

25.2: Forwards and Futures

Learning Objectives

- What is a forward contract and what is it used for?
- What is a futures contract and what is its economic purpose?

Imagine you want to throw a party at the end of the semester and have a budget of \$100 for beer. (If you are underage or a teetotaler think about root beer instead.) You know your buddies will drink up any (root) beer you bring into the house before the party so you have to wait until the day of the event to make your purchases. The problem is that the price of your favorite beer jumps around. Sometimes it costs \$20 per case but other times it is \$30. Having 5 cases of the good stuff would mean an awesome party but having 3 cases of the good stuff and a case of (insert your favorite word for bad \$10/case beer here) would be...like totally lame. What to do?

Buyers naturally fear increases in the prices of the things they want to own in the future. Sellers, by contrast, fear price decreases. Those mutual fears can lead to the creation of a financial instrument known as a forward. In a forward contract, a buyer and a seller agree *today* on the price of an asset to be purchased and delivered in the future. That way, the buyer knows precisely how much he will have to pay and the seller knows precisely how much she will receive. You could sign a forward contract with your beer distributor pegging the price of your favorite beer at \$25 per case and thus ensure that you will have 4 cases of the good stuff at your end of semester bash. Similarly, a farmer and a grocer could contract at planting to fix the price of watermelons, corn, and so forth at harvest time.

Agricultural forward contracts like that just described have been used for centuries if not millennia. Their use is limited by three major problems with forward contracts: (1) it is often costly/difficult to find a willing counterparty; (2) the market for forwards is illiquid due to their idiosyncratic nature so they are not easily sold to other parties if desired; (3) one party usually has an incentive to break the agreement. Imagine, for example, that the price of your favorite beer dropped to only \$15 per case. You might feel cheated at having to pay \$25 and renege on your promise. Conversely, if your beer went to \$40 per case the distributor might tell you to get lost when you tried to pay \$25 under the forward contract.

Exchanges like the Chicago Board Options Exchange (CBOE), Chicago Mercantile Exchange (CME), Chicago Board of Trade (CBOT), and Minneapolis Grain Exchange (MGEX) developed futures to obviate the difficulties with forward contracts by: (1) efficiently linking buyers and sellers; (2) developing standardized weights, definitions, standards, and expiration dates for widely traded commodities, currencies, and other assets; (3) enforcing contracts between counterparties. Each contract specifies the underlying asset (which ranges from bonds to currencies, butter to orange juice, ethanol to oil, and gold to uranium), its amount and quality grade, and the type (cash or physical) and date of settlement or contract expiration. CME, for example, offers a futures contract on copper in which physical settlement of 25,000 pounds of copper is due on any of the last three business days of the delivery month. www.cmegroup.com/trading/metals/base/copper_contract_specifications.html In many contracts, especially for financial assets, physical delivery is not desired or demanded. Instead, a cash settlement representing the difference between the contract price and the spot market price on the expiration date is made.

To lock in the price that it will have to *pay* for an asset in the future, a business should *purchase a futures contract*, thereby committing another party to supply it at the contract price. To lock in the price it will *receive* for an asset in the future, a business should *sell a futures contract*, thereby committing a buyer to purchase it at the contract price.

Here is a concrete example of how a futures contract can be used to hedge against price movements in an underlying asset: If you wanted to hedge the sale of 1 million barrels of crude oil you could sell a 3-month futures contract for \$100 per barrel. If the market price of crude was \$90 per barrel at the expiration date, you would get \$10 per barrel from the buyer of the contract plus the market price (\$90), or \$100 per barrel. If the market price of crude was \$110 at the end of the contract, by contrast, you would have to pay \$10 per barrel to the buyer of the contract. Again, you would net \$100 per barrel, \$110 in the market minus the \$10 paid to the contract counterparty.

To ensure that you would not renege in the latter case by not paying \$10 per barrel to the counterparty, futures exchanges require **margin accounts** and other safeguards. As the contract and market prices diverge, the incentive to default increases and exchanges know it. So they require investors to post bonds or to increase the deposits in their margin accounts or they will pay the money in the margin account to the counterparty and close the contract.

Stop and Think Box

Could a futures contract price ever be lower than the current market price? If not, why not? If so, how?

Futures contract prices will be lower than current market prices if market participants anticipate lower future prices due to deflation, changes in relative prices, or changes in supply or demand conditions. Cold weather in Florida, for example, can make orange juice futures soar on the expectation of a damaged crop (decreased supply) but unexpectedly mild weather in climatically marginal groves can have the opposite effect. Similarly, the expected completion of a new refinery might make gasoline futures decline.

KEY TAKEAWAYS

- Buyers and sellers can hedge or lock in the price they will pay/receive for assets in the future by contracting for the price today.
- Such contracts, called forwards, are costly to consummate, illiquid, and subject to high levels of default risk.
- Standardized forward contracts, called futures, were developed by exchanges to reduce the problems associated with forwards and have proliferated widely across asset classes.

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