plant location) or the Czech Republic (becomes your area 2 plant location). In order to locate in Mexico or the Czech republic you must enter a contract along with a decision to add capacity. These options give the advantage of lower labor rates. There are additional risks in production variability.

The Euro will be the currency used in the EU for both pricing and paying laborers if you're a manufacturer. All other figures are in U.S. dollars.

## THE DOLLARS AND SCENTS QUARTERLY NEWSPAPER

You can follow economic and political trends and try to predict what lies ahead by reading the *Dollars and Scents Quarterly*. This news source will help you understand the economic environment you are operating within.

### PEACOCK INDUSTRIES

Peacock Industries has been in the scent industry for a long time. This Globalview company operates firm 18. Peacock Industries sells product to firms. Peacock does not buy product or sell raw materials, plant hours, or other assets, unless through a special arrangement, such as the liquidation of a bankrupt firm.

Peacock sells finished goods only in the early quarters of the simulation, before manufacturers are present. They may maintain their presence longer at the Introductory level of the simulation. The prices for Peacock wholesale product change weekly. **The current Peacock asking price can always be found in the *Dollars and Scents Quarterly Contract News*.** In quarter 1, year 1 Peacock prices are \$56 per unit of p1 and \$99 per unit of p2.

### MARKET GROUP

This is further explanation of how firms are organized.

There are a series of market groups. Each market group has two retail markets, NAFTA and the EU. Competition for retail market share occurs within a market group (contracts and subsidiaries open markets to firms). Firms in different market groups do not compete with one another for retail market share. They do, however, compete with one another for overall rank within the simulation as expressed by quarterly Net Present Value figures listed in the *Dollars and Scents Quarterly*.

Example:

### The Global View Matrix

	Mkt Group 1	Mkt Group 2	Mkt Group 3	Mkt Group 4
Firm 1	Firm 11	Firm 21	Firm 31	Firm 41
Firm 2	Firm 12	Firm 22	Firm 32	Firm 42
Firm 3	Firm 13	Firm 23	Firm 33	Firm 43
Firm 4	Firm 14	Firm 24	Firm 34	Firm 44
Firm 5	Firm 15	Firm 25	Firm 35	Firm 45
Firm 6	Firm 16	Firm 26	Firm 36	Firm 46
>Firm 7	Firm 17	Firm 27	Firm 37	Firm 47
Firm 8	Firm 18 Peacock Inc. - does not compete for retail market	Firm 28	Firm 38	Firm 48

### RULES

**Rule 1:** Outstanding shares may never fall below 300,000. Starting from the date of your first stock issuance, you must always have at least 300,000 shares outstanding.

**Fine:** \$20,000 and immediate sale of stock required to bring the number of shares outstanding to the 300,000 share minimum.

**Rule 2:** Paying dividends with no retained earnings is illegal. Retained earnings must be positive both prior to and after the dividend payment.

**Fine:** \$20,000 plus additional penalties if the decision is judged to be intentional.

**Rule 3:** Firms may not willfully bankrupt other firms through contract manipulation (including your own subsidiary)

**Fine:** To be arranged by your administrator. Penalty will be severe.

**Rule 4:** Price fixing or engaging in setting market shares or establishing cartel arrangements is not allowed.

**Fine:** This act is criminal in character. A firm could be assessed \$500,000 plus damage awards up to \$5,000,000 to customers and competitors judged to have been injured by the process.



**Rule 5:** Theft through contracts is not allowed. If you find that your firm is losing suspect amounts of money, goods, raw materials, etc... check your records. Your firm may be experiencing theft through the contracts program. Keep your eye on the quarterly list of executed contracts (in the *Dollars and Scents Quarterly*) to make sure that only legal and confirmed contracts for your firm are being executed.

**Fine:** Heavy fines apply, dependent upon assessment of damages.

**Rule 6:** Firms may not retain unreasonable financial benefits. It happens, although rarely, that a firm may receive windfall amounts of money through an administrator error.

**Fine:** Any unreasonable asset gained will be removed. If a cover-up of the benefit is intentional, further action will be taken.

**Firm 7:** Dumping is not allowed. Firms may not place product on the retail market for less than cost, unless it already has a sustained presence in that market. This is considered dumping and is illegal.

**Fine:** A firm may be fined up to \$500,000, depending upon whether or not executives dumping product did so intentionally.

[Marketing](#) | [Financial](#) | [Budget](#) | [Capacity](#) | [Production](#) | [Raw Materials](#) | [Shipping](#) |

## DECISIONS

### TAKE NOTE

**AFTER ENTERING DECISIONS, ALWAYS CLICK THE 'SUBMIT' BUTTON TO RECORD DECISIONS. YOU MAY EDIT AND CHANGE YOUR DECISIONS AS MANY TIMES AS YOU LIKE BEFORE THE DECISION DEADLINE EACH WEEK.**

+ **OR - CHANGE DECISIONS:** some decisions add to or subtract from your existing data. These decisions are shown below with a + Or -If you do not change your change decision variables they will repeat. If you issue 300000 shares of stock in quarter 1, for example, and do not reset this decision to zero for quarter 2, then you will end up with 600000 shares at the end of quarter 2. **ALWAYS** check all of your decision forms before the deadline.

Contract decisions are cleared out each quarter, after the quarter is run. Contract decisions will NOT repeat.

Never enter dollar signs, nor a '+' sign, nor commas. Decimals are used uniquely for commissions and dividend payments.

## MARKETING DECISIONS

Note: A minimum amount should be spent on all marketing variables (advertising, and sales reps, including their remuneration). If not, the demand for your product will be much less.

**ADVERTISING:** Advertising outlays should be calculated on a per unit basis. Advertising rates per unit can vary widely: from \$1 to over \$30 per unit. If you want to sell 2000 P1 in A2, and your advertising rate is \$5 per unit, you would enter a budget outlay of 10000 in the space for Product 1, Area 2. More advertising can give a competitive advantage; however, beyond a certain amount, there are diminishing returns to advertising. Advertising has a cumulative impact: it takes three quarters for advertising to reach its full impact.

**PRICE:** In NAFTA, prices are entered in dollars; in the EU, in euros (sales in euros are converted into dollars on your income statement). All other variables are in dollars. It is best to make gradual changes in prices since there is a negative impact on sales when a firm changes prices dramatically in a single quarter. Sometimes, however, a major price change cannot be avoided for strategic reasons. After a couple of quarters, sales begin to adjust and become steady as your new client base is established at the adjusted price level.

Price Ranges:

	<u>Aftershave</u>	<u>Perfume</u>
Low end	\$85-100 per unit	\$150-185 per unit
Middle range	\$100-170	\$185-250
High end	\$170-250	\$250-350

**SALES REPS:** Enter the total number of sales reps 'desired' in each area. There is a one-time expense of \$12000 to hire an experienced rep. To transfer a sales rep already in the field to the other area, you would simply lower the 'desired' number in the area with too many reps and increase sales reps in the other area to the new total (previous sales reps plus new transfers). The transfer cost is \$3000 per sales rep. If a sales rep quits (because he/she is not earning as much as reps in other firms), the 'current number' will be different from the desired number.

If you wish to fire all of your sales reps, please ask your administrator to facilitate this for you. The program will not allow a value of zero for this entry.

+ **OR - TRAINEES:** You can save money in your initial set of decisions by hiring sales trainees. The training fee is \$3000, plus an additional \$3000 to place the trainee as a sales rep once the training is completed. (You thus save \$6000 by hiring a trainee versus an experienced sales rep.) However, a trainee can only be placed in the field the quarter following his/her training. Enter the number of trainees to be hired. This decision is not area specific. Only after the trainees have been trained and are being placed as sales reps will the area be considered. In the following quarter trainee(s) must be placed in the field by adding them to a sales rep area. To place a

trainee as a sales rep, increase the total number of 'sales reps *desired*' by the number of trainees being placed as sales reps in a given area (previous number of sales reps in the area plus trained trainees being placed in that area). When the number of sales reps is increased the simulation will automatically take the trainee(s) from the training pool first, before hiring new experienced sales reps. If a trainee is not placed as a sales rep the quarter following their hire as a trainee, they will continue to be trained at a cost of \$3000 per quarter though no benefit is gained by this additional training. To fire trainees rather than place them as sales reps, you would enter a negative number. For example, an entry of -2 would eliminate 2 trainees. When the game begins, it is a good idea to hire at least half of your sales force as experienced sales reps. However, some firms have a strategy of gradually increasing the number of sales reps. In this case they use sales trainees and gradually increase the new total number of sales reps each quarter.

Change variables should be set back to zero the following quarter if no change is desired; otherwise, the decision will be repeated. An entry for a change variable always adds to or subtracts from the existing or "current" value. Sales trainees is a 'change variable'. Assume you entered 4 trainees in Q3. If you forget to reset this variable to zero in Q4, the simulation will automatically add another 4 trainees to the trainee pool in Q4. The variable 'sales reps' is not a change variable. You will change the 'desired' number of sales reps only if you intend to increase or decrease the current number of sales reps. Other change variables will be signaled below.

+ **OR - SALARY:** Sales reps are paid a quarterly salary plus a commission. Salaries and commission rates can vary widely. This variable is entered when the sales reps are placed in the field. For example, in quarter 1, if you place 2 reps in A1 and enter 5000, each rep will receive a base salary of \$5000 per quarter. (This is a change variable, so you must not forget to reset it to zero in quarter 2; otherwise, their salary will automatically increase to \$10000 in Q2.) Sales reps compare their average compensation (base salary plus commissions) with that of reps in other firms. If they are underpaid, they quit.

+ **OR - COMMISSION :** Commissions are paid based on the number of units sold. Enter the commission rate: for example, if you enter 5.50 (you can use a decimal in this case) for P1A1, your reps will receive \$5.50 per unit sold in NAFTA. The next quarter, if you wish to increase their commission to \$6.50, you would enter the value 1. An entry of -1.50 would reduce the commission to \$4.00 (you can use a negative sign, but you should never use a '+' sign).

Commissions are paid on units sold. This includes backorders from the previous quarter. Commission are not paid on contract sales to other firms or when your firm 'picks up' the lost sales of competitors. The computer gives the sale to your firm when your closest competitors are unable to meet the demand of their customers; thus, the sales reps are not responsible for the sale.

**CREDIT POLICY:** is determined by entering one of the following numbers.

- 0 = no policy
- 1 = accept all orders

- 2 = refuse sales to those with a poor credit history as per credit report
- 3 = same as 2 but requires a positive supplier reference
- 4 = same as 3 but provides only a small credit limit which expands slowly over time if the account proves credit worthy
- 5 = same as 4 above but also requires a positive bank reference and requires the purchaser to be in business for 2 years

## FINANCIAL DECISIONS

The amount of financing required depends on the size of your plant (a fixed asset) and your working capital needs (cash, raw material and finished goods inventories, and accounts receivable). Interest rates at the start of the game are as follows:

Interest Rate	Quarterly	Annually
Short term loan	2.3%	9.2%
Term loan	3.0%	12.0%
Bonds	2.5%	10.0%
Special loan	9.0%	36.0%

**Note:** If your firm runs short of funds, the program will automatically generate a special loan for you. You do NOT want a special loan (with the exception of a small product order from Peacock going into your first quarter). A special loan carries a rate of 36% annually!

**SHORT TERM INVESTMENT:** enter the US dollar amount you want to put into investments. Your firm is limited to cash on hand (above a \$10,000 cash minimum which you must maintain) at the start of the quarter. Note that contract purchases come out of cash prior to the start of the quarter and should be taken into consideration when determining cash available for investment. Your short term investments will earn a profit (or loss) for the corporation instead of sitting idle. Earnings are reported on the income statement. Any earnings or losses from your investment will come into cash prior to any cash outflows for the quarter, as does the original investment.

As you make the entry, a set of investment choices will appear numbered as 0, 1, 2 or 3. Select one of the following choices.

- Choice 0 = A portfolio of US Treasury Bills.
- Choice 1 = EU government obligations with a yield comparable to US treasury bills. The return is adjusted by the change in the exchange rate. This can be used as a one quarter hedge against changes in the Euro Dollar used to pay labor in your EU plant.
- Choice 2 = An investment in the Bear/Bull Index fund.
- Choice 3 = An investment in the Bear/Bull Index fund through an EU investment house.

**FACTOR RECEIVABLES:** Since customers are given credit, they pay only 60% of their purchases in the current quarter. The remaining 40% is in accounts receivable to be collected the following quarter. If you need cash, you can 'factor receivables' and receive 100% of sales income in the current quarter. Estimate forecasted sales revenue for the coming quarter and enter the amount that would normally go into accounts receivable. There is a 4.25% commission charge for factoring receivables.

**SHORT TERM LOAN:** Enter the loan amount desired. Your reports will identify your firm's unique borrowing rate which changes quarterly. At the start of the simulation the interest rate on short term loans will be 9.2% annually (2.3% quarterly).

Repayment of the short term loan is automatically made by the computer program the first day of the following quarter along with interest. You do not need to make an entry for repayment. If you can't afford repayment or need even more money, then place a request for another loan (referred to as rolling the loan over).

There is no set limit on short term borrowing. However, firms need to manage their debt-to-equity ratio to remain competitive. Bank audits that reveal excessive debt may result in conversion of short term loan to a special loan.

+ **OR - TERM LOAN:** Enter the change you want to make to a term loan. If you want to borrow \$100,000 dollars than enter 100000. Note that this is a change variable. An entry with a negative sign will reduce the loan. No action on your loan balance (except interest charges) will be made by the program if you enter zero. Rates are the same for all firms and have been fairly stable from one quarter to the next. The rate at the start of simulation is 12% per annum (3% per quarter).

The loan limit is \$1,000,000. Firms need to manage their debt-to-equity ratio to remain competitive. Bank audits that reveal excessive debt may result in conversion of long term loan to a special loan.

**ISSUE OR REPURCHASE BONDS:** Enter the **dollar** amount of bonds you wish to buy or sell. Note that there is one entry box for an issue and one for a repurchase, thus you do not need to use a negative sign as with other change variables. The bonds mature in five years, and therefore do not have to be paid back during the simulation. If bonds are bought back by the firm, it will be at face value plus a 4% prepayment penalty. Bond buyers demand a discount from the face value of a bond when it is sold. The discount demanded by the buyers increases as:

- A. the firm's credit standing falls, or;
- B. the amount of bonds issued becomes too large for the market to accept, or;
- C. interest rates on treasury bills move higher.

Interest paid by the firm is always **10%** (2.5% per quarter) on the face value. If the proceeds from the sale decline due to the discount, the effective bond rate could increase substantially. A

firm might only receive \$850,000 from a sale of \$1,000,000 but must pay interest on the full \$1,000,000. The full \$1,000,000 must be repaid, thus a liability of \$150,000 is instantly created.

The face value is always recorded as a liability under BONDS. The fact that the full face value was not received into cash is reflected as a loss to the stockholders. See their equity section on the balance sheet and find the negative stockholder account called AMORTIZED DISCOUNT. In the above example, the discount (or loss) would be \$150,000. This loss is charged off the income statement at **5%** per quarter.

Note that after a 1/1 debt to equity ratio has been reached, the bond market may close on a firm so that no bonds, or fewer bonds, will be sold.

+ ***OR - ISSUE OR REPURCHASE COMMON STOCK:*** Enter the number of shares to be sold. Note that there is one entry box for an issue and one for a repurchase, thus you do not need to use a negative sign as with other change variables.

A firm must issue at least 300,000 shares in order to begin operations. A minimum of 300,000 shares must be outstanding at all time. Slipping below this number will result in a fine.

There is a 10% limit when repurchasing shares of stock in subsequent quarters. Repurchase of stock exceeding 10% of outstanding shares is restricted except for special permission of the instructor, granted generally on proof of extreme need.

The accounting entries for a sale of stock are: increase cash; show the increase of the cash asset as coming from \$1 per share of COMMON STOCK sold and the balance of the per share sale in PAID IN CAPITAL.

The accounting entries for a repurchase of stock are: decrease cash; reduce COMMON STOCK by \$1 per share repurchased, reduce paid in capital by an average of paid in capital per share, **AND** reduce retained earnings by any excess paid to repurchase the stock.

For example, a repurchase of one share at \$22.50 would reduce cash by \$22.50, reduce COMMON STOCK by \$1.00, reduce PAID IN CAPITAL by the average of paid in (say \$4 in this case), and reduce retained earnings by the balance (which in this case would be \$17.50 per share).

***ESTIMATING STOCK ISSUE PRICE:***

***following are two different examples of shares issued in quarter 1, year 1***

Shares Issued	Amount Received Per Share	Amount Received Per Share
300000	\$4.07	\$3.54
400000	\$3.09	\$3.00
500000	\$2.92	\$2.94
600000	\$2.92	\$2.98
700000	\$2.59	\$2.56
1000000	\$2.92	\$2.33
2000000	\$2.28	\$2.51

***DIVIDEND:*** When retained earnings are positive (see the balance sheet), the firm has been earning profits and can therefore pay dividends. (You must never pay out more than you have in the retained earnings account, it is illegal and your firm could be fined.) The dividend payment is entered on a per share basis for example, \$0.40. (You can use a decimal point.) The first time you pay a dividend, the maximum you can pay is limited to 0.50 per share (you can pay less). An increase in the dividend payment is possible, but the amount of the increase each time is limited to \$0.50. Thus, if your firm has the retained earnings to justify a dividend payment you may issue a dividend as large as \$0.50 the first time, \$1.00 the second time, \$1.50 the third time and so on. Remember that dividends are paid for with cash from the cash account but balanced against retained earnings on the balance sheet. If retained earnings are negative when a dividend issued or after a dividend has been paid, the firm can be fined.

To calculate how much you are paying out, multiply the dividend payment per share by the number of shares outstanding ( $0.50 \times 500,000 = \$250,000$ ). This amount will come out of your cash account and will reduce the amount in your retained earnings, which has an impact on your debt-equity ratio. If a firm issues a dividend and repurchases stock in the same quarter, the dividends are paid first on the entire number of shares outstanding then the stock repurchase is made.

## **BUDGET DECISIONS**

**ENGINEERING:** Spending for the engineering budget reduces labor cost in production. The total savings possible is 20% in both stages. You can see unit production cost declining on the firm production report or on the Special Report (you must order this report). The 'production efficiency factor' on the Special Report has an initial value of one and can decline to zero depending on the amount spent. When it reaches zero, savings on labor costs have reached the maximum of 20%. A plant expansion can sharply reduce previously obtained savings. It is to be noted that the engineering budget is in thousands (i.e. an entry of '5' would equal an engineering budget of \$5,000 while an entry of 100 = \$100,000).

**QUALITY CONTROL:** Enter a dollar budget. Next, enter the percentage of that budget you want spent on P2 (Product 2). Entering 8000 with a percentage of 40 would cause \$4,800 to be spent on P1 and \$3,200 on P2. It is VERY IMPORTANT that you budget quality control as an element of your marketing plan. Poor quality control over time will give your product a bad name.

Budget toward either cost or image. If cost, keep increasing the budget until the cost of avoiding returns is equal to the cost of remanufacturing returns. If image, most returns should be avoided. Even after returns are minimized, additional quality expenditures provide for such things as insuring that labels are on straight. There is no upper dollar limit where expenditure per unit is wasted. Excessive expenditures are not recommended unless a "quality war" is being waged in your market group.

Firms that produce and sell in the same quarter should budget to production. Firms that produce to inventory for later sales have a unique problem, as do those firms who order through Contracts. Some of the inventory might have been damaged in storage. Never set your quality control budget to zero, even in the case where no units are manufactured. The safest, but most expensive method, is to set a per unit budget for production or unit sales, whichever is highest.

Regardless of the expenditure, since the manufacturer does not have complete control over the distribution channels, products might be returned. Some might be returned when the firm is not even at fault. A high quality firm might want to take action if units are returned even when no problem is thought to exist within the firm.

**PRODUCT IMPROVEMENT:** Enter a dollar budget. Enter the percentage of the budget to be spent on P2 (Product 2). Each industry has different opportunities. For some industries, this is a black money hole. For others, it is a competitive tool. Product improvements are announced in the industry section of the news.



## CAPACITY (BUILDING PLANT) DECISIONS

+ **OR - PLANT ADDITION:** Enter the number of hours to be built by STAGE and by AREA. Make the entry in 100's of hours. An entry in A1S2 of 20 will build 2,000 hours of Stage 2 facilities in the NAFTA area. Be sure to build Stage 1 and Stage 2 in the appropriate mix to match desired product mix.

It takes two quarters to build a plant. Thus, a plant ordered in decision#1 will be operational and ready to produce only in decision#3. (Additions to plant capacity also require two quarters to complete.) A second shift can be opened immediately once your plant is operational. To place a plant in one of the low-wage areas make an additional contract decision.

There is a cap on adding plant capacity of 299 (29,900 hours). This is due to building restrictions. If you want more hours than this, you will have to order additional plant in the following quarter. It takes two quarters to build. One half is paid for in the quarter you place the order and the second half in the quarter the plant is finished. The facility is ready for production in the third quarter.

*THIS IS A CHANGE VARIABLE. RESET THE DECISION TO "0" THE FOLLOWING QUARTER OR ANOTHER FACTORY OF THE SAME SIZE WILL BE BUILT.*

How many hours of plant capacity do you need? Let's assume that you produce 5000 units of aftershave and 2500 units of perfume per quarter. Multiply these quantities by the labor production parameters to get plant size:

The first stage of production is the mixing of ingredients; the second stage, bottling and packaging. To produce one unit of each product the following labor hours are required:

	<u>Aftershave</u>	<u>Perfume</u>
Stage 1	1.7 hours	3.0 hours
Stage 2	2.0 hours	2.5 hours

Aftershave	Perfume	Total
1.7 stage 1 hours x 5000 units	+ 3 stage 1 hours x 2500 units	Stage 1 = 16000 hours
2.0 stage 2 hours x 5000 units	+ 2.5 stage 2 hours x 2500 units	Stage 2 = 16250 hours

**Note:** that the two products share available plant hours.

**Plant Construction Cost:** the cost to build 1 hour of plant capacity is  
 \$50 per hour for stage 1  
 \$45 per hour for stage 2

What would be the cost of the plant shown above?

Stage 1: building cost = \$50.00 per hour x 16.000 = \$800000

Stage 2: building cost = \$45.00 per hour x 16.250 = \$731250

Site fee: 80000

Total plant construction cost \$1611250

A one-time site fee of \$80.000 is charged. If your firm were to build one plant each area there would be a site fee for each plant, a total cost of \$160.000. The plant construction cost is paid over two quarters. The site fee is paid in the quarter you order the plant.

+ **OR - SECOND SHIFT:** You can hire a second shift (or night shift) to increase your plant capacity. Additions can be made by increments of 10% (from 10 to 100%). To decrease second-shift capacity, you select a minus number. There is a one-time charge of \$2000 for each 10% increment in capacity and a quarterly overhead charge of \$350 per 10% increment as long as second shift capacity is available. Workers on the second shift earn a 5% wage premium. To reduce the second shift, there is a one-time charge of \$1000 for each 10% increment removed. Adding a second shift is a very convenient way of increasing your production capacity without increasing the size of your physical plant.

## PRODUCTION DECISIONS

If you make production decisions **YOU MUST HAVE A PRODUCTION FACILITY**. To build a plant, use the capacity decision menu!!! It takes 2 quarters for plant hours to be built and ready to use in the 3rd quarter.

Labor hours required to produce one case of aftershave or perfume in each production stage:

	Stage 1	Stage 2
Aftershave (P1):	1.7 hours	2 hours
Perfume (P2):	3 hours	2.5 hours

*Note: A High-tech plant can reduce Stage 2 packaging time by 20% for product 1 and product 2.*

**\*\* High-tech costs \$1,500,000 to install. You must use the Contracts program to order High-tech. High-tech takes only 1 quarter to install. Additional hours are automatically high-tech.**

### ***LABOR COSTS:***

Stage 1 workers receive \$12.00 per hour including benefits.

Stage 2 workers receive \$5.50 per hour, including benefits.

The night shift earns a 5% premium over the day shift.

Overtime = another 25% of your shift hours at a rate of 1.5 times the regular labor cost

Subcontracting = anything beyond overtime (moves incrementally from 2.2 times the cost to 4.4 times to 6.6 times)

Workers are paid based on production scheduled, not the size of the plant.

**First Shift Production (Day Shift: Shift 1):** After calculating how much you think you will sell in the coming quarter and how much you would like to add to inventory, you place your production order. You enter the number of units (P1, P2) to be produced in the current quarter. (You would make two entries if you have plants in A1 and A2.) These units are available for sale the same quarter in which they are produced.

If planned production exceeds plant capacity, the computer automatically schedules overtime (between 100% and 125% of normal capacity). The overtime wage rate is 50% higher. If scheduled production exceeds the overtime limit (125%), the production order is filled through subcontracting. Subcontractors use your raw materials until you have no more, then buy the additional amount required at market prices. Labor rates for subcontracting are 2.2 times the normal rate between 125% and 150% of normal capacity; 4.4 times between 150% and 200% of normal capacity; and 6.6 times if the production order is superior to 200%. Since it takes two quarters to build a plant, if you make a mistake and place a production order before the plant has finished being built, the simulation automatically subcontracts the order (based on a normal capacity level of 5.000 hours per stage) at the 2.2 multiplier rate. Mistakes of this kind are very expensive.

**Second Shift Production (Night Shift: Shift 2):** if you have hired a second shift, you would enter the number of units to be produced in the day shift and the number of units to be produced during the night shift (two separate entries). Be careful to respect capacity limits for each shift.

***MAINTENANCE BUDGET:*** is entered for each stage of production and for each plant. Maintenance cost will depend on the number of plant hours and the level of production. Maintenance budgets must be higher in stage 1 which is a very equipment intensive production stage. One might expect about \$0.30 per hour for stage 2 maintenance for the normal (day-time) shift. Stage 1 could require as much as 75% more due to the complex machinery used in the mixing process. Overtime will increase the need for maintenance, as will the use of a second shift.

Hourly losses of plant capacity per quarter and per stage of 0.001 of total plant hours (29.900 x 0.001 = 29 hours lost) are unavoidable, regardless of how much is budgeted for maintenance. However, if you are losing more than this amount, you will need to increase your maintenance budget. Less than adequate maintenance will have a cumulative effect, that is, plant hours will be lost at an increasing rate even with a constant dollar budget. Maintenance is required even when the plant is shut down—machines rust and corrode, belts rot, and deterioration occurs even if the

plant is idle for just a quarter. Maintenance will be required although some reduction in budget can be achieved. (Hint: Monitor ‘labor hours’ on your firm’s production report.)

## RAW MATERIALS DECISIONS

Raw material Futures ordered in one quarter are delivered on the last day of that quarter ready for use the following quarter. Calculate your raw material requirement and enter the number of units of each type for each plant. When the firm purchases raw materials in the quarter preceding their use (called ‘futures’), it is usually less expensive than purchasing at ‘market’ prices. Raw materials can only be ordered by your firm as ‘futures’. If you do not have enough raw materials in inventory, the simulation will automatically order the quantity required at market prices to complete your production order. However, there is a two-week delivery delay on ‘at market’ raw material deliveries. Thus if your firm had zero raw materials in inventory at the start of a quarter, the simulation would order the necessary raw materials to meet production scheduled, but you would lose two weeks of production time waiting for those raw materials to be delivered. (Since there are 13 weeks in a quarter, two weeks is equal to roughly 16% of production time.) A safe rule is to have at least 16% of the raw material requirement in inventory at all times.

There are two types of raw materials—type 1 (ingredients) and type 2 (packaging). They are the same for each product, only the quantities change. Raw material requirements and costs are as follows:

### *UNITS OF RAW MATERIALS REQUIRED TO PRODUCE 1 UNIT OF PRODUCT:*

	Type 1	Type 2
Aftershave (P1):	6 units	12 units
Perfume (P2):	12 units	25 units

Raw material costs:

\$1.33 per unit of type 1 raw materials

\$0.96 per unit of type 2 raw materials

Inventory carrying costs are \$0.60 per unit for P1 and \$0.90 for P2 for each quarter the unit is in inventory.

Raw materials carrying costs are \$0.005 per unit and per quarter for both types.

## SHIPPING

**Note:** if you are making contracts you do not use this decision menu to ship product. Shipping is handled within the contract itself.

**SHIPPING A1 TO A2:** Enter the number of P1 units to be shipped from A1 to A2. Next, enter the number of P2 to be shipped. You must ship in lots of 1,000.

**Cost:**

- Product 1 shipping = **\$2.25** per unit. Minimum shipment is 1000 units.
- Product 2 shipping = **\$6.25** per unit. Minimum shipment is 1000 units.

**SHIPPING A2 TO A1:** A firm can also ship from A2 to A1. Cost is the same. Enter in lots of 1,000 up to 20,000 units.

**EMERGENCY SHIPPING:** (also called Just in Time) **Shipping:** Say yes or no, when prompted, regarding shipping. "YES" for P1 and/or P2 will allow that product to be shipped air freight, one unit at a time, in order to satisfy a customer in that market area. The program will only ship if a unit is demanded in the needed market area and all regular customers are satisfied in the surplus market area. On rare occasions, when demand is heavy in one area and light in another, some finished goods are retained for the next quarter instead of being shipped. There is a premium for air freight, **30% higher than** regular shipping costs.

## CONTRACTS

In the Globalview simulation, firms are able to make a variety of contracts with one another including the sale/purchase of product.

Peacock Industries has been in the scent industry for a long time. This Globalview company operates firm 18. Peacock Industries sells product to firms. Peacock does not buy product or sell raw materials, plant hours, or other assets, unless through a special arrangement, such as the liquidation of a bankrupt firm.

Peacock sells finished goods only in the early quarters of the simulation, before manufacturers are present. They may maintain their presence longer at the Introductory level of the simulation. The prices for Peacock wholesale product change weekly. **The current Peacock asking price can always be found in the Dollars and Scents Quarterly Contract News.** In quarter 1, year 1 Peacock prices are \$56 per unit of p1 and \$99 per unit of p2.

Contracts may be made between any firm in any market group. In order to make your firm successful you will need to interact with the businesses around you. You cannot succeed if you cut yourself off from the distribution channel. Even a classical firm should keep tabs on opportunities in the market place. To maintain your place in the chain you will need to form business relationships, learn to negotiate, analyze market trends, and create contracts. There are many means to achieve communication: e-mail, chat room, a website to promote your product or service to other firms.

When communicating with other firms be aware of professionalism and cultural differences. Remember that you are representing your firm in your communications.

In order to conclude a valid contract the following must occur:

1. There must be an offer made which includes the essential terms of the "deal"
2. If this offer is accepted unchanged, a contract is made.
3. If the offer is not accepted unchanged, the counter-offer, a new proposal, must be accepted by the original offer or, before there is a valid contract.
4. The contract should not be posted until both parties agree on the terms.

***ONLY 1 PARTY TO THE CONTRACT EXECUTES THE CONTRACT IN THE ONLINE RECORDING SYSTEM.***

Under the firm decision menu, there is a window « Current Contracts » where you can check to see that the contracts have been recorded.

All parties should keep written record of negotiations. In the case of chat room deals, you should print the chat session or formalize the agreement with a written confirmation by e-mail.

Contracts are entered online just like your main decision set. The contracts program allows your firm to make a host of different types of contracts. All contracts which you write up, whether between firms or within your own firm, are executed prior to the start of the main simulation.

**3 IMPORTANT NOTES:**

1. **For the buyer of product:** contracts go through before other decisions. Money will come out of cash (or generate a special loan) and product will come in before the quarter begins. This means you can sell product in the same quarter you order it (but you need to plan for the \$ in advance). If you purchase from Peacock Industries in your very first quarter, you will generate a special loan before you begin operations.

2. **For the seller of product:** product will go out during the quarter along with regular sales. Money from the contracted sale will arrive as income. You will need to subtract contract sales from your total market sales to determine true retail market sales. The cost of shipping is the burden of the seller and appears as a miscellaneous expense.

3. **For the seller of raw materials or plant hours:** these items will come out of your current inventory before the start of the quarter and the corresponding cash will come in. The cost of the contracts is the burden of the seller and appears as a miscellaneous expense during the quarter. Losses will also appear as a miscellaneous expense during the quarter.

## THE OPTIONS

**1. BUY/SELL GOODS:** This option allows you to buy product from or sell product to other firms within the simulation. Use this option also when making contracts with Peacock Industries (firm 18). Read the *Dollars and Scents Quarterly* for current Peacock prices. **The seller pays a 6% fee on any contract to sell goods, this includes the cost of shipping which is built into the terms of the contract.**

**2. BUY/SELL RAW MATERIALS:** This contract option allows you to buy or sell raw materials from or to other firms in the simulation. Do NOT make contracts with Peacock Industries to buy raw materials. If you simply want to order raw material futures, use your main decision set. **The seller pays a 5% fee on any contract to sell raw materials.** This includes shipping which is built into the terms of the contract.

**3. BUY/SELL PLANT HOURS:** This option allows you to buy or sell plant hours from or to other firms in the simulation. If you are the seller you must be aware of two factors: 1. **The seller pays a 20% fee on any contract to sell plant hours.** Expensive! Also, the seller will have to take any gain or loss from the sale as a miscellaneous expense on the income statement. Thus, if you sell a \$7 million dollar plant for \$1 million, you've just lost \$6 million dollars.

**4. CONSULTING SERVICES:** This option allows you to give or receive cash from another firm. This is usually used by those firms that give or receive consulting advice from other firms. It may also be used to make special loan arrangements with another firm or as a way to break up the payment for a finished goods order. **The provider of a consulting service must pay 2% on the value of the contract.**

**5. TRANSFER RAW MATERIALS:** This contract is made within the firm, and allows you to move raw materials from one area to another. **The charge to move raw materials is 3%**

**6. TRANSFER PLANT HOURS:** This option allows you to move your own plant hours from one area to another. This is expensive to do. **The cost is 20%** of the value of the hours being moved.

**7. INSTALL HIGH-TECH:** This option is made within the firm. High-tech improves the productivity of your factory. Adding High-tech will make your production more efficient. A high tech plant reduces the time it takes to produce product 1 and product 2 during stage 2 (packaging) by 20%. **The cost to add high tech is \$1500000 per plant.** High tech takes one full quarter to install. You only make this improvement once, when you build more plant hours they are compatible with your existing high tech.

**8. RELOCATE TO MEXICO OR THE CZECH REPUBLIC:** This option is made within the firm. It allows you to locate your plant somewhere besides general area 1 and area 2 confines. There are benefits and risks to locating in either of these two areas. See the chapter on [Advanced Topics](#) for specific details. You cannot choose to locate to either of these areas if your plants are already situated without incurring a charge of 20% relocation fee.

If you wish to use this last option, you should be aware that it requires an accompanying decision in the Firm Decision Set. If you wish to locate a plant in Mexico or the Czech Republic you will also have to order the construction of plant capacity in that area. If, for example, you decide to locate your Area 1 plant in Mexico, you would make a contract to this effect. Furthermore, you would order plant capacity to be constructed in Area 1. Remember, only one plant per area is allowed.

[Sales](#) | [Production](#) | [Balance Sheet](#) | [Income Statement](#) | [Cash Flow](#) | [Credit Report](#) | [Contract Report](#)

## Firm Reports

### SALES REPORT

The sales report looks at sales outcomes for the quarter (such as unit sales, market shares, etc...) and the state of firm's marketing variables (price, sales representative salaries, etc...).

**Total Unit Sales:** your firm's total unit sales per product by area. **If you are a wholesaler ( you have sold units through contracts) then this figure would include those sales.**

**Backorders:** orders your firm could not fill this quarter. They will be first in line to be filled next quarter, at this quarter's price or at next quarter's price - the lower of the two. If you have backorders in a quarter, be sure to add those backorders to your next quarter's forecasted demand. If you cannot fill your previous quarter's backorders you will lose these sales altogether.

**Returns:** products that failed on initial use or shortly thereafter. The units are reprocessed and resold in the same quarter or, if not sold, are included in the finished goods inventory. The cost of reworking returns is approximately 30% of the unit's sales price (RETURNS X PRICE X .30). Additional expenditures in quality control will help eliminate the return problem.

**Sales Lost:** your inability to supply demand led retail buyers to seek product from another firm in your market group.

**Market Share:** market share is by product and area. It represents your share of what the firms in your market group sold. If there are five firms in your market group, then your "fair share" of the market would be 20%. Given 8 firms (the maximum in any one market group), a "fair share" would be 12.5%. Note that large wholesalers (selling through contracts) may upset market share figures by creating a larger total sales figure (with sales outside of the retail market of the market group). Ending Sales Lost for the market group are not calculated into the market share figure, nor are current backorders.



**Sales Trainees:** are hired and trained at a cost of \$3,000. It takes 1 quarter to fully train a sales trainee. Once the trainee is ready he/she can be assigned to a territory for \$3,000. You should still consider paying a salary and/or commission as soon as the trainee is assigned to an area. If you do not assign your trainee to a sales area, he/she will be kept on hold in the trainee pool and will earn 3,000 per quarter until you do fire or assign him/her.

**Sales Reps:** this is the number of sales representatives still with you at the end of the quarter. If you notice that the number is smaller than it should be this means that some sales reps have quit. The cost to hire a new sales rep is \$12000. Yes, sales reps sometimes do quit. Sales reps compare the base salary and commissions you pay to the salary and commission paid by your competitors. The less relative pay, the less motivated the sales reps are and the greater their incentive to quit. Always check the Industry Report to see how many sales reps are ready to start the next quarter.

**Base Salary:** is the amount paid to each sales rep, each quarter, regardless of the number of units sold. The salary of \$3,000 (in this example) may seem low for a quarter, but most of the reps carry complementary product lines for other non-competing firms. They are not your employees, but independent contractors. The number of sales representatives that have stayed with your product line and are ready to start the next quarter is public information and found on the Industry Report.

**Commissions:** are stated in actual dollars and cents per unit, NOT as a percentage of the selling price. Commissions are paid per unit sold (this includes previous quarter backorders but excludes contract sales for the quarter).

**Product Prices:** your prices per product per area

**Advertising Budget:** your advertising budget per product per area

## **PRODUCTION REPORT**

The production report breaks down manufacturing elements for the quarter, including production, inventory and plant capacity.

**Production - Shift 1:** is the actual number of units manufactured for the stated quarter. Production is broken down by product, area and shift. There is a day shift (shift 1) which exists as soon as the plants hours are available for operation. The second shift, or night shift must be set up through the capacity decision menu.

You will need to compare the actual production to the production schedule you set up in your decisions. The negative variance rarely drops as low as 15% and the positive variance rarely exceeds 5%. In countries with less dependable infrastructures (such as Mexico or The Czech Republic) the range is between 40% to 125%.

**Production - Shift 2:** is what the night shift produced. A second shift is ready to go in the same quarter it is added. In both shifts, wages are paid by the hour. The number of units produced per hour stays fixed. Therefore, the labor charge per unit stays fixed. The night shift earns a 5% premium over the day shift.

**Remember that if you do not have a second shift in place, all second shift production which you schedule will be subcontracted.**

**Finished Goods Inv:** units on hand ready for sale in the coming quarter. There is a carrying cost per unit.

- Finished Goods, Product 1 carrying costs **\$.60** per unit per quarter to store.
- Finished Goods, Product 2 carrying costs **\$.90** per unit per quarter to store.

**Inventory Unit Cost:** averages the production unit costs of old inventory from previous quarters and the new units manufactured or purchased through contracts. The result is the cost of units in your inventory that will be charged to the income statement as cost of goods sold when those units are actually sold (perhaps in the coming quarter).

**Production Unit Cost:** includes the labor and raw material cost components of the product. If you find you have excessive production costs, check to see if you are subcontracting the units you are manufacturing (scheduling production beyond capacity). Remember also that if you wait for the program to order your raw material units at market, you lose 2 weeks of production. The production unit cost is used to adjust finished goods inventory unit cost if the units are not sold.

This is a basic production unit cost (day shift with no overtime and no subcontracting)

Aftershave	Perfume
6 units raw materials type 1 x \$1.33	12 units raw materials type 1 x \$1.33
12 units raw materials type 2 x \$0.96	25 units raw materials type 2 x \$0.96
1.7 stage 1 hours x \$12	3 stage 1 hours x \$12
2.0 stage 2 hours x \$5.50	2.5 stage 2 hours x \$5.50
Total = \$50.90	Total = \$89.71

**Raw Mtls In:** are your raw materials in inventory. The numbers shown in this section are what you have on hand to start the next quarter. The firm cannot place an order for raw materials at market price. The model is designed to order at market automatically, any time during the quarter when production runs out of raw materials.

**RM Units/ FGU P1 and P2:** Raw Material Units/ Finished Goods Unit, specifies how many units of raw material are required to make one finished goods unit.

**Plant Size: Labor Hrs/ Shift 1:** measures the physical plant in terms of labor hours available for production. The figures are stated for shift 1 by Area and by Stage. Hours lost are the actual or

real depreciation of the plant and equipment. The accountant, at the same time, is reporting a depreciation for tax purposes at the rate of 2.5% per quarter.

**Second Shift:** is a night shift. The union contract requires a 5% wage premium be paid.

**Labor Hours/ FGU:** is the number of labor hours required to manufacture one unit of finished goods.

**New Construction (Hours):** are stated in hundreds of hours. You will have an entry if you ordered a plant expansion or started a new facility.

## **BALANCE SHEET**

A balance sheet is a snapshot of the firm's current financial condition taken on the last day of the quarter. Assets are balanced against liabilities and equity.  $\text{Assets} - \text{liabilities} = \text{equity}$ .

**Cash:** is the amount of cash your firm has on hand at the end of the quarter. Your firm must maintain a minimum cash balance of \$10,000. If your cash threatens to drop below \$10,000 the program will issue you a special loan to cover any further expenses. Interest on a special loan is 36% annually, 9% quarterly. Your cash flow statement gives you a detailed account of cash transactions for the quarter, so that you can see how the ending balance was derived.

**Accounts Receivable:** are those sales dollars which your firm has earned that have not yet come into cash. These would be credit sales as opposed to cash sales. Accounts Receivable are approximately 40% of sales revenue, this is true even of contract sales to other firms. These receivables can be factored, which turns them into cash during the same quarter. The cost to do this is 4.25%. The decision to factor receivables can be made on the financial decision menu.

**Marketable Securities:** is the record of your firm's subsidiary investment, if you have opened a subsidiary. This number would be 51% of the shares issued by the subsidiary at the issue price.

**Inventories:** finished Goods inventory is shown here as a dollar amount. Be careful that the money you tie up in finished goods assets is not excessive. Raw Materials inventory is also shown on the balance sheet as a dollar amount.

**Plant and Equipment:** is the original dollar value of your firm's plant. In this example the firm ordered plant construction in Quarter 1, Year 1 worth \$670,000. The number on the balance sheet, \$750,000 also includes the \$80,000 site fee which is charged to all firms constructing a factory. If this firm had ordered High-tech (see the [Scent Industry Section](#)), this would also be recorded in the worth of the plant and equipment.

**Accumulated Depreciation and Net Plant:** is the accountant's record of plant depreciation. When Accumulated Depreciation equals Plant and Equipment, Net Plant will be zero. Depreciation is straight line, using 10 years which is 10% annually, or 2.5% quarterly. The

program calculates depreciation using beginning plant and equipment for the quarter (or last quarter's ending plant and equipment).

**Accounts Payable:** at the end of each quarter you will have a number of unpaid bills or partially paid bills. These are your accounts payable. To find out where your accounts payable are coming from, you should order a cash flow report. Accounts payable are approximately 30% to 35% of payments made for raw materials and labor, including administrative expense.

**Loans and Bonds:** shows loans and bonds. Note: the bond market may close for a firm after a 1/1 debt to equity ratio is reached by that firm.

**Common Stock:** the Common Stock account on the balance sheet records \$1.00 for every share issued. Additional issuance of shares would add \$1.00 per share. Likewise, a repurchase of shares would reduce this account by \$1.00 per share.

**Other Paid in:** of course, your firm probably sold stock for more than \$1.00 per share. The Other Paid in account on your balance sheet is where the accountant records the dollar amount above \$1.00 which your firm earned on the sale of its shares. A later issuance of shares would increase the Other Paid in account by the issuance amount over \$1.00 per share.

A repurchase of stock is a more difficult accounting calculation. A repurchase would reduce cash, reduce the Common Stock Account by \$1.00, reduce Other Paid in by an average of paid in capital per share, and reduce retained earnings by any excess paid to repurchase the stock.

**Unamortized Discount:** the unamortized bond discount is the portion of the bond discount not yet amortized.

**Retained Earnings:** is the account where gains and losses to the stockholder are recorded. Each quarter you will see gains or losses reflected in your retained earnings. If you are repurchasing your firm's stock at a price which is higher than its average issue price, you will see a loss to your Retained Earnings account.

**Total Equity:** is an important number to keep track of. If your firm has a total equity of zero, it means that you have lost 100% of the stockholders investment in your firm. In other words, you are bankrupt!

## INCOME STATEMENT

The purpose of the income statement is to show whether the firm made or lost money during the quarter. It reflects a period of time (the quarter). The income statement shows how revenue (money coming in through sales) is transferred into net income. Revenue - cost and expenses charged against the revenue (including, for example, depreciation and taxes) = the bottom line or net income (or loss).

**Sales revenue:** is calculated as: previous quarter's backorders x previous quarter's price + contract sales this quarter x contracted price + retail sales this quarter at this quarter's price. To determine Area 2 sales revenue you will need to take the exchange rate into consideration. To do this you will need to divide area 2 sales revenue by the current exchange rate listed in the Industry Economic Report.

**Reprocessing cost:** is the cost of putting returned items back into inventory. This cost is 30% of the unit's sales price. Returned items are reprocessed and put back into that quarter's inventory for sale in the same quarter, they do not go into inventory.

**Net Sales:** is the total sales revenue less the reprocessing costs.

**Investment Income:** shows the type of investment made (0, 1, 2, or 3) and the profit or loss from this investment. The amount of profit or loss from moving excess cash into one of the quarterly options is part of gross income.

**Income From Marketable Securities:** is the amount of dividends paid out by the firm's subsidiary. If a subsidiary is started in another market group, the firm receives 51% of the dividends paid by that subsidiary. Dividends paid by subsidiary arrives in the following quarter.

**Cost of Goods Sold:** is the weighted average cost of finished goods from previous quarters and the cost of goods manufactured or purchased this quarter, times the number of units sold. Remember, if you purchase finished goods through Contracts, then the price you pay for these finished goods will also average in with the Cost of Goods Sold figure.

**Advertising:** is a budgeted decision made by the team.

**Quality Control:** is a budgeted decision used to reduce returns and improve product image. Inadequate expenditures on quality control will cause more returns and will affect market share over time.

**Bad Debts:** is a function of the credit policy selected by the firm and the amount of sales.

**Product Improvement:** is a budgeted item, spent in an attempt to achieve a short run differentiation advantage over competitors. If secured, the benefit will last two quarters.

**Engineering** is a budgeted item, spent in an attempt to lower production costs. Engineering budgets are entered in 1000's. Efficiency gains over time are hard to track. You will need to monitor production unit costs closely to pinpoint engineering effects.

**Sales Expense:** is the total of commissions and salaries paid to sales representatives, (excluding both last quarter's backorders and contract sales). Unexpected variations in sales expense are due to variations in commissions. If you pick up the sales lost of other firms, you do not pay a commission on the sale. If your sales expense falls far short of what it should be, beware.

### **Administrative Expense =**

1. \$.05 X plant size (stage 1 + stage 2)
2. \$.15 X hours used (hours used in production for the quarter both stages)
3. \$350 X each 10% of second shift
4. \$.025 X plant hours under construction
5. \$ Fixed administrative overhead = \$ 50,000

\* Plant size measuring first shift only in both Stage 1 & 2; the program uses plant size at the start of the quarter (or last quarter's ending plant size)

### **Inventory and Shipping Charges =**

1. Number of P1 units inventoried x **\$.60** per unit
2. Number of P2 units inventoried x **\$.90** per unit
3. Number of T1 rmtls inventoried x **>\$.005** per unit
4. Number of T2 rmtls inventoried x **\$.005** per unit
5. Number of P1 units shipped ocean freight x **\$2.25** per unit
6. Number of P1 units shipped air x **\$2.925** per unit
7. Number of P2 units shipped ocean freight x **\$6.25** per unit
8. Number of P2 units shipped air x **\$8.125** per unit

Inventoried units are those in the quarter just ended (NOT inventoried units from the previous quarter's report)

**Maintenance:** is an absolute budget and NOT a per hour nor a per unit entry. Inadequate maintenance accelerates the number of plant capacity hours worn out each quarter. You should increase maintenance proportionally if a second shift is used. Remember, some maintenance is required even if zero production is scheduled. If you don't budget enough for maintenance then you risk losing plant hours at an ever increasing rate. A VERY expensive proposition.

**Depreciation:** is straight line, using 10 years which is 10% annually or 2.5% quarterly. Depreciation begins as soon as plant hours exist and includes the \$80000 site fee.

### **Interest**

The interest expense on your income statement is composed of the following interest charges:

**Interest on Short Term Loan.** Short term funds are borrowed for use in the quarter and paid back the first day of the next quarter with interest. At the start of the simulation the interest rate is 9.2% annually or 2.3% quarterly.

**Amortized Bond Discounts.** Amortized bond discounts are included in the interest charge. A firm does not always receive the full value of the Bonds it sells. Bonds mature in five years (20 quarters) so the quarterly amortization rate is 5% per quarter.

**Interest on Bonds.** The bonds pay 10% (2.5% per quarter) on the \$1,000 face value.

**Interest on Long Term Loan.** Interest on Long Term loans is also included in the interest charges found on your Income Statement. The charge for long term borrowing is a set rate for all firms (**at the start of the game this rate is 12% annually**). Unlike short term, long term interest is paid when you receive the funds, not when you repay them. So, if you borrow in Q1, interest will be collected in Q1. The loan itself is not repaid until your firm orders repayment in their decisions.

**A Special Loan.** A Special Loan is the Mother Rate of all loans. This loan is provided automatically by the program whenever you are short on funds. The Special Loan has an interest rate of 36% annually or 9% quarterly. As with a short term loan, a special loan is automatically collected the next quarter along with interest. Note: Contracts often generate a special loan. Because Contracts are put through before the quarter run occurs, many firms find themselves short on funds, and are given a special loan. Be careful when making contracts for finished goods that you understand the effects of a special loan on your income statement.

**Factor Cost:** is the discount taken when you elect to convert all your incoming accounts receivables instantly into cash. The service fee and interest charge is 4.25% of the receivables factored. If you factored all your incoming receivables, Accounts Receivable would be zero and cash would have increased accordingly.

### **Miscellaneous**

The Miscellaneous charge on the Income Statement is composed of the following:

1. Hiring new sales reps \$12000 each
2. Hiring Trainees \$3,000 each
3. Assigning trainees \$3,000 each
4. Transferring sales reps \$3,000 each
5. Cost of changing second shift
6. Administrator's charges<
7. Contract gains and losses on the sale of raw mtl and plant hours
8. Seller's contract fees
9. Consulting Contract

Administrative charges are those charges which the Global View Administrators assign to your firm for violating rules, law suits, and so forth, as well as charges for various reports being offered.

### **Income Taxes**

Income Taxes are paid quarterly at the rate of 22% on the first \$6,250 earned and 48% on the balance of earnings. Losses can offset taxes paid over the last three years. If you paid taxes and then have a loss, a tax rebate will be provided and shown as a negative tax (-). The 48% tax rate reflects federal, state and local income taxes, plus other miscellaneous taxes.

**Net Income:** In the case of a loss, the offset on the balance sheet is a reduction in the stockholders Retained Earnings by the same amount.

**The Bottom Line:** on the Income Statement is important. You can see that an income loss is recognized immediately in the stockholder's net worth (retained earnings). However, it is important to consider the long run objectives. Perhaps, some short term loss can be tolerated to gain long run market position. Losses in some cases are unavoidable and may spread throughout the industries. The net income and the Balance Sheet must be compared to all firms in order to determine the relative value.

There is a common misconception that increases in assets means taking a loss on the income statement. Let's look at expanding plant capacity as an example. Most teams consider the building of a plant to be an expense. What you are doing is simply trading one asset (cash) for another (plant). That is not an expense. Only as it wears out is it an expense (depreciation).

Decision makers are reluctant to expand plants late in the simulation. When challenged regarding that decision, most say it is too late in the game to recover the cost of building. In this situation, however, you are trading an inferior asset (cash) for one you hope to be superior (plant). After two quarters of construction, if you were right, the plant will be on line and will generate returns. Investors will recognize the new level of net income flow and stock prices will increase that quarter and in future quarters as the flow gains stability. In this situation, an argument could be made to begin a plant capacity expansion as late as the second quarter of the last year.

## **CASH FLOW**

A cash flow report shows the movement of money into and out of the firm during the quarter. All incoming cash for the quarter is compared against all outgoing cash to determine your ending cash figure on the balance sheet. If you do not have enough cash to cover outgoing then you will be given a special loan.

Most of the figures which appear in the Cash Flow Report can be taken directly from your current Market group and Firm Reports. Let's take a closer look at some of the more difficult numbers on the Cash Flow Report.

### ***A NOTE ABOUT CONTRACTS:***

Contracts are put through first, then main decisions are run. All cash is paid out for contracts before the start of the quarter. If you are a firm purchasing finished goods, make sure that you have an ending cash balance from the previous quarter to purchase goods through contracts. If you have no cash on hand a special loan is generated. Special loans carry a 9% quarterly interest rate.

The seller of finished goods will deliver and receive payment for goods during the quarter. This allows the producer of goods to produce during the quarter to meet contract demand. It also allows contracts sales to be properly counted in income statement revenue. The same rules apply to contract cash inflow as to other sales revenue inflow - 60% to cash and 40% to accounts receivable. Bad debts can occur and are influenced by your firm's credit policy.



**Net Cash Sales:** are **approximately** 60% of total net sales, the remainder will be credit sales. Credit sales (accounts receivable) and will be collected as cash in the following quarter.

**Raw Materials:** 65 - 85% of the raw materials purchased are paid for immediately. The remaining 15 -35% go into accounts payable. The cash outflow for raw materials will depend upon your scheduled production. It will also depend upon whether or not your firm had raw material inventory on hand. Multiply the raw material cost (remember to combine inventory and at market costs if you start with some raw materials on hand but also order at market during the quarter) by the number of raw material units needed to produce one unit by the number of units manufactured.

**Manufacturing Labor Costs:** The cash outflow for manufacturing labor costs will also depend upon scheduled production and whether or not you used overtime or subcontracting. As with raw materials, only 65 - 85% of your quarter's labor costs are paid up front. The 15 - 35% remainder will appear in your accounts payable. You need to remember to multiply the wage rate by the number of hours required to produce one unit by the number of units manufactured.

Here is a simple example. If 2000 units of aftershave (product 1) are produced with no overtime or subcontracting:

Stage 1: (1.7 hours required x \$12 paid per hour) x 2000 units produced = 40800

Stage 2: ( 2 hours required x \$5.50 paid per hour) x 2000 units produced = 22000

Total: \$62800

Total cash outflow: \$62800 x 85% (approximate) = \$53380

Total in accounts payable: \$ 62800 - \$53380 = \$9420

**Administrative Expense:** The cash outflow for administrative expense is approximately 65% of the total administrative expense. The remaining 35% will appear in accounts payable.

**Raw Materials Futures:** When you purchase raw materials futures (raw materials which are available at the end of the quarter for use in the following quarter) you must pay 70% of the cost immediately. The 30% remaining will appear in accounts payable.

**New Construction:** New construction is paid for in two quarters. Half in the first quarter and half in the second quarter. If this is your initial (first time) plant construction at a particular site, you must also pay an \$80,000 dollar site fee in the first quarter.

**Changes in Capital Accounts:** As the name implies, this section of the Cash Flow Report shows you the changes in your Capital Accounts. The final "equity" number is the total of everything listed below BONDS in one column.

## CREDIT REPORT

A credit report is your credit reputation.

**Credit Rating:** is evaluated each quarter. An evaluation of 1 is the best and 5 the worst. Your rate will begin at 1 and quickly decline since you will probably lose money in your start up quarters. The rating determines, in part, the firm's short term bank borrowing rate.

**Short Term Rate:** is your short term borrowing rate. For example, your firm's credit rating of 1.783 influenced a S.T. (short term) borrowing rate of 13.363%. If your firm borrows \$100,000 in short term for Q4, the collection in Q1, Year 2 will be at 13.363% (3.34% per quarter).

**Debt-to-Equity:** is a measure of financial risk undertaken by the firm. 0.0 to 1.0 is ultra conservative and may restrict the growth in the stock price of a successful firm. 1.0 to 1.5 starts to worry both stock investors and bankers. Above the 1.5 ratio you will find two types of firms: high risk firms pushing financial leverage to its maximum and firms that have lost a great deal of equity and are in financial difficulty.

## THE CONTRACT REPORT

The contract report shows you contracts executed with your firm during the quarter. Even if you did not make contracts with other firms or within your own firm, it is still a good idea to check this report.

[Sales Report](#) | [Financial Report](#) | [Production Report](#) | [Economic Report](#)

## MARKET REPORTS

The Market Reports contains market group information, while the Firm Reports contains information pertaining to an individual firm. A Market Report is public information, while a Firm Report is confidential.

### SALES REPORT

**Total Sales in Units:** shows the total sales across the market group. The reporting is broken down by area and by product.

**Total Advertising:** shows the total advertising spent in this market group by product and area. This allows for some insight into your competitors' use of advertising as a marketing tool. How would you best analyze this information? What is your market share in comparison to your share of advertising within the market group?

**Ending Sales Lost:** shows the number of Product 1 and Product 2 sales lost in your market group. The sales lost data on your Firm Report specifies the number of units your individual firm could have sold had they had enough units to supply demand. This number is important as you attempt to forecast demand for coming quarters. Are your sales lost typical of the market group as a whole? Are you supplying the unfulfilled demand of a competitor?

**Total Wholesale Orders:** are the total of all contract orders for the market group. These are orders only. It is uncertain whether all of these orders have been filled. Those orders that were filled have recorded as sales for the quarter. Those orders that were not filled are recorded as backorders and sales lost. This figure is a tool which allows you to discern how many of the total unit sales in your market group can be attributed to contract sales to other firms. If you find that your market share seems to have dropped inexplicably low, you should look at total wholesale orders for your market group. It may be that one firm pushed up total unit sales through contract sales to other firms. You can find contracts for the quarter listed in the contract section of the *Dollars and Scents Quarterly*. Determining real market share is made more difficult when large wholesalers are present in your market group.

**Average Commission:** is the average commission paid per product by area. It is an important variable to consider as you analyze your competitors.

**Average Sales Rep Salary:** is the average sales rep salary paid by area. This is also an important variable to consider in your competitor analysis.

**Average Price:** is the average price being charged per product by area. It is a quick marker to determine where your firm's pricing falls within the market group. If all firms are close on pricing, the whole market group may suffer from price wars. If firms find a nice distribution from low price leader to niche, the market is more likely to have good growth.

**Individual Firm Information:** shows the number and name of each firm as well as the retail price each firm is charging per product by area. Also shown is the number of sales reps each firm is carrying per area. This is a good place to determine which markets your competitors are active in and what their individual pricing strategies are.

**Sales Representatives:** shows the number of sales representatives ready to sell on the firm's behalf next quarter. Firms often are represented by 3 to 15 sales reps in an area. If the number of sales reps is lower than it should be, assume some of your sales reps have quit.

**Manufacturing Only Firms:** if a firm in your market group is a manufacturing only firm selling through contracts exclusively then you may see a retail price of zero listed. This does not mean that the firm is not selling. Their sales figures are part of the total units sold listing. Wholesalers provide difficult reporting problems to resolve and it is more difficult to determine their marketing strategies. The best way to find this information is to the contracts section of the *Dollars and Scents Quarterly*. Find out who is selling, how, and for how much.

## FINANCIAL REPORT

**Stock Price:** shows the current stock price for each firm in the market group.

The question most commonly asked about stock price is, "How is it modified?" What determines its movement? Firms with an excellent quarter or two of earnings may wonder why their stock is moving up so slowly. Stock prices are determined by a set of statistics as opposed to the setting of prices by supply and demand for shares in the market place. There are two powerful ratios that dominate the share price calculation: current debt/equity ratio but only if it exceeds 1-to-1, as it will draw down share price as the ratio increases. This ratio is a proxy for financial risk in a firm's capital structure.

The second powerful ratio is earnings per share (EPS). Firms with more shares must produce more earnings in order for the stock price to remain equal with firms that issue fewer shares. A firm with fewer shares but the same amount of capital (secured in part through debt) will find stock price to be more volatile since earnings and losses will be magnified over the fewer shares. Firms with all equity (no debt) will have little chance of bankruptcy and little chance of being in the top stock performers. EPS is tracked over time so one quarter's sudden change in EPS will not suddenly boost or radically damage share price. Other ratios, such as credit rating and market share changes have minor affects on stock price but could have longer term impact on EPS which will have a direct impact on share price.

A good strategy to raise share price is to repurchase shares, GIVEN the firm has sufficient cash to buy back shares at the now reported price plus a premium, and a debt to equity ratio that can withstand a large reduction in the equity section. Thus, only strong and financially healthy firms can effectively enact such a strategy. Dividends would also follow a similar strategy. Dividends carefully administered can raise share price and at the same time, directly add value to the shareholder as measured in the NPV ranking.

**Div/Share:** is the dividend per share issued for the quarter. Each firm will develop a different dividend policy which is part of the larger strategy. It is illegal in this simulation to issue a dividend with negative retained earnings. If caught, you will be fined. Retained earnings must be positive both prior to and after the dividend issue. You can only increase your dividend \$0.50 per quarter. If you drop this to zero then you must begin all over again at \$0.50

**Net Income:** is shown per firm for the quarter. Net income affects earnings per share which influences stock price. Note that earnings must be good over several quarters before you will see dramatic affects on stock price, credit rating and so forth. You cannot expect that stockholders will simply jump up and down at one quarter's good showing. They expect good returns over the entire year.

**New Financing:** shows the issue/repurchase of all stock. During the initial offering any amount of stock may be issued above the 300,000 minimum. Repurchasing stock is restricted to 10% of outstanding shares. It is important to monitor the stock activity of competitors as this may have a dramatic impact on stock performance.

**Bonds:** records bond transactions.

**Plant Expansion:** lists plant hours under construction. Keeping an eye on your competition is crucial. How much are they spending on plant construction in which area? What size operation are they gearing toward? Are they expanding in later quarters? It may also be helpful to identify large firms, especially firms located in low production cost areas. These firms may be excellent suppliers of product in the coming quarters.

## **PRODUCTION REPORT**

**Raw Material Prices:** is the at market price for raw materials for the quarter. If you do not have raw materials in inventory but schedule production in your plant, the goods will be made with raw materials at market price. However, you will lose 2 weeks in production waiting for raw materials to arrive.

**Raw Material Prices (futures):** are materials which you order in the quarter delivered to you at the end of the quarter. If you enter a decision to purchase raw materials then this is the price you paid for those materials. Raw materials futures are always cheaper than raw materials at market in the next quarter.

**Raw Material FAQ:** a common question arises when the raw materials futures price listed on the production report exceeds the at market price. Isn't buying futures always supposed to be cheaper? The comparison can be deceptive. What you need to compare the futures price to is the unknown at market price which will be listed in the upcoming quarter. If you find that futures is higher than the at market price listed on the current quarter report, you know that next quarter the cost of at market raw materials will be that much higher.

**Other items:** the rest of the production report is dedicated to individual firm plant figures. The figures themselves are straight forward. The only difficult item is the listing of new construction hours in 100's whereas everything else is listed as total hours. When these new construction hours come online they will be listed as the full amount. You should always check your firms capacity status of stage 1 and stage 2 each quarter to know if you are losing hours through poor maintenance or if you made a data entry error.

On the production report you can find information on the plants of your competitors in any market group. Let's say that you are a wholesaler with a large portion of the contract sales market. However, you have two close competitors in different market groups. Demand is not being met. You are building additional plant. You want to know if your competitors are following similar plans and to what degree. You go to the production report and "aha!" they are adding more hours of capacity and expanding into a second area.

## ECONOMIC REPORT

**Current Economic Index:** is a relative measure of overall economic performance in the quarter just completed. Contrast its value to past and forecasted future values to determine size and strength of the Global Market.

**Next Quarter/Year Forecast:** is an economic forecast for the coming quarter. Both the economic forecast for the quarter and for the year are provided by the Global World Bank.

**The Consumer Confidence Index:** Price quotes for stocks of all firms in the simulation are provided in a special stock market report. The stocks within your market group are quoted in your Industry Report (see STOCK PRICE on the report). The Consumer Confidence Index goes beyond the stocks in your market group and represents all equity stocks on all exchanges in both the EU and NAFTA. The Consumer Confidence Index is a good indicator of the strength of the international equity financial markets and can sometimes be used to forecast overall general economic trends. The index will be useful when considering the issue or repurchase of your firm's stock.

**Bill Rate:** the international borrowing cost for the government. The Bill Rate is important, as it sets the base on most lending rates for corporations, including yours.

**Prime Rate:** Firms such as yours carry more risk than governments and must pay in excess of the Bill Rate. A measure of what the most credit worthy firms can borrow at is the Prime Rate. Your firm's individual credit rating is printed on your firm's confidential Firm Report. At best, your firm will be rated a "1" and at worst a "5".

**The Exchange Rate:** The exchange rate begins at 1 Euro Dollar per U.S. dollar for quarter 1, year 1. The exchange rate has two major impacts on the firm's international, economic environment. It affects pricing strategy in the EU and it affects manufacturing costs if a plant is built in the EU. The pricing of a product in Area 1 (NAFTA) must be in dollars and in Area 2 (EU) in Euro Dollars.

For discussion, let's assume we manufacture and sell perfume in the NAFTA region. We sell one unit (case) at \$65.34 and it costs (labor and materials) \$45.34 to make. The perfume then contributes \$20 to the firm that can be used to pay other expenses (contribution margin).

Should you export the perfume to the EU? Let's say it costs \$4.00 to ship/insure/pay the freight forwarder/and pay the import duties. You can sell it in the EU for 75EURO. Is that good or bad? If \$1 can be exchanged for 1.1 EURO, a contribution margin of \$22.84 is created (including the \$4 cost of shipping). Much better than the \$20 contribution margin available when selling them domestically. Of course, if you manufacture the perfume in the EU, there is no shipping cost, and the contribution margin rises to \$26.84, given the accepted price of 75EURO (of course, labor rate for production in the EU will also depend upon the exchange rate).

Please note: the known exchange rate published on the Economic Report can be used only as a guide to help set price for the coming quarter. The exchange rate used by the Global World Bank

to convert EU sales back into dollars will be the exchange rate quoted on next quarter's Industry Report.

How sensitive are contribution margins to exchange rate fluctuations? Try these two questions using your calculator (divide by the exchange rate to obtain revenue figure in the EU).

1. What if the value of the EURO rose so that for \$1 U.S. dollar you could buy 0.7EURO instead of the current 1.1EURO? Keep the EU sales price set at the 75EURO. Bring your unit sale back at the new exchange rate and determine the contribution margin.

2. What if the dollar became strong, so it would buy 1.5EURO and you continued to price in the EU at 75EURO? Determine the new contribution margin.

The impact of the exchange rate on pricing in the European Community then, occurs when dollars are brought back to the US accounting system. The value of the contribution margin will change depending upon the exchange rate.

Is there a perceptible difference to the consumer in the EU? Will demand be affected by fluctuations in the exchange rate? If the exchange rate moves up or down, will it influence consumer buying patterns? The answer is, no. Since the buyers in the European Community sees a constant EURO price, there is no change in demand as long as the stated EURO price stays the same. If you move the EURO price up or down, demand will be influenced as it is in the NAFTA market.

The second impact of exchange rate changes affects those firms that elect to manufacture in the EU.

Assume labor in the brewing process (Stage 1) costs \$8.20 per hour. It takes 2.5 hours of labor to complete the process. Stage 2 bottling requires much less time. Only, .6 of an hour. However, to maintain quality, those working in Stage 2 assembly must have considerable dexterity. Labor rates in stage two are therefore set at \$9.80 per hour.

The total labor cost is then  $(2.5 \times \$8.20) + (.6 \times \$9.80)$  which works out to be \$26.38. This is really good information, but what does it have to do with exchange rates?

Let's assume you decide to build a plant in the European Union. On EU made units sold in the EU, the firm saves the \$4 cost of shipping and duties. So far so good. The workers in the EU plant, however, must be paid in Euro Dollars. At the start of the simulation, given the 1/1 exchange rate, labor rates are the same in the EU as they are in NAFTA.

Let's say the EURO appreciates in value so \$1 now only buys .8EURO. The labor cost per unit used to be \$26.38 or 26.38EURO. Now, the EURO cost is the same but when paid in US dollars is increased by the ratio of the change in the EURO of 1/.8 or 1.25 times. The new labor cost per unit equals  $\$26.38 \times 1.25 = \$32.97$ . Given the additional \$4 cost to get a NAFTA made unit landed in the EU, is it still cheaper to make them in the EU? At what exchange rate would that advantage disappear?

**Market Index:** shows the how stocks in the two levels of the simulation, the Advanced game and the Introductory game are doing on average.

[Financial Structure](#) | [Manufacturing Plant](#) | [NPV](#) | [Bankruptcy](#) | [Subsidiaries](#) | [Strategy](#) | [Forecasting Demand](#) |

## ADVANCED TOPICS

### DETERMINING CAPITAL NEEDS AND FINANCIAL STRUCTURE

#### Estimating Total Capital Requirement:

The starting point is the cost of building your plant. For example:

Total plant construction cost	\$1.531.250
Site fee	<u>80.000</u>
	\$1.611.250

A rule of thumb can be applied to estimate working capital needs: assume working capital is equal to the amount invested in plant and equipment. Total capital need is then:

Fixed investment:	\$1.611.250
Working capital:	<u>\$1.611.250</u>
Total capital needs:	\$3.222.500

A more reliable estimate of total assets required can be made by estimating your expected assets at the end of the first year (cash + marketable securities + accounts receivable + finished goods + raw materials + plant and equipment). If production and sales are not stable but growing, you will need to increase working capital by the percentage of growth in sales each quarter (accounts receivable and inventories increase when sales increase).

The relationship between fixed assets and working capital is also influenced by your strategy. Following is an example of how firms in a previous simulation designed their asset structure.

Firm N°	% of assets in plant	% in working capital
12	39	61
11	46	54
14	60	40
16	74	26



Both firms 12 and 16 had outstanding performance in spite of radically different structures. Firm 16 had a preponderance of fixed assets (a high degree of operating leverage). It kept its plant working at maximum production (two shifts and a good deal of overtime). It used just-in-time production that is no finished goods and just enough raw materials to meet two weeks of manufacturing. Cash was always at the minimum with extra cash paid out in dividends. If cash was short, accounts receivables were factored. This was a risky strategy, but it worked because they had perfect forecasting and never had to face a major cash crisis. However, the workload and tension on team members were considerable. Firm 12 had a more conservative asset structure. It put the customer first in quality and delivery. They always wanted to end the quarter with finished goods rather than run the risk of disappointing customers. Raw materials were always available in advance.

**Long-term Financial Structure:** The next question is how to finance your capital needs. A general rule is to use long-term financing (equity capital, term loan, and bonds) to finance fixed assets and short-term borrowing to finance working capital. (Equity capital refers to capital raised from the sale of shares.) What rules guide the choice of the type of long-term financing? In general, creditors are reluctant to lend more to a firm than the amount of stockholders' equity. Financial risk is measured by the debt-to-equity ratio: zero means no debt (100% equity financing); a 1/1 ratio means half debt and half equity. If debt financing represents more than half of long-term financing, the bond market might not respond to requests for further funding. Firms can be audited during the simulation. If your firm is audited and your debt-to-equity ratio is over 1.5, you may be forced to convert borrowed funds above \$1,000,000 into a special loan at a rate of 36% annually.

**Financing Working Capital:** Part of working capital can be financed partly with long-term financing, but short-term loans should cover the major part. The short term loan is paid off each quarter with interest, but can be renewed each quarter. If you are building up inventory for Q4, you may want to increase the short-term loan. When you calculate the debt-equity ratio, the short-term loan (and accounts payable) should be included in the numerator.

We have said that stockholders expect a 20% return per year on their investment, while banks and bondholders are satisfied with 10 to 12%. Before opting for borrowing from the bank or bondholders, you should understand that if your firm's performance does not satisfy your stockholders, all you get are complaints and mediocre stock performance. If you do not reimburse the bank or pay the bondholders, you will be forced into bankruptcy. On the other hand, if you can increase earnings per share by more than 20% per year, then it is interesting to borrow money at 10 to 12% (called 'leveraging' or 'gearing'). So debt financing is useful when you have good growth opportunities.

In the example above, firm 12 was conservatively financed, having issued 1 million shares of stock. It could withstand extreme market or financial shocks. As profits came in, they repurchased shares down to the minimum of 300,000 shares. Firm 16 issued only 350,000 shares and secured borrowed funds from all available sources. It had extreme risk—a high risk asset structure financed by a high risk capital structure. In the same simulation, two other firms tried firm 16's strategy and went bankrupt. Concluding that it is best to start out with the minimum number of shares is risky since it could constrain growth opportunities (unless your strategy is

‘to niche’ the market). If you do start out with the minimum of 300,000 shares, you can try to overcome the problem by heavy borrowing. If you survive, retained earnings will increase and the firm’s debt-to-equity ratio will decline over time. You will end up with a very large company with very few shares and a very high stock price. On the other hand, assume you start out with a large number of shares. You are conservative with respect to financial risk and have a maximum potential for growth. Then, as profits increase, you can repurchase shares. At the end of the game, you will have a very large company with very few shares and a very high stock price. The choice will depend upon your strategy and attitude toward risk.

## **MANUFACTURING PLANT - CHALLENGING CONCEPTS**

### ***OVERTIME AND SUBCONTRACTING:***

Overtime may be defined as the hours which you schedule above and beyond your current capacity. If you have a plant which is 5,000 hours large in Stage 1 and 7,500 hours large in Stage 2, and you use up all of these hours in the given 13 week period yet your scheduled production is not yet met, then production will slip into overtime.

Labor hours required to produce one case of aftershave or perfume in each production stage:

	Stage 1	Stage 2
Aftershave (P1):	1.7 hours	2 hours
Perfume (P2):	3 hours	2.5 hours

### **Labor Costs:**

Stage 1 workers receive \$12.00 per hour including benefits.

Stage 2 workers receive \$5.50 per hour, including benefits.

Overtime = another 25% of your shift hours at a rate of 1.5 times the regular labor cost

Subcontracting = anything beyond overtime (moves incrementally from 2.2 times the cost to 4.4 times to 6.6 times)

Workers are paid based on production scheduled, not the size of the plant.

For example, let's assume that you schedule 5,000 units of Product 1 to be produced, and it takes 1.0 hour to process one unit of Product 1. In this case, everyone in Stage 1 will be working full time for the 13 week quarter. Now assume it takes 1.5 hours to process one unit of Product 1 in Stage 1, and you schedule production of 5,000 units. This means your workers will need to work 7,500 hours to meet your scheduled production.

They will use up 5,000 regular hours and then go to overtime up to 25% of normal or 1,250 hours. That still leaves 1,250 hours short. The union will not let them put in more hours. Therefore, the remaining 1,250 hours will be subcontracted out at a labor cost of 2.2 times the normal rate!

If production is scheduled such that subcontracting reaches beyond 100% of regular hours + overtime hours, the labor rate goes up again to 4.4 times the normal rate. If production is scheduled such that subcontracting reaches beyond 200% percent of regular hours + overtime hours, the labor rate rises further to 6.6 times the normal rate. If no hours exist and subcontracting is used for production, the program assumes 5,000 hours (in each stage) at 2.2 times the normal labor cost prior to moving into the 4.4 times labor cost.

## **LOCATING A PLANT IN MEXICO AND/OR THE CZECH REPUBLIC**

### **Mexico**

The labor rate in Mexico is **60%** of the labor rate in Area 1. All transactions in Mexico are in U.S. dollars, including wages. Studies have shown that production is more variable than other area 1 locations.

- Area 1 -- 93% to 105% of scheduled production is normally produced.
- Mexico -- 40% to 125% of scheduled production is normally produced.

### **The Czech Republic**

The labor rate in The Czech Republic is **70%** of the labor rate in Area 2. Czech Republic wages are paid in €euros. Studies have shown that production is more variable than other area 2 locations.

- Area 2 -- 93% to 105% of scheduled production is normally produced.
- The Czech Republic -- 50% to 120% of scheduled production will be produced.

**Special Entries Required to Locate in Mexico/Czech Republic:** To construct a plant in Mexico or the Czech Republic you will have to make a contract decision entry, along with the normal "add capacity" decision in the main decision set. Contracts will specify the Mexico or Czech Republic choice and make necessary changes to labor rates and production, while the Student Decision Program will specify the number of hours to be constructed and the corresponding costs.

**Calculating Production Costs:** Production costs consist of two components - labor and raw materials. Other variable and semi-variable expenses, such as sales commission, are not included in the simulation's calculation of unit manufacturing cost. To determine unit manufacturing cost use the following procedure.

(Number of Type 1 raw material units needed) x (cost of a R.M. unit) +  
(Number of Type 2 raw material units needed) x (cost of a R.M. unit) +  
(Hours of Stage 1 labor needed) x (cost of one hour of labor) +  
(Hours of Stage 2 labor needed) x (cost of one hour of labor)  
= cost of producing one unit.

To determine the cost of manufacturing a unit in overtime, multiply the cost of one hour of labor in Stage 1 and Stage 2 by 1.5. Then, recalculate to determine overtime unit manufacturing cost.

To determine subcontracting unit cost, do the same thing as for overtime, but use 2.2 (4.4 or 6.6) times one hour of labor instead of 1.5.

## NPV

A winning strategy is one that permits the firm to earn positive net income after taxes and to increase its earnings over the duration of the game. Shareholders are counting on a 20% return per year. This means that dividend payments and increases in share price must yield at least this rate of return. The measure of performance is net present value (NPV). It is used to rank firms each week (see the *Dollars and Scents Quarterly*). Increases in stock price and dividends paid to shareholders are the drivers of NPV. Profit per share and the debt-equity ratio are the two principal determinants of stock price.

Net present value = present value (including stock and dividend value) less stockholder investment in period zero.

The average price of the stock in the last four quarters of the simulation is seen as the stock value created that can be accessed by the stockholder.

Any dividend paid by the firm is valued in the period received.

Stockholder's original investment on the day the corporation is formed equals stockholder investment at period zero. For example, let's say the stock is issued on day one of the first quarter played at \$4.25

The stockholder expects that if dividends are not paid, that the stock price will increase over time at a minimum rate of 5% per quarter.

The following example shows dividends paid over 14 quarters of the simulation (second column) and share price in each of the last four quarters (third column). The last four quarters are used for share price instead of just the last quarter.

<b>Period</b>	<b>Dividend</b>	<b>Share Price</b>	<b>Present Value Factors</b>
<b>0</b>	<b>\$0</b>	<b>\$4.25</b>	<b>1</b>
<b>1</b>	<b>\$0</b>	<b><u>x</u></b>	<b>.952</b>
<b><u>2</u></b>	<b>\$0</b>	<b><u>x</u></b>	<b>.907</b>
<b><u>3</u></b>	<b>\$0</b>	<b><u>x</u></b>	<b>.864</b>
<b><u>4</u></b>	<b>\$0</b>	<b><u>x</u></b>	<b>.823</b>
<b><u>5</u></b>	<b>\$0.5</b>	<b><u>x</u></b>	<b>.784</b>
<b><u>6</u></b>	<b>\$1</b>	<b><u>x</u></b>	<b>.746</b>
<b><u>7</u></b>	<b>\$0</b>	<b><u>x</u></b>	<b>.711</b>
<b><u>8</u></b>	<b>\$0</b>	<b><u>x</u></b>	<b>.677</b>
<b><u>9</u></b>	<b>\$0</b>	<b><u>x</u></b>	<b>.645</b>
<b><u>10</u></b>	<b>\$0</b>	<b><u>x</u></b>	<b>.614</b>
<b><u>11</u></b>	<b>\$0</b>	<b>\$20</b>	<b>.585</b>
<b><u>12</u></b>	<b>\$0</b>	<b>\$18</b>	<b>.557</b>
<b><u>13</u></b>	<b>\$0</b>	<b>\$25</b>	<b>.53</b>
<b><u>14</u></b>	<b>\$0</b>	<b>\$26</b>	<b>.5</b>

The last column of numbers were taken from a present value discount table and relate to the period beside which they are listed. The NPV calculations are normally done on a calculator or computer. But, it is important in setting dividend policy, to visualize how time destroys the value of receiving funds. A \$1 dividend received in Q1 is worth \$.952 to the stockholder. If a stockholder must wait until quarter 14 to receive a \$1 dividend, it is only valued at \$.50.

Let's calculate ending NPV, given the information in the preceding table.

First determine the present value of the firm's stock (using the average of the last four stock prices).

$$(.25)(\$20)(.585) +$$

$$(.25)(\$18)(.557) +$$

$$(.25)(\$25)(.530) +$$

$$(.25)(\$26)(.500) = \$11.99$$

Next, determine present value of all dividends paid. To do this, you must discount each quarter's dividend back to period zero.

$$(\$1)(.784) +$$

$$(\$1)(.746) = \$1.138$$

Now, total the two present value numbers. This gives you a total value of \$13.128. Subtract the original investment in period zero (\$4.25) and you arrive at the ending NPV = \$8.88.

It is important that the team understand how NPV is determined. Take the above example and do not pay dividends. Assume stock price the last four quarters are \$28, \$30, \$30 and \$36. Is NPV higher? Would it have been better to retain dividends to promote growth and thus a higher stock price?

Try the original NPV calculation but this time add dividends in period 10 of \$1, along with \$1 in period 11 and \$1 in period 12. What is your NPV? How much was it worth to the stockholder to receive the dividends early.

Dividends are valued for themselves, but they also can influence stock price in a positive direction if declared in a financially prudent manner. Thus, dividend policy for a mature firm with limited growth opportunities needs to be addressed.

Remember that your firm is restricted to a \$.50 dividend increase per quarter.

## **BANKRUPTCY**

Bankruptcy is something which all firms hope to avoid. Unfortunately this is not always possible. This chapter will help you to figure out whether you are in danger of bankruptcy and what actions you can take to salvage your firm. Sometimes it is best to abandon a sinking firm and start fresh with your hard earned knowledge.

When you have lost 100% of the stockholder's value, your firm is considered bankrupt. More precisely, when your negative retained earnings account plus your bond discount account equals the sum of the common stock account plus the Paid in Capital account, your team has lost 100% of the stockholder's investment (in other words, when equity equals zero).

When this occurs, your firm is owned wholly by creditors.

If large losses continually erode your stockholder's investment, consult with your instructor. Many options exist. Some of those follow:

1. Issue more stock.
2. Search the balance sheet for assets that can be liquidated. Take the resulting cash and pay off the most expensive debt. Liquidate accounts receivable by factoring. Do not order raw material futures (except for a two week supply). Make an effort to sell out finished goods. Perhaps liquidate some plant hours. These actions trim the assets and create a leaner corporation.
3. Seek a consulting partnership with a successful firm. Perhaps they will agree to payment only if and when profits reach a predetermined level.
4. Enlist the aid of Venture Capitalists. Venture Capitalists Inc. can be reached through your simulation consultant. These investors will exchange shares of stock for debt in a private off-line deal. They will NOT consider requests for other arrangements. Consider this your last line of defense.

To close an existing firm and start another, your firm must have permission from your instructor. Once permission is secured, a new firm and password will be issued. Securing permission from your instructor for a firm closing and the opening of a new firm usually requires a grade concession or extra work agreements.

## **SUBSIDIARIES**

A subsidiary occurs when a firm creates a new firm in another market group. Your firm, called the parent, owns 51% of the stock of the new firm. The other 49% of the stock must be made available to the public. A parent firm is not allowed to open a subsidiary in its own market group. A parent firm may only open one subsidiary during the course of the simulation.

The parent must make payment for 51% of the subsidiaries' stock issued in the quarter first subsidiary decisions are made (payment = shares issued X sale price per share X 51%). This amount is taken out of cash, AR or creates a special loan after the quarterly run. A confirmation of this transaction should be sent to your firm by your administrator, as there will be no record on the quarterly report.

The parent firm has the right to 51% of any dividends. Note that cash from dividends issued does not come into the parent firm until the following quarter. A parent firm may sell product to the subsidiary or buy product from the subsidiary through the contracts program.

When the subsidiary closes, or when the simulation comes to an end, it is necessary to merge the value of the subsidiary with the value of the parent firm. This ensures that proper effects of the subsidiary are applied to the parent firm. It also ensures that teams do not simply open a subsidiary in order to bleed it to death.

### Ending NPV calculation:

Subsidiary NPV x 51% = Y

Subsidiaries Number Shares / Parents Number of Shares = Z

Y x Z = Change to Parent's NPV

### STRATEGY

The first step is to decide what your product and market strategy will be. Do you want to be a low-cost producer of aftershave selling large quantities on the low-price segment in both retail market areas? Or, do you want to specialize in luxury perfume on the European market, selling at a high price with lots of spending on advertising and quality? Once this decision is made, you can make a preliminary calculation of the number of units you think you can sell each year. If, for example, the demand for perfume in Europe is expected to be around 200.000 units per year, and there are seven firms in your market group, an average market share would be 14%. However, if you are in the high-price end, your market share might be only 5% or 7%. With a 5% share, you would sell 10.000 units per year, or an average of 2500 units per quarter. With a 7% share, you could sell 14.000 units per year or 3500 units per quarter. This estimation permits you to calculate the plant size that will be necessary to produce these quantities. Knowing the plant size, you can calculate construction cost and estimate working capital requirements (50% to 100% of the value of the fixed asset) to get the total amount of financing required. The next step is to decide the best way to finance this sum.

If your goal is to be in the top 10 in the NPV standings, you will need a good strategy and the ability to implement it effectively. You will also probably take more risks than if your goal is simply to be in the top 30. Managers must make difficult decisions under conditions of uncertainty and time constraints. It will help to define the company's mission and vision. Some firms want to be niche players with assured product delivery. Others want to manage a large international firm, maybe with a subsidiary.

Competitive conditions can pose problems. In a recent simulation one market group had all firms attempting to niche the upper market segment. The average market group price was high, the firms were small with few sales reps, little advertising, but high average quality. In year three, they raised prices for P2 so high (each trying to be the price leader) sales fell to zero. All firms suffered. In another market group, which started out under the same conditions, business was booming. This group had large firms with high volume in the middle price range and a couple of market nichers. Given the large number of sales reps, large advertising budgets, and lower average market group price, everyone was profitable.

In each simulation, different scenarios can develop. Two years ago, firms had an unexpected opportunity to invest in plants in Indonesia, which offered low-cost production advantages and special privileges for exporting to Europe. Firms which seized the opportunity were heavily represented in the top 10 in NPV. Firms operating plants in the EU failed in their attempt to organize a political campaign to gain tariffs protection and had poor performance. Strikes with



labor negotiations and electrical blackouts have been other scenarios.

Successful performance also depends on strategy implementation. A chain is as strong as its weakest link. A firm may have the lowest production costs; but if its sales forecasts are poor, it will be unable to exploit its advantage. Different strategies require different capabilities. Traders will want to develop close relations with suppliers and will focus on communication tools and negotiating skills. Low cost producers will develop spread sheets for estimating costs and managing inventories. Risk takers will sharpen their marketing and financial skills. Some teams have found that they were able to make better decisions and make them faster by using a team approach to analysis and decision making, rather than assigning these to separate individuals. Good implementation depends on the cooperation of all team members. Do not forget that everyone is involved in human resource management.

When starting out, there are some guiding principles that might help. From a management point of view, what are the personal ambitions, strengths and weaknesses, risk preferences of each team member? Can these be channeled into goals, a corporate mission statement, a strategy, and an organizational structure which all members can agree upon? What is already known about the positions and strategies of competitors and how the industry is evolving? Preliminary consideration of these questions can help in thinking about possible strategic options. In the first two quarters, gather as much market research information as possible on competitors and products in different market groups. Always monitor the competitors in your market group and be aware that existing firms or new firms may enter your market group later in the simulation.

Losses early in the game are usually unavoidable. Keep an eye on your long run objectives. Some short term losses can be tolerated to gain long run market position. Finally, don't forget that long run strategies take time to play out. Do not get caught in a short term NPV contest. It is the last four quarters that count. However, if your long run strategy is unattainable, or turns out to be unrealistic, you will be forced to make modifications to your initial strategy. Strategy is also about action and realism, and this requires adapting to changes in the environment and/or to the development of new capabilities within your firm.

## **FORECASTING DEMAND**

The following model can be used to forecast unit demand for your firm. Be aware, however, as you work with the model that it is just that, a model. No one can provide an exact calculation for predicting the future. Learn your environment, the markets, the competition, your own team's capabilities; and your forecasting will grow more precise.

To show you the possible range in forecasting, the formula is applied to a conservative and an aggressive estimate (actual would probably fall in the middle of these two extremes).

**FORECASTING MODEL:**

1. Determine overall market demand.
2. Determine your real market share
3. Multiply real market share times forecasted market demand

In order to begin, you must calculate from your own firm's numbers and those given on the Industry Report, demand for the entire market group. Once you have an accurate picture of overall demand, you can then work backwards to determine what share of that potential market you actually captured.

**Step 1:** Determine overall market demand.

Following are the variables which you must use to calculate overall demand within your market group.

Market Group Demand Variables		
	Conservative	Aggressive
Unit Sales	Add (+)	Add (+)
BO this Q	Do not use	Add (+)
BO last Q	Subtract (-)	Do not use
Mkt Share	Use	Use
Mkt Group Ending Sales Lost	Add (+)	Add (+)
Mkt Group Contract Sales	Subtract (-)	Subtract (-)
<i>Seasonal Ratio</i>	Use	Use

Note that the only difference between the conservative forecast and the aggressive forecast is the treatment of backorders. The aggressive forecaster assumes that all firms had similar backorders this quarter, and that no competing firms had backorders in the previous quarter. The conservative forecaster seeks to make sure that demand in the coming quarter is fully met. The aggressive forecaster tries to hone the number more precisely.

Also note that the Ending Sales Lost figure and the Contract Sales figure are for the entire market group, not just for your individual firm.

Now, assume the firm in question had 5000 unit sales of Product 1 in Area 1 and 1000 backorders of Product 1 in Area 1 for Quarter 1. In Quarter 4 of the previous year they had 2000 backorders. Their market share for Product 1 in Area 1 was 10%. Ending Sales Lost for the market group was 500 P1A1. Contract sales within the market group for Product 1 in Area 1 was 4000 units. The seasonal ratio for Quarter 2 forecasting is 1.2/.8.

The firm must apply the variables as indicated in the table in order to determine total market group demand.

### *Conservative Calculation*

**Step1**

5000 sales - 2000 B.O. last qtr/ .10 = 30000 units

**Step 2**

30000 units + 500 Ending Sales Lost - 4000 market group contract sales = 26500

**Step 3**

26500 units x (1.2 / .8 seasonal ratio) = 39750

**Total = 39750** forecasted market group demand Q2

### *Aggressive Calculation*

**Step1**

5000 units + 1000 B.O. this qtr / .10 = 60000

**Step 2**

60000 units + 500 Ending Sales Lost - 4000 market group contract sales = 56500

**Step 3**

56500 units x (1.2/.8 seasonal ratio) = 84750

**Total = 84750** forecasted market group demand Q2

### *Step 2: Determine Your Real Market Share*

Now that you know what the potential market was for Quarter 1, you need to find your adjusted market share. Continue with the previous example.

First calculate the firm's adjusted units sold. To do this subtract contract sales for the firm and last quarter's backorders for the firm from the unit sales figure.

Next, divide the adjusted units sold by the market group demand figure calculated previously.  
Note: do not use the forecasted number, but the demand figure for the current quarter (before the seasonal ratio was applied).

Assume the firm in our example sold 1200 units of P1A1 through contracts.

### *Conservative Calculation*

**Step 1.**

5000 units - 1200 contract sales - 2000 B.O. last qtr = 1800 adjusted unit sales

**Step 2.**

$1800/26500 = 6.79\%$  adjusted mkt shr

### *Aggressive Calculation*

**Step 1.**

Same as above = 1800 adjusted unit sales

**Step 2.**

$1800/56500 = 3.18\%$  adjusted mkt shr

### *Step 3 Multiply real market share times forecasted market demand:*

Now you have an accurate figure for market group demand and an accurate number for market share. The last calculation is very simple. Multiply the forecasted market demand figure by the adjusted mkt share figure

### *Conservative Calculation*

$39750 \text{ units} \times 6.79\% = 2699$  forecasted unit demand for Q2

### *Aggressive Calculation*

$84750 \text{ units} \times 3.18\% = 2695$  forecasted unit demand for Q2