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Styles of Options

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- **American style**
 - Can be exercised at any time before the expiration date
 - Most options are American style
 - All options on individual stocks are American style
- **European style**
 - Can be exercised only at the expiration date, at a pre-defined single point in time
 - Major index options are European style

American Style Options

- Can be exercised at any time before the expiration date
- When markets close for trading on the 3rd Friday of the month, the final price becomes the settlement price
 - Under current rules, if the option has intrinsic value (is in the money) it is automatically exercised
 - Owner may choose to instruct broker not to exercise
 - Call owner buys shares / call seller sells shares at the strike price
 - Put owner sells shares / put seller buys shares at the strike price
 - Example for 3rd Friday of December, IBM Dec 140 calls and puts:
 - If IBM closes 140.01 or higher, call owner pays \$14,000 for 100 shares IBM, and call seller receives \$14,000 in exchange for 100 shares IBM
 - If IBM closes 139.99 or lower, put owner receives \$14,000 in exchange for 100 shares of IBM, and put seller pays \$14,000 for 100 shares IBM
- Settlement takes place on Saturday

European Style Options

- Options Clearing Corporation will Automatically exercise European style options that are ITM on expiration date
- Options on major indexes are European
 - SPX: Standard & Poor's 500 Index
 - DJX: Dow Jones Industrial Average
 - NDX: NASDAQ 100 Index
 - RUT: Russell 2000 (small cap) Index
- Cash settled – no shares trade hands
 - Owners of options with intrinsic value receive the intrinsic value, and the funds are automatically deposited in their account
 - Sellers of options with intrinsic value have cash equal to the intrinsic value automatically removed from their account

European Style Options: Determination of Settlement Price

- Trading stops at the close of market on Thursday before the 3rd Friday of the expiration month
- The settlement price is determined Friday morning as each component of the index opens
- Index is calculated once all components have opened, based on each opening price, as if they had all been opened at the same time
- Settlement price is not a real price since components don't all open at the exact same time
- Official settlement price is published later in the day
 - May be higher than index high or lower than index low of day

European Style Options: Settlement Example

- Intrinsic value is determined by how much the index is in the money
- If OTM, the index option expires worthless and no cash is exchanged
- Example for SPX Dec 1200 calls and puts, and SPX settlement price on 3rd Friday of December is 1205.34
 - Call owner receives $(1205.34 - 1200.00) \times 100 = \534
 - Call seller pays \$534
 - Put owner receives nothing (loses premium)
 - Put seller pays nothing (keeps premium)