Student Manual

Principles of Economics

Beat The Market On Line: An Interactive Microeconomics Game

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GoldSimulations
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Beat The Market : Student Manual
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SIMULATION GAME PROCEDURE

FOLLOW THE DECISION-MAKING PROCESS

The objective of the game is to be the most profitable firm in the market. To play the game, the basic procedure is very simple: view game reports, make and enter decisions, and execute the game to see the results. The procedure is simple, but many students ask: "*How do I begin to make good decisions to achieve the objectives of the game*?" So our game procedure closely follows the standard steps in the decision making process. This will help you develop your decision-making and critical thinking skills. The steps to play the game are as follows:

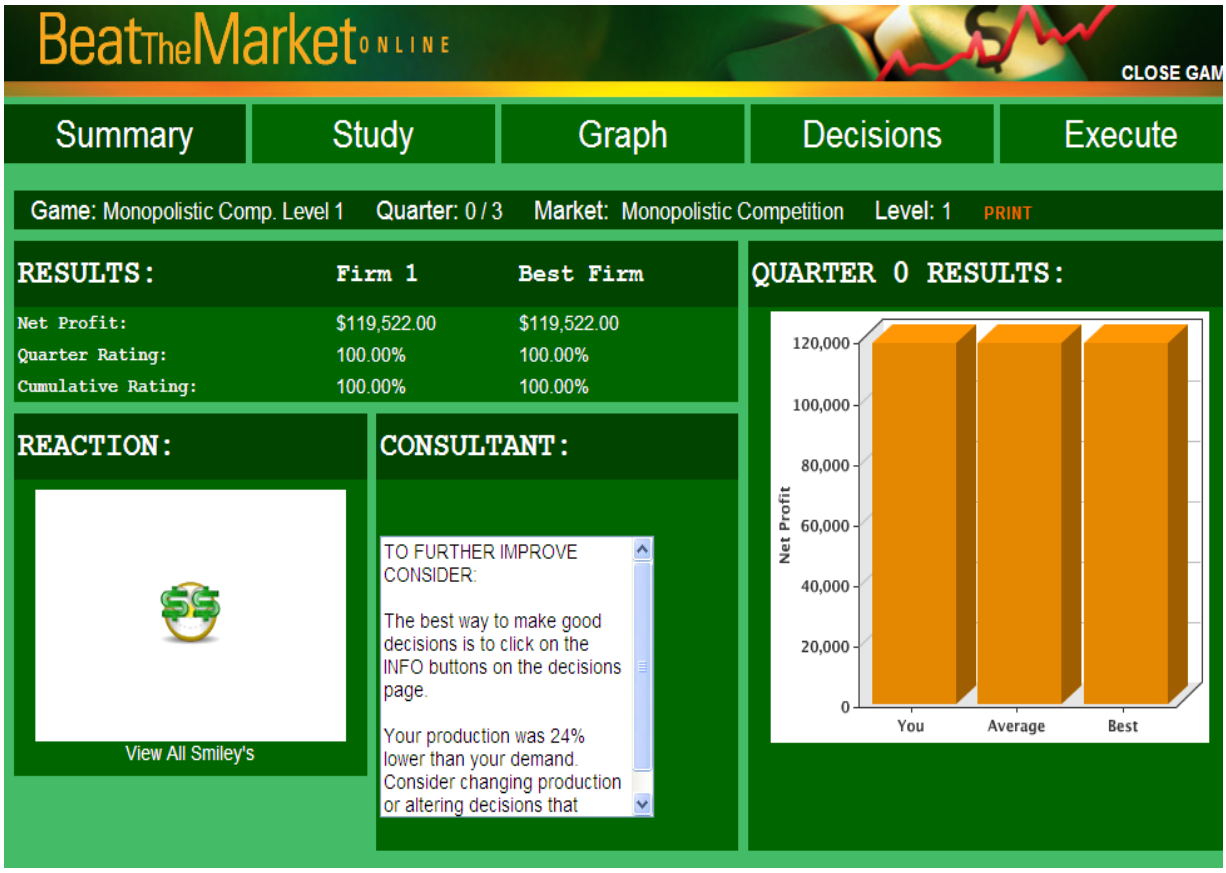
Step 1. Understand the Game Objective and set Goals you want to achieve each quarter

The game objective is to maximize the long-run profits of your firm. Long-run profits are measured by cumulative net profits over the number of periods of simulated play. To achieve your long-run objective you should set goals each quarter of the game, like improving your sales, increasing your market share, or becoming more efficient and lowering your costs of production.

Step 2. View the Summary Screen of your overall performance

The **SUMMARY** screen (figure 1.1 below) provides a summary report on your results compared to the best firm in the marketplace, an animated REACTION of your performance, and advice on what data to look at to improve by a CONSULTANT. The role of the consultant is to point to relevant information, not to tell you what to do.

Figure 1.1: Summary Screen



Step 3. Study Reports and identify problems

After reviewing the information on the SUMMARY tab, which includes guidance from your on-line CONSULTANT, select the STUDY tab (see Figure 1.1) to get more information and see the following reports:

- **Firm Profit Statement:**
  Revenues, costs, and profits each period.
- **Demand and Supply Reports**:
  Firm demand, supply, shortages, and market share
- **Market Research:**
  Number of firms, market demand and market supply
  Economic news relevant to market
  Macroeconomic data on GDP and CPI
- **Competitive Analysis:**

Decisions and key results of rivals

Step 4. Make Decisions

After reviewing all the reports, defining the situation and what you want to achieve, develop solutions and enter your game decisions. The game decisions are found by clicking the Decisions tab. Note the information (info) buttons listed to the right of each decision entry box. Clicking these buttons will give you valuable information and advice relevant to making decisions.

Step 5. Execute Simulation

For a single player game where you are competing against computer managed firms, the "Execute" tab will advance the simulation to the next quarter of play. You can assume a quarter of play is 3 months in time. Simply press the execute button on the top right hand side of the screen. If you are playing a mult-player game, you do not have an "execute" tab and the instructor will execute the game at a specified time.

"Executing" the simulation will take all the decisions of your firm, and the rival firms, and given the state of the economy and current events, evaluate your performance. A new set of reports will be generated, and you will be informed of your profit rating from 0-100%.

Step 6. Evaluate Results and repeat steps 2 to 6.

After the game is executed, review your firm's new performance and study reports to reassess your current situation and develop a new strategy, if needed, and make your next set of decisions.

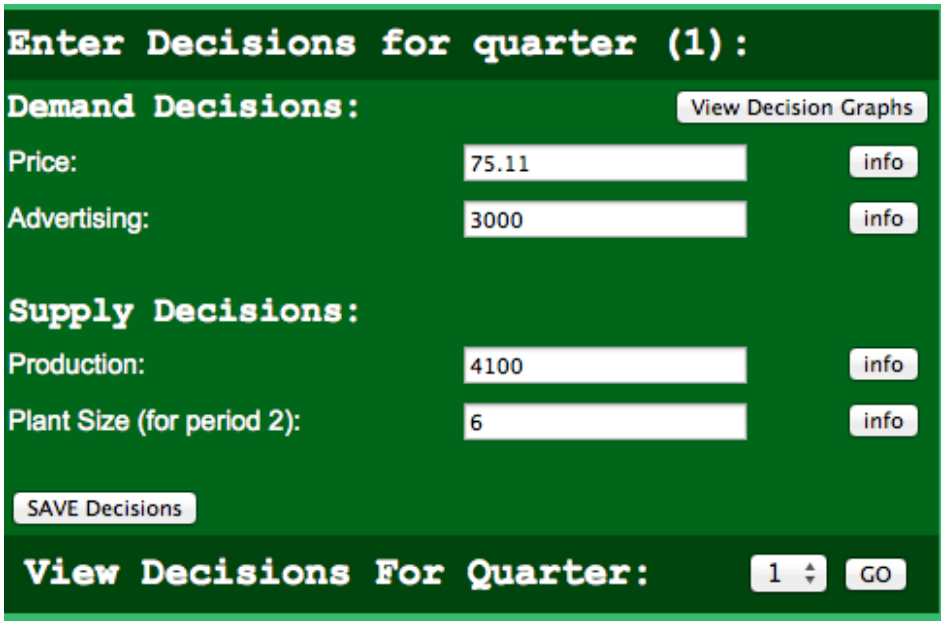
DESCRIPTION OF GAME DECISIONS

Overview

The purpose of this section is to describe the game decisions and their effects on the firm in the simulation. The decisions, based on their impacts on the firm, are placed into two broad categories: *demand and supply*. The demand decisions affect, directly, the quantity of units demanded and the revenues of the firm whereas the supply decisions affect the production and costs of goods.

The DECISION ENTRY FORM, accessed from the main menu by clicking DECISIONS, lists the demand and supply decisions. The number of decisions that appear on the screen depend on the learning level of the game selected by the instructor. The most advanced games may include 4 decisions. (see Fig 3.1). The simplest game only has price and production. At the start of each new quarter, the decision values are the same as those from the previous quarter. It is up to you to decide to change the decisions or keep them the same as last quarter.

FIGURE 3.1: Example Firm Decisions



Demand Decisions

The demand decisions will vary from one to two depending on the level of the game selected by the instructor. At the simplest level your game may include only the price decision. The two demand decisions are price and advertising. Each decision and its impact on the firm are explained below.

Price

The price is the dollar amount you are asking your customers to pay for your product. For this example, in quarter 1 it is listed as $75.11 unless you change it.

In general, if you raise price you should expect to lose some customers (assuming your competitors do not raise price). How significantly a change in your price will impact firm demand depends on the market structure and the price elasticity of demand. Clicking the information button next to the price decision (Figure 3.1) will give you the PRICING INFORMATION screen (Fig. 3.2).

You are given the price elasticity from last quarter. For example, a price elasticity of -2.86 means that a 1% increase in price will decrease quantity demand by 2.86%; or lowering price 1% will increase quantity demanded by 2.86%.

The price elasticity is a useful tool to forecast demand. As an example, suppose the firm was considering lowering price from $75.11 to $72.11, which is a *decrease* of 4%. The percent change in quantity demanded is equal to the percent change in price times the elasticity value. Using the price elasticity of -2.86, the expected percent change in quantity demanded would be 11.4% (-4% x -2.86).

Figure 3.2: Making Pricing decisions

Remember the price elasticity could change from quarter to quarter. Price elasticity depends on a number of factors in the game, including:

- Competitiveness of the market reflected by the number of rivals
- Price level (a higher firm price will increase elasticity)
- Advertising investments relative to the competition
- Macroeconomic conditions (growth versus contraction)
- Other economic factors such as changing consumer preference, demographics, etc.

Studying the market research reports in the game will help you assess how these factors are changing.

The impact of price on revenues is measured by marginal revenues. In this example, the marginal revenue (MR) for last quarter is reported as $38.67. This means a one unit increase in quantity demanded will increase revenues by $38.67. The marginal revenue depends on the price elasticity of demand. As the price elasticity increases (becomes more elastic) the marginal revenue increases and becomes closer to the firm's price.

Costs should be considered in setting price and are reported in Figure 3.2 for last quarter. If the price you set does not cover the costs of production, it is not possible to make a profit. In this example, average total costs last quarter were $38.67. If this does not change, then a price below $38.67 will cause the firm's profits to be in the "red" (negative). The factors that influence costs, including average variable (AVC) and marginal costs (MC), are discussed with the supply decisions: production and plant

size, (Fig. 3.1). An itemized listing of the costs of the firm is given in the Profit Report and explained in Section 4 "Description of Reports" (Fig. 4.1).

The BASIC STEPS TO MAKE A PRICE DECISION is given at the bottom of Fig. 3.2. The general rule in economics is to change price so marginal revenues (MR) are equal or close to marginal costs (MC).

Advertising

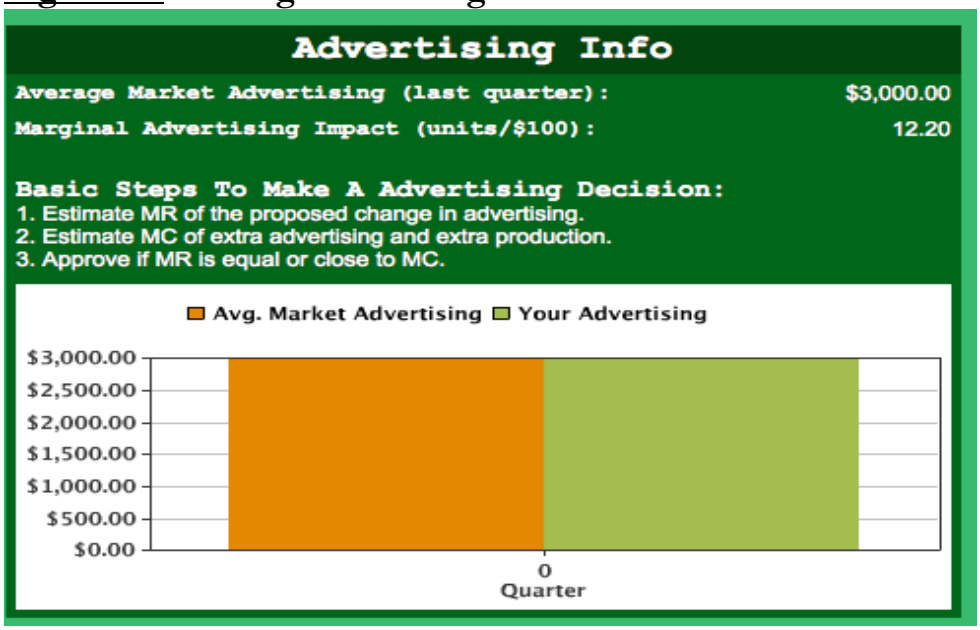
Advertising expenditures will affect a firm's demand as customers become more aware of the product and its advantages. (Advertising is not permitted in the perfect competition market structure).

Clicking the information button next to the advertising decision (Fig. 3.1) will give you the marginal impact of advertising on demand from the prior quarter as shown in the ADVERTISING INFORMATION screen (Fig. 3.3). Given a marginal impact of 12.2 means a hundred dollar increase in advertising from $3000 to $3100 would be expected to increase demand by 12.2 units. Be cautious. Advertising is subject to the laws of diminishing returns.

The degree to which advertising will increase demand depends not only on the level of advertising but the nature of the market, the amount your rivals spend on advertising relative to your own budget, and general macroeconomic conditions. Studying the market research report in the game will help you assess these conditions.

It is important to compare your advertising budget with your rival's (unless you are a monopolist). For example, if you increase your advertising budget 5% but your rivals increase their advertising 15% you may lose customers!

Figure 3.3 Making Advertising decisions



The BASIC STEPS TO MAKE AN ADVERTISING DECISION is given at the bottom of Fig. 3.3. The general rule in economics is to change advertising as long as the marginal revenues (MR) is equal or close to marginal costs (MC) of both the advertising and the extra production needed to meet the extra demand.

Supply Decisions

The supply decisions will vary from one to four depending on the level of the game selected by the instructor. At the simplest level your game may include only the production decision. The two supply decisions are: production, and plant size. These decisions will influence the quantity of goods produced, inventory levels, productivity, and the costs of the firm. The profits of the firm are highly dependent on these decisions.

Production

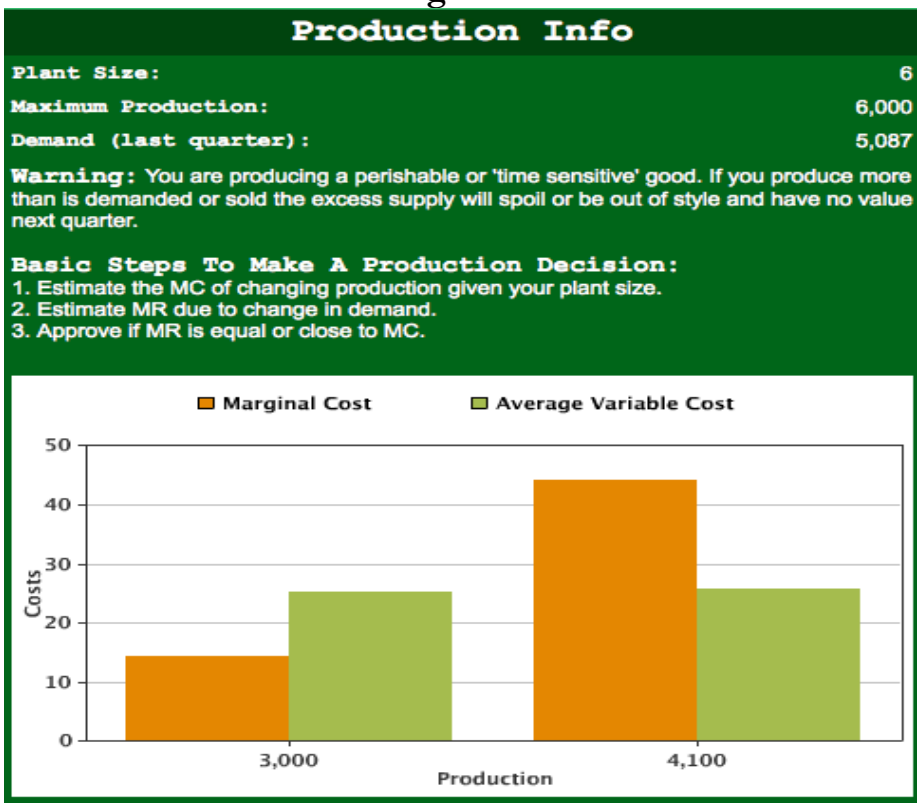
You must decide the quantity to schedule for production (in units) each quarter. This decision is critical because you are producing a "perishable" or "time-sensitive" product that cannot be stored in inventory. If you produce more than is demanded, the excess supply will be spoiled or will be out of style and cannot be sold in future quarters. If you do not produce enough goods to meet demand you will stock-out and disappoint your customers. There is an opportunity cost of lost sales equal to the profits that could have been earned if you were able to meet demand.

To help you make the production decision, click the information button on the decision screen (Fig. 3.1) and you will see the Production Info (Figure 3.6.)

In this example, in quarter zero the quantity demanded was 5,087 units but the firm produced only 4,100 units. The firm was not able to meet the excess demand of 987 units over the amount produced.

The maximum production you may schedule depends on the firm's capacity based on its plant size. In this example, at the start of the game the plant size is 6. This size plant was designed to produce a "maximum" of 6,000 units per quarter. But production efficiency changes with the level of production. The most efficient level of production (measured in terms of output per unit of input or the average product of labor) for plant size 6 is around 3,000 units. It may be more *profitable* to produce up to 6,000 units if the selling price is high enough. A list of the designed production levels for each plant size is given under the plant size decision.

Figure 3.6



The general rule to make an effective production decision (Fig. 3.6) is to change production until the marginal revenues (MR) are equal or close to the marginal costs (MC).

PLANT SIZE

The plant size determines the production capacity of the firm. In this example, at the start of the game the plant size is 6. You may increase or decrease the plant size by up to 2 units per quarter. This change in plant size does not occur immediately, it takes one quarter to build or reduce the plant size. This means that in the *short-run* you are constrained to operate with a given plant size.

Clicking the information button next to the plant size decision (Fig. 3.8) will give you the maximum production and the variable costs associated with each plant size as shown in Figure 3.8. The plant size may be increased to as high as 20 (not shown in Figure 3.8). This will help you select the best plant size.

Figure 3.8: Selecting the Plant Size

Plant Size Info

Plant Size: 6

Maximum Production: 6,000

Demand (last quarter): 5,087

Warning: Plant size will not change until the beginning of next quarter. For example, an increase in plant size this quarter of one unit will make your plant size 7 next quarter.

Basic Steps To Make a Plant Size Decision:
1. Estimate quantity demanded over the next 2 quarters based on studying reports and the "Demand Decisions" you plan on making.
2. Determine what size plant is needed to produce cost efficiently based on your estimated demand.

Note: The average variable costs and marginal costs do not include capital costs (like rent) which are $7,000 per unit of plant size..

Plant Size	50% of Max Production	Maximum Production	At 50% of Maximum		At Maximum	
			AVC	MC	AVC	MC
1	500	1000	38.28	34.92	35.85	32.83
2	1000	2000	35.07	28.97	32.66	35.25
3	1500	3000	32.17	23.92	32.25	49.05
4	2000	4000	29.58	19.81	34.61	74.25
5	2500	5000	27.28	16.59	39.72	110.83
6	3000	6000	25.31	14.31	47.60	158.81
7	3500	7000	23.62	12.93	58.25	218.17
8	4000	8000	22.24	12.47	71.67	288.92
9	4500	9000	21.95	12.93	87.85	371.05
10	5000	10000	20.41	14.31	106.81	464.58
11	5500	11000	19.95	16.59	128.52	569.51

Each plant was designed to produce efficiently at around 50% of the maximum. For example, a plant size of 6 was designed to produce 3000 units per quarter, but a maximum of 6000 units may be scheduled. But be careful, average and marginal costs rise significantly as production is increased from the design to the maximum levels. At a production level of 3000 units in this example, average variable costs (AVC) are $25.31 per unit; but increase to $47.61 at the maximum production level of 6000 units. Marginal costs rise even more, from $14.31 to $157.81. So increasing production to the maximum is very expensive. There are clearly diminishing returns and productivity problems as a firm approaches maximum capacity for this plant size.

In selecting the best plant size, a rule of thumb is to increase plant size based on the expected demand of the firm. If demand is expected to be around 6000 units, it would be much more efficient to increase plant size to 12. Plant size 12 is designed to produce 6000 units efficiently (at 50% of maximum), with an average variable cost of only $19.81 per unit. In the long-run you may change your plant to any size between 1 and 20, but it takes time. To increase plant size from 6 to 12, it would take 3 quarters because you can only increase plant size by 2 units per quarter. (You may also decrease plant size by up to 2 units per quarter if demand starts declining.)

Increasing plant size does have a risk, however, as overhead costs will increase. In this example, the capital costs (like rent) in this example game are reported as $7,000 per unit of plant (see bottom of Figure 3.8). This means a plant of size 6 will cost $42,000 in capital costs (fixed costs). A plant size of 12 will have double the overhead (fixed costs) of $84,000 per quarter. These costs will increase with inflation. It is up to you to track your costs as you increase plant size to assess economies of scale. There are economies and diseconomies of scale in the game. Production efficiency will increase with plant size up to a point (economies) and then decrease (diseconomies).

SECTION 3: DESCRIPTION OF REPORTS

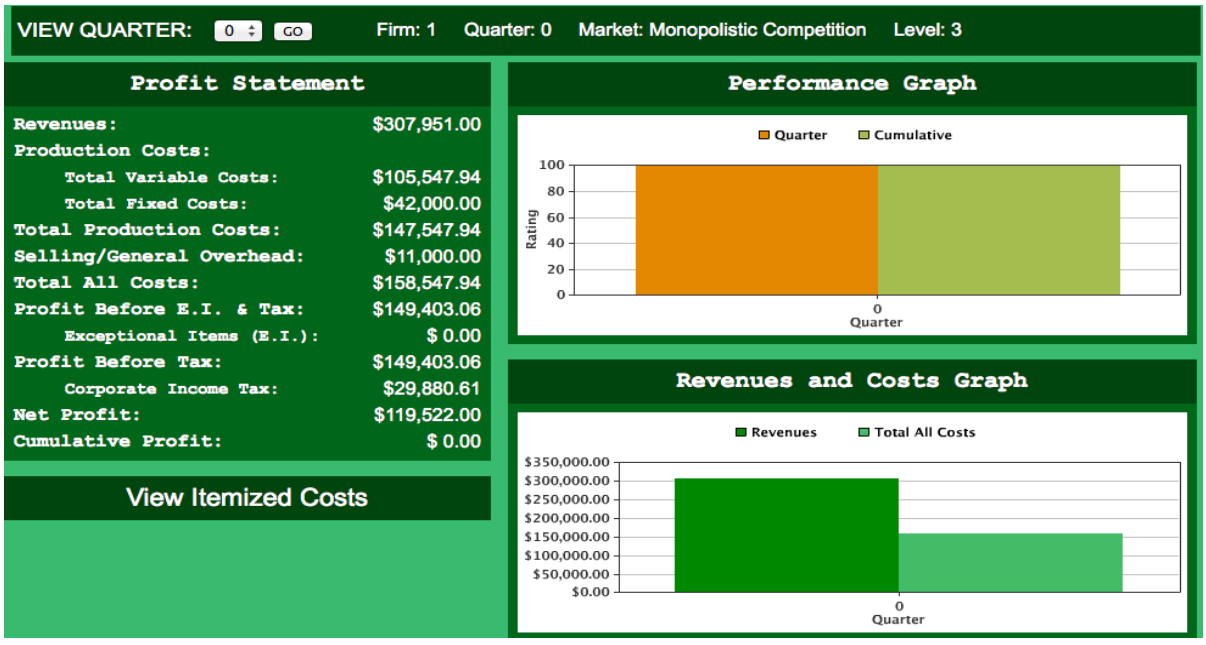
You are provided with a set of reports each quarter of play that will help you understand your profit performance and how to *beat the market*. It is critical to study these reports before making decisions.

The purpose of this section is to explain these reports and the significance of the information. To view the reports from the main menu, simply click on "STUDY" and make a selection. Initially, the reports from quarter 0, the starting point, will be discussed.

Profit Statement - Revenues and Costs Itemized

The PROFIT STATEMENT is one of the most important reports because it shows the calculation of your firm's net profit (Fig. 4.1). Net profit is the difference between revenues and costs, and is the criteria used to rate your performance in the game. The quarter 0 results in this example are displayed as they appear on the computer screen.

Figure 4.1: Profit Statement



An explanation of each item in the Profit Statement follows (Figs. 4.2, 4.3, 4.4).

Revenues

Total revenues are the dollars received from selling the products of the firm. Revenues are equal to the current selling price multiplied by the units sold. In this example, the quarter 0 selling price ($75.11) and the units sold (4,100) are shown in the DEMAND AND SUPPLY REPORT (Fig. 4.5). In quarter 0, revenues are $307,951 (Fig. 4.1). Revenues equal $75.11 x 4,100 (Fig. 4.5).

Production Costs

These are the direct costs of producing the goods or services of the firm. Total production costs are the sum of total variable costs and total fixed costs.

Total Variable Costs

These are the costs that vary with the level of production. Clicking TOTAL VARIABLE COSTS (Fig. 4.1) on the computer screen will give you an itemized listing of the variable costs (Fig. 4.2).

Figure 4.2: Variable Costs

TOTAL VARIABLE COSTS ITEMIZED

Labor	$79,823
Materials	$11,443
Power	$4,559
Repairs	$9,723
TOTAL VARIABLE	$105,548

In this example, in quarter 0, the total variable costs of producing 4,100 units are $105,548 which is the sum of labor, material, power and repair costs. The average variable costs are $25.74 per unit ($105,548/4,100 units). These costs change with the level of production, plant size, and inflation.

Training expenditures, a controllable decision variable of the firm, should improve lower the average costs of all your resources (up to a point).

Total Fixed Costs

These are costs that do not change with the level of production, but will increase with plant size (or inflation). Clicking TOTAL FIXED COSTS (Fig. 4.1) will give you an itemized listing of the fixed costs (Fig. 4.3).

In this example, in quarter 0 the plant size is 6 and the total fixed costs are $42,000. These costs are fixed in the short-run and will not change with the level of production. Average fixed costs are $10.24 ($42,000/4,100 units). Fixed costs will change, however, with plant size as follows:

Increasing plant size by 1 unit from 6 to 7 will increase total fixed costs by $7,000, i.e. from $42,000 to $49,000.

Figure 4.3: Fixed costs

TOTAL FIXED COSTS ITEMIZED

Supervision/Staff Salaries	$15,000
Factory/Equipment Rent	$18,000
General Maintenance	$6,000
Property Tax	$3,000
TOTAL FIXED COSTS	$42,000

Selling/General Overhead

Clicking SELLING/GENERAL OVERHEAD (Fig. 4.1) on the computer screen will give you an itemized listing of these costs (Fig. 4.4).

Figure 4.4: Overhead Expenses

SELLING/GEN OVERHEAD ITEMIZED

Advertising	$3,000
E-Commerce	$3,000
Product Development	$3,000
Training	$1,000
Process Improvement	$1,000
TOTAL OVERHEAD	$11,000

Note that the advertising decision may be a "controllable" decision in your game. But if the level 1 game is selected by your instructor, you will not be able to change the advertising level. The other overhead expenses are also outside of your control.

In a level 2 game, you decide on the budget for advertising, and enter the new expenditure levels on the DECISION ENTRY FORM (Fig 3.1) by simply clicking the main menu choice "MAKE DECISIONS" (Fig. 1.1). For example, increasing advertising from $3,000 to $6,000 will increase TOTAL OVERHEAD from $11,000 to $14,000. Although each decision variable (such as advertising, e-commerce, etc.) benefits the firm in some way, they add to the costs of doing business. The budget for these items should only be increased if the benefits exceed the costs. The beneficial impacts of each of these decision items were discussed in Section 3.

Total All Costs

These are the sum of Total Production Costs ($147,548) (Fig. 4.1) plus Selling/General Overhead ($11,000) (Fig. 4.4), which is equal to $158,548 in quarter 0.

Profit before Tax

This is Revenues ($307,951) minus Total All Costs ($158,548) which equals $149,403 in quarter 0.

Net Profit

This is Profit before Tax ($149,403) minus Corporate Income Tax ($29,881) which equals $119,522 in quarter 0 (Fig. 4.1). Corporate Income Tax in the game is 20% of Profit before Tax. The tax rate of 20% is fixed unless you are notified in the MARKET RESEARCH REPORT under "Relevant Economic News" that it will change (Fig. 4.6).

It is interesting to note that if the Profit before Tax is negative, then the Corporate Income Tax will be negative. What this means is that the firm will receive a tax rebate of 20% of the loss. This occurs because, according to tax law, a firm is allowed to *carry back* losses, re-calculate their prior tax liabilities, and qualify for a rebate in the current quarter based on the fact that their prior tax liabilities have been reduced.

Cumulative Net Profit

This is the sum of all net profits earned in each quarter. In quarter 0, the starting point, cumulative net profits are zero (Fig. 4.1). So, if your firm has net profits of $100,000 in quarter 1, then the cumulative net profits in quarter 1 would be also $100,000. In quarter 2, if your firm earns $150,000 in net profits, then the cumulative profits would be $250,000 in quarter 2. For simplicity, interest income is not considered in the game (i.e. the time value of money is ignored).

Overall Performance

Performance is measured by quarter rating and cumulative rating. In quarter 0 all firms start with the top rating of 100%. The QUARTER RATING is the percent of your firm's net profits compared to the best firm for the quarter. For example, if the best firm in net profits earned $100,000 and you earned only $90,000 then your Quarter Rating would be 90% (90000/100000). The CUMULATIVE RATING is the percent of your firm's cumulative net profit compared to the best firm. The cumulative profit is simply the sum of all net profits for all quarters of play. For example, if you had net profits of

$100,000 in quarter 1 and $100,000 in quarter 2 your firm's cumulative net profits would be $200,000 after two quarters. If the best firm had cumulative profits of $250,000 your firm's Cumulative Rating would be 80% (200000/250000). The profits of the best firm are shown in the COMPETITIVE ANALYSIS Report (Fig. 4.7).

Demand & Supply Reports

The Demand & Supply Reports (Fig. 4.5) are economic reports that summarize some significant results about the firm that are not readily apparent on the Profit Statement Report (Fig. 4.1). The quarter 0 results are displayed as they appear on the computer screen and each line item is explained below. The blue ink items represent "controllable" decisions you make in the game.

Demand

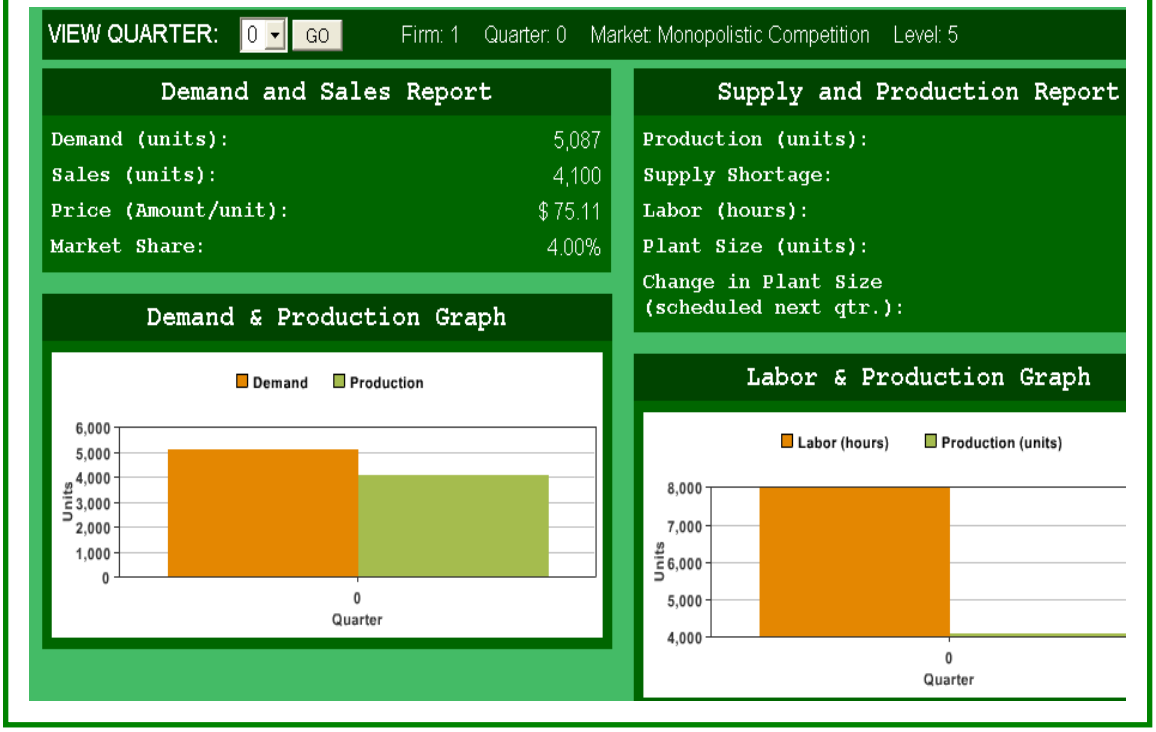
The quantity your customers are willing and able to buy at your specified price is the demand. In this example, in quarter 0 your demand is 5,087 units, given the price of $75.11.

Units demanded depend on numerous factors relating to the economy, the market structure, the customer, and the competition. Of course your own decisions regarding price, advertising, product development, and e-commerce are also very important. Random economic events may affect your demand (such as the change in the price of a substitute good). These types of events are given to you in the Market Research Report (Fig. 4.6).

Sales (units)

Sales are the quantity sold in units for the quarter (Fig. 4.5). You can sell up to your demand, assuming you produced enough goods. In quarter 0, the quantity demanded (5,087) exceeded the quantity produced (4,100), so the quantity sold equaled the quantity produced.

Figure 4.5: Demand and supply reports



If production would have exceeded demand, then the excess production over demand would not have been sold. This is very costly because there is no inventory in the game. The product is assumed to be perishable or a time-sensitive product with no value in future quarters. The loss to the firm of producing a good that is not sold would equal the variable costs of production. In quarter zero, total variable costs were $105,548 to produce 4,100 units. As an extreme example of the loss to the firm, if the firm did not sell any goods in quarter zero, the firm would have lost all it spent on production, i.e. $105,548 (Fig. 4.1, 4.2).

Market Share (%)

The market share is the firm's percent of the total market sales (Fig. 4.5). It is calculated by dividing the firm's units sold by the total sales in units in the market. In quarter 0, the market share is 4% if the monopolistic competition market structure is selected. This is because there are 25 firms in the market, and initially each firm is selling the same number of goods and has an equal share of the market. So the market share is 1 divided by 25. The market share varies based on the market structure. For example, in monopoly it is always 100% because there is only one firm selling to the entire market.

Production (units)

This is a controllable decision you make in the game (Fig. 4.5). Section 3 discusses the impacts of the production decision.

Supply Shortage

If quantity demanded exceeds quantity supplied then there is a shortage of supply (Fig. 4.5). In this example in quarter 0 the supply shortage was 987 units because the quantity demand was 5,087 and the quantity produced was only 4,100. There is an opportunity cost of a shortage equal to the lost profits that could have been realized if adequate production were scheduled to meet demand. An Excess Supply is reported if production exceeds demand. There is a direct cost in this case because you are producing a perishable or time-sensitive product with no sales potential in future quarters. Clearly, studying demand and supply in the game is critical to your success.

Labor (hours)

Labor hours required to meet the production scheduled for the quarter are reported (Fig. 4.5). The labor hours depend on the amount scheduled for production given the firm's plant size. It took 7,982 labor hours (rounded to the nearest whole number) to produce 4,100 goods.

The information on labor hours is useful to track the efficiency of your operation. A common measure of efficiency is the average product of labor, which is production divided by labor hours. In quarter 0, the average product of labor is 0.514 units produced per labor hour. It is recommended that you check to see if there are increasing or diminishing returns to labor as you schedule more production for a given plant size. As you increase plant size it is also insightful to note the impact on the average product. Try to determine if there are increasing or decreasing returns to scale (i.e. plant size). Returns to scale exist if efficiency improves with increases in plant size.

Plant Size (units)

The plant size is a measure of the production capability (or scale) of the firm. In quarter 0, the plant size is reported to be 6. A plant of size 6 was designed to produce 3,000 units in the long-run but can produce up to 6,000 units if demand is high enough. However, beware of diminishing returns to labor productivity (measured by the average product of labor) as you increase production to its maximum level. Lower productivity means higher costs of production.

Plant size is a controllable decision of the firm. There are 20 different plant sizes in the game. The relationship between plant size and production capabilities is explained in Section 3.

Change in Plant Size (units)

In quarter 0 there is no change forthcoming because a value of zero is reported for the Change in Plant Size (Fig. 4.5).

If the "Change in Plant Size" were reported to be 1, then starting next quarter your plant size would be 7. If this were the case, you need to realize that your plant size will be 7 when you make decisions for the next quarter.

If a value of negative one (-1) were reported in quarter 0 for the "Change in Plant Size" then next quarter your plant size would be reduced by one unit from 6 to 5.

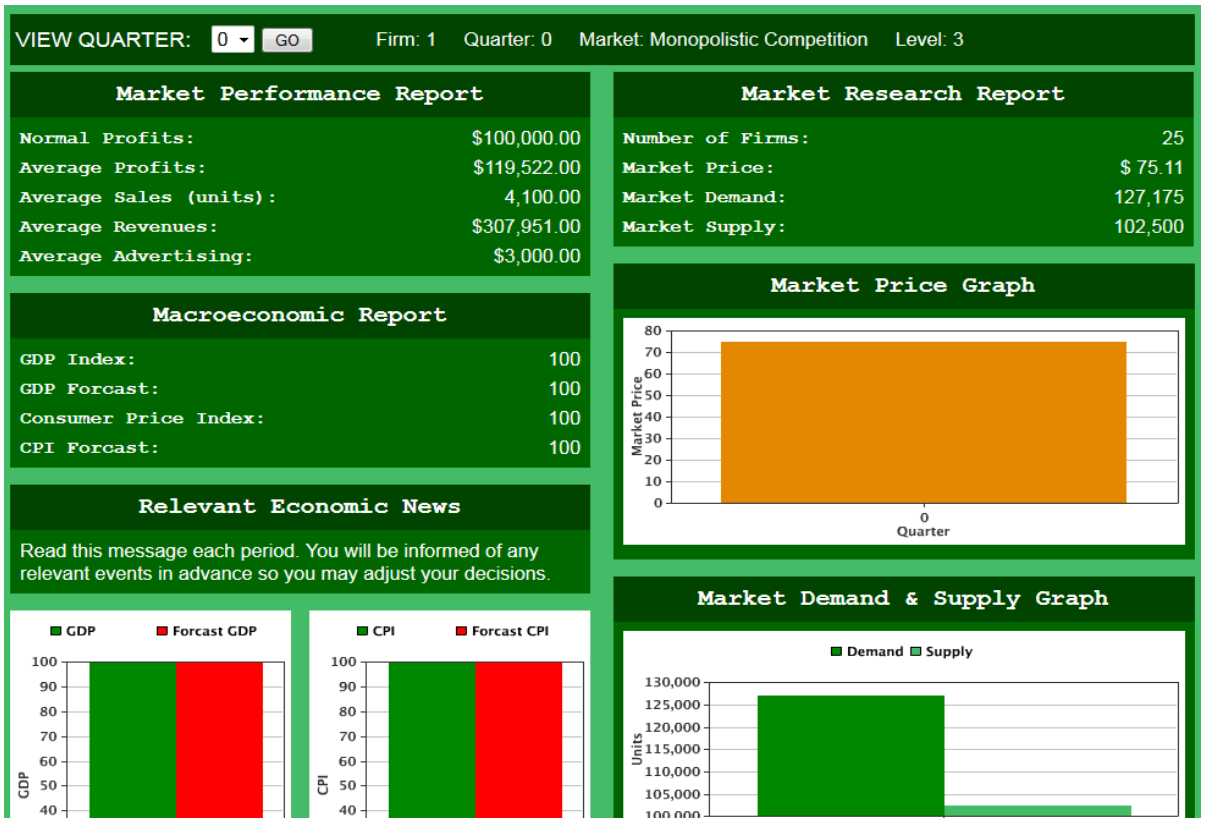
Remember the level of your fixed costs change with plant size. Variable costs should change as well with plant size. If there are economies of scale, average variable costs should decline as plant size increases. If diseconomies of scale occur then average variable costs will increase with plant size.

Market Research Report

Market Research is important to understand the overall market and the likely macroeconomic changes. Your decisions concerning price, advertising, production and plant size, should be modified based on your assessment of the market conditions. The Market Research Report includes a Demand and Supply Report for the market, Market Performance characteristics, Relevant Economic News, and a Macroeconomic Report. The quarter 0 results are displayed (Fig. 4.6) and each line item is explained.

The **Number of Firms** in the market is 25 in this particular game. The number of firms changes with the market structure. For example, there is only 1 firm in the market in the monopoly game. The **Market Price** is the average price of all firms in the market and is currently $75.11. Market demand (127,175) exceeds market supply (102,500) in quarter 0. The **Market Demand** is the sum of all customers in the market and the **Market Supply** is the sum of all 25 firms in the market. The excess demand is likely to cause the computer managed firms to increase supply and raise prices.

Figure 4.6 Market Research report



Market Performance

Numerous measures of market performance are given (Fig. 4.6). All the variables are averages of all firms in the market. These measures should help you gauge your performance in the game and the impacts of your decisions. For example, if your profits are above the **Average Profits** in the market this is commendable. If your sales and revenues are below the **Average Sales Units** and **Average Revenues** this might be due to your firm's advertising and price decisions compared to the **Average Advertising** and **Price** decisions in the market. You need to compare your firm to the market to understand your own performance.

Average Profits are also a signal for market entry or exit of firms in certain market structures, such as Perfect Competition or Monopolistic Competition. If average profits in the market exceed normal levels, then firms will enter the market in perfect competitive and monopolistic competition. If average profits are below normal levels then firms will exit these markets. The entry and exit of firms will influence market price.

Relevant Economic News

Any important economic events that will influence the market will be told to you in advance in Relevant Economic News (Fig. 4.6). This way you can modify your decisions based on your assessment of the direction of the market in the next quarter.

Macroeconomic Report

The **GDP INDEX** (Fig. 4.6) measures the level of the Gross Domestic Product compared to the base quarter (Quarter 0). GDP is a measure of total production of goods and services in the economy. If GDP increases from 100 to 104, then the economy has grown by 4%. This should increase consumer demand for goods and services. The **GDP FORECAST** (Fig. 4.6) is an estimate of GDP for next quarter. The estimate is accurate within plus or minus 1 point. Currently there is no forecasted change in GDP.

The **CONSUMER PRICE INDEX** (CPI) measures the average price of consumer goods and services compared to the base quarter 0 (Fig. 4.6). If the CPI increases from 100 to 102, then prices in the economy have increased by 2%, which is a measure of inflation. Inflation will increase the costs of doing business as wage rates, material prices, and other resource prices rise. Purchasing power of consumers will also be reduced with inflation. The **CPI FORECAST** (Fig. 4.6) is an estimate of the CPI for next quarter. The estimate is accurate within plus or minus 1 point. Currently there is no forecasted increase in CPI.

It is up to you, as executive, to decide how to respond to the information and "forecasts" provided. Just as in the real world, judgment must be used.

Competitive Analysis Report

The Competitive Analysis Report (Fig. 4.7) lists the decisions and profit performance of each firm in the game. The firms are ranked by cumulative profit. The challenge is to see whether you can you do better than the other firms in the game that face the same costs and demand function as you. To "*beat the market*" you should be ranked at the top of the list. The quarter 0 results are displayed as they appear on the computer screen. In quarter 0, all profits are the same, so the firms are just ranked in numerical order. There are two real players (students) in the example game, Harvey and Kimberly. The firms (3 and higher) with no names are managed by the computer, which in reality is Dr. Steven Gold, the developer of the game, and Professor of Economics at the Rochester Institute of Technology. *He personally challenges you to beat him!*

The competitive analysis report is critical to assess your performance and to try to understand the strategies of the other firms in the game and to "*beat the market*".

Figure 4.7: Sample Competitive Analysis report (at start of game all firms are equal)

VIEW QUARTER: 0 GO Firm: 1 Quarter: 0 Market: Monopolistic Competition Level: 3

Competitive Analysis Report — Sort By Net Profit

Firm	Price	Advertising	Plant Size	Sales Units	Exceptional Items	Net Profit	Cumulative Profit
1	$75.11	$3,000	6	4,100	$ 0	$119,522	$ 0
2	$75.11	$3,000	6	4,100	$ 0	$119,522	$ 0
3	$75.11	$3,000	6	4,100	$ 0	$119,522	$ 0
4	$75.11	$3,000	6	4,100	$ 0	$119,522	$ 0
5	$75.11	$3,000	6	4,100	$ 0	$119,522	$ 0

FEQUENTLY ASKED STUDENT QUESTIONS

1. **How do I begin to make a decision?**
   a. Understand that the objective is to maximize profits.
   b. Study the reports in the game including: Market Research, Demand & Supply, Net Profit, and Competitive Analysis.
   c. Review the suggestions of the automated "CONSULTANT" that are on the Summary page of the game.
   d. Click on the information buttons next to each decision and read the suggested process.

2. **What are the "key" factors that affect profits in the game?**
   There are three "major factors" in the game:
   a. Set production as close as possible to firm demand.
   b. Set marginal revenue close to marginal cost
   c. If plant size is a decision, select the plant size that will be most cost effective, given the projected level of demand. Information how costs change by plant size is found on the Decision page by clicking the Info button.

3. **The CONSULTANT tells me to set production closer to firm demand, how do I do this?**
   a. Look at the past reports to study the sensitivity of demand to changes in your firm's price, your rival's price and he market price (if not a monopoly). Once you learn about price elasticity, this information is very helpful and may be found on the Decision page by clicking the Info button for price.
   b. If advertising, then look at the marginal impact of this decision. This information is found on the Decision page by clicking the Info button.
   c. If there are random economic events occurring in the game, check out this information on the Market Research Report.
   d. If the economy is changing, check out the GDP forecast in the Market Research Report. As a rule of thumb, a 10 unit change in the index would increase market demand by 5%.

4. **The CONSULTANT tells me my average costs are much higher than the average, why?**
   a. Costs rise rapidly as production gets close to maximum capacity. The maximum production capacity is found on the Decision page by clicking the Info button for production.

b. If plant size is a decision, average costs depend also on plant size. The impact of plant size on average costs is found on the Decision page by clicking the Info button for plant size.
c. Selling or overhead costs include advertising, if very high it could have an impact.

5. The CONSULTANTS tells me to set MR closer to MC, how do I do this?

a. Changing price is the most important factor affecting MR. MR will change positively with price. As price is increased, MR will rise and become closer to the price level but will always be less than price; and as price is decreased, MR will decline at a faster rate and the gap between MR and price will widen.
b. Changing "production" will alter MC. As production gets closer to the maximum production capacity of the firm, then MC will rise rapidly.
c. If you can change plant size, then this will also change MC. The impact of plant size on MC may be found on the Decision page by clicking the Info button.

6. How do I decide on the level of advertising?

If advertising is a decision, be competitive and raise advertising as long as the extra (marginal) revenues from increased advertising exceed the extra (marginal) costs of production. But be careful there are diminishing returns to advertising. (Information on the marginal impact of advertising is available by clicking the Info button on the decision page for advertising).