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Econ-4

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Supply & Demand Paper

### Effects on Hard Drive' Supply and Demand

In the late 1880s, Herman Hollerith created a company which later on, became the start of computer industry. The company name had changed several times, and it ended up as IBM, International Business Machines (Parsons, Oja pg 231 par.3). These days, computer industry is a really big industry. The demand of computer continues to rise and of course, it might as well increase the demand of the components and accessories inside or outside the computers .As we all know, in order for the computer to store data and files, it has to be installed or equipped with the data storage. There are some choices for the data storage, but people prefer hard drive than any other data storage since it has big capacity and easy to access. Hard drives are generally used for computer, but also used in MP3 player, iPods, and cell phone these days. People use hard drive when they store data or file. As they store it inside the hard disk drive, the data will still remain there unless they delete it or some problem occurred with the hard disk drive. For the computer, hard disk drive is not the only storage device available; in fact, there is flash disk which is also a storage device and is the main competitor for the hard disk drive market. But, still, hard disk drive is the most preferred storage device so far. This paper will explain about the allocation of resources for Hard Drive storage and how the independent variables affect the supply and demand.

According to Parsons in the book *Computer Concepts*, there are three reasons that hard disk drive is the preferred main storage for most computer systems. First, they provide lots of storage capacities. Second, they provide fast access to files since it is installed inside the system unit. Third, it is economical. The cost of storing forty megabytes of data in 2009 is about a penny (Parsons, Oja pg. 36 par.1). Currently, hard disk drive is the preferred main storage device and really important for people as they need to store files and data in their computer.

The first hard drive was initiated by IBM, known as the RAMAC, and was shipped on September 13, 1956. It weighed 2,140 pounds and held a total of 5 megabytes of data on fifty 24-inch platters. It was available for lease for \$35,000 USD, the equivalent of \$254,275 in today's dollars (as of 2006) (Bryant par. 2). The development of the hard drive capacity for the last five decades has quadrupled many times. After more than fifty years, hard disk drive developer has come up to a capacity of two terabytes on 3.5 inch platters (Murph par.1). Computer and electronic development in the world has brought a new era to the people, such as iPods, cell phone, PDA, and computers.

There are some independent variables that might affect the demand of the hard drive storage. They are income, taste & preference, substitute/complement.

First, income, this economy recession really affects the income of people. There are a lot of people get laid off, get paid less, and work for less hours than they used to. Tina Kell pointed out,

“2008 was the worst year for layoffs and job losses in the United States since World War II and 2009 is expected to be even more devastating. A report out today says that 1.9 million jobs were lost in the last four months of 2008, 2.6 million for the year, and the layoff list continues to grow on a daily basis.”(Kell par.1)

Most people get less income than they used to get in several years ago, but it is still better than having no jobs because bills and mortgage payment cannot wait. Moreover, this economy recession also created other problems such as, homelessness, increase rate of crime, bankruptcy of businesses, etc. With a decreasing income of the people, most of them would think that they might not need a larger size of hard drive storage. They will surely think twice to spend their money to expand their hard drive storage only to be able to store more data and photos in this recession.

Second is taste and preference. For hard drive storage market, the preference would be size, reading/transfer speed, and power consumption. As for the size, there are lots choices for hard drives with different capacity that are available on the market such as, 250GB, 500GB, and 1TB. The average size of the hard drive people use these days is 250GB. However, people might have different things in mind, some people might think that they do not need that much capacity and decide to buy the small capacity one; on the other hand, some people might think that it is not bad idea to have a lot of free space. With a lot of extra free space, they could put whatever data they want without considering the space availability. Next, the reading/ transfer speed is also a common preference of people who use computer a lot, especially for gamers. The speed rate is very important because it determine how fast you can copy and read data. The higher rpm you have, the faster your hard drive is going to read or copy. As of 2009, the hard drives with the specific speed rate are available from 5400rpm to 12000rpm or above (“Hard Drive RPM speed” par. 17). In addition, people might have a difficult time when it comes to consider about the speed rate because the higher the rpm, the more expensive it would be. Next, the last one of the taste and preference is the power consumption. Hard drive does need the power supply to give the energy so that it can run and read the data. The hard drive manufacturer have manufactured

the less power consumption hard drive, a green power hard drive (less power and environmental friendly). So far, Western Digital is the first and the only manufacturer who produces the green power hard drive. As hard drive capacities increase, the power required to run those drives increases as well. Currently available 1 TB hard drives have a typical power consumption rating greater than 13.5 watts. WD has designed the first 3.5-inch hard drives that deliver power savings as the primary attribute (“WD Greenpower technology” par. 3). Nevertheless, people are always having different kinds of needs and demand. However, size, power consumption, and reading/transfer rate are the terms that represent the taste and preferences which affect the demand curve.

The supply for the hard drive has independent variables that affect the supply curve such as, Cost of the resources, taxes, technology, and number of seller.

First is the cost of the resources. If the cost of the resources go up, the company is going to increase the price of the hard drive to keep their profits in the same margin or even increase their profit margin. When the price is high, the supply will increase as it is said in the law of supply. On the other hand, if the costs of the resources go down, the company might lower their price to maintain the same profit margin and to attract consumer to buy the hard drive when it is cheaper. But, according to the law of supply, when the price is low, the supply will decrease. So, when the price of the hard drive is low, the manufacturer might limit their supply because they know that they will sell a lot of their product for less money.

Second, taxes. If the government wants to regulate the hard drive market by taxing the manufacturer, the manufacturer would announce a new price for the hard drive includes the new tax rate. So, consumer is the one who suffer from government’s regulation because the

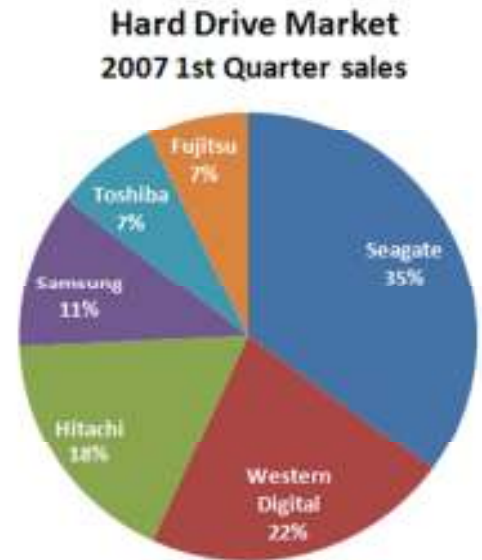
manufacturer would not want to sacrifice their profits. Sellers are always selfish. They always think about profits.

Third is the number of sellers. There are five large companies that manufacture hard drive. They are Seagate, Western Digital, Hitachi, Samsung, Fujitsu, and Toshiba (“Hard Disk Drive” par. 17).

As it shows in the pie-chart, Seagate holds a big portion of the hard drive market in the U.S. with 35%.

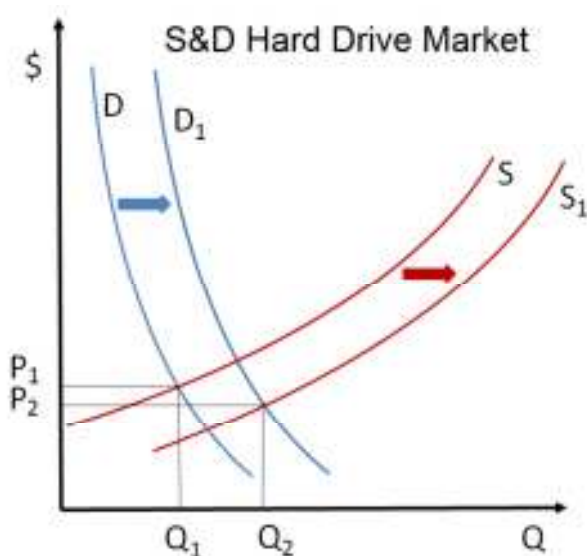
Meanwhile, Toshiba and Fujitsu both have the least market

share with 7%. However, the number of sellers affects the supply. [From : asia.cnet.com](http://asia.cnet.com)



If there is fewer seller, then there is less supplier to supply the product. On the other hand, if there is more seller, then the new seller will produce the new “similar” product and there will be more products for consumer, in other word, more supply for consumers.

As Figure.1 shows, the demand curve shifts to the right when the increase of income,



**Figure 1**

different taste or preference, and the increase of substitute or complement goods or service. Also, the supply curve shifts to the right when the costs of resources is getting more expensive and scarce, government regulate a new tax rate, and more competitor or more seller joining the group.

Three other things that also affect the supply and demand of hard drive are the population growth, technology, and global computerization.

The first reason that increases the demand and quantity supply of hard drive is population increase. World population has increased significantly for the last two centuries. It is predicted that it will increase even faster than before, especially in the developing countries, such as India, China, Nigeria, etc. Theoretically, there are several factors that shift the demand curve in the economy. One of the factors that shift the demand curve to the right is an increase in population. Population growth will increase the demand in the market, while it will also lead to an increase in quantity supply. For example, more people will need personal computers, cell phones, digital cameras, camcorders, etc. All those electronic things require hard drive storages. The supplier will then increase their production level to meet those demands. Therefore, the demand of the hard drive storages will be directly affected by the number of world population.

The second reason that affects the supply and demand of the hard drive is global computerization. With climate change and global warming issues, more and more people started to be concerned about the environment. The use of paper in the world today has begun to shrink because it is made from trees, and not environmentally friendly. In addition, it could eventually lead to deforestation or global warming. Furthermore, everything is going to be electronic and paperless.

The third reason is the technology in developing the hard drive. Back in 1956, the early days of computer, the start of the first hard drive from IBM is worth \$50,000 for a 5MB capacity which cost \$10,000 per megabyte. Then, it was increased to 10 MB capacity is worth \$710 which cost around \$71 per megabyte in 1985. Finally in 2004, the capacity of hard drive reaches 250GB for \$250 and cost around 0.115 cents per megabyte. This implies that in the several past

decades, the industry player put a lot of work in research and development for hard drive technology which has increased rapidly. As the technology become much better, it would be possible for the manufacturer to produce the hard drive in a lower price. It is happen because they need to compete with the market competitor and to meet the demand of a larger capacity of hard drive. Also, the manufacturer has to do something to innovate their products. They cannot just sit around and wait for consumer to the same product and capacity. So, they came up with some ideas such as, to manufacture hard drive with different speed rate, develop and produce higher size capacity. People are too lazy to delete and clean up files they do not need.

Overall, the demand for the hard drive storage is affected by the income that people get, taste and preferences, and substitute or complement. On the other hand, the supply is affected by the cost of the resources, tax, technology, and number of sellers. Most of the businesses today are using computer to store databases, calculate numbers, etc. It is faster and very effective. It is also very convenient because people can see their documents from any computers without having to worry about forgetting to carry it. With all the benefits that computer offers, this trend will continue to develop until the whole world is computerized. It means that there will be more data to be saved and created electronically which requires a lot of hard drive storages. Nowadays, the regular personal desktop computers have an average storage size of about 250GB. With this current trend, that storage size would not be enough for home desktop computers in the next five years. Moreover, businesses and schools would most likely require greater hard drive storage size. Therefore, the demand curve of hard drive storage will keep shifting to the right, and its quantity supply will continue to increase.

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