# The Basic Contracts

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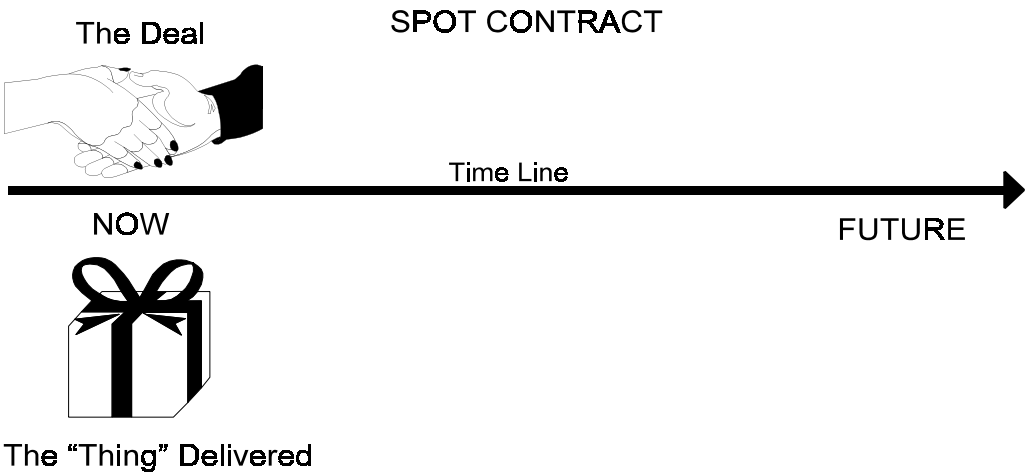
The area of finance is teeming with all sorts of games that can be played, and these games are played for real money. It might initially seem that there are too many games and too many rules to understand, but that is not really true. If a person considers how the games are constructed, then it is easy to learn them all. Notice that the approach here is not to try to understand all the games at once, the idea is to understand the principles behind the games and build from there. This my sound terribly inefficient, but it makes understanding finance terribly easy.

Just as a deck of cards can be used to play poker or bridge or zillions of other games, there are certain basic contracts that serve as the building blocks. These basic contracts can be used to construct any financial instrument. By understanding the basic contracts and their characteristics, it is possible to understand how the more complex financial contracts work. Contracts are the formal expression of how business is conducted, so it is important for any businessperson to understand how they work. Fortunately, it is easy to understand contracts. There are only three types of basic contracts; all financial contracts are some combination of these three.

## The Spot Contract

A spot contract exists when two parties make a deal right now and the deal goes through immediately. The "things" involved in the deal are unimportant; the critical factor is timing. When you buy a hamburger at a fast food restaurant, you have engaged in and have completed a spot contract. You give the counterperson money NOW, and he or she gives you the burger NOW. But spot contracts need not involve money on either side of the deal. If a young boy trades a bag of marbles for a bullfrog, he has completed a spot contract (but he will have lost his marbles). It does not matter what "thing" is involved or the price attached to the "thing". The important concept is that the "thing" is delivered. In a spot contract, the deal is made NOW, and the "thing" is delivered NOW. There is no future component in a spot contract.




Most people live by spot contracts, and most of the world runs on spot contracts. Groceries and the clothes are purchased on the spot (with spot contracts). A person pays the money (transfers some wealth) and receives the "things" he or she wants. Even the use of a credit card does not change the nature of the contract. The deal is made and executed NOW. The use of credit merely provides some flexibility in payment by involving a third party in the money part of the transaction. But since the price is set NOW and the "things" are delivered NOW, the spot contract has been made.

Suppose you were responsible to provide refreshments for a party this evening. Your day would include purchasing food and drink at one or several locations. At each store you could pay cash or write a check or use a credit card to complete the deal whereby the merchant would give you the "things" you need for the party. You would spend the day in a world of spot contracts.

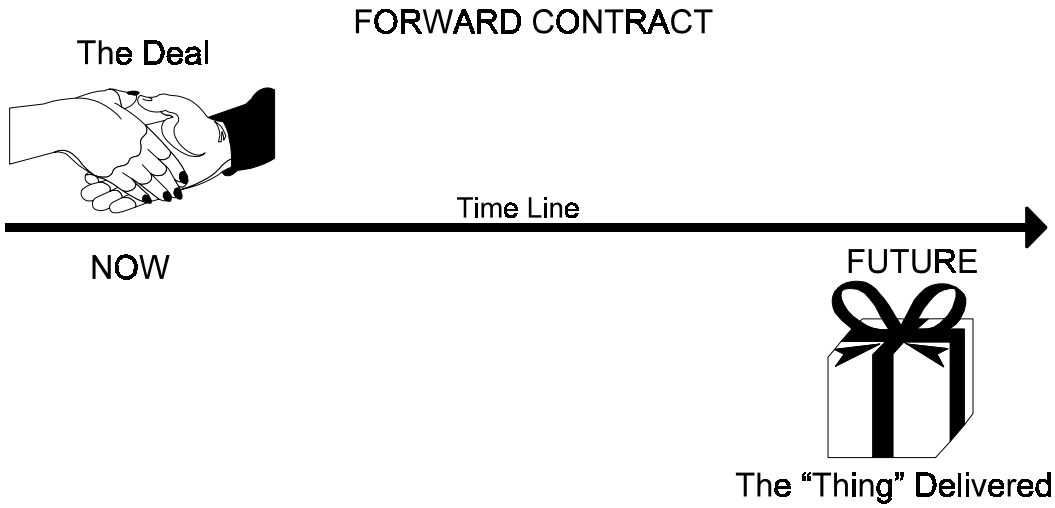
For purposes of investment, the spot contract could represent the buying and holding of physical "things", for example gold coins or baseball cards. An investor can only make money on this type of transaction if "things" can be sold later at a higher price using a second spot contract. The difference in the price of the "things" from the time they were purchased until the time they are sold is called a capital gain, if the "thing" is sold for more than it cost, or a capital loss if it is sold for less than the cost.

Another type of spot contract would be the purchase of a productive asset, like an oil well or a hot dog making machine. In these cases, the "thing" purchased produces other "things" that someone else may buy in the market. Note that the asset itself does not necessarily appreciate in price and might actually wear out, or depreciate, while it is used for production. The only wealth gained may be from the production of other "things" by the asset. But according to a bank book, it really does not matter whether wealth has increased from merely holding an asset or using it to generate income. The money all spends the same.

Since spot contracts involve the sale or purchase of "things" and a transfer of ownership (and usually control), they are not really financial investments. Financial investments arise out of contracts that give the owner a claim on someone else's "things". Even though they are not financial contracts, spot contracts are very important in finance for two reasons. First, many financial contracts require the investor to pay some money in order to control another set of contracts; this purchase of a "thing" (a set of contracts) is a spot contract. Second, a major use of spot contracts in financial investments is when they are used to close out a position that was created by a forward or option contract (which was purchased with some original spot contract). Spot contracts serve as the staring point or the ending point for many more advanced financial contracts.

## The Forward Contract

The second type of basic contract is the forward contract. A forward contract exists when two parties make a deal right now but the actual completion of the contract is delayed. Timing is once again the important factor. You make a deal NOW which WILL be completed in the FUTURE. This is like a lay-away plan. You obligate yourself to complete a deal on certain terms at a point in the future. Once you are in the forward contract, you have no choice but to carry through with the delivery. This is a key aspect in the nature of the forward contract; once the contract has been agreed to, both parties are obligated to complete the contract whether or not is to their individual advantage.




One obvious question that arises is why anyone would want to commit himself to a deal that will take place in the future. The market is a dynamic place and all sorts of events can occur to change the price of the "thing" being purchased between NOW and the FUTURE. In fact, if the market moves even a little bit, one of the parties in the forward contract must lose and the other party must win since the "thing" could have been sold for a higher price or purchased for a lower price. It seems odd that rational investors would knowingly use this type of contract.

The main advantage of a forward contract is one of insurance. If a cereal company will need 1,000,000 bushels of corn next month to make corn flakes, it can buy the corn now for delivery and payment in one month. Since the firm knows what it will cost for the raw material, it can establish the price it must charge for corn flakes next month. This type of planning is valuable to a firm, and the use of forward contracts makes this planning possible. Sellers also might find the forward contract to be valuable. The farmer who sells the corn might be worried about the price dropping during the next month. He can sell his corn early and lock in a guaranteed price. Once again advance planning is possible.

The forward contract removes risk from transactions that will take place in the future. By making the contract now, both parties know exactly what is going to happen. Since there is only one possible outcome (the completion of the contract), neither the buyer or seller faces any risk.

Suppose you have the responsibility for setting up an office party for next month. You have been given a budget today, and you could wait until the last minute to do all the shopping. But maybe at the last minute you will be unable to locate the caviar (you were given a big budget). It might be a good idea to make arrangements with your local caviar merchant, Sergei, for delivery of the jars of fish eggs next month. If you find out that Sergei cannot get the caviar, you will be able to seek out another source. If you arrange for all the food and drink today, you will not have to worry about the party at all for a month. The use of forward contracts has made your job easier and more certain.

Many types of financial contracts are forward contracts. Futures contracts are merely standardized forward contracts for commodities, or "things", that are used a lot in normal commerce and production activities. Because they are standardized, futures contracts have some special characteristics, but they are nothing more than one type of the basic forward contract. Even stocks and bonds can be regarded as types of forward contracts. The exact nature of the contract determines what "thing" the owner of the contract has a claim on. If the claim is on a flow of cash from some asset, either real or financial, the contract is a financial investment.

This is where the nature of the forward contract with respect to risk can get a little confusing. Once the parties have entered into the forward contract, the risk associated with the combination of the "thing" and the forward contract has disappeared. If Bob obligates himself to buy a Treasury bond for $1,000 in 30 days, the deal is complete and there is no possible change in the price that will be charged. If the forward contract and the bond are regarded as a single package, the creation of the forward contract has eliminated the risk that was inherent with holding a bond whose value might change.

Another way to analyze the bond/forward contract package is to consider the two pieces separately, and in this approach both pieces still contain risk. The risk associated with the bond is exactly the opposite of the risk associated with the forward contract, so as a package there is no risk. But if the components of the package are separated, each will exhibit a variability of returns, and that means each component does contain some risk.

Consider the bond by itself. Since the bond may really be worth more or less than $1,000 in 30 days time, both the buyer and the seller have a certain amount of financial risk due to this potential price change. But this risk is due to the underlying commodity and the market for that commodity, not the forward contract itself.

The forward contract by itself undergoes changes in value exactly opposite of the bond it was written for. If the forward contract requires that a bond with a market value of $1,050 must be sold for $1,000, the contract causes the person who sells the bond to lose $50 of market value while the person who buys the bond saves $50 on the purchase. If the forward contract traded separately from the bond, it would have a value for this reason. This variability in value is due to the price change of the bond, not because of the forward contract itself.

Since there is no risk due to the forward contract itself, it is not necessary for any type of payment to be made at the time the contract is made. If corn is going to be delivered next month, payment can be made at the time of delivery. If the contract commits to the delivery of a Treasury bond, payment can be made on delivery. When practical factors are considered, it is sometimes considered prudent to ask both parties to put up a "performance bond" (called the margin) in order to make sure that they both carry through on the contract, but there is no theoretical reason for requiring a payment for entering into a forward contract for either side of the contract.

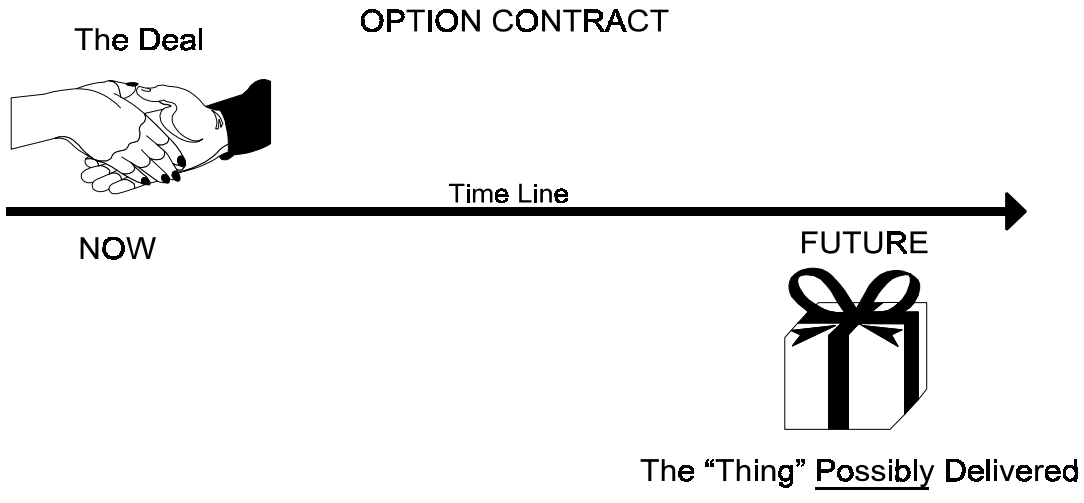
The whole question of risk and forward contracts really depends on how the contract is used in combination with the underlying "thing". If the forward and the "thing" are kept together as a package, the package has no risk. If the forward contract and the "thing" are separated, each piece can change in value, so each piece does contain risk. Parties that use forward contracts to remove risk by keeping the contract and the "thing" together are called hedgers. The forward contract has removed price risk and has allowed them to "hedge their bets". Parties that trade in forward contracts that stand alone (or in "things" that stand alone) are speculators. Their future returns are dependent on the market price for the "thing" that will exist at the maturity of the contract.

This brings up an interesting point that sometimes escapes the notice of critics of the financial markets. Anyone who is not a hedger is by definition a speculator. A farmer who does not use forward (futures) contracts to lock in the price he will get for his crop is speculating on what price will be in the future. His earnings will depend on factors beyond his control. The farmer who uses forward (futures) contracts to lock in a price for his crop is not subject to this variability of returns and therefore has lower or even no risk. The use of forward contracts can be a very effective risk reduction tool.

Another aspect of the forward contract needs to be mentioned again. The contract sets the time of the delivery of the "thing", but it does not matter what the "thing" is. Consider a mortgage loan at a bank. The borrower is expected to make monthly payments on the loan, which is the nature of a forward contract. If the loan happens to carry a variable interest rate, the size of the payment might change, but the obligation to fulfill the forward contract by making a timely payment still remains.

**The Option Contract**

Since the combination of a forward contract and the delivery of the underlying "thing" may exhibit some variation in financial returns because of the underlying commodity, the option contract was created to eliminate some of this variation. An option contract exists when two parties make a deal right now but the actual completion of the contract is delayed. So far this is just like a forward contract. But with an option contract one party (and only the party so specified in the contract) has the right to break the contract.



This little addition to the contract that allows one party to back out changes the entire nature of the contract and the types of deals that are made. Since the contract can be broken, neither party has eliminated risk; there is always the possibility that the contract may not be completed. It is possible, however, to discuss the nature of the risk faced by both parties.

Recall that the risk in a contract is really due to the nature of the underlying "thing". With the forward contract, the participant had no choice in whether or not he really wanted the outcome he got; once he bought the forward contract he was stuck. But with the option contract, he might have the ability to get out of the deal if he does not like the outcome. The ability to get out of the deal depends on which side of the contract he owns.

Suppose an investor is involved in an option contract to purchase a Treasury bond for $1,000 in 30 days. If his side of the contract allowed him the option to purchase the bond, he could buy the bond for $1,000 even if its market value were more than $1,000. But if the bond market had changed and the Treasury bond specified in the contract was only worth $900, he would tell the other party to the contract "No thanks". If the investor really wants the bond, he can purchase it on the open market and save $100. Since the option contract allows him to choose what will happen, he can walk away from a contract that has turned against him. The person on the other side of the contract, however, has no such choice. If the bond has a market value of more than $1,000, he will have to sell it for $1,000 and miss the opportunity to get a higher price elsewhere. If the bond has a market value of $900, the person who controls the contract will walk away from the deal and the person who has the bond can sell it for only $900.

The players in the game of options are called buyers and sellers. The buyer holds the option and has the choice of whether or not the contract is completed. The seller has no choice in the matter and must do whatever the buyer wants. Under these conditions, it might seem strange that anyone would want to be a seller. Since the buyer can decide what happens, the buyer will make sure that only good things happen to the buyer, which means only bad things will happen to the seller.

The terms “buyer” and “seller” tell something about the nature of the option contract. The seller of the option contract, the party who could get the short end of the stick, actually sells the contract to the buyer. Money, or some other form of payment, changes hands. It is this payment that induces the seller to go out on a limb and give the buyer the opportunity to profit in the future. It is not unreasonable to consider this type of contract a form of bet. The buyer purchases the contract (makes the bet), and if he is right he wins (completes the option contract). If the buyer was wrong and the value of the underlying "thing" drops, he does not complete the contract and loses the amount bet (the price of the option contract).

It should be mentioned that even though option contracts have certain characteristics similar to bets, there are differences. The biggest difference is the underlying "thing". Option contracts are usually written against financial or real assets, while bets typically involve animals (like dogs, horses, and football players) or toys (like cards, dice, and numbered ping pong balls). Options usually run for longer periods of time than bets. And most importantly, from a financial point of view, options can be used to hedge a portfolio of assets. Though an option contract is itself risky, it can be used in combination with other contracts to eliminate risk. This trick of combining two or more contracts that each include some risk and winding up with a combination that has no risk is one of the neatest tricks in finance. The various types of financial contracts can be used in combination to create just such a result.

Consider the party that you are going to cater next month, the one with the caviar (have you sent out the invitations yet?). Sergei, your local caviar merchant, is willing to enter into a forward contract with you, but you have read that caviar prices might come down during the next few weeks because the Russians are going to flood the market with caviar in order to raise hard currency to get on with their latest economic reform. If you enter into the forward contract today, you could wind up paying too much in a month relative to the prices that could be in the market at that time. However, if the Russians decide to hold back caviar to drive up prices before unloading the fish eggs, you might have to pay premium prices or go without caviar entirely and ruin the party.

Maybe you could get the caviar merchant to sell you an option contract. You would pay Sergei a fee to write a contract that would allow you to buy the caviar you wanted at a fixed price, say $20 a jar; however, if the market price of caviar drops you will have the right to back out of the contract. You now have the best of both worlds, a guaranteed ceiling price and the possibility of paying even less. Sergei has obligated himself to provide you with caviar unless you choose otherwise, and for this obligation he has taken a fee. (Note the similarity between this contract and a simple bet with Sergei about the price of caviar.)

It is now time to step back and give some serious thought to the matter of the fee that is paid to seller of the option. The seller of the option only makes money if the contract is canceled; he gets to keep the fee because the buyer lost the bet. But if the value of the underlying "thing" skyrockets, the buyer will surely complete the contract, and the seller will lose big. Buyers lose a little or win big, and sellers win a little or lose big.

The only way that this game can continue to be played is if the sellers of the options make enough to cover their losses. Those sellers who lose all their wealth are soon out of business, so they cannot be long-term players. There are two ways that sellers can make enough money to survive. They must either charge very high fees to write the contract, or they must write the contract so that they will win small bets (keep the fees) most of the time. The choice really lies with the buyer of the contract. As it turns out, buyers seem to prefer paying small fees and playing long odds. Sellers win the bet most of the time (the option contract is not completed) and lose big occasionally.

With the option contract, financial contracts gain the property of contingency. The completion of the contract is contingent on developments that occur after the contract was written. This property of contingency can be very valuable, and many complex financial contracts contain an option somewhere.

## Composite Contracts

The universe of financial contracts is really a simple place. Every financial contract written is some combination of the three basic contracts spot, forward, and option. Consider the following common financial contracts and just how they can be broken down into the basic contracts.

Debt

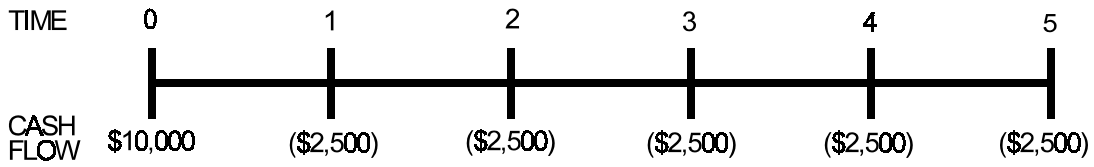
A debt contract occurs when one party borrows an amount of money and agrees to a fixed schedule of repayment. If Sarah finances a car, the lending institution provides her with a payment book, and she is expected to make each payment on time. When organizations like governments or businesses need money, they can borrow from individuals or other organizations. The key is that the payment schedule is set up in advance, and it cannot be changed except under certain, prespecified circumstances (and such changes usually carry a penalty for the payer).

As an example, suppose the Little Joe's Chicken Plucking Company (LJCP) needs to purchase a feather packaging machine (cost = $10,000), but LJCP does not have the money right now. Since Big Joe knows the president of the Friendly Finance Company (FFC), LJCP can get the loan at the interest rate of 10%. LJCP agrees to pay FFC $2,500 each year for the next five years in order to pay off the loan (this is equivalent to about 8% interest).

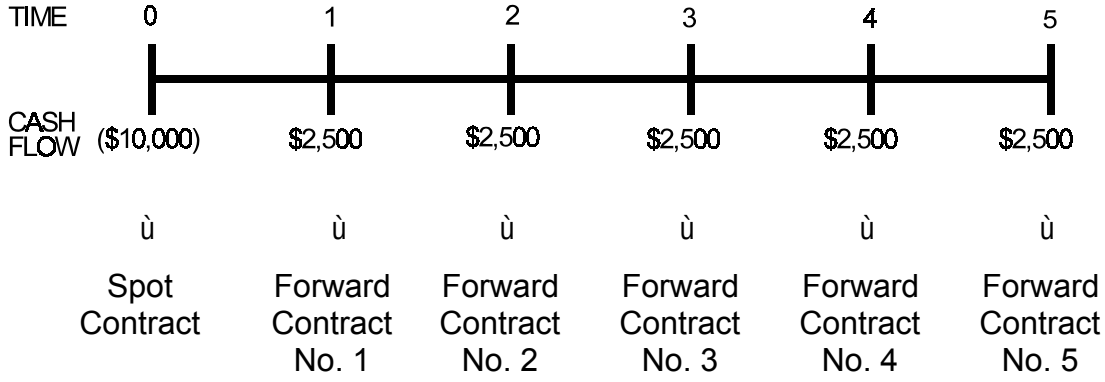
The loan contract specifies when each cash flow occurs. LJCP gets $10,000 right now and must make five future payments of $2,500 each. This entire debt contract is really just a spot contract combined with a series of five forward contracts. LJCP receives the $10,000 on the spot from FFC. In order to get the money, LJCP must accept one forward contract to pay $2,500 in one year, a second forward contract to pay $2,500 in two years, a third forward contract to pay $2,500 in three years, a fourth forward contract to pay $2,500 in four years, and a fifth forward contract to pay $2,500 in five years. Each of these contracts is a fixed obligation and cannot be changed. Both parties see the same cash

flows, although in different directions. (As is conventional in these types of diagrams, cash outflows are in brackets and cash inflows stand by themselves.)

Loan Cash Flows for LJCP




Loan Cash Flows for FFC



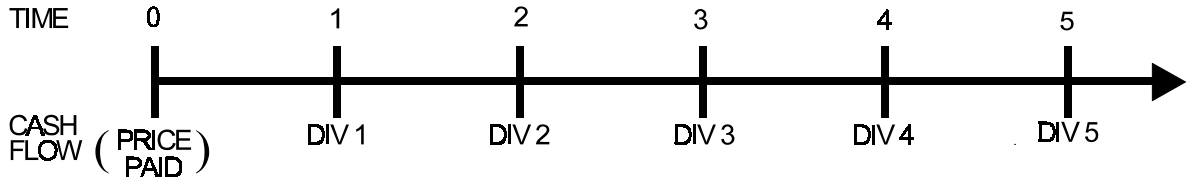

A corporate bond is merely another type of loan, one between individuals or companies and a firm rather than a bank and a firm. These differences only change the size and/or frequency of the payments. A corporate bond that pays interest semiannually for 20 years is just a spot contract combined with forty forward contracts. Since all the cash flows are known ahead of time, the analysis of this type of contract is fairly simple. Even if the debt contract has some unusual features, it can still be analyzed as a spot and forward contracts.

Debt contracts only rent money for a specified period of time, and that money is paid back under specific terms. This rental of money is no different than renting a physical asset, like a truck or a warehouse. The lenders of the money really do not care what the borrower does with the money, as long as the repayment is made according to the contract. In the case of LJCP, the amount borrowed and the interest charges were repaid as part of

the annual payment; this is called an amortized loan and is similar to the mortgage loans that most people have on their houses. A corporate bond is often structured so that the principal of the loan is due at the end of the contract as a balloon payment while the periodic payments just cover the interest charges. Either way, the debt contract is still a combination of the basic spot and forward contracts.

Equity

Equity is the broad term given to the type of contract that allows the holder to have "a piece of the action". The investor who buys an equity contract gives the firm an amount of money and expects to get dividends or capital gains in return. The dividends may be of a fixed size, as with preferred stock, or may depend on the earnings of the firm, as with common stock. The capital gains realized will depend on a complex set of factors which includes market conditions.




An equity contract is quite similar to a debt contract. It is a spot contract combined with a number of forward contracts. The major difference lies in the fact that the cash flows the equity holder receives, the dividends, are not guaranteed as to either size or delivery. Many companies pay dividends quarterly, and many firms try to pay a dividend of a predictable size. But if a company has a bad quarter, it does not have to pay the dividend. The amounts paid to the stockholders as dividends are variable and not fixed as they are with bondholders.

Suppose Carl owned common stock in the Little Joe's Chicken Plucking Company (LJCP). If the market for feathers falters and LJCP does not make any money, that "piece of the action" is not worth very much. Carl could sell his stock in LJCP if he wanted to, but the amount he would get for the stock would depend on conditions in the stock market. If

the market were going through a slump or even if the market was going great, there is no guarantee he will even be able to recover the original investment in LJCP.

Since there is a lot of potential variability in the return a person can earn from a share of stock, stock is considered risky. Debt contracts allow for no variability of return, so they are considered less risky than stock (debt additionally has some extra legal protection on the cash flows). With all the risk, it may be hard to imagine why anyone would want to purchase risky equity contracts. But recall that people usually consider risk and return together. If an equity contract offered the same potential return as a debt contract, no one would buy it. Equity contracts offer higher potential returns than debt, so investors consider all the possibilities and buy whichever type of contract serves their needs best.

Futures

Futures contracts are really simple. A futures contract is just a standardized forward contract. The forward contract for agricultural commodities turned out to be a very valuable invention. Both the farmers and the food processors could benefit from holding forward contracts; both sides used the contracts to reduce uncertainty of supplies and variability of prices. But forward contracts can be written for many different types of commodities and specify different delivery dates and locations.

The history of modern futures contracts begins in the 1700s, but in the United States, the formation of the Chicago Board of Trade (CBOT) in 1848 was the key event. The CBOT lead the way in standardizing forward contracts and providing a centralized location where the contracts could trade. The development of standardized contracts also drew new players into the game, the speculators. Speculators deal in futures contracts without any plan to deliver or to take delivery of the underlying commodities.

For all the fireworks associated with futures trading, the futures contracts are still forward contracts. Two parties are required to fulfill their obligations with regards to the delivery of certain commodities. An interesting development in futures trading has been

the extension of the definition of a commodity. Food products, like corn and wheat, are obvious candidates for futures contracts. But the modern world treats wood, metals, oil, and even money as commodities, and it is possible to deal in futures contracts on all these items. Any "thing" that is widely produced and widely used is a candidate for a futures contract.

It should be noted that there is a large market in forward contracts for certain commodities, like foreign exchange. Though futures contracts draw a lot of attention, pure forward contracts that are tailored to the needs of the individual participants still exist. The use of pure forward contracts is usually limited to specialized players in specialized situations.

Options

The options contracts that trade on the various exchanges are standardized forms of the basic option contract. Just as the forward market found it advantageous to standardize into futures contracts, the options market also uses standardized contracts (but the name did not change). There have developed many situations in which individuals would like to have the ability to "get out" of a contract, so option contracts have expanded to meet these needs.

Option contracts do much more than simply provide an escape route for one party of a contract. When used properly, options can be a valuable part of portfolio management and provide risk reduction or enhancement of portfolio income, and maybe some of both. Like many other contracts, though, it is possible for options to be misused by individuals who do not understand them, and these misuses can be dramatic. There is nothing inherently dangerous about an option contract, and a knowledgeable investor can use them to his advantage.

Other Financial Contracts

There are many more types of financial than those listed here. Bonds may have variable coupons or pay no interest at all. Equity securities can have different claims on

a firm's earnings. Options contracts can be written against futures contracts. Any time there is a need for something special for the financing of any project, a new financial security can be invented if the old ones cannot meet the requirements. Though some of these contracts may at first appear to be extremely strange, they are all combinations of the three basic contracts, the spot, the forward, and the option. By examining any complex contract as a mixture of basic contracts, it is possible to understand the who, what, and why of the deal.

## Summary

The field of finance is cluttered with many different types of financial contracts, and more are being invented everyday. Though at first it may seem impossible to understand all these different ways to make and lose money, these contracts can be best understood as combinations of three basic contracts, spot, forward, and option. All financial contracts, no matter how complex looking, are really just combinations of the three basic contracts. A clear understanding of the basic contracts and the ability to decompose the more complex contracts into their basic pieces will allow a person to identify those financial contracts which are appropriate.