## Lecture 19: Financial Markets

By now, you have heard a great deal about the demand and supply of loans, the market that channels saving into investment. Our loan market is, of course, another of the simple models that we use to great effect throughout this course. It is a simplification of what economists call the capital market, perhaps the most important marketplace in the American economy.

There is always a lot of interest in the capital markets. Americans tend to follow the Stock Markets. A surprising number of people can tell you where the Dow Jones closed yesterday, and almost everybody knows roughly where it is. We even have cable television channels (CNBC comes to mind) which spend all day discussing what the stock market is doing.

The best way to learn about the stock market and other financial markets is, of course, to take a course in Finance. No simple lecture can cover all of the material, but we can cover some of the basics.

## Miller's Pizzeria, Incorporated

As we have done so many times throughout this course, let us turn to Miller's Pizzeria. While many pizzerias are simple mom-and-pop operations, let us assume that Miller's Pizzeria has a sophisticated financial structure, and is in fact Miller's Pizzeria, Inc.

While the term "Inc." (for incorporated) slips so easily off the tongue, it actually represents a major financial development responsible for significant economic development. Beginning in the 17$^{th}$ century, the British Government allowed the establishment of Limited Liability Corporations. If you put money into a traditional partnership, which ultimately becomes a business disaster, you are personally responsible for all the losses. If you put money into a LLC, then your potential loss is limited to the funds you have invested in the business. Were Miller's Pizzeria incorporated in the United Kingdom, it would be known as Miller's Pizzeria, LLC. Here, we think of it as Miller's Pizzeria, Inc. The idea is the same.

### *A Balance Sheet*

Perhaps a good place to begin studying the financial structure of Miller's Pizzeria is to look at its balance sheet. While our balance sheet will be quite cursory, and would not perhaps be good for a laugh at a meeting of accountants, it will get us going.

- Assets whose value is pretty certain including cash and Accounts receivable (money owed it by its customers)

- Tangible assets whose value is less certain, such as its pizza ovens and furniture. While the Pizzeria has a good idea what they are worth, you can never tell for sure until you sell it.

- Other assets whose value is highly uncertain, such as Future business prospects. The Pizzeria has a well-known trademark, and does have its special secret recipe for pizzas. Nonetheless there is uncertainty about how it will do in the future, and these things are of uncertain value. These assets could be quite valuable, but they could turn out to be worthless.

### *Liabilities*

Miller's Pizzeria also has liabilities or obligations to others. Some of these are very simple. Just as it has accounts receivable, so too it has accounts payable, where it has not paid all of its bills. The most common are stocks and bonds.

#### Bonds

A bond is simply a promise by a business such as Miller's Pizzeria to pay money in the future. For example, Miller's Pizzeria have issued a bond, nicely printed on high quality paper that says, in essence,

*"We promise to pay whoever holds this bond $1,000 a year hence"*

While this makes a good story, it is more romantic that realistic. These days, most bonds and coupons are just entries in someone's computer.

Their value depends on several issues; *default risk, nominal interest rates,* and *the term structure of interest rates*. While Miller's Pizzeria is legally obligated to pay, collecting may be like trying to get blood from a turnip. If the Pizza business is bad, Miller's Pizzeria may not be able to pay. Moreover, sad to say, there may be some cases in which businesses such as Miller's Pizzeria fraudulently evades its promise to the bondholders. In any case, there is default risk. Once we could find out the appropriate interest rate r* that incorporates all of these effects, we would value the bond at

$$\$1000/(1+r^*)$$

The only bonds that do not have default risk are those issued by the United States Government. A government bond is simply a promise to redeem it for pictures of George Washington. Since the Government owns the printing press, it can always print up additional dollars to pay off any other bonds. And, as for the risk of fraud, remember that Government bonds are, in the quaint words of the Constitution, guaranteed by the "full faith and credit" of the United States Government. Without question, the courts will force the Government to honor its commitment. A promise by the United States government to pay $1,000 a year hence will be valued at

$$\$1,000/(1+r_f)$$

where $r_f$ is the so-called risk-free nominal rate. We know that $r^* > r_f$. Without a lot of other information, we cannot evaluate $r^*$.

If Miller's Pizza were a real company – and a sufficiently large company – finding out the value of its bonds would be straightforward. We would simply open today's newspaper, such as the *Beacon Journal*, *Plain Dealer*, or *Wall Street Journal*. Or, we might look it up from many financial services companies, some of which are on the web and some of which are not, and find the value at which those bonds are being bought and sold. The best estimate of the true value of a bond is the price at which it is selling.

## Stocks

Stocks, or equities, are the legal rights of ownership of the company. For example if Miller's Pizzeria has 1,000,000 shares of stock outstanding, and you own (say) 10,000 of them, you own one percent of the company. Effectively, owning one percent of the common stock means that Miller's Pizzeria has promised you:

*"You will get one percent of anything we pay out to our owners."*

Most people also assume that the 10,000 shares also promise that

*"In any important decision about the company, you get one percent of the votes"*

That need not be the case. Miller's Pizzeria may have issued two classes of stock, where one class (usually Class A) has greater voting rights. The Cleveland Indians, for example, have both Class A and Class B stock. The Jacobs family owns most of the Class A stock, which has enough voting rights to outvote all other shareholders. If you own Class B stock in the

Indians, you are entitled to a proportionate distribution if the company is sold and to a proportionate share of any dividends. However, Mike Hargrove and John Hart do not worry about you outvoting Dick Jacobs and taking control of the company.

Even if you do have one percent of the voting rights, you will not vote on every decision involving the company. You will get one percent of the votes in the election for a board of directors, who will make the day to day decisions.

What about valuing the stocks? The same principle applies to stocks as to bonds: their value is simply the discounted present value (at the appropriate risk-adjusted discount rate) of the earnings one expects to get from holding the stock.

If you want to know the value of stocks, there is a simple way to find out. Again, all we need do is look the stock up in a newspaper such as the *Beacon Journal*, *Plain Dealer*, or *Wall Street Journal*. While might do for a simple business like Miller's Pizzeria, it will for any company traded on the New York Stock Exchange, NASDAQ, or one of the smaller exchanges this will do. After all, the true value of a stock is the price at which it sells. The financial markets tell us the price at which stock is selling.

### *Derivatives*

While Miller's Pizzeria is probably too small to have any derivative securities, larger corporations do have them. Derivative securities sometimes get bad names in the press. Yet, derivative securities continue to grow in importance. Two of the most common derivatives are **options** and **futures.**

A large corporation almost invariably issues options, and, even if they do not, the financial markets will end up generating their own options and futures contracts.

#### Options

An option contract in Miller's Pizzeria is simply the right to buy the stock at a preset price. For example, Miller's Pizzeria may have a June Option at 50. People who hold options have the right to buy the stock at $50 a share; persons who have issued options have the obligation to sell the stock at $50 a share if the options holders desire. If the Pizzeria stock is selling at (say) $65 a share, the options will be exercised. The longs (people holding options to buy) will gain and the shorts (those who issued the option) will lose. If the stock is selling at $35 a share, the options will not be exercised,

but will be allowed to expire. In that case, the longs will be out whatever they paid for the options and the shorts will have made whatever they got for issuing the options.

Every business day, the Wall Street Journal publishes pages of price lists for options contracts. Like stocks and bonds, option buy and sell every day on financial markets.

### Futures

While futures are seldom issued on common stocks, there are futures contracts on all sorts of other financial instruments. Whereas an options contract is, as the title suggests, an option to purchase a security, a futures contract is an obligation to between buyer and seller to purchase the security. For example, suppose Miller's Pizzeria is now selling at $50 a share. Suppose Barney and Fred enter into a six months futures contract for Miller's Pizzeria at $50 a share, with Barney agreeing to buy at $50 a share and Fred agreeing to sell at $50 a share. If the Pizzeria's stock rises to $65 a share, the Fred might be willing to forget the whole thing, but Barney will not. If the stock drops to $35 a share, circumstances will be reversed. Fred will be the one insisting that a deal is a deal.

As in the case of options, the Wall Street Journal prints, every business day, the market value of numerous futures contracts on things such as corn and wheat, interest rates, precious medals, as well as some stocks.

## The Function of Financial Markets

Many people compare financial markets to Las Vegas or Atlantic City. After all, they say, is there any real difference between the two? In fact, Las Vegas, Atlantic City, and other casinos exist simply to provide people the pleasure of gambling (a pleasure that, like most pleasures, appeals to some and not to others).

By contrast, the financial markets are vital to the proper functioning of a modern economy. If the Casinos shut down, it would not be a big loss. We could all go to the movies instead. If financial markets shut down, it would be catastrophic. Our simple model of the economy would not work without the loans marked. Similarly, while the capital markets are more complicated than our simple loans market, they play just as important a role. Quite literally, if we abolished financial markets, we would soon return to the dark ages.

**Warning required by the Economist-General:**

- This is not to say that we cannot –or should not – regulate and restrict markets. But if we really prevented people from using capital markets at all, we would be shutting down stock exchanges, banks, credit cards, mortgage companies, and so on. It would not be a pretty sight.

Financial markets provide two key services: Intermediation and liquidity.

### *Intermediation*

The Intermediation function is the task of bringing savers and investors together. It allows individuals to think about "how much should I consume now and how much should I save for later" without worrying about "how am I going to store my saving". It allows individuals to think about "should I carry this project forward without having to provide all the funds for the project?" Some industries would simply collapse if they depended on the saving of one individual.

While we talk about the demand and supply of loans and the role of the interest rate in equating the demand and supply of loans with great ease, it is a complicated task. In fact, many people make their living working in banks, brokerage companies and other financial institutions. They all have the essential *function* of making sure that funds flow from savers to investors.

Intermediation means that people can save for the future by lending to others. It means that thousands can pool small amounts of savings into one large sum of money to lend. People and businesses can borrow to buy homes, build factories, and start new businesses and so on. It helps to assure the efficient allocation of capital throughout the economy.

### *Liquidity*

One of the ways that financial institutions do their task is by providing liquidity. That is simply the ability to buy or sell an asset quickly. If you have a checking account, a stock certificate, or a corporate bond, they are *liquid*. You can get money from the checking account almost immediately. If you want to sell some stock, you can also sell it almost immediately, though you may have to wait a few days to get the cash. By contrast some assets such as houses, art collections, and stamp collections are *illiquid*. It may take some time to find a buyer.

## Risk

In discussing how we would go out valuing Miller's Pizzeria, we talked about the importance of the risk-adjusted rate. Most financial decisions, whether it be buying a home, starting a business of buying stocks are risky. The future is uncertain. In short, every financial investment involves *risk*. And it is not just financial investments. No one knows for sure whether they will get sick in the coming year and run up expensive medical bills, or whether their house will catch on fire and so on.

The proper accounting for risk is a complicated subject, bringing us to topics like "diversifable and non-diversifable risk". We ought to spend a little time sketching out how risk affects our calculations

### *An Application to Insurance*

While we want to think about risk in terms of financial decisions, a little diversion to medical insurance helps explain a key issue: diversification. There is a risk that you will get sick in the coming year. Insurance companies can calculate the chance that you will get sick and, if so, the medical bills you will run up. They can then calculate the expected value of your medical payments for the coming year. For example, suppose that

- There is a 90% chance that you will not get sick at all next year,
- A 9% chance that you will have a very bad case of flu and incur $500 of medical bills, and
- A 1% chance that you will come down with cancer and incur $50,000 of medical bills.

The insurance company calculates the expected value of your medical bills as (0.09($500) + (0.01)(50,000) = $545. They will offer to pay your medical bills, whatever they might be, for $545 plus a premium to cover their administrative costs and their profit margin. (The problem is more complicated than this; you worry about the insurance company honoring its promise and they worry about you not telling them you already have cancer or some other medical problem. But let's keep the example simple.)

Should you buy the insurance policy? It depends on how much you want to avoid risk. However, most people would willingly purchase the insurance.

The insurance company eliminates the risk of insuring you by insuring thousands of individuals. They will pay hefty medical bills for a few people, modest medical bills for some and nothing for others. In total, they will pay out almost exactly the expected value of all of their policies. By insuring so many people, they get the advantages of *diversification*. The uncertainties cancel out. Insurance companies understand something statisticians call the **law of large numbers**. If you insure enough people, the risks cancel out. Intuitively this is just the problem faced by a casino. Every time a customer places a bet, the casino takes a risk. However, it has thousands of customers, and those risks cancel out.

(There is an old joke about an insurance company knowing just when you will get sick. This is literally untrue, but they do know the probability of your getting sick. And, if they are insuring a large number of people, they know almost the exact number that will get sick this year.)

Insurance companies do not always get the advantages of diversification. For example, insurance companies insured many people in South Florida against hurricane damage. When Hurricane Andrew came through a few years ago, there was insufficient diversification. (Another way of making this point. Kent State University provides medical insurance to its faculty and staff. The University engages in self-insurance. It pays the actual bills, because it knows that the risk of all of us coming down with a dread disease – a dread disease being defined as an expensive one – is negligible. But it does worry about what would happen if (say) a 747 crashed on campus, injuring hundreds of us in one accident. It carries a special insurance policy to cover such catastrophes. An insurer who knows that while a 747 might crash into the KSU Campus, there will not be simultaneous crashes on several University campuses provides the insurance policy.)

### *Application to Investments*

When you are making investments, you have to worry about risk. In part, you can, like insurance companies, diversify your risk away by buying many different securities. Thus economists always stress the advantage of purchasing a diversified portfolio (one consisting of many different stocks or other investments) so as to reduce risk.

When it comes to stocks, you cannot eliminate all risk. Indeed economists talk about diversifable and non-diversifable risk. The flip side is of course, that that you can eliminate the diversifable risk by holding a

diversifable portfolio and can earn a risk premium by accepting the non-diversifable risk.

The essence of a good investment strategy is simple: diversify. That is you should have a number of stocks. Some will do well, and some will do poorly. The law of large numbers does work, and if you own enough stocks, the winners and losers will cancel out.

However, you cannot eliminate the risk. There are certainly years stocks as a whole do very well or very badly. The period since 1982 has generally been a very good period, with stocks doing quite nicely. There are other periods, such as the 1960's, 1970's, and 1929-33 when stocks did poorly. From 1929 to 1933, stocks lost, on average 90 percent of their value. When we adjust for deflation, the real value of stocks declined by about 60%. While stockbrokers like to tell you that this was a long time ago, it should serve as a reminded that, as Bernard Baruch, a financial sage from long ago, liked to say: "Markets fluctuate".

There is a reward for bearing that risk. For the past 70 years for instance, investments in the stock market have earned, on average, about 8 to 10 percent a year more than investments in Government Bonds.

## The Stock Market

Discussions of saving and investment and financial markets often turn to the question of the stock market. The stock market is just another example of a financial market, but it gets a lot of attention. Hence this is a good time to discuss the economics of the stock market. This is a quick and dirty introduction to the subject. We just don't have time for lots of details. *A course in finance is strongly recommended.*

Like most financial institutions, the stock market plays two important roles in our economy: Intermediation and liquidity. Companies raise capital from a variety of sources, particularly Stock, or more appropriately, Common Stock. Several trillion dollars of assets are represented by Common Stock. Many individuals keep their savings in the stock market directly or indirectly through their pension funds.

### *A Little Institutional Background on the Stock Market*

The major US stock market is the New York Stock Exchange. Other exchanges include the AMEX (American Exchange) and the NASDAQ (North American Association of Security Dealers, the OTC – Over the Counter --

exchange.) The last two are in the process of merging. Contrary to what you may have heard, the stock market is not a giant lottery. Stocks are fairly priced, more so than most other assets in the economy. The average return on stocks is well above that of low risk securities, but there is considerable variation (risk) in this return. There are several standard stock price indices:

- The Dow-Jones is an unweighted index of 30 major securities.
- The S & P 500 is a weighted index of the 500 largest companies.

In terms of which one you follow, it makes little difference, but the S & P 500 is technically a more reliable index.

### *What Will the Market do in the Future?*

It will go up and it will go down. Some years it will go up, and other years it will go down. If I knew which years it would go up and which years it will go down, I would not be here today. The market is not overdue for a "crash". The market goes up on average, but so do most other economic variables

### *Why are Economists so interested in the Stock Market?*

#### The Stock Market as a Signal

The market valuation of any company is the best indicator of the value of that company. When the economy goes up (down) the value of companies generally goes up (down). Thus a stock market rise or fall can provide a powerful signal about whether the future will be good or bad. However, it is not always true that what is good for the stock market is good for the economy (or vice versa). Two examples will illustrate the point:

- A monopoly is broken up. That may be good news for consumers, but is certainly bad news for its stockholders.
- The World War II headline "Japanese sink American Aircraft Carrier" was bad news for the US, but good news for shipbuilding companies.

Many other things influence the market, and a rise or fall in the stock market may signal something besides good or bad times in the future.

One of the most important markets in the United States, or indeed in any industrial country, is the capital market, the market that allocates resources for investment. Much of that happens via the stock market, and its orderly function is important for the well being of the US economy. Any healthy economy requires an efficient well functioning capital market. How else can you raise capital and invest your savings at so little effort?

And, since economists are interested in markets, it is no surprise that they are very interested in the biggest market of them all.

## Personal Investing in One Easy Lesson

Many students ask how to make money in the stock market. There are some basic principles.

### *The key principles of investing*

You invest to make money for a reason: for retirement, for the yacht, for your kid's college expenses. Your reason for investing should determine what you invest in. Don't be so naive or arrogant as to believe that you can beat the market or that you or your broker or your neighbor knows how to pick stocks. Do hold a "diversified" portfolio consisting of many stocks. Do remember that the objective is to make money for yourself, and not for your broker. That is, regard someone who recommends you do a lot of trading in stocks as you would someone who had a social disease.

### *A Simple Action Plan for Buying Stocks*

Purchase shares in the Vanguard 500 Index Fund. They guarantee that you will earn a return equal to the return on the S &P 500 minus 0.2%. That is, if the S & P 500 goes up (down) by 20% and pays average dividends of 3%, you will earn 22.8% (lose 17.2%). In the long run, you will be hard pressed to beat this advice. When you have accumulated $200,000, check with me for further advice.

## Relation to the Text

Each lecture ends with a section relating it to the text. In some cases, material is omitted, either because the text covers it well enough or because it is not worth learning. In other cases, material is added. Each of these "lectures" will end with a brief note relating the lecture to the text, describing

what material is left to the student to learn alone and what material may safely be skipped.

### *Which Chapters does this lecture cover?*

| Section from Stockman | Coverage |
|---|---|
| Ch. 15, Financial Assets and Markets | Covered |
| Ch. 15, Risk and Insurance | Covered |
| Ch. 15, Debt Instruments: Bond Markets and Money Markets | Covered |
| Ch. 15, Stocks and Stock Markets | Covered |
| Ch. 15, Other Financial Assets | Covered |
| Ch. 15, Personal Decision Making: Investment Advice | Covered |
| Ch. 15, Ownership and Control of Firms | Not Covered |

A general comment. The material on personal investment advice will not be on any examination. Nevertheless, it is correct advice, and is offered because people keep asking for it.

Stockman also presents some material on how to read financial tables from the Wall Street Journal. This is useful material, and you should look at it as a primer on how to read financial data.

### *What material is new?*

None.