wikipedia_mining

May 26, 2025

Wikipedia Mining Kelvin Yeh

As the finance world becomes increasingly available to everyday people, so to does the volume of equities and derivatives being traded each day. One such derivative, options contracts, has been especially popular amongst retail traders. We will use data extraction and analysis tools to gain insight from the Wikipedia page on options.

ref: https://en.wikipedia.org/wiki/Option_(finance)

```python
[1]: import requests
     from bs4 import BeautifulSoup
```

```python
[2]: url = 'https://en.wikipedia.org/wiki/Option_(finance)'
     response = requests.get(url)
```

```python
[3]: soup = BeautifulSoup(response.text, 'html.parser')
     print(soup)
```

```
<!DOCTYPE html>

<html class="client-nojs vector-feature-language-in-header-enabled vector-
feature-language-in-main-page-header-disabled vector-feature-page-tools-pinned-
disabled vector-feature-toc-pinned-clientpref-1 vector-feature-main-menu-pinned-
disabled vector-feature-limited-width-clientpref-1 vector-feature-limited-width-
content-enabled vector-feature-custom-font-size-clientpref-1 vector-feature-
appearance-pinned-clientpref-1 vector-feature-night-mode-enabled skin-theme-
clientpref-day vector-sticky-header-enabled vector-toc-available" dir="ltr"
lang="en">
<head>
<meta charset="utf-8"/>
<title>Option (finance) - Wikipedia</title>
<script>(function(){var className="client-js vector-feature-language-in-header-
enabled vector-feature-language-in-main-page-header-disabled vector-feature-
page-tools-pinned-disabled vector-feature-toc-pinned-clientpref-1 vector-
feature-main-menu-pinned-disabled vector-feature-limited-width-clientpref-1
vector-feature-limited-width-content-enabled vector-feature-custom-font-size-
clientpref-1 vector-feature-appearance-pinned-clientpref-1 vector-feature-night-
mode-enabled skin-theme-clientpref-day vector-sticky-header-enabled vector-toc-
available";var cookie=document.cookie.match(/(?:^|; )enwikimwclientpreferences=(
[^;]+)/);if(cookie){cookie[1].split('%2C').forEach(function(pref){className=clas
```

sName.replace(new RegExp('(^|
)'+pref.replace(/-clientpref-\w+$|[^\w-]+/g,'')+'-clientpref-\\w+(|$)'),'$1'+pr
ef+'$2');});}document.documentElement.className=className;}());RLCONF={"wgBreakF
rames":false,"wgSeparatorTransformTable":["",""],"wgDigitTransformTable":["",""]
,"wgDefaultDateFormat":"dmy","wgMonthNames":["","January","February","March","Ap
ril","May","June","July","August","September","October","November","December"],"
wgRequestId":"92bb5c45-597a-4963-b207-
6f39933c97af","wgCanonicalNamespace":"","wgCanonicalSpecialPageName":false,"wgNa
mespaceNumber":0,"wgPageName":"Option_(finance)","wgTitle":"Option (finance)","w
gCurRevisionId":1282937596,"wgRevisionId":1282937596,"wgArticleId":9272073,"wgIs
Article":true,"wgIsRedirect":false,"wgAction":"view","wgUserName":null,"wgUserGr
oups":["*"],"wgCategories":["CS1: unfit URL","Articles with short
description","Short description is different from Wikidata","Use mdy dates from
August 2014","All articles with unsourced statements","Articles with unsourced
statements from December 2023","All articles lacking reliable
references","Articles lacking reliable references from August 2013","CS1 maint:
location missing publisher","Options (finance)","Contract law"],"wgPageViewLangu
age":"en","wgPageContentLanguage":"en","wgPageContentModel":"wikitext","wgReleva
ntPageName":"Option_(finance)","wgRelevantArticleId":9272073,"wgIsProbablyEditab
le":true,"wgRelevantPageIsProbablyEditable":true,"wgRestrictionEdit":[],"wgRestr
ictionMove":[],"wgNoticeProject":"wikipedia","wgCiteReferencePreviewsActive":fal
se,"wgFlaggedRevsParams":{"tags":{"status":{"levels":1}}},"wgMediaViewerOnClick"
:true,"wgMediaViewerEnabledByDefault":true,"wgPopupsFlags":0,"wgVisualEditor":{"
pageLanguageCode":"en","pageLanguageDir":"ltr","pageVariantFallbacks":"en"},"wgM
FDisplayWikibaseDescriptions":{"search":true,"watchlist":true,"tagline":false,"n
earby":true},"wgWMESchemaEditAttemptStepOversample":false,"wgWMEPageLength":5000
0,"wgEditSubmitButtonLabelPublish":true,"wgULSPosition":"interlanguage","wgULSis
CompactLinksEnabled":false,"wgVector2022LanguageInHeader":true,"wgULSisLanguageS
electorEmpty":false,"wgWikibaseItemId":"Q187860","wgCheckUserClientHintsHeadersJ
sApi":["brands","architecture","bitness","fullVersionList","mobile","model","pla
tform","platformVersion"],"GEHomepageSuggestedEditsEnableTopics":true,"wgGETopic
sMatchModeEnabled":false,"wgGELevelingUpEnabledForUser":false};
RLSTATE={"ext.globalCssJs.user.styles":"ready","site.styles":"ready","user.style
s":"ready","ext.globalCssJs.user":"ready","user":"ready","user.options":"loading
","ext.cite.styles":"ready","ext.math.styles":"ready","skins.vector.search.codex
.styles":"ready","skins.vector.styles":"ready","skins.vector.icons":"ready","jqu
ery.makeCollapsible.styles":"ready","ext.wikimediamessages.styles":"ready","ext.
visualEditor.desktopArticleTarget.noscript":"ready","ext.uls.interlanguage":"rea
dy","wikibase.client.init":"ready","ext.wikimediaBadges":"ready"};RLPAGEMODULES=
["ext.cite.ux-enhancements","mediawiki.page.media","site","mediawiki.page.ready"
,"jquery.makeCollapsible","mediawiki.toc","skins.vector.js","ext.centralNotice.g
eoIP","ext.centralNotice.startUp","ext.gadget.ReferenceTooltips","ext.gadget.swi
tcher","ext.urlShortener.toolbar","ext.centralauth.centralautologin","mmv.bootst
rap","ext.popups","ext.visualEditor.desktopArticleTarget.init","ext.visualEditor
.targetLoader","ext.echo.centralauth","ext.eventLogging","ext.wikimediaEvents","
ext.navigationTiming","ext.uls.interface","ext.cx.eventlogging.campaigns","ext.c
x.uls.quick.actions","wikibase.client.vector-
2022","ext.checkUser.clientHints","ext.quicksurveys.init","ext.growthExperiments

```
.SuggestedEditSession"];</script>
<script>(RLQ=window.RLQ||[]).push(function(){mw.loader.impl(function(){return["u
ser.options@12s5i",function($,jQuery,require,module){mw.user.tokens.set({"patrol
Token":"+\\","watchToken":"+\\","csrfToken":"+\\"});
}];});});</script>
<link href="/w/load.php?lang=en&amp;modules=ext.cite.styles%7Cext.math.styles%7C
ext.uls.interlanguage%7Cext.visualEditor.desktopArticleTarget.noscript%7Cext.wik
imediaBadges%7Cext.wikimediamessages.styles%7Cjquery.makeCollapsible.styles%7Csk
ins.vector.icons%2Cstyles%7Cskins.vector.search.codex.styles%7Cwikibase.client.i
nit&amp;only=styles&amp;skin=vector-2022" rel="stylesheet"/>
<script async="" src="/w/load.php?lang=en&amp;modules=startup&amp;only=scripts&a
mp;raw=1&amp;skin=vector-2022"></script>
<meta content="" name="ResourceLoaderDynamicStyles"/>
<link href="/w/load.php?lang=en&amp;modules=site.styles&amp;only=styles&amp;skin
=vector-2022" rel="stylesheet"/>
<meta content="MediaWiki 1.45.0-wmf.2" name="generator"/>
<meta content="origin" name="referrer"/>
<meta content="origin-when-cross-origin" name="referrer"/>
<meta content="max-image-preview:standard" name="robots"/>
<meta content="telephone=no" name="format-detection"/>
<meta content="width=1120" name="viewport"/>
<meta content="Option (finance) - Wikipedia" property="og:title"/>
<meta content="website" property="og:type"/>
<link href="//upload.wikimedia.org" rel="preconnect"/>
<link href="//en.m.wikipedia.org/wiki/Option_(finance)" media="only screen and
(max-width: 640px)" rel="alternate"/>
<link href="/w/index.php?title=Option_(finance)&amp;action=edit" rel="alternate"
title="Edit this page" type="application/x-wiki"/>
<link href="/static/apple-touch/wikipedia.png" rel="apple-touch-icon"/>
<link href="/static/favicon/wikipedia.ico" rel="icon"/>
<link href="/w/rest.php/v1/search" rel="search" title="Wikipedia (en)"
type="application/opensearchdescription+xml"/>
<link href="//en.wikipedia.org/w/api.php?action=rsd" rel="EditURI"
type="application/rsd+xml"/>
<link href="https://en.wikipedia.org/wiki/Option_(finance)" rel="canonical"/>
<link href="https://creativecommons.org/licenses/by-sa/4.0/deed.en"
rel="license"/>
<link href="/w/index.php?title=Special:RecentChanges&amp;feed=atom"
rel="alternate" title="Wikipedia Atom feed" type="application/atom+xml"/>
<link href="//meta.wikimedia.org" rel="dns-prefetch">
<link href="auth.wikimedia.org" rel="dns-prefetch"/>
</link></head>
<body class="skin--responsive skin-vector skin-vector-search-vue mediawiki ltr
sitedir-ltr mw-hide-empty-elt ns-0 ns-subject mw-editable page-Option_finance
rootpage-Option_finance skin-vector-2022 action-view"><a class="mw-jump-link"
href="#bodyContent">Jump to content</a>
<div class="vector-header-container">
<header class="vector-header mw-header no-font-mode-scale">
```

```
<div class="vector-header-start">
<nav aria-label="Site" class="vector-main-menu-landmark">
<div class="vector-dropdown vector-main-menu-dropdown vector-button-flush-left
vector-button-flush-right" id="vector-main-menu-dropdown" title="Main menu">
<input aria-haspopup="true" aria-label="Main menu" class="vector-dropdown-
checkbox" data-event-name="ui.dropdown-vector-main-menu-dropdown" id="vector-
main-menu-dropdown-checkbox" role="button" type="checkbox"/>
<label aria-hidden="true" class="vector-dropdown-label cdx-button cdx-button--
fake-button cdx-button--fake-button--enabled cdx-button--weight-quiet cdx-button
--icon-only" for="vector-main-menu-dropdown-checkbox" id="vector-main-menu-
dropdown-label"><span class="vector-icon mw-ui-icon-menu mw-ui-icon-wikimedia-
menu"></span>
<span class="vector-dropdown-label-text">Main menu</span>
</label>
<div class="vector-dropdown-content">
<div class="vector-unpinned-container" id="vector-main-menu-unpinned-container">
<div class="vector-main-menu vector-pinnable-element" id="vector-main-menu">
<div class="vector-pinnable-header vector-main-menu-pinnable-header vector-
pinnable-header-unpinned" data-feature-name="main-menu-pinned" data-pinnable-
element-id="vector-main-menu" data-pinned-container-id="vector-main-menu-pinned-
container" data-unpinned-container-id="vector-main-menu-unpinned-container">
<div class="vector-pinnable-header-label">Main menu</div>
<button class="vector-pinnable-header-toggle-button vector-pinnable-header-pin-
button" data-event-name="pinnable-header.vector-main-menu.pin">move to
sidebar</button>
<button class="vector-pinnable-header-toggle-button vector-pinnable-header-
unpin-button" data-event-name="pinnable-header.vector-main-
menu.unpin">hide</button>
</div>
<div class="vector-menu mw-portlet mw-portlet-navigation" id="p-navigation">
<div class="vector-menu-heading">
                Navigation
        </div>
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="mw-list-item" id="n-mainpage-description"><a accesskey="z"
href="/wiki/Main_Page" title="Visit the main page [z]"><span>Main
page</span></a></li><li class="mw-list-item" id="n-contents"><a
href="/wiki/Wikipedia:Contents" title="Guides to browsing
Wikipedia"><span>Contents</span></a></li><li class="mw-list-item"
id="n-currentevents"><a href="/wiki/Portal:Current_events" title="Articles
related to current events"><span>Current events</span></a></li><li class="mw-
list-item" id="n-randompage"><a accesskey="x" href="/wiki/Special:Random"
title="Visit a randomly selected article [x]"><span>Random
article</span></a></li><li class="mw-list-item" id="n-aboutsite"><a
href="/wiki/Wikipedia:About" title="Learn about Wikipedia and how it
works"><span>About Wikipedia</span></a></li><li class="mw-list-item"
id="n-contactpage"><a href="//en.wikipedia.org/wiki/Wikipedia:Contact_us"
```

```
title="How to contact Wikipedia"><span>Contact us</span></a></li>
</ul>
</div>
</div>
<div class="vector-menu mw-portlet mw-portlet-interaction" id="p-interaction">
<div class="vector-menu-heading">
                Contribute
        </div>
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="mw-list-item" id="n-help"><a href="/wiki/Help:Contents"
title="Guidance on how to use and edit Wikipedia"><span>Help</span></a></li><li
class="mw-list-item" id="n-introduction"><a href="/wiki/Help:Introduction"
title="Learn how to edit Wikipedia"><span>Learn to edit</span></a></li><li
class="mw-list-item" id="n-portal"><a href="/wiki/Wikipedia:Community_portal"
title="The hub for editors"><span>Community portal</span></a></li><li class="mw-
list-item" id="n-recentchanges"><a accesskey="r"
href="/wiki/Special:RecentChanges" title="A list of recent changes to Wikipedia
[r]"><span>Recent changes</span></a></li><li class="mw-list-item"
id="n-upload"><a href="/wiki/Wikipedia:File_upload_wizard" title="Add images or
other media for use on Wikipedia"><span>Upload file</span></a></li><li
class="mw-list-item" id="n-specialpages"><a
href="/wiki/Special:SpecialPages"><span>Special pages</span></a></li>
</ul>
</div>
</div>
</div>
</div>
</div>
</div>
</nav>
<a class="mw-logo" href="/wiki/Main_Page">
<img alt="" aria-hidden="true" class="mw-logo-icon" height="50"
src="/static/images/icons/wikipedia.png" width="50"/>
<span class="mw-logo-container skin-invert">
<img alt="Wikipedia" class="mw-logo-wordmark"
src="/static/images/mobile/copyright/wikipedia-wordmark-en.svg" style="width:
7.5em; height: 1.125em;"/>
<img alt="The Free Encyclopedia" class="mw-logo-tagline" height="13"
src="/static/images/mobile/copyright/wikipedia-tagline-en.svg" style="width:
7.3125em; height: 0.8125em;" width="117"/>
</span>
</a>
</div>
<div class="vector-header-end">
<div class="vector-search-box-vue vector-search-box-collapses vector-search-box-
show-thumbnail vector-search-box-auto-expand-width vector-search-box"
id="p-search" role="search">
```

```
<a accesskey="f" class="cdx-button cdx-button--fake-button cdx-button--fake-
button--enabled cdx-button--weight-quiet cdx-button--icon-only search-toggle"
href="/wiki/Special:Search" title="Search Wikipedia [f]"><span class="vector-
icon mw-ui-icon-search mw-ui-icon-wikimedia-search"></span>
<span>Search</span>
</a>
<div class="vector-typeahead-search-container">
<div class="cdx-typeahead-search cdx-typeahead-search--show-thumbnail cdx-
typeahead-search--auto-expand-width">
<form action="/w/index.php" class="cdx-search-input cdx-search-input--has-end-
button" id="searchform">
<div class="cdx-search-input__input-wrapper" data-search-loc="header-moved"
id="simpleSearch">
<div class="cdx-text-input cdx-text-input--has-start-icon">
<input accesskey="f" aria-label="Search Wikipedia" autocapitalize="sentences"
class="cdx-text-input__input mw-searchInput" id="searchInput" name="search"
placeholder="Search Wikipedia" spellcheck="false" title="Search Wikipedia [f]"
type="search"/>
<span class="cdx-text-input__icon cdx-text-input__start-icon"></span>
</div>
<input name="title" type="hidden" value="Special:Search"/>
</div>
<button class="cdx-button cdx-search-input__end-button">Search</button>
</form>
</div>
</div>
</div>
<nav aria-label="Personal tools" class="vector-user-links vector-user-links-
wide">
<div class="vector-user-links-main">
<div class="vector-menu mw-portlet emptyPortlet" id="p-vector-user-menu-
preferences">
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
</ul>
</div>
</div>
<div class="vector-menu mw-portlet emptyPortlet" id="p-vector-user-menu-
userpage">
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
</ul>
</div>
</div>
<nav aria-label="Appearance" class="vector-appearance-landmark">
<div class="vector-dropdown" id="vector-appearance-dropdown" title="Change the
appearance of the page's font size, width, and color">
<input aria-haspopup="true" aria-label="Appearance" class="vector-dropdown-
```

```
checkbox" data-event-name="ui.dropdown-vector-appearance-dropdown" id="vector-
appearance-dropdown-checkbox" role="button" type="checkbox"/>
<label aria-hidden="true" class="vector-dropdown-label cdx-button cdx-button--
fake-button cdx-button--fake-button--enabled cdx-button--weight-quiet cdx-button
--icon-only" for="vector-appearance-dropdown-checkbox" id="vector-appearance-
dropdown-label"><span class="vector-icon mw-ui-icon-appearance mw-ui-icon-
wikimedia-appearance"></span>
<span class="vector-dropdown-label-text">Appearance</span>
</label>
<div class="vector-dropdown-content">
<div class="vector-unpinned-container" id="vector-appearance-unpinned-
container">
</div>
</div>
</div>
</nav>
<div class="vector-menu mw-portlet emptyPortlet" id="p-vector-user-menu-
notifications">
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
</ul>
</div>
</div>
<div class="vector-menu mw-portlet" id="p-vector-user-menu-overflow">
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="user-links-collapsible-item mw-list-item user-links-collapsible-item"
id="pt-sitesupport-2"><a class="" data-mw="interface" href="https://donate.wikim
edia.org/?wmf_source=donate&amp;wmf_medium=sidebar&amp;wmf_campaign=en.wikipedia
.org&amp;uselang=en"><span>Donate</span></a>
</li>
<li class="user-links-collapsible-item mw-list-item user-links-collapsible-item"
id="pt-createaccount-2"><a class="" data-mw="interface" href="/w/index.php?title
=Special:CreateAccount&amp;returnto=Option+%28finance%29" title="You are
encouraged to create an account and log in; however, it is not
mandatory"><span>Create account</span></a>
</li>
<li class="user-links-collapsible-item mw-list-item user-links-collapsible-item"
id="pt-login-2"><a accesskey="o" class="" data-mw="interface"
href="/w/index.php?title=Special:UserLogin&amp;returnto=Option+%28finance%29"
title="You're encouraged to log in; however, it's not mandatory. [o]"><span>Log
in</span></a>
</li>
</ul>
</div>
</div>
<div class="vector-dropdown vector-user-menu vector-button-flush-right vector-
```

```
user-menu-logged-out" id="vector-user-links-dropdown" title="Log in and more
options">
<input aria-haspopup="true" aria-label="Personal tools" class="vector-dropdown-
checkbox" data-event-name="ui.dropdown-vector-user-links-dropdown" id="vector-
user-links-dropdown-checkbox" role="button" type="checkbox"/>
<label aria-hidden="true" class="vector-dropdown-label cdx-button cdx-button--
fake-button cdx-button--fake-button--enabled cdx-button--weight-quiet cdx-button
--icon-only" for="vector-user-links-dropdown-checkbox" id="vector-user-links-
dropdown-label"><span class="vector-icon mw-ui-icon-ellipsis mw-ui-icon-
wikimedia-ellipsis"></span>
<span class="vector-dropdown-label-text">Personal tools</span>
</label>
<div class="vector-dropdown-content">
<div class="vector-menu mw-portlet mw-portlet-personal user-links-collapsible-
item" id="p-personal" title="User menu">
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="user-links-collapsible-item mw-list-item" id="pt-sitesupport"><a href
="https://donate.wikimedia.org/?wmf_source=donate&amp;wmf_medium=sidebar&amp;wmf
_campaign=en.wikipedia.org&amp;uselang=en"><span>Donate</span></a></li><li
class="user-links-collapsible-item mw-list-item" id="pt-createaccount"><a href="
/w/index.php?title=Special:CreateAccount&amp;returnto=Option+%28finance%29"
title="You are encouraged to create an account and log in; however, it is not
mandatory"><span class="vector-icon mw-ui-icon-userAdd mw-ui-icon-wikimedia-
userAdd"></span> <span>Create account</span></a></li><li class="user-links-
collapsible-item mw-list-item" id="pt-login"><a accesskey="o"
href="/w/index.php?title=Special:UserLogin&amp;returnto=Option+%28finance%29"
title="You're encouraged to log in; however, it's not mandatory. [o]"><span
class="vector-icon mw-ui-icon-logIn mw-ui-icon-wikimedia-logIn"></span>
<span>Log in</span></a></li>
</ul>
</div>
</div>
<div class="vector-menu mw-portlet mw-portlet-user-menu-anon-editor" id="p-user-
menu-anon-editor">
<div class="vector-menu-heading">
                Pages for logged out editors <a aria-label="Learn more about
editing" href="/wiki/Help:Introduction"><span>learn more</span></a>
</div>
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="mw-list-item" id="pt-anoncontribs"><a accesskey="y"
href="/wiki/Special:MyContributions" title="A list of edits made from this IP
address [y]"><span>Contributions</span></a></li><li class="mw-list-item" id="pt-
anontalk"><a accesskey="n" href="/wiki/Special:MyTalk" title="Discussion about
edits from this IP address [n]"><span>Talk</span></a></li>
</ul>
</div>
```

```
</div>
</div>
</div>
</nav>
</div>
</header>
</div>
<div class="mw-page-container">
<div class="mw-page-container-inner">
<div class="vector-sitenotice-container">
<div id="siteNotice"><!-- CentralNotice --></div>
</div>
<div class="vector-column-start">
<div class="vector-main-menu-container">
<div id="mw-navigation">
<nav aria-label="Site" class="vector-main-menu-landmark" id="mw-panel">
<div class="vector-pinned-container" id="vector-main-menu-pinned-container">
</div>
</nav>
</div>
</div>
<div class="vector-sticky-pinned-container">
<nav aria-label="Contents" class="mw-table-of-contents-container vector-toc-
landmark" data-event-name="ui.sidebar-toc" id="mw-panel-toc">
<div class="vector-pinned-container" id="vector-toc-pinned-container">
<div class="vector-toc vector-pinnable-element" id="vector-toc">
<div class="vector-pinnable-header vector-toc-pinnable-header vector-pinnable-
header-pinned" data-feature-name="toc-pinned" data-pinnable-element-id="vector-
toc">
<h2 class="vector-pinnable-header-label">Contents</h2>
<button class="vector-pinnable-header-toggle-button vector-pinnable-header-pin-
button" data-event-name="pinnable-header.vector-toc.pin">move to
sidebar</button>
<button class="vector-pinnable-header-toggle-button vector-pinnable-header-
unpin-button" data-event-name="pinnable-header.vector-toc.unpin">hide</button>
</div>
<ul class="vector-toc-contents" id="mw-panel-toc-list">
<li class="vector-toc-list-item vector-toc-level-1" id="toc-mw-content-text">
<a class="vector-toc-link" href="#">
<div class="vector-toc-text">(Top)</div>
</a>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-
Definition_and_application">
<a class="vector-toc-link" href="#Definition_and_application">
<div class="vector-toc-text">
<span class="vector-toc-numb">1</span>
<span>Definition and application</span>
```

```html
</div>
</a>
<ul class="vector-toc-list" id="toc-Definition_and_application-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-History">
<a class="vector-toc-link" href="#History">
<div class="vector-toc-text">
<span class="vector-toc-numb">2</span>
<span>History</span>
</div>
</a>
<button aria-controls="toc-History-sublist" class="cdx-button cdx-button--
weight-quiet cdx-button--icon-only vector-toc-toggle">
<span class="vector-icon mw-ui-icon-wikimedia-expand"></span>
<span>Toggle History subsection</span>
</button>
<ul class="vector-toc-list" id="toc-History-sublist">
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
Historical_uses_of_options">
<a class="vector-toc-link" href="#Historical_uses_of_options">
<div class="vector-toc-text">
<span class="vector-toc-numb">2.1</span>
<span>Historical uses of options</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Historical_uses_of_options-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
Modern_stock_options">
<a class="vector-toc-link" href="#Modern_stock_options">
<div class="vector-toc-text">
<span class="vector-toc-numb">2.2</span>
<span>Modern stock options</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Modern_stock_options-sublist">
</ul>
</li>
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-
Contract_specifications">
<a class="vector-toc-link" href="#Contract_specifications">
<div class="vector-toc-text">
<span class="vector-toc-numb">3</span>
<span>Contract specifications</span>
```

```
</div>
</a>
<ul class="vector-toc-list" id="toc-Contract_specifications-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-Option_trading">
<a class="vector-toc-link" href="#Option_trading">
<div class="vector-toc-text">
<span class="vector-toc-numb">4</span>
<span>Option trading</span>
</div>
</a>
<button aria-controls="toc-Option_trading-sublist" class="cdx-button cdx-button
--weight-quiet cdx-button--icon-only vector-toc-toggle">
<span class="vector-icon mw-ui-icon-wikimedia-expand"></span>
<span>Toggle Option trading subsection</span>
</button>
<ul class="vector-toc-list" id="toc-Option_trading-sublist">
<li class="vector-toc-list-item vector-toc-level-2" id="toc-Forms_of_trading">
<a class="vector-toc-link" href="#Forms_of_trading">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.1</span>
<span>Forms of trading</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Forms_of_trading-sublist">
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Exchange-
traded_options">
<a class="vector-toc-link" href="#Exchange-traded_options">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.1.1</span>
<span>Exchange-traded options</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Exchange-traded_options-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Over-the-
counter_options">
<a class="vector-toc-link" href="#Over-the-counter_options">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.1.2</span>
<span>Over-the-counter options</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Over-the-counter_options-sublist">
</ul>
</li>
```

```
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-Exchange_trading">
<a class="vector-toc-link" href="#Exchange_trading">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.2</span>
<span>Exchange trading</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Exchange_trading-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
Basic_trades_(American_style)">
<a class="vector-toc-link" href="#Basic_trades_(American_style)">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.3</span>
<span>Basic trades (American style)</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Basic_trades_(American_style)-sublist">
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Long_call">
<a class="vector-toc-link" href="#Long_call">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.3.1</span>
<span>Long call</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Long_call-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Long_put">
<a class="vector-toc-link" href="#Long_put">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.3.2</span>
<span>Long put</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Long_put-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Short_call">
<a class="vector-toc-link" href="#Short_call">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.3.3</span>
<span>Short call</span>
</div>
</a>
```

```html
<ul class="vector-toc-list" id="toc-Short_call-sublist">
</ul>
</li>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Short_put">
<a class="vector-toc-link" href="#Short_put">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.3.4</span>
<span>Short put</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Short_put-sublist">
</ul>
</li>
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-Options_strategies">
<a class="vector-toc-link" href="#Options_strategies">
<div class="vector-toc-text">
<span class="vector-toc-numb">4.4</span>
<span>Options strategies</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Options_strategies-sublist">
</ul>
</li>
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-Types">
<a class="vector-toc-link" href="#Types">
<div class="vector-toc-text">
<span class="vector-toc-numb">5</span>
<span>Types</span>
</div>
</a>
<button aria-controls="toc-Types-sublist" class="cdx-button cdx-button--weight-
quiet cdx-button--icon-only vector-toc-toggle">
<span class="vector-icon mw-ui-icon-wikimedia-expand"></span>
<span>Toggle Types subsection</span>
</button>
<ul class="vector-toc-list" id="toc-Types-sublist">
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
According_to_the_option_rights">
<a class="vector-toc-link" href="#According_to_the_option_rights">
<div class="vector-toc-text">
<span class="vector-toc-numb">5.1</span>
<span>According to the option rights</span>
</div>
</a>
```

```
<ul class="vector-toc-list" id="toc-According_to_the_option_rights-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
According_to_the_delivery_type">
<a class="vector-toc-link" href="#According_to_the_delivery_type">
<div class="vector-toc-text">
<span class="vector-toc-numb">5.2</span>
<span>According to the delivery type</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-According_to_the_delivery_type-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
According_to_the_underlying_assets">
<a class="vector-toc-link" href="#According_to_the_underlying_assets">
<div class="vector-toc-text">
<span class="vector-toc-numb">5.3</span>
<span>According to the underlying assets</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-According_to_the_underlying_assets-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-Other_option_types">
<a class="vector-toc-link" href="#Other_option_types">
<div class="vector-toc-text">
<span class="vector-toc-numb">5.4</span>
<span>Other option types</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Other_option_types-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-Option_styles">
<a class="vector-toc-link" href="#Option_styles">
<div class="vector-toc-text">
<span class="vector-toc-numb">5.5</span>
<span>Option styles</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Option_styles-sublist">
</ul>
</li>
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-Valuation">
```

```
<a class="vector-toc-link" href="#Valuation">
<div class="vector-toc-text">
<span class="vector-toc-numb">6</span>
<span>Valuation</span>
</div>
</a>
<button aria-controls="toc-Valuation-sublist" class="cdx-button cdx-button--
weight-quiet cdx-button--icon-only vector-toc-toggle">
<span class="vector-icon mw-ui-icon-wikimedia-expand"></span>
<span>Toggle Valuation subsection</span>
</button>
<ul class="vector-toc-list" id="toc-Valuation-sublist">
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
Basic_decomposition">
<a class="vector-toc-link" href="#Basic_decomposition">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.1</span>
<span>Basic decomposition</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Basic_decomposition-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-Valuation_models">
<a class="vector-toc-link" href="#Valuation_models">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.2</span>
<span>Valuation models</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Valuation_models-sublist">
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Black-Scholes">
<a class="vector-toc-link" href="#Black-Scholes">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.2.1</span>
<span>Black-Scholes</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Black-Scholes-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-
Stochastic_volatility_models">
<a class="vector-toc-link" href="#Stochastic_volatility_models">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.2.2</span>
<span>Stochastic volatility models</span>
</div>
```

```
</a>
<ul class="vector-toc-list" id="toc-Stochastic_volatility_models-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Short-rate_models">
<a class="vector-toc-link" href="#Short-rate_models">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.2.3</span>
<span>Short-rate models</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Short-rate_models-sublist">
</ul>
</li>
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
Model_implementation">
<a class="vector-toc-link" href="#Model_implementation">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.3</span>
<span>Model implementation</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Model_implementation-sublist">
<li class="vector-toc-list-item vector-toc-level-3" id="toc-
Analytic_techniques">
<a class="vector-toc-link" href="#Analytic_techniques">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.3.1</span>
<span>Analytic techniques</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Analytic_techniques-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-
Binomial_tree_pricing_model">
<a class="vector-toc-link" href="#Binomial_tree_pricing_model">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.3.2</span>
<span>Binomial tree pricing model</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Binomial_tree_pricing_model-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Monte_Carlo_models">
```

```
<a class="vector-toc-link" href="#Monte_Carlo_models">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.3.3</span>
<span>Monte Carlo models</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Monte_Carlo_models-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-
Finite_difference_models">
<a class="vector-toc-link" href="#Finite_difference_models">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.3.4</span>
<span>Finite difference models</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Finite_difference_models-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-3" id="toc-Other_models">
<a class="vector-toc-link" href="#Other_models">
<div class="vector-toc-text">
<span class="vector-toc-numb">6.3.5</span>
<span>Other models</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Other_models-sublist">
</ul>
</li>
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-Risks">
<a class="vector-toc-link" href="#Risks">
<div class="vector-toc-text">
<span class="vector-toc-numb">7</span>
<span>Risks</span>
</div>
</a>
<button aria-controls="toc-Risks-sublist" class="cdx-button cdx-button--weight-
quiet cdx-button--icon-only vector-toc-toggle">
<span class="vector-icon mw-ui-icon-wikimedia-expand"></span>
<span>Toggle Risks subsection</span>
</button>
<ul class="vector-toc-list" id="toc-Risks-sublist">
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
```

```
</div>
</a>
<button aria-controls="toc-Options_exchanges-sublist" class="cdx-button cdx-
button--weight-quiet cdx-button--icon-only vector-toc-toggle">
<span class="vector-icon mw-ui-icon-wikimedia-expand"></span>
<span>Toggle Options exchanges subsection</span>
</button>
<ul class="vector-toc-list" id="toc-Options_exchanges-sublist">
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
Chicago_Board_Options_Exchange_(CBOE)">
<a class="vector-toc-link" href="#Chicago_Board_Options_Exchange_(CBOE)">
<div class="vector-toc-text">
<span class="vector-toc-numb">8.1</span>
<span>Chicago Board Options Exchange (CBOE)</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-
Chicago_Board_Options_Exchange_(CBOE)-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-NASDAQ_OMX_PHLX">
<a class="vector-toc-link" href="#NASDAQ_OMX_PHLX">
<div class="vector-toc-text">
<span class="vector-toc-numb">8.2</span>
<span>NASDAQ OMX PHLX</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-NASDAQ_OMX_PHLX-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
International_Securities_Exchange_(ISE)">
<a class="vector-toc-link" href="#International_Securities_Exchange_(ISE)">
<div class="vector-toc-text">
<span class="vector-toc-numb">8.3</span>
<span>International Securities Exchange (ISE)</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-
International_Securities_Exchange_(ISE)-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-Eurex_Exchange">
<a class="vector-toc-link" href="#Eurex_Exchange">
<div class="vector-toc-text">
<span class="vector-toc-numb">8.4</span>
<span>Eurex Exchange</span>
</div>
```

```html
</a>
<ul class="vector-toc-list" id="toc-Eurex_Exchange-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-2" id="toc-
Tokyo_Stock_Exchange_(TSE)">
<a class="vector-toc-link" href="#Tokyo_Stock_Exchange_(TSE)">
<div class="vector-toc-text">
<span class="vector-toc-numb">8.5</span>
<span>Tokyo Stock Exchange (TSE)</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Tokyo_Stock_Exchange_(TSE)-sublist">
</ul>
</li>
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-See_also">
<a class="vector-toc-link" href="#See_also">
<div class="vector-toc-text">
<span class="vector-toc-numb">9</span>
<span>See also</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-See_also-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-References">
<a class="vector-toc-link" href="#References">
<div class="vector-toc-text">
<span class="vector-toc-numb">10</span>
<span>References</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-References-sublist">
</ul>
</li>
<li class="vector-toc-list-item vector-toc-level-1" id="toc-Further_reading">
<a class="vector-toc-link" href="#Further_reading">
<div class="vector-toc-text">
<span class="vector-toc-numb">11</span>
<span>Further reading</span>
</div>
</a>
<ul class="vector-toc-list" id="toc-Further_reading-sublist">
</ul>
</li>
</ul>
```

```
</div>
</div>
</nav>
</div>
</div>
<div class="mw-content-container">
<main class="mw-body" id="content">
<header class="mw-body-header vector-page-titlebar no-font-mode-scale">
<nav aria-label="Contents" class="vector-toc-landmark">
<div class="vector-dropdown vector-page-titlebar-toc vector-button-flush-left"
id="vector-page-titlebar-toc" title="Table of Contents">
<input aria-haspopup="true" aria-label="Toggle the table of contents"
class="vector-dropdown-checkbox" data-event-name="ui.dropdown-vector-page-
titlebar-toc" id="vector-page-titlebar-toc-checkbox" role="button"
type="checkbox"/>
<label aria-hidden="true" class="vector-dropdown-label cdx-button cdx-button--
fake-button cdx-button--fake-button--enabled cdx-button--weight-quiet cdx-button
--icon-only" for="vector-page-titlebar-toc-checkbox" id="vector-page-titlebar-
toc-label"><span class="vector-icon mw-ui-icon-listBullet mw-ui-icon-wikimedia-
listBullet"></span>
<span class="vector-dropdown-label-text">Toggle the table of contents</span>
</label>
<div class="vector-dropdown-content">
<div class="vector-unpinned-container" id="vector-page-titlebar-toc-unpinned-
container">
</div>
</div>
</div>
</nav>
<h1 class="firstHeading mw-first-heading" id="firstHeading"><span class="mw-
page-title-main">Option (finance)</span></h1>
<div class="vector-dropdown mw-portlet mw-portlet-lang" id="p-lang-btn">
<input aria-haspopup="true" aria-label="Go to an article in another language.
Available in 55 languages" class="vector-dropdown-checkbox mw-interlanguage-
selector" data-event-name="ui.dropdown-p-lang-btn" id="p-lang-btn-checkbox"
role="button" type="checkbox"/>
<label aria-hidden="true" class="vector-dropdown-label cdx-button cdx-button--
fake-button cdx-button--fake-button--enabled cdx-button--weight-quiet cdx-button
--action-progressive mw-portlet-lang-heading-55" for="p-lang-btn-checkbox"
id="p-lang-btn-label"><span class="vector-icon mw-ui-icon-language-progressive
mw-ui-icon-wikimedia-language-progressive"></span>
<span class="vector-dropdown-label-text">55 languages</span>
</label>
<div class="vector-dropdown-content">
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="interlanguage-link interwiki-af mw-list-item"><a
class="interlanguage-link-target" data-language-autonym="Afrikaans" data-
```

language-local-name="Afrikaans" data-title="Opsie (Finansies)"
href="https://af.wikipedia.org/wiki/Opsie_(Finansies)" hreflang="af" lang="af"
title="Opsie (Finansies) - Afrikaans">Afrikaans
<li
class="interlanguage-link interwiki-ar mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="   " data-language-local-name="Arabic"
data-title="   (   ) href="https://ar.wikipedia.org/wiki/%D8%AE%D9%8A%D8%A7
%D8%B1_(%D8%AA%D9%85%D9%88%D9%8A%D9%84)" hreflang="ar" lang="ar" title="
(   ) - Arabic"><span   <>
<li class="interlanguage-link
interwiki-zh-min-nan mw-list-item"><a class="interlanguage-link-target" data-
language-autonym="   / Bân-lâm-gú" data-language-local-name="Minnan" data-
title="Kî-khoân" href="https://zh-min-nan.wikipedia.org/wiki/K%C3%AE-kho%C3%A2n"
hreflang="nan" lang="nan" title="Kî-khoân - Minnan">   / Bân-lâm-
gú
<li class="interlanguage-link interwiki-be-x-old mw-list-
item"><a class="interlanguage-link-target" data-language-autonym="
(   )" data-language-local-name="Belarusian (Taraškievica orthography)"
data-title="   " href="https://be-
tarask.wikipedia.org/wiki/%D0%90%D0%BF%D1%86%D1%8B%D1%91%D0%BD" hreflang="be-
tarask" lang="be-tarask" title="   - Belarusian (Taraškievica
orthography)">   (   )
<li
class="interlanguage-link interwiki-bh mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="   " data-language-local-name="Bhojpuri"
data-title="   " href="https://bh.wikipedia.org/wiki/%E0%A4%91%E0%A4%
AA%E0%A5%8D%E0%A4%B6%E0%A4%A8_%E0%A4%9F%E0%A5%8D%E0%A4%B0%E0%A5%87%E0%A4%A1%E0%A
4%BF%E0%A4%82%E0%A4%97" hreflang="bh" lang="bh" title="   -
Bhojpuri">   <li class="interlanguage-link interwiki-
bg mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="   " data-language-local-name="Bulgarian" data-title="
(   )" href="https://bg.wikipedia.org/wiki/%D0%9E%D0%BF%D1%86%D0%B8%D1%8F_(%
D1%84%D0%B8%D0%BD%D0%B0%D0%BD%D1%81%D0%B8)" hreflang="bg" lang="bg" title="
(   ) - Bulgarian">   <li class="interlanguage-
link interwiki-ca mw-list-item"><a class="interlanguage-link-target" data-
language-autonym="Català" data-language-local-name="Catalan" data-title="Opció"
href="https://ca.wikipedia.org/wiki/Opci%C3%B3" hreflang="ca" lang="ca"
title="Opció - Catalan">Català
<li class="interlanguage-
link interwiki-cs mw-list-item"><a class="interlanguage-link-target" data-
language-autonym="Čeština" data-language-local-name="Czech" data-title="Opce
(finance)" href="https://cs.wikipedia.org/wiki/Opce_(finance)" hreflang="cs"
lang="cs" title="Opce (finance) - Czech">Čeština
<li
class="interlanguage-link interwiki-da mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Dansk" data-language-local-name="Danish"
data-title="Option (finansiering)"
href="https://da.wikipedia.org/wiki/Option_(finansiering)" hreflang="da"
lang="da" title="Option (finansiering) - Danish">Dansk
<li
class="interlanguage-link interwiki-de mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Deutsch" data-language-local-name="German"
data-title="Option (Wirtschaft)"
href="https://de.wikipedia.org/wiki/Option_(Wirtschaft)" hreflang="de" lang="de"
title="Option (Wirtschaft) - German">Deutsch
<li

```
class="interlanguage-link interwiki-et mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Eesti" data-language-local-name="Estonian"
data-title="Optsioon" href="https://et.wikipedia.org/wiki/Optsioon"
hreflang="et" lang="et" title="Optsioon -
Estonian"><span>Eesti</span></a></li><li class="interlanguage-link interwiki-el
mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="E    " data-language-local-name="Greek" data-title="Δ
    " href="https://el.wikipedia.org/wiki/%CE%94%CE%B9%CE%BA%CE%B1%CE%AF%C
F%89%CE%BC%CE%B1_%CF%80%CF%81%CE%BF%CE%B1%CE%AF%CF%81%CE%B5%CF%83%CE%B7%CF%82"
hreflang="el" lang="el" title="Δ               -
Greek"><span>E    </span></a></li><li class="interlanguage-link interwiki-es
mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Español" data-language-local-name="Spanish" data-title="Opción
financiera" href="https://es.wikipedia.org/wiki/Opci%C3%B3n_financiera"
hreflang="es" lang="es" title="Opción financiera -
Spanish"><span>Español</span></a></li><li class="interlanguage-link interwiki-eo
mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Esperanto" data-language-local-name="Esperanto" data-title="Opcio
(ekonomio)" href="https://eo.wikipedia.org/wiki/Opcio_(ekonomio)" hreflang="eo"
lang="eo" title="Opcio (ekonomio) -
Esperanto"><span>Esperanto</span></a></li><li class="interlanguage-link
interwiki-eu mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Euskara" data-language-local-name="Basque" data-title="Opzio"
href="https://eu.wikipedia.org/wiki/Opzio" hreflang="eu" lang="eu" title="Opzio
- Basque"><span>Euskara</span></a></li><li class="interlanguage-link interwiki-
fa mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="  " data-language-local-name="Persian" data-title="      "    hr
ef="https://fa.wikipedia.org/wiki/%D8%A7%D8%AE%D8%AA%DB%8C%D8%A7%D8%B1_%D9%85%D8
%B9%D8%A7%D9%85%D9%84%D9%87" hreflang="fa" lang="fa" title="           -
Persian"><span  <>/span></a></li><li class="interlanguage-link interwiki-fr
mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Français" data-language-local-name="French" data-title="Option"
href="https://fr.wikipedia.org/wiki/Option" hreflang="fr" lang="fr"
title="Option - French"><span>Français</span></a></li><li class="interlanguage-
link interwiki-ga mw-list-item"><a class="interlanguage-link-target" data-
language-autonym="Gaeilge" data-language-local-name="Irish" data-title="Rogha
(airgeadas)" href="https://ga.wikipedia.org/wiki/Rogha_(airgeadas)"
hreflang="ga" lang="ga" title="Rogha (airgeadas) -
Irish"><span>Gaeilge</span></a></li><li class="interlanguage-link interwiki-ko
mw-list-item"><a class="interlanguage-link-target" data-language-autonym="  "
data-language-local-name="Korean" data-title="  ( )"
href="https://ko.wikipedia.org/wiki/%EC%98%B5%EC%85%98_(%EA%B8%88%EC%9C%B5)"
hreflang="ko" lang="ko" title="  ( ) - Korean"><span> </span></a></li><li
class="interlanguage-link interwiki-hy mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="    " data-language-local-name="Armenian"
data-title="    "
href="https://hy.wikipedia.org/wiki/%D5%95%D5%BA%D6%81%D5%AB%D5%B8%D5%B6"
hreflang="hy" lang="hy" title="      -
```

Armenian">   <li class="interlanguage-link interwiki-
hi mw-list-item"><a class="interlanguage-link-target" data-language-
autonym=" " data-language-local-name="Hindi" data-title="   ( )" hr
ef="https://hi.wikipedia.org/wiki/%E0%A4%B5%E0%A4%BF%E0%A4%95%E0%A4%B2%E0%A5%8D%
E0%A4%AA_(%E0%A4%B5%E0%A4%BF%E0%A4%A4%E0%A5%8D%E0%A4%A4)" hreflang="hi"
lang="hi" title="   ( ) – Hindi"> <li
class="interlanguage-link interwiki-hr mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Hrvatski" data-language-local-
name="Croatian" data-title="Opcija (financije)"
href="https://hr.wikipedia.org/wiki/Opcija_(financije)" hreflang="hr" lang="hr"
title="Opcija (financije) – Croatian">Hrvatski
<li
class="interlanguage-link interwiki-id mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Bahasa Indonesia" data-language-local-
name="Indonesian" data-title="Opsi (keuangan)"
href="https://id.wikipedia.org/wiki/Opsi_(keuangan)" hreflang="id" lang="id"
title="Opsi (keuangan) – Indonesian">Bahasa Indonesia
<li
class="interlanguage-link interwiki-is mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Íslenska" data-language-local-
name="Icelandic" data-title="Valréttarsamningur"
href="https://is.wikipedia.org/wiki/Valr%C3%A9ttarsamningur" hreflang="is"
lang="is" title="Valréttarsamningur –
Icelandic">Íslenska
<li class="interlanguage-link
interwiki-it mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Italiano" data-language-local-name="Italian" data-title="Opzione
(finanza)" href="https://it.wikipedia.org/wiki/Opzione_(finanza)" hreflang="it"
lang="it" title="Opzione (finanza) – Italian">Italiano
<li
class="interlanguage-link interwiki-he mw-list-item"><a class="interlanguage-
link-target" data-language-autonym=" " data-language-local-name="Hebrew"
data-title="   "
href="https://he.wikipedia.org/wiki/%D7%90%D7%95%D7%A4%D7%A6%D7%99%D7%94"
hreflang="he" lang="he" title="   – Hebrew"><span <>/span>
<li
class="interlanguage-link interwiki-kk mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="   " data-language-local-name="Kazakh"
data-title="   " href="https://kk.wikipedia.org/wiki/%D0%9E%D0%BF%
D1%86%D0%B8%D0%BE%D0%BD%D0%B4%D1%8B%D2%9B_%D0%BA%D0%B5%D0%BB%D1%96%D1%81%D1%96%D
0%BC" hreflang="kk" lang="kk" title="   –
Kazakh">   <li class="interlanguage-link interwiki-ky
mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="   " data-language-local-name="Kyrgyz" data-title="   "
href="https://ky.wikipedia.org/wiki/%D0%9E%D0%BF%D1%86%D0%B8%D0%BE%D0%BD"
hreflang="ky" lang="ky" title="   –
Kyrgyz">   <li class="interlanguage-link interwiki-lb
mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Lëtzebuergesch" data-language-local-name="Luxembourgish" data-
title="Optioun" href="https://lb.wikipedia.org/wiki/Optioun" hreflang="lb"
lang="lb" title="Optioun –
Luxembourgish">Lëtzebuergesch
<li class="interlanguage-link
interwiki-lt mw-list-item"><a class="interlanguage-link-target" data-language-

autonym="Lietuvių" data-language-local-name="Lithuanian" data-title="Pasirinkimo
sandoris" href="https://lt.wikipedia.org/wiki/Pasirinkimo_sandoris"
hreflang="lt" lang="lt" title="Pasirinkimo sandoris -
Lithuanian">Lietuvių
<li class="interlanguage-link
interwiki-hu mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Magyar" data-language-local-name="Hungarian" data-title="Opciós ügylet"
href="https://hu.wikipedia.org/wiki/Opci%C3%B3s_%C3%BCgylet" hreflang="hu"
lang="hu" title="Opciós ügylet - Hungarian">Magyar
<li
class="interlanguage-link interwiki-mk mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="   " data-language-local-
name="Macedonian" data-title="   "
href="https://mk.wikipedia.org/wiki/%D0%9E%D0%BF%D1%86%D0%B8%D1%98%D0%B0"
hreflang="mk" lang="mk" title="   -
Macedonian">   <li class="interlanguage-link
interwiki-ml mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="   " data-language-local-name="Malayalam" data-title="
(   )" href="https://ml.wikipedia.org/wiki/%E0%B4%93%E0%B4%AA%E0%B5%8D%E
0%B4%B7%E0%B5%BB_(%E0%B4%B8%E0%B4%BE%E0%B4%AE%E0%B5%8D%E0%B4%AA%E0%B4%A4%E0%B5%8
D%E0%B4%A4%E0%B4%BF%E0%B4%95%E0%B4%82)" hreflang="ml" lang="ml" title="
(   ) - Malayalam">   <li class="interlanguage-
link interwiki-mn mw-list-item"><a class="interlanguage-link-target" data-
language-autonym="   " data-language-local-name="Mongolian" data-
title="   "
href="https://mn.wikipedia.org/wiki/%D0%9E%D0%BF%D1%86%D0%B8%D0%BE%D0%BD"
hreflang="mn" lang="mn" title="   -
Mongolian">   <li class="interlanguage-link interwiki-
nl mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Nederlands" data-language-local-name="Dutch" data-title="Optie"
href="https://nl.wikipedia.org/wiki/Optie" hreflang="nl" lang="nl" title="Optie
- Dutch">Nederlands
<li class="interlanguage-link
interwiki-ja mw-list-item"><a class="interlanguage-link-target" data-language-
autonym=" " data-language-local-name="Japanese" data-title="   " href="htt
ps://ja.wikipedia.org/wiki/%E3%82%AA%E3%83%97%E3%82%B7%E3%83%A7%E3%83%B3%E5%8F%9
6%E5%BC%95" hreflang="ja" lang="ja" title="   -
Japanese"> <li class="interlanguage-link interwiki-no
mw-list-item"><a class="interlanguage-link-target" data-language-autonym="Norsk
bokmål" data-language-local-name="Norwegian Bokmål" data-title="Opsjon"
href="https://no.wikipedia.org/wiki/Opsjon" hreflang="nb" lang="nb"
title="Opsjon - Norwegian Bokmål">Norsk bokmål
<li
class="interlanguage-link interwiki-nn mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Norsk nynorsk" data-language-local-
name="Norwegian Nynorsk" data-title="Opsjon"
href="https://nn.wikipedia.org/wiki/Opsjon" hreflang="nn" lang="nn"
title="Opsjon - Norwegian Nynorsk">Norsk nynorsk
<li
class="interlanguage-link interwiki-uz mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="O zbekcha /   " data-language-local-
name="Uzbek" data-title="Valyuta opsioni"
href="https://uz.wikipedia.org/wiki/Valyuta_opsioni" hreflang="uz" lang="uz"

title="Valyuta opsioni - Uzbek">O zbekcha /   <li
class="interlanguage-link interwiki-km mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="   " data-language-local-name="Khmer"
data-title="   (   )" href="https://km.wikipedia.org/wiki/%E1%9E%A2%
E1%9E%94%E1%9F%8B%E1%9E%9F%E1%9E%B7%E1%9E%93_(%E1%9E%A0%E1%9E%B7%E1%9E%9A%E1%9E%
89%E1%9F%92%E1%9E%89%E1%9E%9C%E1%9E%8F%E1%9F%92%E1%9E%90%E1%9E%BB)"
hreflang="km" lang="km" title="   (   ) -
Khmer">   <li class="interlanguage-link interwiki-pl
mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Polski" data-language-local-name="Polish" data-title="Opcja"
href="https://pl.wikipedia.org/wiki/Opcja" hreflang="pl" lang="pl" title="Opcja
- Polish">Polski
<li class="interlanguage-link interwiki-pt
mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Português" data-language-local-name="Portuguese" data-title="Mercado de
opções" href="https://pt.wikipedia.org/wiki/Mercado_de_op%C3%A7%C3%B5es"
hreflang="pt" lang="pt" title="Mercado de opções -
Portuguese">Português
<li class="interlanguage-link
interwiki-ru mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="   " data-language-local-name="Russian" data-title="   "
href="https://ru.wikipedia.org/wiki/%D0%9E%D0%BF%D1%86%D0%B8%D0%BE%D0%BD"
hreflang="ru" lang="ru" title="   -
Russian">   <li class="interlanguage-link interwiki-
simple mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Simple English" data-language-local-name="Simple English" data-
title="Option (finance)"
href="https://simple.wikipedia.org/wiki/Option_(finance)" hreflang="en-simple"
lang="en-simple" title="Option (finance) - Simple English">Simple
English
<li class="interlanguage-link interwiki-sr mw-list-
item"><a class="interlanguage-link-target" data-language-autonym="   /
srpski" data-language-local-name="Serbian" data-title="   (   )" href=
"https://sr.wikipedia.org/wiki/%D0%9E%D0%BF%D1%86%D0%B8%D1%98%D0%B0_(%D1%84%D0%B
8%D0%BD%D0%B0%D0%BD%D1%81%D0%B8%D1%98%D0%B5)" hreflang="sr" lang="sr"
title="   (   ) - Serbian">   / srpski
<li
class="interlanguage-link interwiki-fi mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Suomi" data-language-local-name="Finnish"
data-title="Optio" href="https://fi.wikipedia.org/wiki/Optio" hreflang="fi"
lang="fi" title="Optio - Finnish">Suomi
<li
class="interlanguage-link interwiki-sv mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Svenska" data-language-local-name="Swedish"
data-title="Option" href="https://sv.wikipedia.org/wiki/Option" hreflang="sv"
lang="sv" title="Option - Swedish">Svenska
<li
class="interlanguage-link interwiki-ta mw-list-item"><a class="interlanguage-
link-target" data-language-autonym=" " data-language-local-name="Tamil"
data-title=" " href="https://ta.wikipedia.org/wiki/%E0%AE%9A%E0%AF%82%E0%AE%
A4%E0%AE%AE%E0%AF%8D" hreflang="ta" lang="ta" title="   -
Tamil">   <li class="interlanguage-link interwiki-tt mw-
list-item"><a class="interlanguage-link-target" data-language-autonym="   /
tatarça" data-language-local-name="Tatar" data-title="Optsion"

```
href="https://tt.wikipedia.org/wiki/Optsion" hreflang="tt" lang="tt"
title="Optsion - Tatar"><span>    / tatarça</span></a></li><li
class="interlanguage-link interwiki-th mw-list-item"><a class="interlanguage-
link-target" data-language-autonym=" " data-language-local-name="Thai" data-
title="    " href="https://th.wikipedia.org/wiki/%E0%B8%95%E0%B8%A3%E0%B8
%B2%E0%B8%AA%E0%B8%B2%E0%B8%A3%E0%B8%AA%E0%B8%B4%E0%B8%97%E0%B8%98%E0%B8%B4"
hreflang="th" lang="th" title="    - Thai"><span> </span></a></li><li
class="interlanguage-link interwiki-tr mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="Türkçe" data-language-local-name="Turkish"
data-title="Opsiyon (finans)"
href="https://tr.wikipedia.org/wiki/Opsiyon_(finans)" hreflang="tr" lang="tr"
title="Opsiyon (finans) - Turkish"><span>Türkçe</span></a></li><li
class="interlanguage-link interwiki-uk mw-list-item"><a class="interlanguage-
link-target" data-language-autonym="    " data-language-local-
name="Ukrainian" data-title="    "
href="https://uk.wikipedia.org/wiki/%D0%9E%D0%BF%D1%86%D1%96%D0%BE%D0%BD"
hreflang="uk" lang="uk" title="    -
Ukrainian"><span>    </span></a></li><li class="interlanguage-link
interwiki-vi mw-list-item"><a class="interlanguage-link-target" data-language-
autonym="Tiếng Việt" data-language-local-name="Vietnamese" data-title="Quyền
chọn (tài chính)" href="https://vi.wikipedia.org/wiki/Quy%E1%BB%81n_ch%E1%BB%8Dn
_(t%C3%A0i_ch%C3%ADnh)" hreflang="vi" lang="vi" title="Quyền chọn (tài chính) -
Vietnamese"><span>Tiếng Việt</span></a></li><li class="interlanguage-link
interwiki-zh-yue mw-list-item"><a class="interlanguage-link-target" data-
language-autonym=" " data-language-local-name="Cantonese" data-title=" "
href="https://zh-yue.wikipedia.org/wiki/%E6%9C%9F%E6%AC%8A" hreflang="yue"
lang="yue" title="  - Cantonese"><span> </span></a></li><li
class="interlanguage-link interwiki-zh badge-Q17437798 badge-goodarticle mw-
list-item" title="good article badge"><a class="interlanguage-link-target" data-
language-autonym=" " data-language-local-name="Chinese" data-title=" "
href="https://zh.wikipedia.org/wiki/%E6%9C%9F%E6%AC%8A" hreflang="zh" lang="zh"
title="  - Chinese"><span> </span></a></li>
</ul>
<div class="after-portlet after-portlet-lang"><span class="wb-langlinks-edit wb-
langlinks-link"><a class="wbc-editpage"
href="https://www.wikidata.org/wiki/Special:EntityPage/Q187860#sitelinks-
wikipedia" title="Edit interlanguage links">Edit links</a></span></div>
</div>
</div>
</div>
</header>
<div class="vector-page-toolbar vector-feature-custom-font-size-clientpref--
excluded">
<div class="vector-page-toolbar-container">
<div id="left-navigation">
<nav aria-label="Namespaces">
<div class="vector-menu vector-menu-tabs mw-portlet mw-portlet-associated-pages"
id="p-associated-pages">
```

```
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="selected vector-tab-noicon mw-list-item" id="ca-nstab-main"><a
accesskey="c" href="/wiki/Option_(finance)" title="View the content page
[c]"><span>Article</span></a></li><li class="vector-tab-noicon mw-list-item"
id="ca-talk"><a accesskey="t" href="/wiki/Talk:Option_(finance)"
rel="discussion" title="Discuss improvements to the content page
[t]"><span>Talk</span></a></li>
</ul>
</div>
</div>
<div class="vector-dropdown emptyPortlet" id="vector-variants-dropdown">
<input aria-haspopup="true" aria-label="Change language variant" class="vector-
dropdown-checkbox" data-event-name="ui.dropdown-vector-variants-dropdown"
id="vector-variants-dropdown-checkbox" role="button" type="checkbox"/>
<label aria-hidden="true" class="vector-dropdown-label cdx-button cdx-button--
fake-button cdx-button--fake-button--enabled cdx-button--weight-quiet"
for="vector-variants-dropdown-checkbox" id="vector-variants-dropdown-
label"><span class="vector-dropdown-label-text">English</span>
</label>
<div class="vector-dropdown-content">
<div class="vector-menu mw-portlet mw-portlet-variants emptyPortlet"
id="p-variants">
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
</ul>
</div>
</div>
</div>
</div>
</nav>
</div>
<div class="vector-collapsible" id="right-navigation">
<nav aria-label="Views">
<div class="vector-menu vector-menu-tabs mw-portlet mw-portlet-views"
id="p-views">
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="selected vector-tab-noicon mw-list-item" id="ca-view"><a
href="/wiki/Option_(finance)"><span>Read</span></a></li><li class="vector-tab-
noicon mw-list-item" id="ca-edit"><a accesskey="e"
href="/w/index.php?title=Option_(finance)&amp;action=edit" title="Edit this page
[e]"><span>Edit</span></a></li><li class="vector-tab-noicon mw-list-item"
id="ca-history"><a accesskey="h"
href="/w/index.php?title=Option_(finance)&amp;action=history" title="Past
revisions of this page [h]"><span>View history</span></a></li>
</ul>
</div>
```

```
</div>
</nav>
<nav aria-label="Page tools" class="vector-page-tools-landmark">
<div class="vector-dropdown vector-page-tools-dropdown" id="vector-page-tools-
dropdown">
<input aria-haspopup="true" aria-label="Tools" class="vector-dropdown-checkbox"
data-event-name="ui.dropdown-vector-page-tools-dropdown" id="vector-page-tools-
dropdown-checkbox" role="button" type="checkbox"/>
<label aria-hidden="true" class="vector-dropdown-label cdx-button cdx-button--
fake-button cdx-button--fake-button--enabled cdx-button--weight-quiet"
for="vector-page-tools-dropdown-checkbox" id="vector-page-tools-dropdown-
label"><span class="vector-dropdown-label-text">Tools</span>
</label>
<div class="vector-dropdown-content">
<div class="vector-unpinned-container" id="vector-page-tools-unpinned-
container">
<div class="vector-page-tools vector-pinnable-element" id="vector-page-tools">
<div class="vector-pinnable-header vector-page-tools-pinnable-header vector-
pinnable-header-unpinned" data-feature-name="page-tools-pinned" data-pinnable-
element-id="vector-page-tools" data-pinned-container-id="vector-page-tools-
pinned-container" data-unpinned-container-id="vector-page-tools-unpinned-
container">
<div class="vector-pinnable-header-label">Tools</div>
<button class="vector-pinnable-header-toggle-button vector-pinnable-header-pin-
button" data-event-name="pinnable-header.vector-page-tools.pin">move to
sidebar</button>
<button class="vector-pinnable-header-toggle-button vector-pinnable-header-
unpin-button" data-event-name="pinnable-header.vector-page-
tools.unpin">hide</button>
</div>
<div class="vector-menu mw-portlet mw-portlet-cactions emptyPortlet vector-has-
collapsible-items" id="p-cactions" title="More options">
<div class="vector-menu-heading">
                Actions
        </div>
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="selected vector-more-collapsible-item mw-list-item" id="ca-more-
view"><a href="/wiki/Option_(finance)"><span>Read</span></a></li><li
class="vector-more-collapsible-item mw-list-item" id="ca-more-edit"><a
accesskey="e" href="/w/index.php?title=Option_(finance)&amp;action=edit"
title="Edit this page [e]"><span>Edit</span></a></li><li class="vector-more-
collapsible-item mw-list-item" id="ca-more-history"><a
href="/w/index.php?title=Option_(finance)&amp;action=history"><span>View
history</span></a></li>
</ul>
</div>
</div>
```

```
<div class="vector-menu mw-portlet mw-portlet-tb" id="p-tb">
<div class="vector-menu-heading">
                General
        </div>
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="mw-list-item" id="t-whatlinkshere"><a accesskey="j"
href="/wiki/Special:WhatLinksHere/Option_(finance)" title="List of all English
Wikipedia pages containing links to this page [j]"><span>What links
here</span></a></li><li class="mw-list-item" id="t-recentchangeslinked"><a
accesskey="k" href="/wiki/Special:RecentChangesLinked/Option_(finance)"
rel="nofollow" title="Recent changes in pages linked from this page
[k]"><span>Related changes</span></a></li><li class="mw-list-item"
id="t-upload"><a accesskey="u"
href="//en.wikipedia.org/wiki/Wikipedia:File_Upload_Wizard" title="Upload files
[u]"><span>Upload file</span></a></li><li class="mw-list-item"
id="t-permalink"><a
href="/w/index.php?title=Option_(finance)&amp;oldid=1282937596" title="Permanent
link to this revision of this page"><span>Permanent link</span></a></li><li
class="mw-list-item" id="t-info"><a
href="/w/index.php?title=Option_(finance)&amp;action=info" title="More
information about this page"><span>Page information</span></a></li><li
class="mw-list-item" id="t-cite"><a href="/w/index.php?title=Special:CiteThisPag
e&amp;page=Option_%28finance%29&amp;id=1282937596&amp;wpFormIdentifier=titleform
" title="Information on how to cite this page"><span>Cite this
page</span></a></li><li class="mw-list-item" id="t-urlshortener"><a href="/w/ind
ex.php?title=Special:UrlShortener&amp;url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%
2FOption_%28finance%29"><span>Get shortened URL</span></a></li><li class="mw-
list-item" id="t-urlshortener-qrcode"><a href="/w/index.php?title=Special:QrCode
&amp;url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FOption_%28finance%29"><span>Dow
nload QR code</span></a></li>
</ul>
</div>
</div>
<div class="vector-menu mw-portlet mw-portlet-coll-print_export" id="p-coll-
print_export">
<div class="vector-menu-heading">
                Print/export
        </div>
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="mw-list-item" id="coll-download-as-rl"><a href="/w/index.php?title=Sp
ecial:DownloadAsPdf&amp;page=Option_%28finance%29&amp;action=show-download-
screen" title="Download this page as a PDF file"><span>Download as
PDF</span></a></li><li class="mw-list-item" id="t-print"><a accesskey="p"
href="/w/index.php?title=Option_(finance)&amp;printable=yes" title="Printable
version of this page [p]"><span>Printable version</span></a></li>
</ul>
```

```
</div>
</div>
<div class="vector-menu mw-portlet mw-portlet-wikibase-otherprojects"
id="p-wikibase-otherprojects">
<div class="vector-menu-heading">
                In other projects
        </div>
<div class="vector-menu-content">
<ul class="vector-menu-content-list">
<li class="wb-otherproject-link wb-otherproject-wikibase-dataitem mw-list-item"
id="t-wikibase"><a accesskey="g"
href="https://www.wikidata.org/wiki/Special:EntityPage/Q187860"
title="Structured data on this page hosted by Wikidata [g]"><span>Wikidata
item</span></a></li>
</ul>
</div>
</div>
</div>
</div>
</div>
</nav>
</div>
</div>
</div>
<div class="vector-column-end no-font-mode-scale">
<div class="vector-sticky-pinned-container">
<nav aria-label="Page tools" class="vector-page-tools-landmark">
<div class="vector-pinned-container" id="vector-page-tools-pinned-container">
</div>
</nav>
<nav aria-label="Appearance" class="vector-appearance-landmark">
<div class="vector-pinned-container" id="vector-appearance-pinned-container">
<div class="vector-appearance vector-pinnable-element" id="vector-appearance">
<div class="vector-pinnable-header vector-appearance-pinnable-header vector-
pinnable-header-pinned" data-feature-name="appearance-pinned" data-pinnable-
element-id="vector-appearance" data-pinned-container-id="vector-appearance-
pinned-container" data-unpinned-container-id="vector-appearance-unpinned-
container">
<div class="vector-pinnable-header-label">Appearance</div>
<button class="vector-pinnable-header-toggle-button vector-pinnable-header-pin-
button" data-event-name="pinnable-header.vector-appearance.pin">move to
sidebar</button>
<button class="vector-pinnable-header-toggle-button vector-pinnable-header-
unpin-button" data-event-name="pinnable-header.vector-
appearance.unpin">hide</button>
</div>
</div>
```

```
</div>
</nav>
</div>
</div>
<div aria-labelledby="firstHeading" class="vector-body" data-mw-ve-target-
container="" id="bodyContent">
<div class="vector-body-before-content">
<div class="mw-indicators">
</div>
<div class="noprint" id="siteSub">From Wikipedia, the free encyclopedia</div>
</div>
<div id="contentSub"><div id="mw-content-subtitle"></div></div>
<div class="mw-body-content" id="mw-content-text"><div class="mw-content-ltr mw-
parser-output" dir="ltr" lang="en"><div class="shortdescription nomobile
noexcerpt noprint searchaux" style="display:none">Right to buy or sell a certain
thing at a later date at an agreed price</div>
<style data-mw-deduplicate="TemplateStyles:r1236090951">.mw-parser-output
.hatnote{font-style:italic}.mw-parser-output div.hatnote{padding-
left:1.6em;margin-bottom:0.5em}.mw-parser-output .hatnote i{font-
style:normal}.mw-parser-output .hatnote+link+.hatnote{margin-top:-0.5em}@media
print{body.ns-0 .mw-parser-output .hatnote{display:none!important}}</style><div
class="hatnote navigation-not-searchable" role="note">"Stock option" redirects
here. For the employee incentive, see <a href="/wiki/Employee_stock_option"
title="Employee stock option">employee stock option</a>.</div>
<p class="mw-empty-elt">
</p>
<style data-mw-deduplicate="TemplateStyles:r1129693374">.mw-parser-output .hlist
dl,.mw-parser-output .hlist ol,.mw-parser-output .hlist
ul{margin:0;padding:0}.mw-parser-output .hlist dd,.mw-parser-output .hlist
dt,.mw-parser-output .hlist li{margin:0;display:inline}.mw-parser-output
.hlist.inline,.mw-parser-output .hlist.inline dl,.mw-parser-output .hlist.inline
ol,.mw-parser-output .hlist.inline ul,.mw-parser-output .hlist dl dl,.mw-parser-
output .hlist dl ol,.mw-parser-output .hlist dl ul,.mw-parser-output .hlist ol
dl,.mw-parser-output .hlist ol ol,.mw-parser-output .hlist ol ul,.mw-parser-
output .hlist ul dl,.mw-parser-output .hlist ul ol,.mw-parser-output .hlist ul
ul{display:inline}.mw-parser-output .hlist .mw-empty-li{display:none}.mw-parser-
output .hlist dt::after{content:": "}.mw-parser-output .hlist dd::after,.mw-
parser-output .hlist li::after{content:" · ";font-weight:bold}.mw-parser-output
.hlist dd:last-child::after,.mw-parser-output .hlist dt:last-child::after,.mw-
parser-output .hlist li:last-child::after{content:none}.mw-parser-output .hlist
dd dd:first-child::before,.mw-parser-output .hlist dd dt:first-
child::before,.mw-parser-output .hlist dd li:first-child::before,.mw-parser-
output .hlist dt dd:first-child::before,.mw-parser-output .hlist dt dt:first-
child::before,.mw-parser-output .hlist dt li:first-child::before,.mw-parser-
output .hlist li dd:first-child::before,.mw-parser-output .hlist li dt:first-
child::before,.mw-parser-output .hlist li li:first-child::before{content:"
(";font-weight:normal}.mw-parser-output .hlist dd dd:last-child::after,.mw-
parser-output .hlist dd dt:last-child::after,.mw-parser-output .hlist dd
```

```
li:last-child::after,.mw-parser-output .hlist dt dd:last-child::after,.mw-
parser-output .hlist dt dt:last-child::after,.mw-parser-output .hlist dt
li:last-child::after,.mw-parser-output .hlist li dd:last-child::after,.mw-
parser-output .hlist li dt:last-child::after,.mw-parser-output .hlist li
li:last-child::after{content:")";font-weight:normal}.mw-parser-output .hlist
ol{counter-reset:listitem}.mw-parser-output .hlist ol>li{counter-
increment:listitem}.mw-parser-output .hlist ol>li::before{content:"
"counter(listitem)"\a0 "}.mw-parser-output .hlist dd ol>li:first-
child::before,.mw-parser-output .hlist dt ol>li:first-child::before,.mw-parser-
output .hlist li ol>li:first-child::before{content:" ("counter(listitem)"\a0
"}</style><style data-mw-deduplicate="TemplateStyles:r1126788409">.mw-parser-
output .plainlist ol,.mw-parser-output .plainlist ul{line-height:inherit;list-
style:none;margin:0;padding:0}.mw-parser-output .plainlist ol li,.mw-parser-
output .plainlist ul li{margin-bottom:0}</style><style data-mw-
deduplicate="TemplateStyles:r1246091330">.mw-parser-output
.sidebar{width:22em;float:right;clear:right;margin:0.5em 0 1em
1em;background:var(--background-color-neutral-subtle,#f8f9fa);border:1px solid
var(--border-color-base,#a2a9b1);padding:0.2em;text-align:center;line-
height:1.4em;font-size:88%;border-collapse:collapse;display:table}body.skin-
minerva .mw-parser-output
.sidebar{display:table!important;float:right!important;margin:0.5em 0 1em
1em!important}.mw-parser-output .sidebar-subgroup{width:100%;margin:0;border-
spacing:0}.mw-parser-output .sidebar-left{float:left;clear:left;margin:0.5em 1em
1em 0}.mw-parser-output .sidebar-none{float:none;clear:both;margin:0.5em 1em 1em
0}.mw-parser-output .sidebar-outer-title{padding:0 0.4em 0.2em;font-
size:125%;line-height:1.2em;font-weight:bold}.mw-parser-output .sidebar-top-
image{padding:0.4em}.mw-parser-output .sidebar-top-caption,.mw-parser-output
.sidebar-pretitle-with-top-image,.mw-parser-output .sidebar-
caption{padding:0.2em 0.4em 0;line-height:1.2em}.mw-parser-output .sidebar-
pretitle{padding:0.4em 0.4em 0;line-height:1.2em}.mw-parser-output .sidebar-
title,.mw-parser-output .sidebar-title-with-pretitle{padding:0.2em 0.8em;font-
size:145%;line-height:1.2em}.mw-parser-output .sidebar-title-with-
pretitle{padding:0.1em 0.4em}.mw-parser-output .sidebar-image{padding:0.2em
0.4em 0.4em}.mw-parser-output .sidebar-heading{padding:0.1em 0.4em}.mw-parser-
output .sidebar-content{padding:0 0.5em 0.4em}.mw-parser-output .sidebar-
content-with-subgroup{padding:0.1em 0.4em 0.2em}.mw-parser-output .sidebar-
above,.mw-parser-output .sidebar-below{padding:0.3em 0.8em;font-weight:bold}.mw-
parser-output .sidebar-collapse .sidebar-above,.mw-parser-output .sidebar-
collapse .sidebar-below{border-top:1px solid #aaa;border-bottom:1px solid
#aaa}.mw-parser-output .sidebar-navbar{text-align:right;font-size:115%;padding:0
0.4em 0.4em}.mw-parser-output .sidebar-list-title{padding:0 0.4em;text-
align:left;font-weight:bold;line-height:1.6em;font-size:105%}.mw-parser-output
.sidebar-list-title-c{padding:0 0.4em;text-align:center;margin:0
3.3em}@media(max-width:640px){body.mediawiki .mw-parser-output
.sidebar{width:100%!important;clear:both;float:none!important;margin-
left:0!important;margin-right:0!important}}body.skin--responsive .mw-parser-
output .sidebar a>img{max-width:none!important}@media screen{html.skin-theme-
clientpref-night .mw-parser-output .sidebar:not(.notheme) .sidebar-list-
```

title,html.skin-theme-clientpref-night .mw-parser-output .sidebar:not(.notheme) .sidebar-title-with-pretitle{background:transparent!important}html.skin-theme-clientpref-night .mw-parser-output .sidebar:not(.notheme) .sidebar-title-with-pretitle a{color:var(--color-progressive)!important}}@media screen and (prefers-color-scheme:dark){html.skin-theme-clientpref-os .mw-parser-output .sidebar:not(.notheme) .sidebar-list-title,html.skin-theme-clientpref-os .mw-parser-output .sidebar:not(.notheme) .sidebar-title-with-pretitle{background:transparent!important}html.skin-theme-clientpref-os .mw-parser-output .sidebar:not(.notheme) .sidebar-title-with-pretitle a{color:var(--color-progressive)!important}}@media print{body.ns-0 .mw-parser-output .sidebar{display:none!important}}</style><link href="mw-data:TemplateStyles:r1129693374" rel="mw-deduplicated-inline-style"><link href="mw-data:TemplateStyles:r1129693374" rel="mw-deduplicated-inline-style"><link href="mw-data:TemplateStyles:r1129693374" rel="mw-deduplicated-inline-style"><link href="mw-data:TemplateStyles:r1129693374" rel="mw-deduplicated-inline-style"><table class="sidebar nomobile nowraplinks plainlist"><tbody><tr><td class="sidebar-pretitle">Part of a series on</td></tr><tr><th class="sidebar-title-with-pretitle">Financial markets</th></tr><tr><td class="sidebar-image"></td></tr><tr><td class="sidebar-above" style="padding-bottom:0.7em;">
Public market
Exchange · Securities</td></tr><tr><th class="sidebar-heading" style="background:#ddddff;">
Bond market</th></tr><tr><td class="sidebar-content hlist" style="padding:0.15em 0.5em 0.7em;">
Bond valuation
Corporate bond
Fixed income
Government bond
<a href="/wiki/High-yield_debt" title="High-yield debt">High-yield

```
debt</a></li>
<li><a href="/wiki/Municipal_bond" title="Municipal bond">Municipal
bond</a></li>
<li><br/><a href="/wiki/Securitization"
title="Securitization">Securitization</a></li></ul></td>
</tr><tr><th class="sidebar-heading" style="background:#ddddff;">
<a href="/wiki/Stock_market" title="Stock market">Stock
market</a></th></tr><tr><td class="sidebar-content hlist" style="padding:0.15em
0.5em 0.7em;">
<ul><li><a href="/wiki/Common_stock" title="Common stock">Common stock</a></li>
<li><a href="/wiki/Growth_stock" title="Growth stock">Growth stock</a></li>
<li><a href="/wiki/Preferred_stock" title="Preferred stock">Preferred
stock</a></li>
<li><a href="/wiki/Registered_share" title="Registered share">Registered
share</a></li>
<li><a href="/wiki/Shareholder" title="Shareholder">Shareholder</a></li>
<li><a href="/wiki/Stock" title="Stock">Stock</a></li>
<li><a href="/wiki/Stockbroker" title="Stockbroker">Stockbroker</a></li>
<li><a href="/wiki/Stock_certificate" title="Stock certificate">Stock
certificate</a></li>
<li><a href="/wiki/Stock_exchange" title="Stock exchange">Stock
exchange</a></li>
<li><a href="/wiki/Watered_stock" title="Watered stock">Watered
stock</a></li></ul></td>
</tr><tr><th class="sidebar-heading" style="background:#ddddff;">
Other markets</th></tr><tr><td class="sidebar-content hlist"
style="padding:0.15em 0.5em 0.7em;">
<div style="display:inline-block; padding:0.2em 0.4em; line-height:1.2em; line-
height:1.25em;"><a href="/wiki/Derivatives_market" title="Derivatives
market">Derivatives</a> <div class="hlist"><ul><li>(<a
href="/wiki/Credit_derivative" title="Credit derivative">Credit
derivative</a></li><li><a href="/wiki/Futures_exchange" title="Futures
exchange">Futures exchange</a></li><li><a href="/wiki/Hybrid_security"
title="Hybrid security">Hybrid security</a>)</li></ul></div> </div>
<div style="display:inline-block; padding:0.2em 0.4em; line-height:1.2em; line-
height:1.25em;padding-bottom:0.25em;"><a href="/wiki/Foreign_exchange_market"
title="Foreign exchange market">Foreign exchange</a> <div
class="hlist"><ul><li>(<a href="/wiki/Currency"
title="Currency">Currency</a></li><li><a href="/wiki/Exchange_rate"
title="Exchange rate">Exchange rate</a>)</li></ul></div> </div>
<ul><li><a href="/wiki/Commodity_market" title="Commodity
market">Commodity</a></li>
<li><a href="/wiki/Exchange-traded_fund" title="Exchange-traded
fund">ETF</a></li>
<li><a href="/wiki/Money_market" title="Money market">Money</a></li>
<li><a href="/wiki/Mutual_fund" title="Mutual fund">Mutual fund</a></li>
<li><a class="mw-selflink selflink">Option</a></li>
<li><a href="/wiki/Real_estate" title="Real estate">Real estate</a></li>
```

```html
<li><a href="/wiki/Reinsurance" title="Reinsurance">Reinsurance</a></li>
<li><a href="/wiki/Structured_product" title="Structured product">Structured
product</a></li>
<li><a href="/wiki/Swap_(finance)" title="Swap (finance)">Swap
(finance)</a></li></ul></td>
</tr><tr><th class="sidebar-heading" style="background:#ddddff;">
<a href="/wiki/Alternative_investment" title="Alternative
investment">Alternative investment</a></th></tr><tr><td class="sidebar-content
hlist" style="padding:0.15em 0.5em 0.7em;">
<ul><li><a href="/wiki/Private_equity" title="Private equity">Private
equity</a></li>
<li><a href="/wiki/Private_credit" title="Private credit">Private
credit</a></li>
<li><a href="/wiki/Leveraged_buyout" title="Leveraged buyout">Leveraged
buyout</a></li>
<li><a href="/wiki/Venture_capital" title="Venture capital">Venture</a></li>
<li><a href="/wiki/Growth_capital" title="Growth capital">Growth</a></li>
<li><a class="mw-redirect" href="/wiki/Private_equity_secondary_market"
title="Private equity secondary market">Secondaries</a></li>
<li><a href="/wiki/Special-purpose_acquisition_company" title="Special-purpose
acquisition company">SPAC</a></li>
<li><a class="mw-redirect" href="/wiki/Carried_Interest" title="Carried
Interest">Carried Interest</a></li>
<li><a href="/wiki/Leverage_(finance)" title="Leverage (finance)">Leveraged
finance</a></li></ul></td>
</tr><tr><th class="sidebar-heading" style="background:#ddddff;">
<a href="/wiki/Over-the-counter_(finance)" title="Over-the-counter
(finance)">Over-the-counter (off-exchange)</a></th></tr><tr><td class="sidebar-
content hlist" style="padding:0.15em 0.5em 0.7em;">
<div class="hlist"><ul><li><a href="/wiki/Forward_contract" title="Forward
contract">Forwards</a></li><li><a class="mw-selflink
selflink">Options</a></li></ul></div>
<div class="hlist"><ul><li><a href="/wiki/Spot_market" title="Spot market">Spot
market</a></li><li><a href="/wiki/Swap_(finance)" title="Swap
(finance)">Swaps</a></li></ul></div></td>
</tr><tr><th class="sidebar-heading" style="background:#ddddff;">
<a href="/wiki/Trader_(finance)" title="Trader
(finance)">Trading</a></th></tr><tr><td class="sidebar-content hlist"
style="padding:0.15em 0.5em 0.7em;">
<ul><li><a href="/wiki/Financial_market_participants" title="Financial market
participants">Participants</a></li>
<li><a href="/wiki/Financial_regulation" title="Financial
regulation">Regulation</a></li>
<li><a href="/wiki/Clearing_(finance)" title="Clearing
(finance)">Clearing</a></li></ul></td>
</tr><tr><th class="sidebar-heading" style="background:#ddddff;">
Related areas</th></tr><tr><td class="sidebar-content hlist"
style="padding:0.15em 0.5em 0.7em;">
```

```
<ul><li><a href="/wiki/Asset_management" title="Asset management">Asset
management</a></li>
<li><a href="/wiki/Bank" title="Bank">Banks and banking</a></li>
<li><a href="/wiki/Bull_(stock_market_speculator)" title="Bull (stock market
speculator)">Bulls</a> and <a href="/wiki/Market_trend#Bear_market)"
title="Market trend">Bears</a></li>
<li><a href="/wiki/Diversification_(finance)" title="Diversification
(finance)">Diversification</a></li>
<li><a href="/wiki/Environmental,_social,_and_governance" title="Environmental,
social, and governance">ESG</a>
<ul><li><a href="/wiki/Climate_finance" title="Climate finance">Climate
finance</a></li>
<li><a href="/wiki/Eco-investing" title="Eco-investing">Eco-investing</a></li>
<li><a href="/wiki/Impact_investing" title="Impact investing">Impact
investing</a></li>
<li><a href="/wiki/Sustainable_finance" title="Sustainable finance">Sustainable
finance</a></li>
<li><a href="/wiki/Greenwashing"
title="Greenwashing">Greenwashing</a></li></ul></li>
<li><a href="/wiki/Financial_technology" title="Financial technology">Financial
technology</a></li>
<li><a href="/wiki/Investment_management" title="Investment
management">Investment management</a></li>
<li><a href="/wiki/Market_risk" title="Market risk">Market risk</a></li>
<li><a href="/wiki/Market_trend" title="Market trend">Market trend</a></li>
<li><a href="/wiki/Speculative_attack" title="Speculative attack">Speculative
attack</a></li></ul></td>
</tr><tr><td class="sidebar-navbar" style="border-top:1px solid #aaa;"><link
href="mw-data:TemplateStyles:r1129693374" rel="mw-deduplicated-inline-
style"><style data-mw-deduplicate="TemplateStyles:r1239400231">.mw-parser-output
.navbar{display:inline;font-size:88%;font-weight:normal}.mw-parser-output
.navbar-collapse{float:left;text-align:left}.mw-parser-output .navbar-
boxtext{word-spacing:0}.mw-parser-output .navbar ul{display:inline-block;white-
space:nowrap;line-height:inherit}.mw-parser-output .navbar-
brackets::before{margin-right:-0.125em;content:"[ "}.mw-parser-output .navbar-
brackets::after{margin-left:-0.125em;content:" ]"}.mw-parser-output .navbar
li{word-spacing:-0.125em}.mw-parser-output .navbar a>span,.mw-parser-output
.navbar a>abbr{text-decoration:inherit}.mw-parser-output .navbar-mini abbr{font-
variant:small-caps;border-bottom:none;text-decoration:none;cursor:inherit}.mw-
parser-output .navbar-ct-full{font-size:114%;margin:0 7em}.mw-parser-output
.navbar-ct-mini{font-size:114%;margin:0 4em}html.skin-theme-clientpref-night
.mw-parser-output .navbar li a abbr{color:var(--color-
base)!important}@media(prefers-color-scheme:dark){html.skin-theme-clientpref-os
.mw-parser-output .navbar li a abbr{color:var(--color-base)!important}}@media
print{.mw-parser-output .navbar{display:none!important}}</style><div
class="navbar plainlinks hlist navbar-mini"><ul><li class="nv-view"><a
href="/wiki/Template:Financial_markets" title="Template:Financial markets"><abbr
title="View this template">v</abbr></a></li><li class="nv-talk"><a
```

href="/wiki/Template_talk:Financial_markets" title="Template talk:Financial
markets"><abbr title="Discuss this template">t</abbr>
<li class="nv-
edit"><a href="/wiki/Special:EditPage/Template:Financial_markets"
title="Special:EditPage/Template:Financial markets"><abbr title="Edit this
template">e</abbr>
</div></link></td></tr></tbody></table>
<p>In finance, an option is a
contract which conveys to its owner, the <i>holder</i>, the right, but not the
obligation, to buy or sell a specific quantity of an <a class="mw-redirect"
href="/wiki/Underlying" title="Underlying">underlying <a href="/wiki/Asset"
title="Asset">asset or <a href="/wiki/Financial_instrument" title="Financial
instrument">instrument at a specified <a href="/wiki/Strike_price"
title="Strike price">strike price on or before a specified <a
href="/wiki/Expiration_(options)" title="Expiration (options)">date,
depending on the style of
the option.
</p><p>Options are typically acquired by purchase, as a form of compensation, or
as part of a complex financial transaction. Thus, they are also a form of asset
(or contingent liability) and have a <a href="/wiki/Valuation_of_options"
title="Valuation of options">valuation that may depend on a complex
relationship between underlying asset price, time until expiration, <a
class="mw-redirect" href="/wiki/Market_volatility" title="Market
volatility">market volatility, the risk-free rate of interest, and the
strike price of the option.
</p><p>Options may be traded between private parties in <i><a href="/wiki/Over-
the-counter_(finance)" title="Over-the-counter (finance)">over-the-
counter</i> (OTC) transactions, or they may be exchange-traded in live,
public markets in the form of standardized contracts.
</p>
<meta property="mw:PageProp/toc">
<div class="mw-heading mw-heading2"><h2
id="Definition_and_application">Definition and application</h2><span class="mw-
editsection">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=1"
title="Edit section: Definition and application">edit]</div>
<p>An option is a contract that allows the holder the right to buy or sell an
underlying asset or financial instrument at a specified strike price on or
before a specified date, depending on the form of the option. Selling or
exercising an option before expiry typically requires a buyer to pick the
contract up at the agreed upon price. The strike price may be set by reference
to the spot
price (market price) of the underlying security or commodity on the day an
option is issued, or it may be fixed at a discount or at a premium. The issuer
has the corresponding obligation to fulfill the transaction (to sell or buy) if
the holder "exercises" the option. An option that conveys to the holder the
right to buy at a specified price is referred to as a <a
href="/wiki/Call_option" title="Call option">call, while one that conveys
the right to sell at a specified price is known as a <a href="/wiki/Put_option"

title="Put option">put.
</p><p>The issuer may grant an option to a buyer as part of another transaction
(such as a share issue or as part of an employee incentive scheme), or the buyer
may pay a premium to the issuer for the option. A call option would normally be
exercised only when the strike price is below the market value of the underlying
asset, while a put option would normally be exercised only when the strike price
is above the market value. When an option is exercised, the cost to the option
holder is the strike price of the asset acquired plus the premium, if any, paid
to the issuer. If the option's expiration date passes without the option being
exercised, the option expires, and the holder forfeits the premium paid to the
issuer. In any case, the premium is income to the issuer, and normally a capital
loss to the option holder.
</p><p>An option holder may on-sell the option to a third party in a <a
href="/wiki/Secondary_market" title="Secondary market">secondary market, in
either an <a href="/wiki/Over-the-counter_(finance)" title="Over-the-counter
(finance)">over-the-counter transaction or on an <a
href="/wiki/Exchange_(organized_market)" title="Exchange (organized
market)">options exchange, depending on the option. The market price of an
American-style option normally closely follows that of the underlying stock
being the difference between the market price of the stock and the strike price
of the option. The actual market price of the option may vary depending on a
number of factors, such as a significant option holder needing to sell the
option due to the expiration date approaching and not having the financial
resources to exercise the option, or a buyer in the market trying to amass a
large option holding. The ownership of an option does not generally entitle the
holder to any rights associated with the underlying asset, such as voting rights
or any income from the underlying asset, such as a <a href="/wiki/Dividend"
title="Dividend">dividend.
</p>
<div class="mw-heading mw-heading2"><h2 id="History">History</h2>[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=2"
title="Edit section: History">edit<span class="mw-editsection-
bracket">]</div>
<div class="mw-heading mw-heading3"><h3
id="Historical_uses_of_options">Historical uses of options</h3><span class="mw-
editsection">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=3"
title="Edit section: Historical uses of options">edit]</div>
<p>Contracts similar to options have been used since ancient times.<sup
class="reference" id="cite_ref-1"><span class="cite-
bracket">[1]</sup> The first
reputed option buyer was the <a href="/wiki/Ancient_Greece" title="Ancient
Greece">ancient Greek mathematician and philosopher <a
href="/wiki/Thales_of_Miletus#Olive_story_as_example_of_option_type_trade"
title="Thales of Miletus">Thales of Miletus. On a certain occasion, it was
predicted that the season's olive

harvest would be larger than usual, and during the off-season, he acquired the right to use a number of olive presses the following spring. When spring came and the olive harvest was larger than expected, he exercised his options and then rented the presses out at a much higher price than he paid for his 'option'.^{[2]}^{[3]}
</p><p>The 1688 book Confusion of Confusions describes the trading of "<i>opsies</i>" on the Amsterdam stock exchange (now Euronext), explaining that "there will be only limited risks to you, while the gain may surpass all your imaginings and hopes."^{[4]}
</p><p>In London, puts and "refusals" (calls) first became well-known trading instruments in the 1690s during the reign of William and Mary.^{[5]} Privileges were options sold over the counter in nineteenth-century America, with both puts and calls on shares offered by specialized dealers. Their exercise price was fixed at a rounded-off market price on the day or week that the option was bought, and the expiry date was generally three months after purchase. They were not traded in secondary markets.
</p><p>In the real estate market, call options have long been used to assemble large parcels of land from separate owners; e.g., a developer pays for the right to buy several adjacent plots, but is not obligated to buy these plots and might not unless they can buy all the plots in the entire parcel. Additionally, purchase of real property, like houses, requires a buyer paying the seller into an escrow account an earnest payment, which offers the buyer the right to buy the property at the set terms, including the purchase price.^[<i>citation needed</i>]
</p><p>In the motion picture industry, film or theatrical producers often buy an option giving the right – but not the obligation – to dramatize a specific book or script.
</p><p>Lines of credit give the potential borrower the right – but not the obligation – to borrow within a specified time period.

```
</p><p>Many choices, or embedded options, have traditionally been included in <a
href="/wiki/Bond_(finance)" title="Bond (finance)">bond</a> contracts. For
example, many bonds are <a href="/wiki/Convertible_bond" title="Convertible
bond">convertible</a> into common stock at the buyer's option, or may be called
(bought back) at specified prices at the issuer's option. <a class="mw-redirect"
href="/wiki/Mortgage_loan" title="Mortgage loan">Mortgage</a> borrowers have
long had the option to repay the loan early, which corresponds to a callable
bond option.
</p>
<div class="mw-heading mw-heading3"><h3 id="Modern_stock_options">Modern stock
options</h3><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=4"
title="Edit section: Modern stock options"><span>edit</span></a><span class="mw-
editsection-bracket">]</span></span></div>
<p>Options contracts have been known for decades. The <a class="mw-redirect"
href="/wiki/Chicago_Board_Options_Exchange" title="Chicago Board Options
Exchange">Chicago Board Options Exchange</a> was established in 1973, which set
up a regime using standardized forms and terms and trade through a guaranteed
clearing house. Trading activity and academic interest have increased since
then.
</p><p>Today, many options are created in a standardized form and traded through
clearing houses on regulated <a href="/wiki/Exchange_(organized_market)"
title="Exchange (organized market)">options exchanges</a>. In contrast, other <a
href="/wiki/Over-the-counter_(finance)" title="Over-the-counter (finance)">over-
the-counter</a> options are written as bilateral, customized contracts between a
single buyer and seller, one or both of which may be a dealer or market-maker.
Options are part of a larger class of financial instruments known as <a
class="mw-redirect" href="/wiki/Derivative_products" title="Derivative
products">derivative products</a>, or simply, derivatives.<sup class="reference"
id="cite_ref-6"><a href="#cite_note-6"><span class="cite-bracket">[</span>6<span
class="cite-bracket">]</span></a></sup><sup class="reference" id="cite_ref-7"><a
href="#cite_note-7"><span class="cite-bracket">[</span>7<span class="cite-
bracket">]</span></a></sup>
</p>
<div class="mw-heading mw-heading2"><h2 id="Contract_specifications">Contract
specifications</h2><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=5"
title="Edit section: Contract specifications"><span>edit</span></a><span
class="mw-editsection-bracket">]</span></span></div>
<p>A financial option is a contract between two counterparties with the terms of
the option specified in a <a href="/wiki/Term_sheet" title="Term sheet">term
sheet</a>. Option contracts may be quite complicated; however, at minimum, they
usually contain the following specifications:<sup class="reference"
id="cite_ref-occ_8-0"><a href="#cite_note-occ-8"><span class="cite-
bracket">[</span>8<span class="cite-bracket">]</span></a></sup>
</p>
```

```
<ul><li>whether the option holder has the right to buy (a <a
href="/wiki/Call_option" title="Call option">call option</a>) or the right to
sell (a <a href="/wiki/Put_option" title="Put option">put option</a>)</li>
<li>the quantity and class of the <a class="mw-redirect" href="/wiki/Underlying"
title="Underlying">underlying</a> asset(s) (e.g., 100 shares of XYZ Co. B
stock)</li>
<li>the <a href="/wiki/Strike_price" title="Strike price">strike price</a>, also
known as the exercise price, which is the price at which the underlying
transaction will occur upon <a href="/wiki/Exercise_(options)" title="Exercise
(options)">exercise</a></li>
<li>the <a href="/wiki/Expiration_(options)" title="Expiration
(options)">expiration</a> date, or expiry, which is the last date the option can
be exercised</li>
<li>the <a href="/wiki/Settlement_(finance)" title="Settlement
(finance)">settlement terms</a>, for instance, whether the writer must deliver
the actual asset on exercise, or may simply tender the equivalent cash
amount</li>
<li>the terms by which the option is quoted in the market to convert the quoted
price into the actual premium - the total amount paid by the holder to the
writer</li></ul>
<div class="mw-heading mw-heading2"><h2 id="Option_trading">Option
trading</h2><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=6"
title="Edit section: Option trading"><span>edit</span></a><span class="mw-
editsection-bracket">]</span></span></div>
<figure typeof="mw:File/Thumb"><a class="mw-file-description"
href="/wiki/File:Put_Volume_vs._Call_Volume.png"><img class="mw-file-element"
data-file-height="1058" data-file-width="2038" decoding="async" height="225" src
="//upload.wikimedia.org/wikipedia/commons/thumb/d/d5/Put_Volume_vs._Call_Volume
.png/500px-Put_Volume_vs._Call_Volume.png" srcset="//upload.wikimedia.org/wikipe
dia/commons/thumb/d/d5/Put_Volume_vs._Call_Volume.png/960px-
Put_Volume_vs._Call_Volume.png 1.5x" width="434"/></a><figcaption>Put Volume vs.
Call Volume (90-Day Average Volume)</figcaption></figure>
<div class="mw-heading mw-heading3"><h3 id="Forms_of_trading">Forms of
trading</h3><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=7"
title="Edit section: Forms of trading"><span>edit</span></a><span class="mw-
editsection-bracket">]</span></span></div>
<div class="mw-heading mw-heading4"><h4 id="Exchange-traded_options">Exchange-
traded options</h4><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=8"
title="Edit section: Exchange-traded options"><span>edit</span></a><span
class="mw-editsection-bracket">]</span></span></div>
<p>Exchange-traded options (also called "listed options") are a class of <a
href="/wiki/Derivative_(finance)#OTC_and_exchange-traded" title="Derivative
```

(finance)">exchange-traded derivatives. Exchange-traded options have standardized contracts and are settled through a clearing house with fulfillment guaranteed by the Options Clearing Corporation (OCC). Since the contracts are standardized, accurate pricing models are often available. Exchange-traded options include:^{[9]}^{[10]}
</p>
Stock options
Bond options and other interest rate options
Stock market index options or, simply, index options
Options on futures contracts and
Callable bull/bear contract
<figure typeof="mw:File/Thumb"><figcaption>Average Option Volume (90 days) vs Market Capitalization</figcaption></figure>
<div class="mw-heading mw-heading4"><h4 id="Over-the-counter_options">Over-the-counter options</h4>[edit]</div>
<p>Over-the-counter options (OTC options, also called "dealer options") are traded between two private parties and are not listed on an exchange. The terms of an OTC option are unrestricted and may be individually tailored to meet any business need. In general, the option writer is a well-capitalized institution (to prevent credit risk). Option types commonly traded over the counter include:
</p>

```
<ul><li>Interest rate options</li>
<li>Currency cross rate options, and</li>
<li>Options on <a href="/wiki/Swap_(finance)" title="Swap (finance)">swaps</a>
or <a href="/wiki/Swaption" title="Swaption">swaptions</a>.</li></ul>
<p>By avoiding an exchange, users of OTC options can narrowly tailor the terms
of the option contract to suit individual business requirements. In addition,
OTC option transactions generally do not need to be advertised to the market and
face little or no regulatory requirements. However, OTC counterparties must
establish credit lines with each other and conform to each other's clearing and
settlement procedures.
</p><p>With few exceptions,<sup class="reference" id="cite_ref-11"><a
href="#cite_note-11"><span class="cite-bracket">[</span>11<span class="cite-
bracket">]</span></a></sup> there are no <a href="/wiki/Secondary_market"
title="Secondary market">secondary markets</a> for <a class="mw-redirect"
href="/wiki/Employee_stock_options" title="Employee stock options">employee
stock options</a>. These must either be exercised by the original grantee or
allowed to expire.
</p>
<figure typeof="mw:File/Thumb"><a class="mw-file-description" href="/wiki/File:O
ption_Volume_vs_Open_Interest_(for_7000%2B_Contracts).png"><img class="mw-file-
element" data-file-height="920" data-file-width="1782" decoding="async"
height="223" src="//upload.wikimedia.org/wikipedia/commons/thumb/d/d0/Option_Vol
ume_vs_Open_Interest_%28for_7000%2B_Contracts%29.png/500px-
Option_Volume_vs_Open_Interest_%28for_7000%2B_Contracts%29.png" srcset="//upload
.wikimedia.org/wikipedia/commons/thumb/d/d0/Option_Volume_vs_Open_Interest_%28fo
r_7000%2B_Contracts%29.png/960px-
Option_Volume_vs_Open_Interest_%28for_7000%2B_Contracts%29.png 1.5x"
width="432"/></a><figcaption>Option Volume vs Open Interest (for 7000+
Contracts)</figcaption></figure>
<div class="mw-heading mw-heading3"><h3 id="Exchange_trading">Exchange
trading</h3><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=10"
title="Edit section: Exchange trading"><span>edit</span></a><span class="mw-
editsection-bracket">]</span></span></div>
<p>The most common way to trade options is via standardized options contracts
listed by various <a href="/wiki/Futures_exchange" title="Futures
exchange">futures and options exchanges</a>.<sup class="reference"
id="cite_ref-12"><a href="#cite_note-12"><span class="cite-
bracket">[</span>12<span class="cite-bracket">]</span></a></sup> Listings and
prices are tracked and can be looked up by <a href="/wiki/Option_symbol"
title="Option symbol">ticker symbol</a>. By publishing continuous, live markets
for option prices, an exchange enables independent parties to engage in <a
href="/wiki/Price_discovery" title="Price discovery">price discovery</a> and
execute transactions. As an intermediary to both sides of the transaction, the
benefits the exchange provides to the transaction include:
</p>
<ul><li>Fulfillment of the contract is backed by the credit of the exchange,
```

which typically has the highest rating (AAA),
Counterparties remain anonymous,
Enforcement of market regulation to ensure fairness and transparency, and
Maintenance of orderly markets, especially during fast trading conditions.
<figure typeof="mw:File/Thumb"><figcaption>Days till Expiration vs Option Volume (7000+ contracts)</figcaption></figure>
<div class="mw-heading mw-heading3"><h3 id="Basic_trades_(American_style)">Basic trades (American style)</h3>[edit]</div>
<p>These trades are described from the point of view of a speculator. If they are combined with other positions, they can also be used in hedging. An option contract in US markets usually represents 100 shares of the underlying security.^{[13]}^{[14]}
</p>
<div class="mw-heading mw-heading4"><h4 id="Long_call">Long call</h4>[edit]</div>
<figure typeof="mw:File/Thumb"><figcaption>Payoff from buying a call</figcaption></figure>
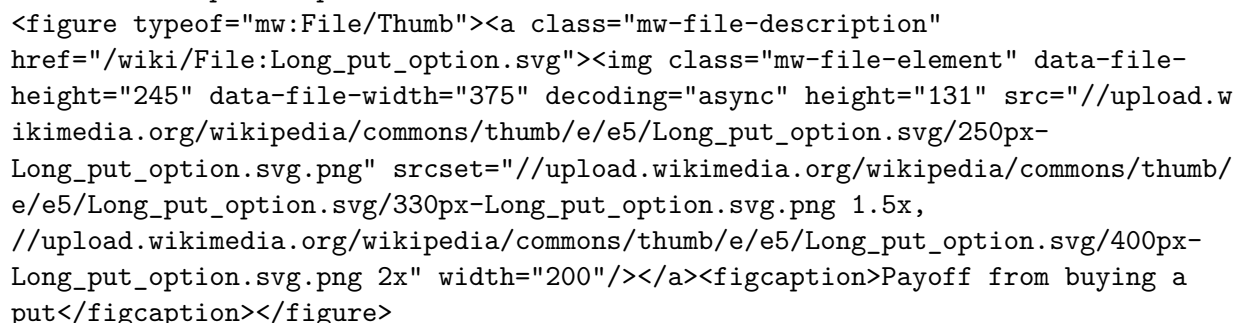
<p>A trader who expects a stock's price to increase can buy a call option to purchase the stock at a fixed price (strike price) at a later date, rather than purchase the stock outright. The cash outlay on the option is the premium. The trader would have no obligation to buy the stock, but only has the right to do so on or before the expiration date. The risk of loss would be limited to the premium paid, unlike the possible loss had the stock been bought outright.
</p><p>The holder of an American-style call option can sell the option holding at any time until the expiration date and would consider doing so when the stock's spot price is above the exercise price, especially if the holder expects the price of the option to drop. By selling the option early in that situation, the trader can realise an immediate profit. Alternatively, the trader can exercise the option - for example, if there is no secondary market for the options - and then sell the stock, realising a profit. A trader would make a profit if the spot price of the shares rises by more than the premium. For example, if the exercise price is 100 and the premium paid is 10, then if the spot price of 100 rises to only 110, the transaction is break-even; an increase in the stock price above 110 produces a profit.
</p><p>If the stock price at expiration is lower than the exercise price, the holder of the option at that time will let the call contract expire and lose only the premium (or the price paid on transfer).
</p>
<div class="" style="clear:both;"></div>
<div class="mw-heading mw-heading4"><h4 id="Long_put">Long put</h4>[edit]</div>
<figure typeof="mw:File/Thumb"><figcaption>Payoff from buying a put</figcaption></figure>
<p>A trader who expects a stock's price to decrease can buy a put option to sell the stock at a fixed price (strike price) at a later date. The trader is not obligated to sell the stock, but has the right to do so on or before the expiration date. If the stock price at expiration is below the exercise price by more than the premium paid, the trader makes a profit. If the stock price at expiration is above the exercise price, the trader lets the put contract expire and loses only the premium paid. In the transaction, the premium also plays a role as it enhances the break-even point. For example, if the exercise price is 100 and the premium paid is 10, then a spot price between 90 and 100 is not profitable. The trader

makes a profit only if the spot price is below 90.
</p><p>The trader exercising a put option on a stock does not need to own the underlying asset, because most stocks can be shorted.
</p>
<div class="mw-heading mw-heading4"><h4 id="Short_call">Short call</h4>[edit]</div>
<figure typeof="mw:File/Thumb"><figcaption>Payoff from writing a call</figcaption></figure>
<p>A trader who expects a stock's price to decrease can sell the stock short or instead sell, or "write", a call. The trader selling a call has an obligation to sell the stock to the call buyer at a fixed price ("strike price"). If the seller does not own the stock when the option is exercised, they are obligated to purchase the stock in the market at the prevailing market price. If the stock price decreases, the seller of the call (call writer) makes a profit in the amount of the premium. If the stock price increases over the strike price by more than the amount of the premium, the seller loses money, with the potential loss being unlimited.
</p>
<div class="mw-heading mw-heading4"><h4 id="Short_put">Short put</h4>[edit]</div>
<figure typeof="mw:File/Thumb"><figcaption>Payoff from writing a put</figcaption></figure>
<p>A trader who expects a stock's price to increase can buy the stock or instead sell, or "write", a put. The trader selling a put has an obligation to buy the stock from the put buyer at a fixed price ("strike price"). If the stock price at expiration is above the strike price, the seller of the put (put writer)
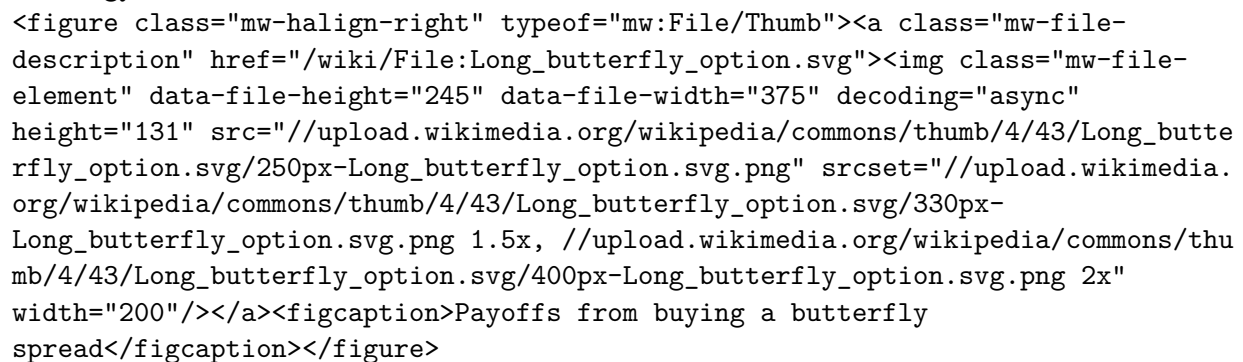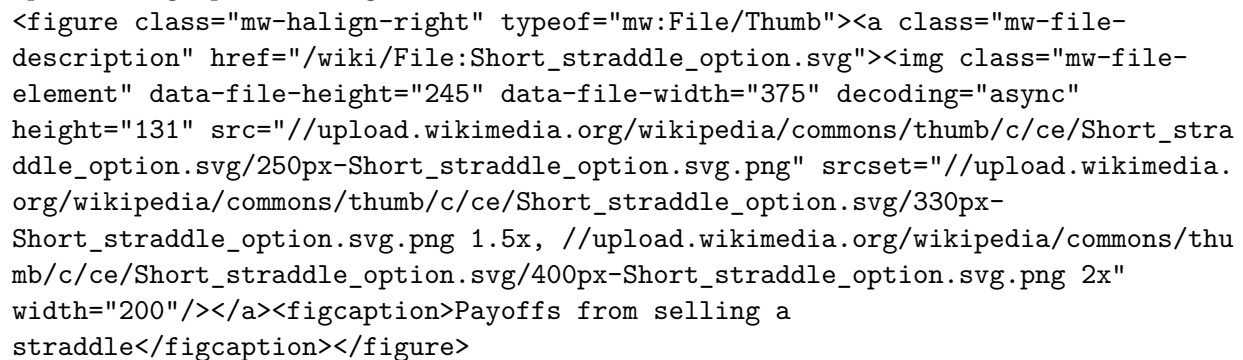
makes a profit in the amount of the premium. If the stock price at expiration is below the strike price by more than the amount of the premium, the trader loses money, with the potential loss being up to the strike price minus the premium. A benchmark index for the performance of a cash-secured short put option position is the CBOE S&P 500 PutWrite Index (ticker PUT).
</p>
<div class="mw-heading mw-heading3"><h3 id="Options_strategies">Options strategies</h3>[edit]</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-style"><div class="hatnote navigation-not-searchable" role="note">Main article: Options strategy</div>
<figure class="mw-halign-right" typeof="mw:File/Thumb"><figcaption>Payoffs from buying a butterfly spread</figcaption></figure>
<figure class="mw-halign-right" typeof="mw:File/Thumb"><figcaption>Payoffs from selling a straddle</figcaption></figure>
<figure class="mw-halign-right" typeof="mw:File/Thumb"><figcaption>Payoffs from a covered call</figcaption></figure>
<p>Combining any of the four basic kinds of option trades (possibly with different exercise prices and maturities) and the two basic kinds of stock
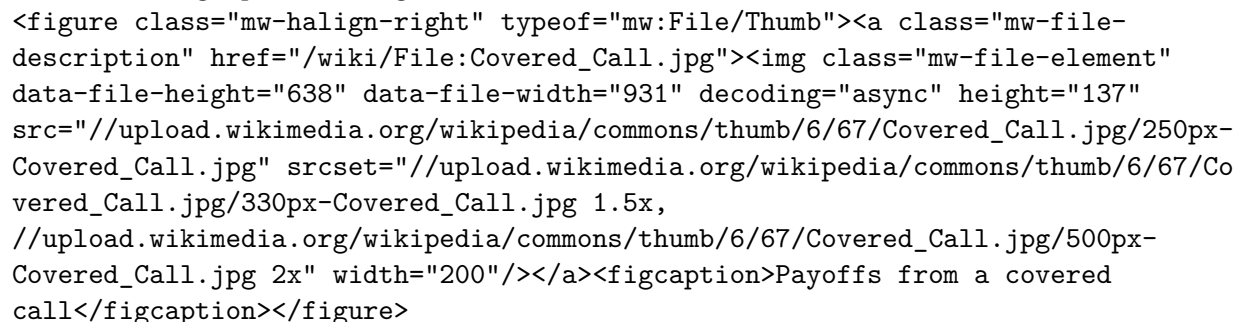
trades (long and short) allows a variety of options strategies. Simple strategies usually combine only a few trades, while more complicated strategies can combine several.
</p><p>Strategies are often used to engineer a particular risk profile to movements in the underlying security. For example, buying a butterfly spread (long one X1 call, short two X2 calls, and long one X3 call) allows a trader to profit if the stock price on the expiration date is near the middle exercise price, X2, and does not expose the trader to a large loss.
</p><p>A condor is a strategy similar to a butterfly spread, but with different strikes for the short options – offering a larger likelihood of profit but with a lower net credit compared to the butterfly spread.
</p><p>Selling a straddle (selling both a put and a call at the same exercise price) would give a trader a greater profit than a butterfly if the final stock price is near the exercise price, but might result in a large loss.
</p><p>Similar to the straddle is the strangle which is also constructed by a call and a put, but whose strikes are different, reducing the net debit of the trade, but also reducing the risk of loss in the trade.
</p><p>One well-known strategy is the covered call, in which a trader buys a stock (or holds a previously purchased stock position), and sells a call. (This can be contrasted with a naked call. See also naked put.) If the stock price rises above the exercise price, the call will be exercised and the trader will get a fixed profit. If the stock price falls, the call will not be exercised, and any loss incurred to the trader will be partially offset by the premium received from selling the call. Overall, the payoffs match the payoffs from selling a put. This relationship is known as put-call parity and offers insights for financial theory. A benchmark index for the performance of a buy-write strategy is the CBOE S&P 500 BuyWrite Index (ticker symbol BXM).
</p><p>Another very common strategy is the protective put, in which a trader buys a stock (or holds a previously-purchased long stock position), and buys a put. This strategy acts as an insurance when investing long on the underlying stock, hedging the investor's potential losses, but also shrinking an otherwise larger profit, if just purchasing the stock without the put. The maximum profit of a protective put is theoretically unlimited as the strategy involves being long on the underlying stock. The maximum loss is limited to the purchase price of the underlying stock less the strike price of the put option

and the premium paid. A protective put is also known as a married put.
</p>
<div class="mw-heading mw-heading2"><h2 id="Types">Types</h2>[edit]</div>
<p>Options can be classified in a few ways.
</p>
<div class="mw-heading mw-heading3"><h3 id="According_to_the_option_rights">According to the option rights</h3>[edit]</div>
Call options give the holder the right – but not the obligation – to buy something at a specific price for a specific time period.
Put options give the holder the right – but not the obligation – to sell something at a specific price for a specific time period.
<div class="mw-heading mw-heading3"><h3 id="According_to_the_delivery_type">According to the delivery type</h3>[edit]</div>
Physical delivery option requires actual delivery of the goods or stocks to take place.
Cash-settled option is settled in resulting cash payment.
<div class="mw-heading mw-heading3"><h3 id="According_to_the_underlying_assets">According to the underlying assets</h3>[edit]</div>
Equity option
Bond option
Future option
Index option
Commodity option
Currency option
Swap option
<div class="mw-heading mw-heading3"><h3 id="Other_option_types">Other option types</h3>[edit<span class="mw-

editsection-bracket">]</div>
<p>Another important class of options, particularly in the U.S., are employee stock options, which a company awards to their employees as a form of incentive compensation. Other types of options exist in many financial contracts. For example real estate options are often used to assemble large parcels of land, and prepayment options are usually included in mortgage loans. However, many of the valuation and risk management principles apply across all financial options.
</p>
<div class="mw-heading mw-heading3"><h3 id="Option_styles">Option styles</h3>[edit]</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-style"><div class="hatnote navigation-not-searchable" role="note">Main article: Option style</div>
<p>Options are classified into a number of styles, the most common of which are:
</p>
American option - an option that may be exercised on any trading day on or before expiration.
European option - an option that may only be exercised on expiry.
<p>These are often described as vanilla options. Other styles include:
</p>
Bermudan option - an option that may be exercised only on specified dates on or before expiration.
Asian option - an option whose payoff is determined by the average underlying price over some preset time period.
Barrier option - any option with the general characteristic that the underlying security's price must pass a certain level or "barrier" before it can be exercised.
Binary option - An all-or-nothing option that pays the full amount if the underlying security meets the defined condition on expiration, otherwise, it expires.
Exotic option - any of a broad category of options that may include complex financial structures.<sup class="reference" id="cite_ref-15">[15<span class="cite-

bracket">]</sup>
<div class="mw-heading mw-heading2"><h2 id="Valuation">Valuation</h2>[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=23"
title="Edit section: Valuation">edit<span class="mw-
editsection-bracket">]</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-
style"><div class="hatnote navigation-not-searchable" role="note">Main article:
Valuation of
options</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-
style"><div class="hatnote navigation-not-searchable" role="note">See also: <a
href="/wiki/Mathematical_finance#Derivatives_pricing:_the_Q_world"
title="Mathematical finance">Mathematical finance § Derivatives pricing: the Q
world, <a href="/wiki/Financial_modeling#Quantitative_finance"
title="Financial modeling">Financial modeling § Quantitative finance, and
<a href="/wiki/Financial_economics#Derivative_pricing" title="Financial
economics">Financial economics § Derivative pricing</div>
<p>Because the values of option contracts depend on a number of different
variables in addition to the value of the underlying asset, they are complex to
value. There are many pricing models in use, although all essentially
incorporate the concepts of <a href="/wiki/Rational_pricing#Options"
title="Rational pricing">rational pricing (i.e. <a class="mw-redirect"
href="/wiki/Risk_neutral" title="Risk neutral">risk neutrality), <a
href="/wiki/Moneyness" title="Moneyness">moneyness, <a
href="/wiki/Option_time_value" title="Option time value">option time value,
and put-call
parity.
</p><p>The valuation itself combines a model of the behavior (<a
href="/wiki/Stochastic_process" title="Stochastic process">"process") of the
underlying price with a mathematical method which returns the premium as a
function of the assumed behavior. The models range from the (prototypical) <a
href="/wiki/Black%E2%80%93Scholes_model" title="Black-Scholes
model">Black-Scholes model for equities,<sup class="reference"
id="cite_ref-16"><span class="cite-
bracket">[16]</sup><sup
class="noprint Inline-Template" style="white-space:nowrap;">[<i><a
href="/wiki/Wikipedia:Reliable_sources" title="Wikipedia:Reliable sources"><span
title="The material near this tag may rely on an unreliable source. (August
2013)">unreliable source?</i>]</sup><sup class="reference"
id="cite_ref-17"><span class="cite-
bracket">[17]</sup> to the <a
href="/wiki/Heath%E2%80%93Jarrow%E2%80%93Morton_framework"
title="Heath-Jarrow-Morton framework">Heath-Jarrow-Morton framework for
interest rates, to the Heston
model where volatility itself is considered <a href="/wiki/Stochastic"
title="Stochastic">stochastic. See <a href="/wiki/Asset_pricing"
title="Asset pricing">Asset pricing for a listing of the various models

here.
</p>
<div class="mw-heading mw-heading3"><h3 id="Basic_decomposition">Basic decomposition</h3>[edit]</div>
<p>In its most basic terms, the value of an option is commonly decomposed into two parts:
</p>
The first part is the intrinsic value, which is defined as the difference between the market value of the underlying, and the strike price of the given option
The second part is the time value, which depends on a set of other factors which, through a multi-variable, non-linear interrelationship, reflect the discounted expected value of that difference at expiration.
<div class="mw-heading mw-heading3"><h3 id="Valuation_models">Valuation models</h3>[edit]</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-style"><div class="hatnote navigation-not-searchable" role="note">Main article: Valuation of options</div>
<p>As above, the value of the option is estimated using a variety of quantitative techniques, all based on the principle of risk-neutral pricing and using stochastic calculus in their solution. The most basic model is the Black-Scholes model. More sophisticated models are used to model the volatility smile. These models are implemented using a variety of numerical techniques.^{[18]} In general, standard option valuation models depend on the following factors:
</p>
The current market price of the underlying security
The strike price of the option, particularly in relation to the current market price of the underlying (in the money vs. out of the money)
The cost of holding a position in the underlying security, including

interest and dividends
The time to <a href="/wiki/Expiration_(options)" title="Expiration
(options)">expiration together with any restrictions on when exercise may
occur
an estimate of the future <a href="/wiki/Volatility_(finance)"
title="Volatility (finance)">volatility of the underlying security's price
over the life of the option
<p>More advanced models can require additional factors, such as an estimate of
how volatility changes over time and for various underlying price levels, or the
dynamics of stochastic interest rates.
</p><p>The following are some principal valuation techniques used in practice to
evaluate option contracts.
</p>
<div class="mw-heading mw-heading4"><h4 id="Black-Scholes">Black-Scholes</h4><span class="mw-
editsection">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=26"
title="Edit section: Black-Scholes">edit<span class="mw-
editsection-bracket">]</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-
style"><div class="hatnote navigation-not-searchable" role="note">Main article:
<a href="/wiki/Black%E2%80%93Scholes_model" title="Black-Scholes
model">Black-Scholes model</div>
<p>Following early work by <a href="/wiki/Louis_Bachelier" title="Louis
Bachelier">Louis Bachelier and later work by <a
href="/wiki/Robert_C._Merton" title="Robert C. Merton">Robert C. Merton, <a
href="/wiki/Fischer_Black" title="Fischer Black">Fischer Black and <a
href="/wiki/Myron_Scholes" title="Myron Scholes">Myron Scholes made a major
breakthrough by deriving a differential equation that must be satisfied by the
price of any derivative dependent on a non-dividend-paying stock. By employing
the technique of constructing a risk-neutral portfolio that replicates the
returns of holding an option, Black and Scholes produced a closed-form solution
for a European option's theoretical price.<sup class="reference"
id="cite_ref-19"><span class="cite-
bracket">[19]</sup> At the same
time, the model generates <a href="/wiki/Greeks_(finance)" title="Greeks
(finance)">hedge parameters necessary for effective risk management of
option holdings.
</p><p>While the ideas behind the Black-Scholes model were ground-breaking and
eventually led to Scholes and Merton receiving the <a class="mw-redirect"
href="/wiki/Swedish_Central_Bank" title="Swedish Central Bank">Swedish Central
Bank's associated <a class="mw-redirect" href="/wiki/The_Sveriges_Riksbank_P
rize_in_Economic_Sciences_in_Memory_of_Alfred_Nobel" title="The Sveriges
Riksbank Prize in Economic Sciences in Memory of Alfred Nobel">Prize for
Achievement in Economics (a.k.a., the <a href="/wiki/Nobel_Prize"
title="Nobel Prize">Nobel Prize in Economics),<sup class="reference"
id="cite_ref-20"><span class="cite-
bracket">[20]</sup> the application

of the model in actual options trading is clumsy because of the assumptions of continuous trading, constant volatility, and a constant interest rate. Nevertheless, the Black-Scholes model is still one of the most important methods and foundations for the existing financial market in which the result is within the reasonable range.[21]

Stochastic volatility models

Main article: Stochastic volatility

See also: Local volatility

Since the market crash of 1987, it has been observed that market implied volatility for options of lower strike prices is typically higher than for higher strike prices, suggesting that volatility varies both for time and for the price level of the underlying security - a so-called volatility smile; and with a time dimension, a volatility surface.

The main approach here is to treat volatility as stochastic, with the resultant stochastic volatility models and the Heston model as a prototype;[22] see #Risk-neutral_measure for a discussion of the logic. Other models include the CEV and SABR volatility models. One principal advantage of the Heston model, however, is that it can be solved in closed form, while other stochastic volatility models require complex numerical methods.[22]

class="cite-bracket">]</sup>
</p><p>An alternate, though related, approach is to apply a <a
href="/wiki/Local_volatility" title="Local volatility">local volatility
model, where <a href="/wiki/Volatility_(finance)" title="Volatility
(finance)">volatility is treated as a <i><a class="mw-redirect"
href="/wiki/Deterministic" title="Deterministic">deterministic</i> function
of both the current asset level <span class="mwe-math-element mwe-math-element-
inline"><span class="mwe-math-mathml-inline mwe-math-mathml-a11y"
style="display: none;"><math alttext="{\displaystyle S_{t}}"
xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<msub>
<mi>S</mi>
<mrow class="MJX-TeXAtom-ORD">
<mi>t</mi>
</mrow>
</msub>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle S_{t}}</annotation>
</semantics>
</math><img alt="{\displaystyle S_{t}}" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/7e2391e6e796fbf718be3828080775ac2ac3d3d4"
style="vertical-align: -0.671ex; width:2.251ex; height:2.509ex;"/> and of
time <span class="mwe-
math-mathml-inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle t}" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>t</mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle t}</annotation>
</semantics>
</math><img alt="{\displaystyle t}" aria-hidden="true" class="mwe-math-
fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api/rest
_v1/media/math/render/svg/65658b7b223af9e1acc877d848888ecdb4466560"
style="vertical-align: -0.338ex; width:0.84ex; height:2.009ex;"/>. As
such, a local volatility model is a generalisation of the <a
href="/wiki/Black%E2%80%93Scholes_model" title="Black-Scholes
model">Black-Scholes model, where the volatility is a constant. The concept
was developed when Bruno
Dupire<sup class="reference" id="cite_ref-dupire_23-0"><a href="#cite_note-
dupire-23">[23<span class="cite-

bracket">]</sup> and <a href="/wiki/Emanuel_Derman" title="Emanuel
Derman">Emanuel Derman and <a class="new"
href="/w/index.php?title=Iraj_Kani&action=edit&redlink=1" title="Iraj
Kani (page does not exist)">Iraj Kani<sup class="reference" id="cite_ref-
derman_24-0"><span class="cite-
bracket">[24]</sup> noted that
there is a unique diffusion process consistent with the risk neutral densities
derived from the market prices of European options. See <a
href="/wiki/Local_volatility#Development" title="Local
volatility">#Development for discussion.
</p>
<div class="mw-heading mw-heading4"><h4 id="Short-rate_models">Short-rate
models</h4><span class="mw-editsection-
bracket">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=28"
title="Edit section: Short-rate models">edit<span class="mw-
editsection-bracket">]</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-
style"/><div class="hatnote navigation-not-searchable" role="note">Main article:
Short-rate
model</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-
style"/><div class="hatnote navigation-not-searchable" role="note">See also: <a
href="/wiki/Heath%E2%80%93Jarrow%E2%80%93Morton_framework"
title="Heath-Jarrow-Morton framework">Heath-Jarrow-Morton framework</div>
<p>For the valuation of bond
options, swaptions (i.e.
options on swaps), and
<a href="/wiki/Interest_rate_cap_and_floor" title="Interest rate cap and
floor">interest rate cap and floors (effectively options on the interest
rate) various short-
rate models have been developed (applicable, in fact, to <a class="mw-
redirect" href="/wiki/Interest_rate_derivatives" title="Interest rate
derivatives">interest rate derivatives generally). The best known of these
are <a href="/wiki/Black%E2%80%93Derman%E2%80%93Toy_model"
title="Black-Derman-Toy model">Black-Derman-Toy and <a
href="/wiki/Hull%E2%80%93White_model" title="Hull-White
model">Hull-White.<sup class="reference" id="cite_ref-25"><a
href="#cite_note-25">[25<span class="cite-
bracket">]</sup> These models describe the future evolution of <a
class="mw-redirect" href="/wiki/Interest_rates" title="Interest rates">interest
rates by describing the future evolution of the short rate. The other major
framework for interest rate modelling is the <a
href="/wiki/Heath%E2%80%93Jarrow%E2%80%93Morton_framework"
title="Heath-Jarrow-Morton framework">Heath-Jarrow-Morton framework (HJM).
The distinction is that HJM gives an analytical description of the <i>entire</i>
yield curve, rather than
just the short rate. (The HJM framework incorporates the <a class="mw-redirect"

href="/wiki/Brace%E2%80%93Gatarek%E2%80%93Musiela_model"
title="Brace-Gatarek-Musiela model">Brace-Gatarek-Musiela model and <a
class="new" href="/w/index.php?title=Market_model&action=edit&redlink=1"
title="Market model (page does not exist)">market models. And some of the
short rate models can be straightforwardly expressed in the HJM framework.) For
some purposes, e.g., valuation of <a class="mw-redirect" href="/wiki/Mortgage-
backed_securities" title="Mortgage-backed securities">mortgage-backed
securities, this can be a big simplification; regardless, the framework is
often preferred for models of higher dimension. Note that for the simpler
options here, i.e. those mentioned initially, the <a href="/wiki/Black_model"
title="Black model">Black model can instead be employed, with certain
assumptions.
</p>
<div class="mw-heading mw-heading3"><h3 id="Model_implementation">Model
implementation</h3><span class="mw-editsection-
bracket">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=29"
title="Edit section: Model implementation">edit<span class="mw-
editsection-bracket">]</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-
style"/><div class="hatnote navigation-not-searchable" role="note">Further
information: <a href="/wiki/Valuation_of_options" title="Valuation of
options">Valuation of options</div>
<p>Once a valuation model has been chosen, there are a number of different
techniques used to implement the models.
</p>
<div class="mw-heading mw-heading4"><h4 id="Analytic_techniques">Analytic
techniques</h4><span class="mw-editsection-
bracket">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=30"
title="Edit section: Analytic techniques">edit<span class="mw-
editsection-bracket">]</div>
<p>In some cases, one can take the <a href="/wiki/Mathematical_model"
title="Mathematical model">mathematical model and using analytical methods,
develop <a href="/wiki/Closed-form_expression" title="Closed-form
expression">closed form solutions such as the <a
href="/wiki/Black%E2%80%93Scholes_model" title="Black-Scholes
model">Black-Scholes model and the <a href="/wiki/Black_model" title="Black
model">Black model. The resulting solutions are readily computable, as are
their "Greeks".
Although the <a class="mw-redirect"
href="/wiki/Roll%E2%80%93Geske%E2%80%93Whaley_model" title="Roll-Geske-Whaley
model">Roll-Geske-Whaley model applies to an American call with one
dividend, for other cases of <a class="mw-redirect" href="/wiki/American_option"
title="American option">American options, closed form solutions are not
available; approximations here include <a class="mw-redirect"
href="/wiki/Barone-Adesi_and_Whaley" title="Barone-Adesi and Whaley">Barone-
Adesi and Whaley, <a class="mw-redirect"

href="/wiki/Bjerksund_and_Stensland" title="Bjerksund and Stensland">Bjerksund and Stensland and others.
</p>
<div class="mw-heading mw-heading4"><h4 id="Binomial_tree_pricing_model">Binomial tree pricing model</h4>[edit]</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-style"/><div class="hatnote navigation-not-searchable" role="note">Main article: Binomial options pricing model</div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-style"/><div class="hatnote navigation-not-searchable" role="note">Further information: Lattice model (finance)</div>
<p>Closely following the derivation of Black and Scholes, John Cox, Stephen Ross and Mark Rubinstein developed the original version of the binomial options pricing model.^{[26]}^{[27]} It models the dynamics of the option's theoretical value for discrete time intervals over the option's life. The model starts with a binomial tree of discrete future possible underlying stock prices. By constructing a riskless portfolio of an option and stock (as in the Black-Scholes model) a simple formula can be used to find the option price at each node in the tree. This value can approximate the theoretical value produced by Black-Scholes, to the desired degree of precision. However, the binomial model is considered more accurate than Black-Scholes because it is more flexible; e.g., discrete future dividend payments can be modeled correctly at the proper forward time steps, and American options can be modeled as well as European ones. Binomial models are widely used by professional option traders. The trinomial tree is a similar model, allowing for an up, down or stable path; although considered more accurate, particularly when fewer time-steps are modelled, it is less commonly used as its implementation is more complex. For a more general discussion, as well as for application to commodities, interest rates and hybrid instruments, see Lattice model (finance).

```
</p>
<div class="mw-heading mw-heading4"><h4 id="Monte_Carlo_models">Monte Carlo
models</h4><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=32"
title="Edit section: Monte Carlo models"><span>edit</span></a><span class="mw-
editsection-bracket">]</span></span></div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-
style"/><div class="hatnote navigation-not-searchable" role="note">Main article:
<a href="/wiki/Monte_Carlo_methods_for_option_pricing" title="Monte Carlo
methods for option pricing">Monte Carlo methods for option pricing</a></div>
<p>For many classes of options, traditional valuation techniques are <a
class="mw-redirect" href="/wiki/Tractable_problem" title="Tractable
problem">intractable</a> because of the complexity of the instrument. In these
cases, a Monte Carlo approach may often be useful. Rather than attempt to solve
the differential equations of motion that describe the option's value in
relation to the underlying security's price, a Monte Carlo model uses <a
class="mw-redirect" href="/wiki/Monte_Carlo_simulation" title="Monte Carlo
simulation">simulation</a> to generate random price paths of the underlying
asset, each of which results in a payoff for the option. The average of these
payoffs can be discounted to yield an <a class="mw-redirect"
href="/wiki/Expectation_value" title="Expectation value">expectation value</a>
for the option.<sup class="reference" id="cite_ref-28"><a
href="#cite_note-28"><span class="cite-bracket">[</span>28<span class="cite-
bracket">]</span></a></sup> Note though, that despite its flexibility, using
simulation for <a class="mw-redirect" href="/wiki/American_option"
title="American option">American styled options</a> is somewhat more complex
than for lattice based models.
</p>
<div class="mw-heading mw-heading4"><h4 id="Finite_difference_models">Finite
difference models</h4><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=33"
title="Edit section: Finite difference models"><span>edit</span></a><span
class="mw-editsection-bracket">]</span></span></div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-
style"/><div class="hatnote navigation-not-searchable" role="note">Main article:
<a href="/wiki/Finite_difference_methods_for_option_pricing" title="Finite
difference methods for option pricing">Finite difference methods for option
pricing</a></div>
<p>The equations used to model the option are often expressed as <a
href="/wiki/Partial_differential_equation" title="Partial differential
equation">partial differential equations</a> (see for example <a
href="/wiki/Black%E2%80%93Scholes_equation" title="Black-Scholes
equation">Black-Scholes equation</a>). Once expressed in this form, a <a
href="/wiki/Finite_difference_method" title="Finite difference method">finite
difference model</a> can be derived, and the valuation obtained. A number of
implementations of finite difference methods exist for option valuation,
```

including: `<a class="mw-redirect" href="/wiki/Explicit_method" title="Explicit method">explicit finite difference</a>`, `<a class="mw-redirect" href="/wiki/Implicit_method" title="Implicit method">implicit finite difference</a>` and the `<a href="/wiki/Crank%E2%80%93Nicolson_method" title="Crank-Nicolson method">Crank-Nicolson method</a>`. A trinomial tree option pricing model can be shown to be a simplified application of the explicit finite difference method. Although the finite difference approach is mathematically sophisticated, it is particularly useful where changes are assumed over time in model inputs - for example dividend yield, risk-free rate, or volatility, or some combination of these - that are not `<a class="mw-redirect" href="/wiki/Tractable_problem" title="Tractable problem">tractable</a>` in closed form.
`</p>`
`<div class="mw-heading mw-heading4"><h4 id="Other_models">Other models</h4>[edit]</div>`
`<p>`Other numerical implementations which have been used to value options include `<a href="/wiki/Finite_element_method" title="Finite element method">finite element methods</a>`.
`</p>`
`<div class="mw-heading mw-heading2"><h2 id="Risks">Risks</h2>[edit]</div>`
`<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-style"/><div class="hatnote navigation-not-searchable" role="note">`See also: `<a href="/wiki/Derivative_(finance)#Risks" title="Derivative (finance)">Derivative (finance) § Risks</a></div>`
`<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-style"/><div class="hatnote navigation-not-searchable" role="note">`Further information: `<a href="/wiki/Financial_risk_management#Investment_banking" title="Financial risk management">Financial risk management § Investment banking</a></div>`
`<table class="wikitable floatright" width="100">`
`<tbody><tr>`
`<td>`Example:
`<p>`A call option (also known as a CO) expiring in 99 days on 100 shares of XYZ stock is struck at $50, with XYZ currently trading at $48. With future realized volatility over the life of the option estimated at 25%, the theoretical value of the option is $1.89. The hedge parameters `<span class="mwe-math-element mwe-math-element-inline"><span class="mwe-math-mathml-inline mwe-math-mathml-a11y" style="display: none;"><math alttext="{\displaystyle \Delta }" xmlns="http://www.w3.org/1998/Math/MathML">`
`<semantics>`
`<mrow class="MJX-TeXAtom-ORD">`

```
<mstyle displaystyle="true" scriptlevel="0">
<mi mathvariant="normal">Δ<!-- Δ --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle \Delta }</annotation>
</semantics>
</math></span><img alt="{\displaystyle \Delta }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/32769037c408874e1890f77554c65f39c523ebe2"
style="vertical-align: -0.338ex; width:1.936ex; height:2.176ex;"/></span>, <span
class="mwe-math-element mwe-math-element-inline"><span class="mwe-math-mathml-
inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle \Gamma }" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi mathvariant="normal">Γ<!-- Γ --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle \Gamma }</annotation>
</semantics>
</math></span><img alt="{\displaystyle \Gamma }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/4cfde86a3f7ec967af9955d0988592f0693d2b19"
style="vertical-align: -0.338ex; width:1.453ex; height:2.176ex;"/></span>, <span
class="mwe-math-element mwe-math-element-inline"><span class="mwe-math-mathml-
inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle \kappa }" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi> <!--   --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle \kappa }</annotation>
</semantics>
</math></span><img alt="{\displaystyle \kappa }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/54ddec2e922c5caea4e47d04feef86e782dc8e6d"
style="vertical-align: -0.338ex; width:1.339ex; height:1.676ex;"/></span>, <span
class="mwe-math-element mwe-math-element-inline"><span class="mwe-math-mathml-
inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle \theta }" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi> <!--   --></mi>
</mstyle>
```

```
</mrow>
<annotation encoding="application/x-tex">{\displaystyle \theta }</annotation>
</semantics>
</math></span><img alt="{\displaystyle \theta }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/6e5ab2664b422d53eb0c7df3b87e1360d75ad9af"
style="vertical-align: -0.338ex; width:1.09ex; height:2.176ex;"/></span> are
(0.439, 0.0631, 9.6, and -0.022), respectively. Assume that on the following
day, XYZ stock rises to $48.5 and volatility falls to 23.5%. We can calculate
the estimated value of the call option by applying the hedge parameters to the
new model inputs as:
</p>
<dl><dd><dl><dd><span class="mwe-math-element mwe-math-element-inline"><span
class="mwe-math-mathml-inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle dC=(0.439\cdot 0.5)+\left(0.0631\cdot {\frac
{0.5^{2}}{2}}\right)+(9.6\cdot -0.015)+(-0.022\cdot 1)=0.0614}"
xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>d</mi>
<mi>C</mi>
<mo>=</mo>
<mo stretchy="false">(</mo>
<mn>0.439</mn>
<mo> <!--   --></mo>
<mn>0.5</mn>
<mo stretchy="false">)</mo>
<mo>+</mo>
<mrow>
<mo>(</mo>
<mrow>
<mn>0.0631</mn>
<mo> <!--   --></mo>
<mrow class="MJX-TeXAtom-ORD">
<mfrac>
<msup>
<mn>0.5</mn>
<mrow class="MJX-TeXAtom-ORD">
<mn>2</mn>
</mrow>
</msup>
<mn>2</mn>
</mfrac>
</mrow>
</mrow>
<mo>)</mo>
</mrow>
```

```
<mo>+</mo>
<mo stretchy="false">(</mo>
<mn>9.6</mn>
<mo> <!--   --></mo>
<mo>-<!-- - --></mo>
<mn>0.015</mn>
<mo stretchy="false">)</mo>
<mo>+</mo>
<mo stretchy="false">(</mo>
<mo>-<!-- - --></mo>
<mn>0.022</mn>
<mo> <!--   --></mo>
<mn>1</mn>
<mo stretchy="false">)</mo>
<mo>=</mo>
<mn>0.0614</mn>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle dC=(0.439\cdot
0.5)+\left(0.0631\cdot {\frac {0.5^{2}}{2}}\right)+(9.6\cdot
-0.015)+(-0.022\cdot 1)=0.0614}</annotation>
</semantics>
</math></span><img alt="{\displaystyle dC=(0.439\cdot 0.5)+\left(0.0631\cdot
{\frac {0.5^{2}}{2}}\right)+(9.6\cdot -0.015)+(-0.022\cdot 1)=0.0614}" aria-
hidden="true" class="mwe-math-fallback-image-inline mw-invert skin-invert" src="
https://wikimedia.org/api/rest_v1/media/math/render/svg/3a91a0d1d91d142da90a8523
9039a9af9cc8c6dd" style="vertical-align: -2.505ex; width:77.658ex;
height:6.343ex;"/></span></dd></dl></dd></dl>
<p>Under this scenario, the value of the option increases by $0.0614 to $1.9514,
realizing a profit of $6.14. Note that for a delta neutral portfolio, whereby
the trader had also sold 44 shares of XYZ stock as a hedge, the net loss under
the same scenario would be ($15.86).
</p>
</td></tr></tbody></table>
<p>As with all securities, trading options entails the risk of the option's
value changing over time. However, unlike traditional securities, the <a
href="/wiki/Stock_option_return" title="Stock option return">return</a> from
holding an option varies non-linearly with the value of the underlying and other
factors. Therefore, the risks associated with holding options are more
complicated to understand and predict.
</p>
<div class="mw-heading mw-heading3"><h3 id="Standard_hedge_parameters">Standard
hedge parameters</h3><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=36"
title="Edit section: Standard hedge parameters"><span>edit</span></a><span
class="mw-editsection-bracket">]</span></span></div>
<p>In general, the change in the value of an option can be derived from <a
```

```
href="/wiki/It%C3%B4%27s_lemma" title="Itô's lemma">Itô's lemma</a> as:
</p>
<dl><dd><dl><dd><span class="mwe-math-element mwe-math-element-inline"><span
class="mwe-math-mathml-inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle dC=\Delta dS+\Gamma {\frac {dS^{2}}{2}}+\kappa d\sigma
+\theta dt\,}" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>d</mi>
<mi>C</mi>
<mo>=</mo>
<mi mathvariant="normal">Δ<!-- Δ --></mi>
<mi>d</mi>
<mi>S</mi>
<mo>+</mo>
<mi mathvariant="normal">Γ<!-- Γ --></mi>
<mrow class="MJX-TeXAtom-ORD">
<mfrac>
<mrow>
<mi>d</mi>
<msup>
<mi>S</mi>
<mrow class="MJX-TeXAtom-ORD">
<mn>2</mn>
</mrow>
</msup>
</mrow>
<mn>2</mn>
</mfrac>
</mrow>
<mo>+</mo>
<mi> <!--   --></mi>
<mi>d</mi>
<mi> <!--   --></mi>
<mo>+</mo>
<mi> <!--   --></mi>
<mi>d</mi>
<mi>t</mi>
<mspace width="thinmathspace"></mspace>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle dC=\Delta dS+\Gamma
{\frac {dS^{2}}{2}}+\kappa d\sigma +\theta dt\,}</annotation>
</semantics>
</math></span><img alt="{\displaystyle dC=\Delta dS+\Gamma {\frac
{dS^{2}}{2}}+\kappa d\sigma +\theta dt\,}" aria-hidden="true" class="mwe-math-
fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api/rest
```

```
_v1/media/math/render/svg/18036fdfa4708512ddd20aa7f030febe27dd004e"
style="vertical-align: -1.838ex; width:32.751ex;
height:5.676ex;"/></span></dd></dl></dd></dl>
<p>where the <a href="/wiki/Greeks_(finance)" title="Greeks
(finance)">Greeks</a> <span class="mwe-math-element mwe-math-element-
inline"><span class="mwe-math-mathml-inline mwe-math-mathml-a11y"
style="display: none;"><math alttext="{\displaystyle \Delta }"
xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi mathvariant="normal">Δ<!-- Δ --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle \Delta }</annotation>
</semantics>
</math></span><img alt="{\displaystyle \Delta }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/32769037c408874e1890f77554c65f39c523ebe2"
style="vertical-align: -0.338ex; width:1.936ex; height:2.176ex;"/></span>, <span
class="mwe-math-element mwe-math-element-inline"><span class="mwe-math-mathml-
inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle \Gamma }" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi mathvariant="normal">Γ<!-- Γ --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle \Gamma }</annotation>
</semantics>
</math></span><img alt="{\displaystyle \Gamma }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/4cfde86a3f7ec967af9955d0988592f0693d2b19"
style="vertical-align: -0.338ex; width:1.453ex; height:2.176ex;"/></span>, <span
class="mwe-math-element mwe-math-element-inline"><span class="mwe-math-mathml-
inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle \kappa }" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi> <!--   --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle \kappa }</annotation>
</semantics>
</math></span><img alt="{\displaystyle \kappa }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
```

/rest_v1/media/math/render/svg/54ddec2e922c5caea4e47d04feef86e782dc8e6d"
style="vertical-align: -0.338ex; width:1.339ex; height:1.676ex;"/> and
<span class="mwe-math-
mathml-inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle \theta }" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi> <!-- --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle \theta }</annotation>
</semantics>
</math><img alt="{\displaystyle \theta }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/6e5ab2664b422d53eb0c7df3b87e1360d75ad9af"
style="vertical-align: -0.338ex; width:1.09ex; height:2.176ex;"/> are the
standard hedge parameters calculated from an option valuation model, such as <a
href="/wiki/Black%E2%80%93Scholes_model" title="Black-Scholes
model">Black-Scholes, and <span class="mwe-math-element mwe-math-element-
inline"><span class="mwe-math-mathml-inline mwe-math-mathml-a11y"
style="display: none;"><math alttext="{\displaystyle dS}"
xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>d</mi>
<mi>S</mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle dS}</annotation>
</semantics>
</math><img alt="{\displaystyle dS}" aria-hidden="true" class="mwe-math-
fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api/rest
_v1/media/math/render/svg/66f6ab8a2a8b85df78efbea896fcfeb3d4ea39e4"
style="vertical-align: -0.338ex; width:2.715ex; height:2.176ex;"/>, <span class="mwe-math-mathml-
inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle d\sigma }" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>d</mi>
<mi> <!-- --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle d\sigma }</annotation>
</semantics>

</math> and <math alttext="{\displaystyle dt}" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>d</mi>
<mi>t</mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle dt}</annotation>
</semantics>
</math> are unit changes in the underlying's price, the underlying's volatility and time, respectively.
</p><p>Thus, at any point in time, one can estimate the risk inherent in holding an option by calculating its hedge parameters and then estimating the expected change in the model inputs, <math alttext="{\displaystyle dS}" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>d</mi>
<mi>S</mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle dS}</annotation>
</semantics>
</math>, <span class="mwe-math-element mwe-math-element-inline"><span class="mwe-math-mathml-inline mwe-math-mathml-a11y" style="display: none;"><math alttext="{\displaystyle d\sigma }" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>d</mi>

```
<mi> <!--   --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle d\sigma }</annotation>
</semantics>
</math></span><img alt="{\displaystyle d\sigma }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/1a5824bc315231366cb8a7268d5143a62d59a178"
style="vertical-align: -0.338ex; width:2.546ex; height:2.176ex;"/></span> and
<span class="mwe-math-element mwe-math-element-inline"><span class="mwe-math-
mathml-inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle dt}" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>d</mi>
<mi>t</mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle dt}</annotation>
</semantics>
</math></span><img alt="{\displaystyle dt}" aria-hidden="true" class="mwe-math-
fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api/rest
_v1/media/math/render/svg/ebee76a835701fd1f26047a09855f2ea36bb08fc"
style="vertical-align: -0.338ex; width:2.055ex; height:2.176ex;"/></span>,
provided the changes in these values are small. This technique can be used
effectively to understand and manage the risks associated with standard options.
For instance, by offsetting a holding in an option with the quantity <span
class="mwe-math-element mwe-math-element-inline"><span class="mwe-math-mathml-
inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle -\Delta }" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mo>-<!-- - --></mo>
<mi mathvariant="normal">Δ<!-- Δ --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle -\Delta }</annotation>
</semantics>
</math></span><img alt="{\displaystyle -\Delta }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/da918ee919c25ab41aa8c995995b6890764183c7"
style="vertical-align: -0.505ex; width:3.744ex; height:2.343ex;"/></span> of
shares in the underlying, a trader can form a <a href="/wiki/Delta_neutral"
title="Delta neutral">delta neutral</a> portfolio that is hedged from loss for
small changes in the underlying's price. The corresponding price sensitivity
formula for this portfolio <span class="mwe-math-element mwe-math-element-
```

```
inline"><span class="mwe-math-mathml-inline mwe-math-mathml-a11y"
style="display: none;"><math alttext="{\displaystyle \Pi }"
xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi mathvariant="normal">Π<!-- Π --></mi>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle \Pi }</annotation>
</semantics>
</math></span><img alt="{\displaystyle \Pi }" aria-hidden="true" class="mwe-
math-fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api
/rest_v1/media/math/render/svg/eed3e3db6cc2028a183af948212ed2551d25c954"
style="vertical-align: -0.338ex; width:1.743ex; height:2.176ex;"/></span> is:
</p>
<dl><dd><dl><dd><span class="mwe-math-element mwe-math-element-inline"><span
class="mwe-math-mathml-inline mwe-math-mathml-a11y" style="display: none;"><math
alttext="{\displaystyle d\Pi =\Delta dS+\Gamma {\frac {dS^{2}}{2}}+\kappa
d\sigma +\theta dt-\Delta dS=\Gamma {\frac {dS^{2}}{2}}+\kappa d\sigma +\theta
dt\,}" xmlns="http://www.w3.org/1998/Math/MathML">
<semantics>
<mrow class="MJX-TeXAtom-ORD">
<mstyle displaystyle="true" scriptlevel="0">
<mi>d</mi>
<mi mathvariant="normal">Π<!-- Π --></mi>
<mo>=</mo>
<mi mathvariant="normal">Δ<!-- Δ --></mi>
<mi>d</mi>
<mi>S</mi>
<mo>+</mo>
<mi mathvariant="normal">Γ<!-- Γ --></mi>
<mrow class="MJX-TeXAtom-ORD">
<mfrac>
<mrow>
<mi>d</mi>
<msup>
<mi>S</mi>
<mrow class="MJX-TeXAtom-ORD">
<mn>2</mn>
</mrow>
</msup>
</mrow>
<mn>2</mn>
</mfrac>
</mrow>
<mo>+</mo>
<mi> <!--   --></mi>
```

```
<mi>d</mi>
<mi> <!--   --></mi>
<mo>+</mo>
<mi> <!--   --></mi>
<mi>d</mi>
<mi>t</mi>
<mo>-<!-- - --></mo>
<mi mathvariant="normal">Δ<!-- Δ --></mi>
<mi>d</mi>
<mi>S</mi>
<mo>=</mo>
<mi mathvariant="normal">Γ<!-- Γ --></mi>
<mrow class="MJX-TeXAtom-ORD">
<mfrac>
<mrow>
<mi>d</mi>
<msup>
<mi>S</mi>
<mrow class="MJX-TeXAtom-ORD">
<mn>2</mn>
</mrow>
</msup>
</mrow>
<mn>2</mn>
</mfrac>
</mrow>
<mo>+</mo>
<mi> <!--   --></mi>
<mi>d</mi>
<mi> <!--   --></mi>
<mo>+</mo>
<mi> <!--   --></mi>
<mi>d</mi>
<mi>t</mi>
<mspace width="thinmathspace"></mspace>
</mstyle>
</mrow>
<annotation encoding="application/x-tex">{\displaystyle d\Pi =\Delta dS+\Gamma
{\frac {dS^{2}}{2}}+\kappa d\sigma +\theta dt-\Delta dS=\Gamma {\frac
{dS^{2}}{2}}+\kappa d\sigma +\theta dt\,}</annotation>
</semantics>
</math></span><img alt="{\displaystyle d\Pi =\Delta dS+\Gamma {\frac
{dS^{2}}{2}}+\kappa d\sigma +\theta dt-\Delta dS=\Gamma {\frac
{dS^{2}}{2}}+\kappa d\sigma +\theta dt\,}" aria-hidden="true" class="mwe-math-
fallback-image-inline mw-invert skin-invert" src="https://wikimedia.org/api/rest
_v1/media/math/render/svg/98367d65f59657fed489a274fa243e3e256a3528"
style="vertical-align: -1.838ex; width:62.11ex;
height:5.676ex;"/></span></dd></dl></dd></dl>
```

```html
<div class="mw-heading mw-heading3"><h3 id="Pin_risk">Pin risk</h3><span
class="mw-editsection"><span class="mw-editsection-bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=37"
title="Edit section: Pin risk"><span>edit</span></a><span class="mw-editsection-
bracket">]</span></span></div>
<link href="mw-data:TemplateStyles:r1236090951" rel="mw-deduplicated-inline-
style"/><div class="hatnote navigation-not-searchable" role="note">Main article:
<a href="/wiki/Pin_risk" title="Pin risk">Pin risk</a></div>
<p>A special situation called <a class="mw-redirect"
href="/wiki/Pin_risk_(options)" title="Pin risk (options)">pin risk</a> can
arise when the underlying closes at or very close to the option's strike value
on the last day the option is traded prior to expiration. The option writer
(seller) may not know with certainty whether or not the option will actually be
exercised or be allowed to expire. Therefore, the option writer may end up with
a large, unwanted residual position in the underlying when the markets open on
the next trading day after expiration, regardless of his or her best efforts to
avoid such a residual.
</p>
<div class="mw-heading mw-heading3"><h3 id="Counterparty_risk">Counterparty
risk</h3><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=38"
title="Edit section: Counterparty risk"><span>edit</span></a><span class="mw-
editsection-bracket">]</span></span></div>
<p>A further, often ignored, risk in derivatives such as options is <a
class="mw-redirect" href="/wiki/Counterparty_credit_risk" title="Counterparty
credit risk">counterparty risk</a>. In an option contract this risk is that the
seller will not sell or buy the underlying asset as agreed. The risk can be
minimized by using a financially strong intermediary able to make good on the
trade, but in a major panic or crash the number of defaults can overwhelm even
the strongest intermediaries.
</p>
<div class="mw-heading mw-heading3"><h3 id="Options_approval_levels">Options
approval levels</h3><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=39"
title="Edit section: Options approval levels"><span>edit</span></a><span
class="mw-editsection-bracket">]</span></span></div>
<p>To limit risk, brokers use <a href="/wiki/Access_control" title="Access
control">access control</a> systems to restrict traders from executing certain
options strategies that would not be suitable for them. Brokers generally offer
about four or five approval levels, with the lowest level offering the lowest
risk and the highest level offering the highest risk. The actual numbers of
levels, and the specific options strategies permitted at each level, vary
between brokers. Brokers may also have their own specific vetting criteria, but
they are usually based on factors such as the trader's annual salary and net
worth, trading experience, and investment goals (capital preservation, income,
growth, or speculation). For example, a trader with a low salary and net worth,
```

little trading experience, and only concerned about preserving capital generally
would not be permitted to execute high-risk strategies like <a class="mw-
redirect" href="/wiki/Naked_call" title="Naked call">naked calls and <a
class="mw-redirect" href="/wiki/Naked_put" title="Naked put">naked puts.
Traders can update their information when requesting permission to upgrade to a
higher approval level.<sup class="reference" id="cite_ref-29"><a
href="#cite_note-29">[29<span class="cite-
bracket">]</sup>
</p>
<div class="mw-heading mw-heading2"><h2 id="Options_exchanges">Options
exchanges</h2><span class="mw-editsection-
bracket">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=40"
title="Edit section: Options exchanges">edit<span class="mw-
editsection-bracket">]</div>
<div class="mw-heading mw-heading3"><h3
id="Chicago_Board_Options_Exchange_(CBOE)">Chicago Board Options
Exchange (CBOE)</h3><span class="mw-editsection-
bracket">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=41"
title="Edit section: Chicago Board Options Exchange
(CBOE)">edit<span class="mw-editsection-
bracket">]</div>
<p><a class="mw-redirect" href="/wiki/Chicago_Board_Options_Exchange"
title="Chicago Board Options Exchange">The Chicago Board Options Exchange
(CBOE) is an options exchange located in Chicago, Illinois. Founded in 1973, the
CBOE is the first options exchange in the United States. The CBOE offers options
trading on various underlying securities including market indexes, exchange-
traded funds (ETFs), stocks, and volatility indexes. Its flagship product is
options on the S&P 500
Index (SPX), one of the most actively traded options globally. In addition to
its floor-based open outcry trading, the CBOE also operates an all-<a
href="/wiki/Electronic_trading_platform" title="Electronic trading
platform">electronic trading platform. The CBOE is regulated by the <a
href="/wiki/U.S._Securities_and_Exchange_Commission" title="U.S. Securities and
Exchange Commission">U.S. Securities and Exchange Commission (SEC).<sup
class="reference" id="cite_ref-30"><span class="cite-
bracket">[30]</sup>
</p>
<div class="mw-heading mw-heading3"><h3 id="NASDAQ_OMX_PHLX">NASDAQ OMX
PHLX</h3><span class="mw-editsection-
bracket">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=42"
title="Edit section: NASDAQ OMX PHLX">edit<span class="mw-
editsection-bracket">]</div>
<p>Founded in 1790, The <a class="mw-redirect" href="/wiki/NASDAQ_OMX_PHLX"
title="NASDAQ OMX PHLX">NASDAQ OMX PHLX, also known as the <a

href="/wiki/Philadelphia_Stock_Exchange" title="Philadelphia Stock
Exchange">Philadelphia Stock Exchange is an options and futures exchange
located in Philadelphia, Pennsylvania. It is the oldest stock exchange in the
United States. The NASDAQ OMX PHLX allows trading of options on equities,
indexes, ETFs, and foreign currencies. It is one of the few exchanges designated
for trading currency options in the U.S. In 2008, <a href="/wiki/Nasdaq"
title="Nasdaq">NASDAQ acquired the Philadelphia Stock Exchange and renamed
it NASDAQ OMX PHLX. It operates as a subsidiary of NASDAQ, Inc.<sup
class="reference" id="cite_ref-31"><span class="cite-
bracket">[31]</sup>
</p>
<div class="mw-heading mw-heading3"><h3
id="International_Securities_Exchange_(ISE)">International Securities
Exchange (ISE)</h3><span class="mw-editsection-
bracket">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=43"
title="Edit section: International Securities Exchange
(ISE)">edit<span class="mw-editsection-
bracket">]</div>
<p><a href="/wiki/International_Securities_Exchange" title="International
Securities Exchange">International Securities Exchange (ISE) is an
electronic options exchange located in New York City. Launched in 2000, ISE was
the first all-electronic U.S. options exchange. ISE provides options trading on
U.S. equities, indexes, and ETFs. Its trading platform provides a maximum price
improvement auction to allow market makers to compete for orders. ISE is
regulated by the SEC and is owned by Nasdaq, Inc.<sup class="reference"
id="cite_ref-32"><span class="cite-
bracket">[32]</sup>
</p>
<div class="mw-heading mw-heading3"><h3 id="Eurex_Exchange">Eurex
Exchange</h3><span class="mw-editsection-
bracket">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=44"
title="Edit section: Eurex Exchange">edit<span class="mw-
editsection-bracket">]</div>
<p><a class="mw-redirect" href="/wiki/Eurex_Exchange" title="Eurex
Exchange">Eurex Exchange is a derivatives exchange located in Frankfurt,
Germany. It offers trading in futures and options on interest rates, equities,
indexes, and fixed-income products. Formed in 1998 from the merger of Deutsche
Terminbörse (DTB) and Swiss Options and Financial Futures Exchange (SOFFEX),
Eurex Exchange operates electronic and open outcry trading platforms. Eurex
Exchange is owned by Eurex Frankfurt AG.<sup class="reference"
id="cite_ref-33"><span class="cite-
bracket">[33]</sup>
</p>
<div class="mw-heading mw-heading3"><h3 id="Tokyo_Stock_Exchange_(TSE)">Tokyo Stock Exchange (TSE)</h3><span

class="mw-editsection">[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=45"
title="Edit section: Tokyo Stock Exchange (TSE)">edit]</div>
<p>Founded in 1878, the <a href="/wiki/Tokyo_Stock_Exchange" title="Tokyo Stock
Exchange">Tokyo Stock Exchange (TSE) is a stock exchange located in Tokyo,
Japan. In addition to equities, the TSE also provides trading in stock index
futures and options. Trading is conducted electronically as well as through
auction bidding by securities companies. The TSE is regulated by the <a
href="/wiki/Financial_Services_Agency" title="Financial Services
Agency">Financial Services Agency of Japan. It is owned by the <a
href="/wiki/Japan_Exchange_Group" title="Japan Exchange Group">Japan Exchange
Group.<sup class="reference" id="cite_ref-34">[34]</sup>
</p>
<div class="mw-heading mw-heading2"><h2 id="See_also">See also</h2>[<a
href="/w/index.php?title=Option_(finance)&action=edit&section=46"
title="Edit section: See also">edit<span class="mw-editsection-
bracket">]</div>
<style data-mw-deduplicate="TemplateStyles:r1184024115">.mw-parser-output .div-
col{margin-top:0.3em;column-width:30em}.mw-parser-output .div-col-small{font-
size:90%}.mw-parser-output .div-col-rules{column-rule:1px solid #aaa}.mw-parser-
output .div-col dl,.mw-parser-output .div-col ol,.mw-parser-output .div-col
ul{margin-top:0}.mw-parser-output .div-col li,.mw-parser-output .div-col
dd{page-break-inside:avoid;break-inside:avoid-column}</style><div class="div-
col">
<a class="mw-redirect" href="/wiki/American_Stock_Exchange"
title="American Stock Exchange">American Stock Exchange
<a href="/wiki/Area_yield_options_contract" title="Area yield options
contract">Area yield options contract
Ascot
(finance)
<a class="mw-redirect" href="/wiki/Chicago_Board_Options_Exchange"
title="Chicago Board Options Exchange">Chicago Board Options Exchange
Dilutive
security
Eurex
<a class="mw-redirect" href="/wiki/Euronext.liffe"
title="Euronext.liffe">Euronext.liffe
<a href="/wiki/International_Securities_Exchange" title="International
Securities Exchange">International Securities Exchange
NYSE Arca
<a href="/wiki/Philadelphia_Stock_Exchange" title="Philadelphia Stock
Exchange">Philadelphia Stock Exchange
LEAPS
(finance)
Options

backdating
Options Clearing Corporation
Options spread
Options strategy
Option symbol
Real options analysis
PnL Explained
Pin risk (options)
XVA
</div>
<div class="mw-heading mw-heading2"><h2 id="References">References</h2>[edit]</div>
<style data-mw-deduplicate="TemplateStyles:r1239543626">.mw-parser-output .reflist{margin-bottom:0.5em;list-style-type:decimal}@media screen{.mw-parser-output .reflist{font-size:90%}}.mw-parser-output .reflist .references{font-size:100%;margin-bottom:0;list-style-type:inherit}.mw-parser-output .reflist-columns-2{column-width:30em}.mw-parser-output .reflist-columns-3{column-width:25em}.mw-parser-output .reflist-columns{margin-top:0.3em}.mw-parser-output .reflist-columns ol{margin-top:0}.mw-parser-output .reflist-columns li{page-break-inside:avoid;break-inside:avoid-column}.mw-parser-output .reflist-upper-alpha{list-style-type:upper-alpha}.mw-parser-output .reflist-upper-roman{list-style-type:upper-roman}.mw-parser-output .reflist-lower-alpha{list-style-type:lower-alpha}.mw-parser-output .reflist-lower-greek{list-style-type:lower-greek}.mw-parser-output .reflist-lower-roman{list-style-type:lower-roman}</style><div class="reflist reflist-columns references-column-width" style="column-width: 30em;">
<ol class="references">
<li id="cite_note-1">^ <span class="reference-text"><style data-mw-deduplicate="TemplateStyles:r1238218222">.mw-parser-output cite.citation{font-style:inherit;word-wrap:break-word}.mw-parser-output .citation q{quotes:"\"""\"""'""'"}.mw-parser-output .citation:target{background-color:rgba(0,127,255,0.133)}.mw-parser-output .id-lock-free.id-lock-free a{background:url("//upload.wikimedia.org/wikipedia/commons/6/65/Lock-green.svg")right 0.1em center/9px no-repeat}.mw-parser-output .id-lock-limited.id-lock-limited a,.mw-parser-output .id-lock-registration.id-lock-registration a{background:url("//upload.wikimedia.org/wikipedia/commons/d/d6/Lock-gray-alt-2.svg")right 0.1em center/9px no-repeat}.mw-parser-output .id-lock-

```
subscription.id-lock-subscription
a{background:url("//upload.wikimedia.org/wikipedia/commons/a/aa/Lock-red-
alt-2.svg")right 0.1em center/9px no-repeat}.mw-parser-output .cs1-ws-icon
a{background:url("//upload.wikimedia.org/wikipedia/commons/4/4c/Wikisource-
logo.svg")right 0.1em center/12px no-repeat}body:not(.skin-timeless):not(.skin-
minerva) .mw-parser-output .id-lock-free a,body:not(.skin-timeless):not(.skin-
minerva) .mw-parser-output .id-lock-limited a,body:not(.skin-
timeless):not(.skin-minerva) .mw-parser-output .id-lock-registration
a,body:not(.skin-timeless):not(.skin-minerva) .mw-parser-output .id-lock-
subscription a,body:not(.skin-timeless):not(.skin-minerva) .mw-parser-output
.cs1-ws-icon a{background-size:contain;padding:0 1em 0 0}.mw-parser-output
.cs1-code{color:inherit;background:inherit;border:none;padding:inherit}.mw-
parser-output .cs1-hidden-error{display:none;color:var(--color-error,#d33)}.mw-
parser-output .cs1-visible-error{color:var(--color-error,#d33)}.mw-parser-output
.cs1-maint{display:none;color:#085;margin-left:0.3em}.mw-parser-output
.cs1-kern-left{padding-left:0.2em}.mw-parser-output .cs1-kern-right{padding-
right:0.2em}.mw-parser-output .citation .mw-selflink{font-weight:inherit}@media
screen{.mw-parser-output .cs1-format{font-size:95%}html.skin-theme-clientpref-
night .mw-parser-output .cs1-maint{color:#18911f}}@media screen and (prefers-
color-scheme:dark){html.skin-theme-clientpref-os .mw-parser-output
.cs1-maint{color:#18911f}}</style><cite class="citation web cs1"
id="CITEREFAbraham2010">Abraham, Stephan (May 13, 2010). <a class="external
text" href="http://www.investopedia.com/articles/optioninvestor/10/history-
options-futures.asp" rel="nofollow">"History of Financial Options -
Investopedia"</a>. <i>Investopedia</i><span class="reference-accessdate">.
Retrieved <span class="nowrap">June 2,</span> 2014</span>.</cite><span
class="Z3988" title="ctx_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&amp;rft.genre=unknow
n&amp;rft.jtitle=Investopedia&amp;rft.atitle=History+of+Financial+Options+-
+Investopedia&amp;rft.date=2010-05-
13&amp;rft.aulast=Abraham&amp;rft.aufirst=Stephan&amp;rft_id=http%3A%2F%2Fwww.in
vestopedia.com%2Farticles%2Foptioninvestor%2F10%2Fhistory-options-futures.asp&am
p;rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28finance%29"></span></span>
</li>
<li id="cite_note-2"><span class="mw-cite-backlink"><b><a
href="#cite_ref-2">^</a></b></span> <span class="reference-text">Mattias Sander.
Bondesson's Representation of the Variance Gamma Model and Monte Carlo Option
Pricing. Lunds Tekniska Högskola 2008</span>
</li>
<li id="cite_note-3"><span class="mw-cite-backlink"><b><a
href="#cite_ref-3">^</a></b></span> <span class="reference-text">Aristotle.
Politics.</span>
</li>
<li id="cite_note-4"><span class="mw-cite-backlink"><b><a
href="#cite_ref-4">^</a></b></span> <span class="reference-text">Josef de la
Vega. <i>Confusión de Confusiones</i>. 1688. Portions Descriptive of the
Amsterdam Stock Exchange Selected and Translated by Professor Hermann
Kellenbenz. Baker Library, Harvard Graduate School Of Business Administration,
```

Boston, Massachusetts.

<li id="cite_note-Global-5"><a
href="#cite_ref-Global_5-0">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation cs2" id="CITEREFSmith2003">Smith, B. Mark (2003),
<i>History of the Global Stock Market from Ancient Rome to Silicon Valley</i>,
University of Chicago Press, p. 20, <a class="mw-redirect"
href="/wiki/ISBN_(identifier)" title="ISBN (identifier)">ISBN <a
href="/wiki/Special:BookSources/0-226-76404-4" title="Special:BookSources/0-226-
76404-4"><bdi>0-226-76404-4</bdi></cite><span class="Z3988" title="ctx_ver=Z
39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&
rft.btitle=History+of+the+Global+Stock+Market+from+Ancient+Rome+to+Silicon+Valle
y&rft.pages=20&rft.pub=University+of+Chicago+Press&rft.date=2003&amp
;rft.isbn=0-226-76404-
4&rft.aulast=Smith&rft.aufirst=B.+Mark&rfr_id=info%3Asid%2Fen.wikipe
dia.org%3AOption+%28finance%29">

<li id="cite_note-6"><a
href="#cite_ref-6">^ <link href="mw-
data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-style"/><cite
class="citation cs2" id="CITEREFBrealeyMyers2003"><a
href="/wiki/Richard_A._Brealey" title="Richard A. Brealey">Brealey, Richard
A.; Myers, Stewart
(2003), <a href="/wiki/Principles_of_Corporate_Finance" title="Principles of
Corporate Finance"><i>Principles of Corporate Finance</i> (7th ed.), McGraw-
Hill, Chapter 20</cite><span class="Z3988" title="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&
rft.btitle=Principles+of+Corporate+Finance&rft.edition=7th&rft.pub=McGra
w-Hill&rft.date=2003&rft.aulast=Brealey&rft.aufirst=Richard+A.&r
ft.au=Myers%2C+Stewart&rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28fina
nce%29">

<li id="cite_note-7"><a
href="#cite_ref-7">^ <link href="mw-
data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-style"/><cite
class="citation cs2" id="CITEREFHull2005">Hull, John C. (2005), <a
class="external text" href="https://web.archive.org/web/20160729024723/http://fa
n.zhang.gl/ecref/options" rel="nofollow"><i>Options, Futures and Other
Derivatives (excerpt by Fan Zhang)</i> (6th ed.), Prentice-Hall, p. 6, <a
class="mw-redirect" href="/wiki/ISBN_(identifier)" title="ISBN
(identifier)">ISBN <a href="/wiki/Special:BookSources/0-13-149908-4"
title="Special:BookSources/0-13-149908-4"><bdi>0-13-149908-4</bdi>, archived
from <a class="external text" href="http://fan.zhang.gl/ecref/options"
rel="nofollow">the original on July 29, 2016<span class="reference-
accessdate">, retrieved April 21,
2008</cite><span class="Z3988" title="ctx_ver=Z39.88-

2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&
rft.btitle=Options%2C+Futures+and+Other+Derivatives+%28excerpt+by+Fan+Zhang%29&a
mp;rft.pages=6&rft.edition=6th&rft.pub=Prentice-Hall&rft.date=2005&a
mp;rft.isbn=0-13-149908-
4&rft.aulast=Hull&rft.aufirst=John+C.&rft_id=http%3A%2F%2Ffan.zhang.
gl%2Fecref%2Foptions&rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28financ
e%29">

<li id="cite_note-occ-8"><a href="#cite_ref-
occ_8-0">^ <link href="mw-
data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-style"/><cite
class="citation cs2"><a class="external text" href="https://www.theocc.com/getme
dia/a151a9ae-d784-4a15-bdeb-23a029f50b70/riskstoc.pdf;"
rel="nofollow"><i>Characteristics and Risks of Standardized Options</i>,
Options Clearing Corporation, retrieved July 15, 2020</cite><span class="Z3988" title="ctx_
ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&
rft.btitle=Characteristics+and+Risks+of+Standardized+Options&rft.pub=Options
+Clearing+Corporation&rft_id=https%3A%2F%2Fwww.theocc.com%2Fgetmedia%2Fa151a
9ae-d784-4a15-bdeb-
23a029f50b70%2Friskstoc.pdf%3B&rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption
+%28finance%29">

<li id="cite_note-9"><a
href="#cite_ref-9">^ <link href="mw-
data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-style"/><cite
class="citation cs2"><a class="external text" href="http://www.cme.com/trading/"
rel="nofollow"><i>Trade CME Products</i>, Chicago Mercantile Exchange, retrieved June 21,
2007</cite><span class="Z3988" title="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&
rft.btitle=Trade+CME+Products&rft.pub=Chicago+Mercantile+Exchange&rft_id
=http%3A%2F%2Fwww.cme.com%2Ftrading%2F&rfr_id=info%3Asid%2Fen.wikipedia.org%
3AOption+%28finance%29">

<li id="cite_note-10"><a
href="#cite_ref-10">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation cs2"><a class="external text" href="https://web.ar
chive.org/web/20070511003741/http://www.iseoptions.com/products_traded.aspx"
rel="nofollow"><i>ISE Traded Products</i>, International Securities
Exchange, archived from <a class="external text"
href="http://www.iseoptions.com/products_traded.aspx" rel="nofollow">the
original on May 11, 2007, retrieved June 21, 2007</cite><span class="Z3988" title="ctx_
ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&

```
rft.btitle=ISE+Traded+Products&amp;rft.pub=International+Securities+Exchange&amp
;rft_id=http%3A%2F%2Fwww.iseoptions.com%2Fproducts_traded.aspx&amp;rfr_id=info%3
Asid%2Fen.wikipedia.org%3AOption+%28finance%29"></span></span>
</li>
<li id="cite_note-11"><span class="mw-cite-backlink"><b><a
href="#cite_ref-11">^</a></b></span> <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation cs2" id="CITEREFElinor_Mills2006">Elinor Mills
(December 12, 2006), <a class="external text" href="http://news.cnet.com/Google+
unveils+unorthodox+stock+option+auction/2100-1030_3-6143227.html"
rel="nofollow"><i>Google unveils unorthodox stock option auction</i></a>,
CNet<span class="reference-accessdate">, retrieved <span class="nowrap">June
19,</span> 2007</span></cite><span class="Z3988" title="ctx_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&amp;rft.genre=book&amp;
rft.btitle=Google+unveils+unorthodox+stock+option+auction&amp;rft.pub=CNet&amp;r
ft.date=2006-12-
12&amp;rft.au=Elinor+Mills&amp;rft_id=http%3A%2F%2Fnews.cnet.com%2FGoogle%2Bunve
ils%2Bunorthodox%2Bstock%2Boption%2Bauction%2F2100-1030_3-
6143227.html&amp;rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28finance%29"></
span></span>
</li>
<li id="cite_note-12"><span class="mw-cite-backlink"><b><a
href="#cite_ref-12">^</a></b></span> <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation cs2" id="CITEREFHarris2003">Harris, Larry (2003),
<i>Trading and Exchanges</i>, Oxford University Press, pp.26-27</cite><span
class="Z3988" title="ctx_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&amp;rft.genre=book&amp;
rft.btitle=Trading+and+Exchanges&amp;rft.pub=Oxford+University+Press&amp;rft.dat
e=2003&amp;rft.aulast=Harris&amp;rft.aufirst=Larry&amp;rfr_id=info%3Asid%2Fen.wi
kipedia.org%3AOption+%28finance%29"></span></span>
</li>
<li id="cite_note-13"><span class="mw-cite-backlink"><b><a
href="#cite_ref-13">^</a></b></span> <span class="reference-text"><a
class="external text" href="http://invest-faq.com/cbc/deriv-option-basics.html"
rel="nofollow">invest-faq</a> or <a class="external text"
href="http://www.wfu.edu/~palmitar/Law&amp;Valuation/chapter%204/4-4-1.htm"
rel="nofollow">Law &amp; Valuation</a> for typical size of option
contract</span>
</li>
<li id="cite_note-14"><span class="mw-cite-backlink"><b><a
href="#cite_ref-14">^</a></b></span> <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation web cs1"><a class="external text"
href="https://www.cboe.com/LearnCenter/pdf/understanding.pdf"
rel="nofollow">"Understanding Stock Options"</a> <span
class="cs1-format">(PDF)</span>. <a href="/wiki/Options_Clearing_Corporation"
title="Options Clearing Corporation">The Options Clearing Corporation</a> and <a
```

class="mw-redirect" href="/wiki/CBOE" title="CBOE">CBOE. Retrieved August 27,
2015.</cite><span class="Z3988" title="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=unknown&a
mp;rft.btitle=Understanding+Stock+Options&rft.pub=The+Options+Clearing+Corpo
ration+and+CBOE&rft_id=https%3A%2F%2Fwww.cboe.com%2FLearnCenter%2Fpdf%2Funde
rstanding.pdf&rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28finance%29"><
/span>

<li id="cite_note-15"><a
href="#cite_ref-15">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation book cs1" id="CITEREFFabozzi2002">Fabozzi, Frank
J. (2002). <i>The Handbook of Financial Instruments</i> (1st ed.). <a
href="/wiki/New_Jersey" title="New Jersey">New Jersey: John Wiley and Sons.
p. 471. <a class="mw-redirect" href="/wiki/ISBN_(identifier)" title="ISBN
(identifier)">ISBN <a href="/wiki/Special:BookSources/0-471-22092-2" title="
Special:BookSources/0-471-22092-2"><bdi>0-471-22092-2</bdi>.</cite><span
class="Z3988" title="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&
rft.btitle=The+Handbook+of+Financial+Instruments&rft.place=New+Jersey&rf
t.pages=471&rft.edition=1st&rft.pub=John+Wiley+and+Sons&rft.date=200
2&rft.isbn=0-471-22092-
2&rft.aulast=Fabozzi&rft.aufirst=Frank+J.&rfr_id=info%3Asid%2Fen.wik
ipedia.org%3AOption+%28finance%29">

<li id="cite_note-16"><a
href="#cite_ref-16">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation web cs1 cs1-prop-unfit"
id="CITEREFBenhamou">Benhamou, Eric. <a class="external text" href="https://web.
archive.org/web/20110725103707/http://www.ericbenhamou.net/documents/Encyclo/Pre
%20Black-Scholes.pdf" rel="nofollow">"Options pre-Black Scholes" (PDF). <i>Eric Benhamou</i>. Archived from the
original on July 25, 2011.</cite><span class="Z3988" title="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&rft.genre=unknow
n&rft.jtitle=Eric+Benhamou&rft.atitle=Options+pre-Black+Scholes&rft.
aulast=Benhamou&rft.aufirst=Eric&rft_id=http%3A%2F%2Fwww.ericbenhamou.ne
t%2Fdocuments%2FEncyclo%2FPre%2520Black-Scholes.pdf&rfr_id=info%3Asid%2Fen.w
ikipedia.org%3AOption+%28finance%29">

<li id="cite_note-17"><a
href="#cite_ref-17">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation journal cs1" id="CITEREFBlackScholes1973">Black,
Fischer; Scholes, Myron (1973). "The Pricing of Options and Corporate
Liabilities". <i><a href="/wiki/Journal_of_Political_Economy" title="Journal of
Political Economy">Journal of Political Economy</i>. 81 (3): <span

class="nowrap">637-654. <a class="mw-redirect"
href="/wiki/Doi_(identifier)" title="Doi (identifier)">doi:<a
class="external text" href="https://doi.org/10.1086%2F260062"
rel="nofollow">10.1086/260062. <a class="mw-redirect"
href="/wiki/JSTOR_(identifier)" title="JSTOR (identifier)">JSTOR <a
class="external text" href="https://www.jstor.org/stable/1831029"
rel="nofollow">1831029. <a class="mw-redirect"
href="/wiki/S2CID_(identifier)" title="S2CID (identifier)">S2CID <a
class="external text" href="https://api.semanticscholar.org/CorpusID:154552078"
rel="nofollow">154552078.</cite><span class="Z3988" title="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&rft.genre=articl
e&rft.jtitle=Journal+of+Political+Economy&rft.atitle=The+Pricing+of+Opti
ons+and+Corporate+Liabilities&rft.volume=81&rft.issue=3&rft.pages=63
7-
654&rft.date=1973&rft_id=https%3A%2F%2Fapi.semanticscholar.org%2FCorpusI
D%3A154552078%23id-
name%3DS2CID&rft_id=https%3A%2F%2Fwww.jstor.org%2Fstable%2F1831029%23id-name
%3DJSTOR&rft_id=info%3Adoi%2F10.1086%2F260062&rft.aulast=Black&rft.a
ufirst=Fischer&rft.au=Scholes%2C+Myron&rfr_id=info%3Asid%2Fen.wikipedia.
org%3AOption+%28finance%29">

<li id="cite_note-18"><a
href="#cite_ref-18">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation book cs1" id="CITEREFReillyBrown2003">Reilly,
Frank K.; Brown, Keith C. (2003). <i>Investment Analysis and Portfolio
Management</i> (7th ed.). Thomson Southwestern. Chapter 23.</cite><span
class="Z3988" title="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&
rft.btitle=Investment+Analysis+and+Portfolio+Management&rft.edition=7th&
rft.pub=Thomson+Southwestern&rft.date=2003&rft.aulast=Reilly&rft.auf
irst=Frank+K.&rft.au=Brown%2C+Keith+C.&rfr_id=info%3Asid%2Fen.wikipedia.
org%3AOption+%28finance%29">

<li id="cite_note-19"><a
href="#cite_ref-19">^ Black, Fischer
and Myron S. Scholes. "The Pricing of Options and Corporate Liabilities", <a
class="external text" href="http://www.journals.uchicago.edu/JPE/"
rel="nofollow"><i>Journal of Political Economy</i>, 81 (3), 637-654
(1973).

<li id="cite_note-20"><a
href="#cite_ref-20">^ <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation cs2" id="CITEREFDas2006">Das, Satyajit (2006),
<span class="id-lock-registration" title="Free registration required"><a
class="external text"
href="https://archive.org/details/tradersgunsmoney00dass_0"

```
rel="nofollow"><i>Traders, Guns &amp; Money: Knowns and unknowns in the dazzling
world of derivatives</i></a></span> (6th ed.), London: Prentice-Hall, Chapter 1
'Financial WMDs - derivatives demagoguery,' p.22, <a class="mw-redirect"
href="/wiki/ISBN_(identifier)" title="ISBN (identifier)">ISBN</a> <a
href="/wiki/Special:BookSources/978-0-273-70474-4" title="Special:BookSources/97
8-0-273-70474-4"><bdi>978-0-273-70474-4</bdi></a></cite><span class="Z3988" titl
e="ctx_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&amp;rft.genre=book&amp;
rft.btitle=Traders%2C+Guns+%26+Money%3A+Knowns+and+unknowns+in+the+dazzling+worl
d+of+derivatives&amp;rft.place=London&amp;rft.edition=6th&amp;rft.pub=Prentice-H
all%2C+Chapter+1+%27Financial+WMDs+%E2%80%93+derivatives+demagoguery%2C%27+p.22&
amp;rft.date=2006&amp;rft.isbn=978-0-273-70474-
4&amp;rft.aulast=Das&amp;rft.aufirst=Satyajit&amp;rft_id=https%3A%2F%2Farchive.o
rg%2Fdetails%2Ftradersgunsmoney00dass_0&amp;rfr_id=info%3Asid%2Fen.wikipedia.org
%3AOption+%28finance%29"></span></span>
</li>
<li id="cite_note-21"><span class="mw-cite-backlink"><b><a
href="#cite_ref-21">^</a></b></span> <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation cs2" id="CITEREFHull2005">Hull, John C. (2005),
<i>Options, Futures and Other Derivatives</i> (6th ed.), Prentice-Hall, <a
class="mw-redirect" href="/wiki/ISBN_(identifier)" title="ISBN
(identifier)">ISBN</a> <a href="/wiki/Special:BookSources/0-13-149908-4" title="
Special:BookSources/0-13-149908-4"><bdi>0-13-149908-4</bdi></a></cite><span
class="Z3988" title="ctx_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&amp;rft.genre=book&amp;
rft.btitle=Options%2C+Futures+and+Other+Derivatives&amp;rft.edition=6th&amp;rft.
pub=Prentice-Hall&amp;rft.date=2005&amp;rft.isbn=0-13-149908-
4&amp;rft.aulast=Hull&amp;rft.aufirst=John+C.&amp;rfr_id=info%3Asid%2Fen.wikiped
ia.org%3AOption+%28finance%29"></span></span>
</li>
<li id="cite_note-gatheral-22"><span class="mw-cite-backlink">^ <a
href="#cite_ref-gatheral_22-0"><sup><i><b>a</b></i></sup></a> <a
href="#cite_ref-gatheral_22-1"><sup><i><b>b</b></i></sup></a></span> <span
class="reference-text"><link href="mw-data:TemplateStyles:r1238218222" rel="mw-
deduplicated-inline-style"/><cite class="citation cs2"
id="CITEREFJim_Gatheral2006">Jim Gatheral (2006), <i>The Volatility Surface, A
Practitioner's Guide</i>, Wiley Finance, <a class="mw-redirect"
href="/wiki/ISBN_(identifier)" title="ISBN (identifier)">ISBN</a> <a
href="/wiki/Special:BookSources/978-0-471-79251-2" title="Special:BookSources/97
8-0-471-79251-2"><bdi>978-0-471-79251-2</bdi></a></cite><span class="Z3988" titl
e="ctx_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&amp;rft.genre=book&amp;
rft.btitle=The+Volatility+Surface%2C+A+Practitioner%27s+Guide&amp;rft.pub=Wiley+
Finance&amp;rft.date=2006&amp;rft.isbn=978-0-471-79251-
2&amp;rft.au=Jim+Gatheral&amp;rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28f
inance%29"></span></span>
</li>
```

```
<li id="cite_note-dupire-23"><span class="mw-cite-backlink"><b><a
href="#cite_ref-dupire_23-0">^</a></b></span> <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation magazine cs1" id="CITEREFBruno_Dupire2007">Bruno
Dupire (July 2007) [January 1994]. <a class="external text" href="https://web.ar
chive.org/web/20120907114056/http://www.risk.net/data/risk/pdf/technical/2007/ri
sk20_0707_technical_volatility.pdf" rel="nofollow">"Pricing with a Smile"</a>
<span class="cs1-format">(PDF)</span>. <i>Risk</i>. Archived from <a
class="external text" href="http://www.risk.net/data/risk/pdf/technical/2007/ris
k20_0707_technical_volatility.pdf" rel="nofollow">the original</a> <span
class="cs1-format">(PDF)</span> on September 7, 2012<span class="reference-
accessdate">. Retrieved <span class="nowrap">June 14,</span>
2013</span>.</cite><span class="Z3988" title="ctx_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&amp;rft.genre=articl
e&amp;rft.jtitle=Risk&amp;rft.atitle=Pricing+with+a+Smile&amp;rft.date=2007-
07&amp;rft.au=Bruno+Dupire&amp;rft_id=http%3A%2F%2Fwww.risk.net%2Fdata%2Frisk%2F
pdf%2Ftechnical%2F2007%2Frisk20_0707_technical_volatility.pdf&amp;rfr_id=info%3A
sid%2Fen.wikipedia.org%3AOption+%28finance%29"></span></span>
</li>
<li id="cite_note-derman-24"><span class="mw-cite-backlink"><b><a
href="#cite_ref-derman_24-0">^</a></b></span> <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation magazine cs1"
id="CITEREFDerman,_E.Iraj_Kani1994">Derman, E.; Iraj Kani (January 1994). <a
class="external text" href="https://web.archive.org/web/20110710170610/http://ww
w.ederman.com/new/docs/gs-volatility_smile.pdf" rel="nofollow">"Riding on a
Smile"</a> <span class="cs1-format">(PDF)</span>. <i>Quantitative Strategies
Research Notes</i>. Goldman Sachs. Archived from <a class="external text"
href="http://www.ederman.com/new/docs/gs-volatility_smile.pdf"
rel="nofollow">the original</a> <span class="cs1-format">(PDF)</span> on July
10, 2011<span class="reference-accessdate">. Retrieved <span class="nowrap">June
1,</span> 2007</span>.</cite><span class="Z3988" title="ctx_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&amp;rft.genre=articl
e&amp;rft.jtitle=Quantitative+Strategies+Research+Notes&amp;rft.atitle=Riding+on
+a+Smile&amp;rft.date=1994-
01&amp;rft.au=Derman%2C+E.&amp;rft.au=Iraj+Kani&amp;rft_id=http%3A%2F%2Fwww.eder
man.com%2Fnew%2Fdocs%2Fgs-volatility_smile.pdf&amp;rfr_id=info%3Asid%2Fen.wikipe
dia.org%3AOption+%28finance%29"></span></span>
</li>
<li id="cite_note-25"><span class="mw-cite-backlink"><b><a
href="#cite_ref-25">^</a></b></span> <span class="reference-text"><i><a
class="external text"
href="https://books.google.com/books?id=GnR3g9lvwfkC&amp;pg=PA410"
rel="nofollow">Fixed Income Analysis</a></i>, p. 410, at <a
href="/wiki/Google_Books" title="Google Books">Google Books</a></span>
</li>
<li id="cite_note-26"><span class="mw-cite-backlink"><b><a
href="#cite_ref-26">^</a></b></span> <span class="reference-text"><a
```

href="/wiki/John_Carrington_Cox" title="John Carrington Cox">Cox, J. C., <a
href="/wiki/Stephen_Ross_(economist)" title="Stephen Ross (economist)">Ross
SA and Rubinstein
M. 1979. Options pricing: a simplified approach, <a
href="/wiki/Journal_of_Financial_Economics" title="Journal of Financial
Economics">Journal of Financial Economics, 7:229-263.<a class="external
autonumber" href="http://www.in-the-
money.com/artandpap/Option%20Pricing%20-%20A%20Simplified%20Approach.doc"
rel="nofollow">[1]

<li id="cite_note-27"><a
href="#cite_ref-27">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation cs2" id="CITEREFCoxRubinstein1985"><a class="mw-
redirect" href="/wiki/John_C._Cox" title="John C. Cox">Cox, John C.; <a
href="/wiki/Mark_Rubinstein" title="Mark Rubinstein">Rubinstein, Mark
(1985), <i>Options Markets</i>, Prentice-Hall, Chapter 5</cite><span
class="Z3988" title="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&
rft.btitle=Options+Markets&rft.pub=Prentice-Hall&rft.date=1985&rft.a
ulast=Cox&rft.aufirst=John+C.&rft.au=Rubinstein%2C+Mark&rfr_id=info%
3Asid%2Fen.wikipedia.org%3AOption+%28finance%29">

<li id="cite_note-28"><a
href="#cite_ref-28">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation cs2" id="CITEREFCrack2004">Crack, Timothy Falcon
(2004), <a class="external text" href="http://www.BasicBlackScholes.com/"
rel="nofollow"><i>Basic Black-Scholes: Option Pricing and Trading</i>,
Timothy Crack, pp. 91-102, <a class="mw-redirect"
href="/wiki/ISBN_(identifier)" title="ISBN (identifier)">ISBN <a
href="/wiki/Special:BookSources/0-9700552-2-6" title="Special:BookSources/0-
9700552-2-6"><bdi>0-9700552-2-6</bdi></cite><span class="Z3988" title="ctx_v
er=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&
rft.btitle=Basic+Black%E2%80%93Scholes%3A+Option+Pricing+and+Trading&rft.pag
es=91-102&rft.pub=Timothy+Crack&rft.date=2004&rft.isbn=0-9700552-2-
6&rft.aulast=Crack&rft.aufirst=Timothy+Falcon&rft_id=http%3A%2F%2Fww
w.BasicBlackScholes.com%2F&rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28
finance%29">

<li id="cite_note-29"><a
href="#cite_ref-29">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation web cs1"><a class="external text"
href="https://www.sec.gov/oiea/investor-alerts-
bulletins/ib_openingoptionsaccount" rel="nofollow">"Investor Bulletin: Opening
an Options Account". <a href="/wiki/U.S._Securities_and_Exchange_Commission"

title="U.S. Securities and Exchange Commission">U.S. Securities and Exchange
Commission. March 18, 2015. Retrieved
August 27, 2022.</cite><span class="Z3988" ti
tle="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=unknown&a
mp;rft.btitle=Investor+Bulletin%3A+Opening+an+Options+Account&rft.pub=U.S.+S
ecurities+and+Exchange+Commission&rft.date=2015-03-
18&rft_id=https%3A%2F%2Fwww.sec.gov%2Foiea%2Finvestor-alerts-bulletins%2Fib_
openingoptionsaccount&rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28finan
ce%29">

<li id="cite_note-30"><a
href="#cite_ref-30">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation news cs1" id="CITEREFBaker2023">Baker, Howard
(2023). <a class="external text" href="https://www.moaf.org/publications-
collections/financial-history-
magazine/145/_res/id=Attachments/index=0/Cboe%2050th%20Anniversary.pdf"
rel="nofollow">"50 Years of Exchange-Traded Options. Cboe Marks Golden
Anniversary" (PDF). <i>moaf.org</i>.
pp. 20-23.</cite><span class="Z3988" title="ctx_ver=
Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&rft.genre=articl
e&rft.jtitle=moaf.org&rft.atitle=50+Years+of+Exchange-Traded+Options.+Cb
oe+Marks+Golden+Anniversary&rft.pages=20-
23&rft.date=2023&rft.aulast=Baker&rft.aufirst=Howard&rft_id=http
s%3A%2F%2Fwww.moaf.org%2Fpublications-collections%2Ffinancial-history-magazine%2
F145%2F_res%2Fid%3DAttachments%2Findex%3D0%2FCboe%252050th%2520Anniversary.pdf&a
mp;rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28finance%29">

<li id="cite_note-31"><a
href="#cite_ref-31">^ <link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation web cs1"><a class="external text"
href="https://www.nasdaq.com/solutions/nasdaq-phlx" rel="nofollow">"Nasdaq PHLX
(PHLX)".</cite><span class="Z3988" title="ctx_ver=Z39.88-
2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=unknown&a
mp;rft.btitle=Nasdaq+PHLX+%28PHLX%29&rft_id=https%3A%2F%2Fwww.nasdaq.com%2Fs
olutions%2Fnasdaq-phlx&rfr_id=info%3Asid%2Fen.wikipedia.org%3AOption+%28fina
nce%29">

<li id="cite_note-32"><a
href="#cite_ref-32">^ <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation web cs1"><a class="external text"
href="https://www.nasdaq.com/solutions/nasdaq-ise" rel="nofollow">"Nasdaq
International Securities Exchange (ISE)".</cite><span class="Z3988" title="c
tx_ver=Z39.88-

```
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&amp;rft.genre=unknown&a
mp;rft.btitle=Nasdaq+International+Securities+Exchange+%28ISE%29&amp;rft_id=http
s%3A%2F%2Fwww.nasdaq.com%2Fsolutions%2Fnasdaq-ise&amp;rfr_id=info%3Asid%2Fen.wik
ipedia.org%3AOption+%28finance%29"></span></span>
</li>
<li id="cite_note-33"><span class="mw-cite-backlink"><b><a
href="#cite_ref-33">^</a></b></span> <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation web cs1"><a class="external text"
href="https://www.eurex.com/ex-en/find/about-us" rel="nofollow">"About us"</a>.
<i>www.eurex.com</i><span class="reference-accessdate">. Retrieved <span
class="nowrap">March 3,</span> 2024</span>.</cite><span class="Z3988" title="ctx
_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&amp;rft.genre=unknow
n&amp;rft.jtitle=www.eurex.com&amp;rft.atitle=About+us&amp;rft_id=https%3A%2F%2F
www.eurex.com%2Fex-en%2Ffind%2Fabout-us&amp;rfr_id=info%3Asid%2Fen.wikipedia.org
%3AOption+%28finance%29"></span></span>
</li>
<li id="cite_note-34"><span class="mw-cite-backlink"><b><a
href="#cite_ref-34">^</a></b></span> <span class="reference-text"><link
href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-
style"/><cite class="citation web cs1"><a class="external text"
href="https://www.jpx.co.jp/english/" rel="nofollow">"Japan Exchange Group"</a>.
<i>Japan Exchange Group</i><span class="reference-accessdate">. Retrieved <span
class="nowrap">March 3,</span> 2024</span>.</cite><span class="Z3988" title="ctx
_ver=Z39.88-
2004&amp;rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Ajournal&amp;rft.genre=unknow
n&amp;rft.jtitle=Japan+Exchange+Group&amp;rft.atitle=Japan+Exchange+Group&amp;rf
t_id=https%3A%2F%2Fwww.jpx.co.jp%2Fenglish%2F&amp;rfr_id=info%3Asid%2Fen.wikiped
ia.org%3AOption+%28finance%29"></span></span>
</li>
</ol></div>
<div class="mw-heading mw-heading2"><h2 id="Further_reading">Further
reading</h2><span class="mw-editsection"><span class="mw-editsection-
bracket">[</span><a
href="/w/index.php?title=Option_(finance)&amp;action=edit&amp;section=48"
title="Edit section: Further reading"><span>edit</span></a><span class="mw-
editsection-bracket">]</span></span></div>
<ul><li>Fischer Black and Myron S. Scholes. "The Pricing of Options and
Corporate Liabilities", <i><a class="external text"
href="http://www.journals.uchicago.edu/JPE/" rel="nofollow">Journal of Political
Economy</a></i>, 81 (3), 637-654 (1973).</li>
<li>Feldman, Barry and Dhuv Roy. "Passive Options-Based Investment Strategies:
The Case of the CBOE S&amp;P 500 BuyWrite Index". <a class="external text"
href="http://www.iijournals.com/JOI/default.asp" rel="nofollow"><i>The Journal
of Investing</i></a>, (Summer 2005).</li>
<li><a href="/wiki/Hagen_Kleinert" title="Hagen Kleinert">Kleinert, Hagen</a>,
<i>Path Integrals in Quantum Mechanics, Statistics, Polymer Physics, and
```

Financial Markets</i>, 4th edition, World Scientific (Singapore, 2004); Paperback <link href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-style"/>ISBN 981-238-107-4 <i>(also available online: PDF-files)</i>
Hill, Joanne, Venkatesh Balasubramanian, Krag (Buzz) Gregory, and Ingrid Tierens. "Finding Alpha via Covered Index Writing". Financial Analysts Journal. (Sept.-Oct. 2006). pp. 29-46.
<link href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-style"/><cite class="citation cs2" id="CITEREFMillman2008">Millman, Gregory J. (2008), "Futures and Options Markets", in David R. Henderson (ed.), <i>Concise Encyclopedia of Economics</i> (2nd ed.), Indianapolis: Library of Economics and Liberty, ISBN <bdi>978-0-86597-665-8</bdi>, OCLC 237794267</cite>
<link href="mw-data:TemplateStyles:r1238218222" rel="mw-deduplicated-inline-style"/><cite class="citation book cs1" id="CITEREFNatenberg2015">Natenberg, Sheldon (2015). <i>Option Volatility and Pricing: Advanced Trading Strategies and Techniques</i> (Second ed.). New York. ISBN <bdi>978-0-07-181877-3</bdi>.</cite><span class="Z3988" title="ctx_ver=Z39.88-2004&rft_val_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Abook&rft.genre=book&rft.btitle=Option+Volatility+and+Pricing%3A+Advanced+Trading+Strategies+and+Tech

niques&rft.place=New+York&rft.edition=Second&rft.date=2015&rft.i
sbn=978-0-07-181877-
3&rft.aulast=Natenberg&rft.aufirst=Sheldon&rfr_id=info%3Asid%2Fen.wi
kipedia.org%3AOption+%28finance%29"><span class="cs1-maint citation-
comment"><code class="cs1-code">{{<a href="/wiki/Template:Cite_book"
title="Template:Cite book">cite book}}</code>: CS1 maint: location missing
publisher (<a href="/wiki/Category:CS1_maint:_location_missing_publisher"
title="Category:CS1 maint: location missing publisher">link)
Moran, Matthew. "Risk-adjusted Performance for Derivatives-based Indexes -
Tools to Help Stabilize Returns". <i><a class="external text" href="https://web.
archive.org/web/20070527102103/http://www.indexuniverse.com/JOI/"
rel="nofollow">The Journal of Indexes</i>. (Fourth Quarter, 2002)
pp. 34-40.
Reilly, Frank and Keith C. Brown, Investment Analysis and Portfolio
Management, 7th edition, Thompson Southwestern, 2003, pp. 994-5.
Schneeweis, Thomas, and Richard Spurgin. "The Benefits of Index Option-Based
Strategies for Institutional Portfolios" <i><a class="external text"
href="http://www.iijournals.com/JAI/" rel="nofollow">The Journal of Alternative
Investments</i>, (Spring 2001), pp. 44-52.
Whaley, Robert. "Risk and Return of the CBOE BuyWrite Monthly Index" <i><a
class="external text" href="http://www.iijournals.com/JOD/" rel="nofollow">The
Journal of Derivatives</i>, (Winter 2002), pp. 35-42.
Bloss, Michael; Ernst, Dietmar; Häcker Joachim (2008): Derivatives - An
authoritative guide to derivatives for financial intermediaries and investors
Oldenbourg Verlag München <link href="mw-data:TemplateStyles:r1238218222"
rel="mw-deduplicated-inline-style"/><a class="mw-redirect"
href="/wiki/ISBN_(identifier)" title="ISBN (identifier)">ISBN <a
href="/wiki/Special:BookSources/978-3-486-58632-9"
title="Special:BookSources/978-3-486-58632-9">978-3-486-58632-9
Espen Gaarder Haug & Nassim Nicholas Taleb (2008): <a class="external
text" href="https://www.researchgate.net/publication/255650680_Why_We_Have_Never
_Used_the_Black-Scholes-Merton_Option_Pricing_Formula" rel="nofollow">"Why We
Have Never Used the Black-Scholes-Merton Option Pricing Formula"
<div class="navbox-styles"><link href="mw-data:TemplateStyles:r1129693374"
rel="mw-deduplicated-inline-style"/><style data-mw-
deduplicate="TemplateStyles:r1236075235">.mw-parser-output .navbox{box-
sizing:border-box;border:1px solid #a2a9b1;width:100%;clear:both;font-
size:88%;text-align:center;padding:1px;margin:1em auto 0}.mw-parser-output
.navbox .navbox{margin-top:0}.mw-parser-output .navbox+.navbox,.mw-parser-output
.navbox+.navbox-styles+.navbox{margin-top:-1px}.mw-parser-output .navbox-
inner,.mw-parser-output .navbox-subgroup{width:100%}.mw-parser-output .navbox-
group,.mw-parser-output .navbox-title,.mw-parser-output .navbox-
abovebelow{padding:0.25em 1em;line-height:1.5em;text-align:center}.mw-parser-
output .navbox-group{white-space:nowrap;text-align:right}.mw-parser-output
.navbox,.mw-parser-output .navbox-subgroup{background-color:#fdfdfd}.mw-parser-
output .navbox-list{line-height:1.5em;border-color:#fdfdfd}.mw-parser-output
.navbox-list-with-group{text-align:left;border-left-width:2px;border-left-
style:solid}.mw-parser-output tr+tr>.navbox-abovebelow,.mw-parser-output

tr+tr>.navbox-group,.mw-parser-output tr+tr>.navbox-image,.mw-parser-output
tr+tr>.navbox-list{border-top:2px solid #fdfdfd}.mw-parser-output .navbox-
title{background-color:#ccf}.mw-parser-output .navbox-abovebelow,.mw-parser-
output .navbox-group,.mw-parser-output .navbox-subgroup .navbox-
title{background-color:#ddf}.mw-parser-output .navbox-subgroup .navbox-
group,.mw-parser-output .navbox-subgroup .navbox-abovebelow{background-
color:#e6e6ff}.mw-parser-output .navbox-even{background-color:#f7f7f7}.mw-
parser-output .navbox-odd{background-color:transparent}.mw-parser-output .navbox
.hlist td dl,.mw-parser-output .navbox .hlist td ol,.mw-parser-output .navbox
.hlist td ul,.mw-parser-output .navbox td.hlist dl,.mw-parser-output .navbox
td.hlist ol,.mw-parser-output .navbox td.hlist ul{padding:0.125em 0}.mw-parser-
output .navbox .navbar{display:block;font-size:100%}.mw-parser-output .navbox-
title .navbar{float:left;text-align:left;margin-right:0.5em}body.skin--
responsive .mw-parser-output .navbox-image img{max-width:none!important}@media
print{body.ns-0 .mw-parser-output .navbox{display:none!important}}</style><link
href="mw-data:TemplateStyles:r1129693374" rel="mw-deduplicated-inline-
style"/></div><div aria-labelledby="Derivatives_market428" class="navbox"
role="navigation" style="padding:3px"><table class="nowraplinks hlist mw-
collapsible autocollapse navbox-inner" style="border-
spacing:0;background:transparent;color:inherit"><tbody><tr><th class="navbox-
title" colspan="2" scope="col"><link href="mw-data:TemplateStyles:r1129693374"
rel="mw-deduplicated-inline-style"/><link href="mw-
data:TemplateStyles:r1239400231" rel="mw-deduplicated-inline-style"/><div
class="navbar plainlinks hlist navbar-mini">
<li class="nv-view"><a
href="/wiki/Template:Derivatives_market" title="Template:Derivatives
market"><abbr title="View this template">v</abbr>
<li class="nv-talk"><a
href="/wiki/Template_talk:Derivatives_market" title="Template talk:Derivatives
market"><abbr title="Discuss this template">t</abbr>
<li class="nv-
edit"><a href="/wiki/Special:EditPage/Template:Derivatives_market"
title="Special:EditPage/Template:Derivatives market"><abbr title="Edit this
template">e</abbr>
</div><div id="Derivatives_market428"
style="font-size:114%;margin:0 4em"><a href="/wiki/Derivatives_market"
title="Derivatives market">Derivatives market</div></th></tr><tr><td
class="navbox-abovebelow" colspan="2"><div><a href="/wiki/Derivative_(finance)"
title="Derivative (finance)">Derivative (finance)</div></td></tr><tr><th
class="navbox-group" scope="row" style="width:1%"><a class="mw-selflink
selflink">Options</th><td class="navbox-list-with-group navbox-list navbox-
odd" style="width:100%;padding:0"><div style="padding:0 0.25em"></div><table
class="nowraplinks navbox-subgroup" style="border-spacing:0"><tbody><tr><th
class="navbox-group" scope="row" style="width:1%">Terms</th><td class="navbox-
list-with-group navbox-list navbox-odd" style="width:100%;padding:0"><div
style="padding:0 0.25em">
Delta
neutral
<a href="/wiki/Exercise_(options)" title="Exercise
(options)">Exercise
<a href="/wiki/Expiration_(options)" title="Expiration
(options)">Expiration

```
<li><a href="/wiki/Moneyness" title="Moneyness">Moneyness</a></li>
<li><a href="/wiki/Open_interest" title="Open interest">Open interest</a></li>
<li><a href="/wiki/Pin_risk" title="Pin risk">Pin risk</a></li>
<li><a class="mw-redirect" href="/wiki/Risk-free_interest_rate" title="Risk-free
interest rate">Risk-free interest rate</a></li>
<li><a href="/wiki/Strike_price" title="Strike price">Strike price</a></li>
<li><a href="/wiki/Synthetic_position" title="Synthetic position">Synthetic
position</a></li>
<li><a href="/wiki/Greeks_(finance)" title="Greeks (finance)">the
Greeks</a></li>
<li><a href="/wiki/Volatility_(finance)" title="Volatility
(finance)">Volatility</a></li></ul>
</div></td></tr><tr><th class="navbox-group" scope="row" style="width:1%"><a
class="mw-redirect" href="/wiki/Vanilla_option" title="Vanilla
option">Vanillas</a></th><td class="navbox-list-with-group navbox-list navbox-
even" style="width:100%;padding:0"><div style="padding:0 0.25em">
<ul><li><a class="mw-redirect" href="/wiki/American_option" title="American
option">American</a></li>
<li><a href="/wiki/Bond_option" title="Bond option">Bond option</a></li>
<li><a href="/wiki/Call_option" title="Call option">Call</a></li>
<li><a href="/wiki/Employee_stock_option" title="Employee stock option">Employee
stock option</a></li>
<li><a class="mw-redirect" href="/wiki/European_option" title="European
option">European</a></li>
<li><a href="/wiki/Fixed_income" title="Fixed income">Fixed income</a></li>
<li><a href="/wiki/Foreign_exchange_option" title="Foreign exchange
option">FX</a></li>
<li><a href="/wiki/Option_style" title="Option style">Option styles</a></li>
<li><a href="/wiki/Put_option" title="Put option">Put</a></li>
<li><a href="/wiki/Warrant_(finance)" title="Warrant
(finance)">Warrants</a></li></ul>
</div></td></tr><tr><th class="navbox-group" scope="row" style="width:1%"><a
href="/wiki/Exotic_option" title="Exotic option">Exotics</a></th><td
class="navbox-list-with-group navbox-list navbox-odd"
style="width:100%;padding:0"><div style="padding:0 0.25em">
<ul><li><a href="/wiki/Asian_option" title="Asian option">Asian</a></li>
<li><a href="/wiki/Barrier_option" title="Barrier option">Barrier</a></li>
<li><a href="/wiki/Basket_option" title="Basket option">Basket</a></li>
<li><a href="/wiki/Binary_option" title="Binary option">Binary</a></li>
<li><a href="/wiki/Callable_bull/bear_contract" title="Callable bull/bear
contract">Callable bull/bear contract</a></li>
<li><a href="/wiki/Chooser_option" title="Chooser option">Chooser</a></li>
<li><a href="/wiki/Cliquet_option" title="Cliquet option">Cliquet</a></li>
<li><a href="/wiki/Compound_option" title="Compound option">Compound</a></li>
<li><a href="/wiki/Forward_start_option" title="Forward start option">Forward
start</a></li>
<li><a href="/wiki/Interest_rate_option" title="Interest rate option">Interest
rate</a></li>
```

```
<li><a href="/wiki/Lookback_option" title="Lookback option">Lookback</a></li>
<li>Mountain range</li>
<li><a href="/wiki/Rainbow_option" title="Rainbow option">Rainbow</a></li>
<li><a href="/wiki/Spread_option" title="Spread option">Spread</a></li>
<li><a href="/wiki/Swaption" title="Swaption">Swaption</a></li></ul>
</div></td></tr><tr><th class="navbox-group" scope="row" style="width:1%"><a
href="/wiki/Options_strategy" title="Options strategy">Strategies</a></th><td
class="navbox-list-with-group navbox-list navbox-even"
style="width:100%;padding:0"><div style="padding:0 0.25em">
<ul><li><a href="/wiki/Backspread" title="Backspread">Backspread</a></li>
<li><a class="mw-redirect" href="/wiki/Box_spread_(options)" title="Box spread
(options)">Box spread</a></li>
<li><a href="/wiki/Butterfly_(options)" title="Butterfly
(options)">Butterfly</a></li>
<li><a href="/wiki/Calendar_spread" title="Calendar spread">Calendar
spread</a></li>
<li><a href="/wiki/Collar_(finance)" title="Collar (finance)">Collar</a></li>
<li><a href="/wiki/Condor_(options)" title="Condor (options)">Condor</a></li>
<li><a href="/wiki/Covered_option" title="Covered option">Covered
option</a></li>
<li><a href="/wiki/Credit_spread_(options)" title="Credit spread
(options)">Credit spread</a></li>
<li><a href="/wiki/Debit_spread" title="Debit spread">Debit spread</a></li>
<li><a href="/wiki/Diagonal_spread" title="Diagonal spread">Diagonal
spread</a></li>
<li><a href="/wiki/Fence_(finance)" title="Fence (finance)">Fence</a></li>
<li><a href="/wiki/Intermarket_spread" title="Intermarket spread">Intermarket
spread</a></li>
<li><a href="/wiki/Iron_butterfly_(options_strategy)" title="Iron butterfly
(options strategy)">Iron butterfly</a></li>
<li><a href="/wiki/Iron_condor" title="Iron condor">Iron condor</a></li>
<li><a href="/wiki/Jelly_roll_(options)" title="Jelly roll (options)">Jelly
roll</a></li>
<li><a href="/wiki/Ladder_(option_combination)" title="Ladder (option
combination)">Ladder</a></li>
<li><a href="/wiki/Naked_option" title="Naked option">Naked option</a></li>
<li><a href="/wiki/Straddle" title="Straddle">Straddle</a></li>
<li><a href="/wiki/Strangle_(options)" title="Strangle
(options)">Strangle</a></li>
<li><a href="/wiki/Protective_option" title="Protective option">Protective
option</a></li>
<li><a href="/wiki/Ratio_spread" title="Ratio spread">Ratio spread</a></li>
<li><a href="/wiki/Risk_reversal" title="Risk reversal">Risk reversal</a></li>
<li><a href="/wiki/Vertical_spread" title="Vertical spread">Vertical spread</a>
(<a href="/wiki/Bear_spread" title="Bear spread">Bear</a>, <a
href="/wiki/Bull_spread" title="Bull spread">Bull</a>)</li></ul>
</div></td></tr><tr><th class="navbox-group" scope="row" style="width:1%"><a
href="/wiki/Valuation_of_options" title="Valuation of
```

options">Valuation</th><td class="navbox-list-with-group navbox-list navbox-odd" style="width:100%;padding:0"><div style="padding:0 0.25em">
Bachelier
Binomial
Black
Black-Scholes (equation)
Finite difference
Garman-Kohlhagen
Heston
Lattices
Margrabe
Put-call parity
MC Simulation
Real options
Trinomial
Vanna-Volga
</div></td></tr></tbody></table><div></div></td></tr><tr><th class="navbox-group" scope="row" style="width:1%">Swaps</th><td class="navbox-list-with-group navbox-list navbox-even" style="width:100%;padding:0"><div style="padding:0 0.25em">
Amortising
Asset
Basis
Commodity
Conditional variance
Constant maturity
Correlation
Credit default
Currency
Dividend

```
<li><a href="/wiki/Equity_swap" title="Equity swap">Equity</a></li>
<li><a href="/wiki/Foreign_exchange_swap" title="Foreign exchange
swap">Forex</a></li>
<li><a href="/wiki/Forward_rate_agreement" title="Forward rate
agreement">Forward Rate Agreement</a></li>
<li><a href="/wiki/Inflation_swap" title="Inflation swap">Inflation</a></li>
<li><a href="/wiki/Interest_rate_swap" title="Interest rate swap">Interest
rate</a></li>
<li><a href="/wiki/Overnight_indexed_swap" title="Overnight indexed
swap">Overnight indexed</a></li>
<li><a href="/wiki/Total_return_swap" title="Total return swap">Total
return</a></li>
<li><a href="/wiki/Variance_swap" title="Variance swap">Variance</a></li>
<li><a href="/wiki/Volatility_swap" title="Volatility swap">Volatility</a></li>
<li><a href="/wiki/Year-on-year_inflation-indexed_swap" title="Year-on-year
inflation-indexed swap">Year-on-year inflation-indexed</a></li>
<li><a href="/wiki/Zero_coupon_swap" title="Zero coupon swap">Zero
Coupon</a></li>
<li><a href="/wiki/Zero-coupon_inflation_swap" title="Zero-coupon inflation
swap">Zero-coupon inflation-indexed</a></li></ul>
</div></td></tr><tr><th class="navbox-group" scope="row" style="width:1%"><div
class="hlist"><ul><li><a href="/wiki/Forward_contract" title="Forward
contract">Forwards</a></li><li><a href="/wiki/Futures_contract" title="Futures
contract">Futures</a></li></ul></div></th><td class="navbox-list-with-group
navbox-list navbox-odd" style="width:100%;padding:0"><div style="padding:0
0.25em">
<ul><li><a href="/wiki/Contango" title="Contango">Contango</a></li>
<li><a class="new"
href="/w/index.php?title=Commodities_future&amp;action=edit&amp;redlink=1"
title="Commodities future (page does not exist)">Commodities future</a></li>
<li><a href="/wiki/Currency_future" title="Currency future">Currency
future</a></li>
<li><a href="/wiki/Dividend_future" title="Dividend future">Dividend
future</a></li>
<li><a href="/wiki/Forward_market" title="Forward market">Forward
market</a></li>
<li><a href="/wiki/Forward_price" title="Forward price">Forward price</a></li>
<li><a href="/wiki/Forward_contract#Spot-forward_parity" title="Forward
contract">Forwards pricing</a></li>
<li><a href="/wiki/Forward_rate" title="Forward rate">Forward rate</a></li>
<li><a href="/wiki/Futures_contract#Pricing" title="Futures contract">Futures
pricing</a></li>
<li><a href="/wiki/Interest_rate_future" title="Interest rate future">Interest
rate future</a></li>
<li><a href="/wiki/Margin_(finance)" title="Margin (finance)">Margin</a></li>
<li><a href="/wiki/Normal_backwardation" title="Normal backwardation">Normal
backwardation</a></li>
<li><a href="/wiki/Perpetual_futures" title="Perpetual futures">Perpetual
```

futures
Single-stock futures
Slippage
Stock market index future
</div></td></tr><tr><th class="navbox-group" scope="row" style="width:1%">Exotic derivatives</th><td class="navbox-list-with-group navbox-list navbox-even" style="width:100%;padding:0"><div style="padding:0 0.25em">
Commodity derivative
Energy derivative
Freight derivative
Inflation derivative
Property derivative
Weather derivative
</div></td></tr><tr><th class="navbox-group" scope="row" style="width:1%">Other derivatives</th><td class="navbox-list-with-group navbox-list navbox-odd" style="width:100%;padding:0"><div style="padding:0 0.25em">
Collateralized debt obligation (CDO)
Constant proportion portfolio insurance
Contract for difference
Credit-linked note (CLN)
Credit default option
Credit derivative
Equity-linked note (ELN)
Equity derivative
Foreign exchange derivative
Fund derivative
Fund of funds
<a href="/wiki/Interest_rate_derivative" title="Interest rate

derivative">Interest rate derivative
Mortgage-backed security
Power reverse dual-currency note (PRDC)
</div></td></tr><tr><th class="navbox-group" scope="row" style="width:1%">Market issues</th><td class="navbox-list-with-group navbox-list navbox-even" style="width:100%;padding:0"><div style="padding:0 0.25em">
Consumer debt
Corporate debt
Government debt
Great Recession
Municipal debt
Tax policy
</div></td></tr><tr><td class="navbox-abovebelow" colspan="2"><div>
 Business portal
</div></td></tr></tbody></table></div>
<div class="navbox-styles"><link href="mw-data:TemplateStyles:r1129693374" rel="mw-deduplicated-inline-style"/><link href="mw-data:TemplateStyles:r1236075235" rel="mw-deduplicated-inline-style"/><style data-mw-deduplicate="TemplateStyles:r1038841319">.mw-parser-output .tooltip-dotted{border-bottom:1px dotted;cursor:help}</style><link href="mw-data:TemplateStyles:r1038841319" rel="mw-deduplicated-inline-style"/><link href="mw-data:TemplateStyles:r1038841319" rel="mw-deduplicated-inline-style"/></div><div aria-label="Navbox1426" class="navbox authority-control" role="navigation" style="padding:3px"><table class="nowraplinks hlist navbox-inner" style="border-spacing:0;background:transparent;color:inherit"><tbody><tr><th class="navbox-group" scope="row" style="width:1%">Authority control databases: National <span class="mw-valign-text-top noprint" typeof="mw:File/Frameless"><a href="https://www.wikidata.org/wiki/Q187860#identifiers" title="Edit this at Wikidata"><img alt="Edit this at Wikidata" class="mw-file-element" data-file-height="20" data-file-width="20" decoding="async" height="10"

```
src="//upload.wikimedia.org/wikipedia/en/thumb/8/8a/OOjs_UI_icon_edit-ltr-
progressive.svg/20px-OOjs_UI_icon_edit-ltr-progressive.svg.png"
width="10"/></a></span></th><td class="navbox-list-with-group navbox-list
navbox-odd" style="width:100%;padding:0"><div style="padding:0
0.25em"><ul><li><span class="uid"><a class="external text"
href="https://id.loc.gov/authorities/sh85109239" rel="nofollow">United
States</a></span></li><li><span class="uid"><span class="rt-commentedText
tooltip tooltip-dotted" title="Options (finances)"><a class="external text"
href="https://catalogue.bnf.fr/ark:/12148/cb11970951p"
rel="nofollow">France</a></span></span></li><li><span class="uid"><span
class="rt-commentedText tooltip tooltip-dotted" title="Options (finances)"><a
class="external text" href="https://data.bnf.fr/ark:/12148/cb11970951p"
rel="nofollow">BnF data</a></span></span></li><li><span class="uid"><a
class="external text" href="https://id.ndl.go.jp/auth/ndlna/00575313"
rel="nofollow">Japan</a></span></li><li><span class="rt-
commentedText tooltip tooltip-dotted" title="opce (finance)"><a class="external
text" href="https://aleph.nkp.cz/F/?func=find-
c&amp;local_base=aut&amp;ccl_term=ica=ph137530&amp;CON_LNG=ENG"
rel="nofollow">Czech Republic</a></span></span></li><li><span class="uid"><a
class="external text" href="https://datos.bne.es/resource/XX534918"
rel="nofollow">Spain</a></span></li><li><span class="uid"><a class="external
text" href="https://www.nli.org.il/en/authorities/987007551087205171"
rel="nofollow">Israel</a></span></li></ul></div></td></tr></tbody></table></div>
<!--
NewPP limit report
Parsed by mw-web.codfw.main-545fbb9556-tclc7
Cached time: 20250524201018
Cache expiry: 2592000
Reduced expiry: false
Complications: [vary-revision-sha1, show-toc]
CPU time usage: 0.607 seconds
Real time usage: 0.799 seconds
Preprocessor visited node count: 3901/1000000
Revision size: 53418/2097152 bytes
Post-expand include size: 113406/2097152 bytes
Template argument size: 3631/2097152 bytes
Highest expansion depth: 14/100
Expensive parser function count: 25/500
Unstrip recursion depth: 1/20
Unstrip post-expand size: 147208/5000000 bytes
Lua time usage: 0.350/10.000 seconds
Lua memory usage: 7025342/52428800 bytes
Number of Wikibase entities loaded: 1/500
-->
<!--
Transclusion expansion time report (%,ms,calls,template)
100.00%  592.214      1 -total
 36.81%  217.981      1 Template:Reflist
```

```
 15.64%    92.599      8 Template:Cite_web
 14.12%    83.598      1 Template:Financial_markets
 13.77%    81.543      1 Template:Sidebar
 11.59%    68.646     14 Template:Citation
  9.45%    55.989      1 Template:Short_description
  7.54%    44.629      1 Template:Derivatives_market
  7.51%    44.495      2 Template:Navbox
  5.90%    34.915      2 Template:Pagetype
-->
<!-- Saved in parser cache with key enwiki:pcache:9272073:|#|:idhash:canonical
and timestamp 20250524201018 and revision id 1282937596. Rendering was triggered
because: page-view
 -->
</link></link></link></link></link></link></link></meta></link></link></link></l
ink></div><!--esi <esi:include src="/esitest-fa8a495983347898/content" />
--><noscript><img alt="" height="1" src="https://en.wikipedia.org/wiki/Special:C
entralAutoLogin/start?type=1x1&amp;usesul3=1" style="border: none; position:
absolute;" width="1"/></noscript>
<div class="printfooter" data-nosnippet="">Retrieved from "<a dir="ltr" href="ht
tps://en.wikipedia.org/w/index.php?title=Option_(finance)&amp;oldid=1282937596">
https://en.wikipedia.org/w/index.php?title=Option_(finance)&amp;oldid=1282937596
</a>"</div></div>
<div class="catlinks" data-mw="interface" id="catlinks"><div class="mw-normal-
catlinks" id="mw-normal-catlinks"><a href="/wiki/Help:Category"
title="Help:Category">Categories</a>: <ul><li><a
href="/wiki/Category:Options_(finance)" title="Category:Options
(finance)">Options (finance)</a></li><li><a href="/wiki/Category:Contract_law"
title="Category:Contract law">Contract law</a></li></ul></div><div class="mw-
hidden-catlinks mw-hidden-cats-hidden" id="mw-hidden-catlinks">Hidden
categories: <ul><li><a href="/wiki/Category:CS1:_unfit_URL" title="Category:CS1:
unfit URL">CS1: unfit URL</a></li><li><a
href="/wiki/Category:Articles_with_short_description" title="Category:Articles
with short description">Articles with short description</a></li><li><a
href="/wiki/Category:Short_description_is_different_from_Wikidata"
title="Category:Short description is different from Wikidata">Short description
is different from Wikidata</a></li><li><a
href="/wiki/Category:Use_mdy_dates_from_August_2014" title="Category:Use mdy
dates from August 2014">Use mdy dates from August 2014</a></li><li><a
href="/wiki/Category:All_articles_with_unsourced_statements" title="Category:All
articles with unsourced statements">All articles with unsourced
statements</a></li><li><a
href="/wiki/Category:Articles_with_unsourced_statements_from_December_2023"
title="Category:Articles with unsourced statements from December 2023">Articles
with unsourced statements from December 2023</a></li><li><a
href="/wiki/Category:All_articles_lacking_reliable_references"
title="Category:All articles lacking reliable references">All articles lacking
reliable references</a></li><li><a
href="/wiki/Category:Articles_lacking_reliable_references_from_August_2013"
```

title="Category:Articles lacking reliable references from August 2013">Articles lacking reliable references from August 2013
CS1 maint: location missing publisher
</div></div>
</div>
</main>
</div>
<div class="mw-footer-container">
<footer class="mw-footer" id="footer">
<ul id="footer-info">
<li id="footer-info-lastmod"> This page was last edited on 29 March 2025, at 14:07 (UTC).
<li id="footer-info-copyright">Text is available under the Creative Commons Attribution-ShareAlike 4.0 License;
additional terms may apply. By using this site, you agree to the Terms of Use and Privacy Policy.
Wikipedia® is a registered trademark of the Wikimedia Foundation, Inc., a non-profit organization.

<ul id="footer-places">
<li id="footer-places-privacy">Privacy policy
<li id="footer-places-about">About Wikipedia
<li id="footer-places-disclaimers">Disclaimers
<li id="footer-places-contact">Contact Wikipedia
<li id="footer-places-wm-codeofconduct">Code of Conduct
<li id="footer-places-developers">Developers
<li id="footer-places-statslink">Statistics
<li id="footer-places-cookiestatement">Cookie statement
<li id="footer-places-mobileview"><a class="noprint stopMobileRedirectToggle" href="//en.m.wikipedia.org/w/index.php?title=Option_(finance)&mobileaction=tog

```
gle_view_mobile">Mobile view</a></li>
</ul>
<ul class="noprint" id="footer-icons">
<li id="footer-copyrightico"><a class="cdx-button cdx-button--fake-button cdx-
button--size-large cdx-button--fake-button--enabled"
href="https://www.wikimedia.org/"><picture><source height="29" media="(min-
width: 500px)" srcset="/static/images/footer/wikimedia-button.svg"
width="84"/><img alt="Wikimedia Foundation" height="25" lang="en" loading="lazy"
src="/static/images/footer/wikimedia.svg" width="25"/></picture></a></li>
<li id="footer-poweredbyico"><a class="cdx-button cdx-button--fake-button cdx-
button--size-large cdx-button--fake-button--enabled"
href="https://www.mediawiki.org/"><picture><source height="31" media="(min-
width: 500px)" srcset="/w/resources/assets/poweredby_mediawiki.svg"
width="88"/><img alt="Powered by MediaWiki" height="25" lang="en" loading="lazy"
src="/w/resources/assets/mediawiki_compact.svg" width="25"/></picture></a></li>
</ul>
</footer>
</div>
</div>
</div>
<div class="vector-header-container vector-sticky-header-container no-font-mode-
scale">
<div class="vector-sticky-header" id="vector-sticky-header">
<div class="vector-sticky-header-start">
<div aria-hidden="true" class="vector-sticky-header-icon-start vector-button-
flush-left vector-button-flush-right">
<button class="cdx-button cdx-button--weight-quiet cdx-button--icon-only vector-
sticky-header-search-toggle" data-event-name="ui.vector-sticky-search-form.icon"
tabindex="-1"><span class="vector-icon mw-ui-icon-search mw-ui-icon-wikimedia-
search"></span>
<span>Search</span>
</button>
</div>
<div class="vector-search-box-vue vector-search-box-show-thumbnail vector-
search-box" role="search">
<div class="vector-typeahead-search-container">
<div class="cdx-typeahead-search cdx-typeahead-search--show-thumbnail">
<form action="/w/index.php" class="cdx-search-input cdx-search-input--has-end-
button" id="vector-sticky-search-form">
<div class="cdx-search-input__input-wrapper" data-search-loc="header-moved">
<div class="cdx-text-input cdx-text-input--has-start-icon">
<input class="cdx-text-input__input mw-searchInput" name="search"
placeholder="Search Wikipedia" type="search"/>
<span class="cdx-text-input__icon cdx-text-input__start-icon"></span>
</div>
<input name="title" type="hidden" value="Special:Search"/>
</div>
<button class="cdx-button cdx-search-input__end-button">Search</button>
```

```
</form>
</div>
</div>
</div>
<div class="vector-sticky-header-context-bar">
<nav aria-label="Contents" class="vector-toc-landmark">
<div class="vector-dropdown mw-portlet mw-portlet-sticky-header-toc vector-
sticky-header-toc vector-button-flush-left" id="vector-sticky-header-toc">
<input aria-haspopup="true" aria-label="Toggle the table of contents"
class="vector-dropdown-checkbox" data-event-name="ui.dropdown-vector-sticky-
header-toc" id="vector-sticky-header-toc-checkbox" role="button"
type="checkbox"/>
<label aria-hidden="true" class="vector-dropdown-label cdx-button cdx-button--
fake-button cdx-button--fake-button--enabled cdx-button--weight-quiet cdx-button
--icon-only" for="vector-sticky-header-toc-checkbox" id="vector-sticky-header-
toc-label"><span class="vector-icon mw-ui-icon-listBullet mw-ui-icon-wikimedia-
listBullet"></span>
<span class="vector-dropdown-label-text">Toggle the table of contents</span>
</label>
<div class="vector-dropdown-content">
<div class="vector-unpinned-container" id="vector-sticky-header-toc-unpinned-
container">
</div>
</div>
</div>
</nav>
<div aria-hidden="true" class="vector-sticky-header-context-bar-primary"><span
class="mw-page-title-main">Option (finance)</span></div>
</div>
</div>
<div aria-hidden="true" class="vector-sticky-header-end">
<div class="vector-sticky-header-icons">
<a class="cdx-button cdx-button--fake-button cdx-button--fake-button--enabled
cdx-button--weight-quiet cdx-button--icon-only" data-event-name="talk-sticky-
header" href="#" id="ca-talk-sticky-header" tabindex="-1"><span class="vector-
icon mw-ui-icon-speechBubbles mw-ui-icon-wikimedia-speechBubbles"></span>
<span></span>
</a>
<a class="cdx-button cdx-button--fake-button cdx-button--fake-button--enabled
cdx-button--weight-quiet cdx-button--icon-only" data-event-name="subject-sticky-
header" href="#" id="ca-subject-sticky-header" tabindex="-1"><span
class="vector-icon mw-ui-icon-article mw-ui-icon-wikimedia-article"></span>
<span></span>
</a>
<a class="cdx-button cdx-button--fake-button cdx-button--fake-button--enabled
cdx-button--weight-quiet cdx-button--icon-only" data-event-name="history-sticky-
header" href="#" id="ca-history-sticky-header" tabindex="-1"><span
class="vector-icon mw-ui-icon-wikimedia-history mw-ui-icon-wikimedia-wikimedia-
```

```
history"></span>
<span></span>
</a>
<a class="cdx-button cdx-button--fake-button cdx-button--fake-button--enabled
cdx-button--weight-quiet cdx-button--icon-only mw-watchlink" data-event-
name="watch-sticky-header" href="#" id="ca-watchstar-sticky-header"
tabindex="-1"><span class="vector-icon mw-ui-icon-wikimedia-star mw-ui-icon-
wikimedia-wikimedia-star"></span>
<span></span>
</a>
<a class="cdx-button cdx-button--fake-button cdx-button--fake-button--enabled
cdx-button--weight-quiet cdx-button--icon-only" data-event-name="wikitext-edit-
sticky-header" href="#" id="ca-edit-sticky-header" tabindex="-1"><span
class="vector-icon mw-ui-icon-wikimedia-wikiText mw-ui-icon-wikimedia-wikimedia-
wikiText"></span>
<span></span>
</a>
<a class="cdx-button cdx-button--fake-button cdx-button--fake-button--enabled
cdx-button--weight-quiet cdx-button--icon-only" data-event-name="ve-edit-sticky-
header" href="#" id="ca-ve-edit-sticky-header" tabindex="-1"><span
class="vector-icon mw-ui-icon-wikimedia-edit mw-ui-icon-wikimedia-wikimedia-
edit"></span>
<span></span>
</a>
<a class="cdx-button cdx-button--fake-button cdx-button--fake-button--enabled
cdx-button--weight-quiet cdx-button--icon-only" data-event-name="ve-edit-
protected-sticky-header" href="#" id="ca-viewsource-sticky-header"
tabindex="-1"><span class="vector-icon mw-ui-icon-wikimedia-editLock mw-ui-icon-
wikimedia-wikimedia-editLock"></span>
<span></span>
</a>
</div>
<div class="vector-sticky-header-buttons">
<button class="cdx-button cdx-button--weight-quiet mw-interlanguage-selector"
data-event-name="ui.dropdown-p-lang-btn-sticky-header" id="p-lang-btn-sticky-
header" tabindex="-1"><span class="vector-icon mw-ui-icon-wikimedia-language mw-
ui-icon-wikimedia-wikimedia-language"></span>
<span>55 languages</span>
</button>
<a class="cdx-button cdx-button--fake-button cdx-button--fake-button--enabled
cdx-button--weight-quiet cdx-button--action-progressive" data-event-
name="addsection-sticky-header" href="#" id="ca-addsection-sticky-header"
tabindex="-1"><span class="vector-icon mw-ui-icon-speechBubbleAdd-progressive
mw-ui-icon-wikimedia-speechBubbleAdd-progressive"></span>
<span>Add topic</span>
</a>
</div>
<div class="vector-sticky-header-icon-end">
```

```
<div class="vector-user-links">
</div>
</div>
</div>
</div>
</div>
<div class="mw-portlet mw-portlet-dock-bottom emptyPortlet" id="p-dock-bottom">
<ul>
</ul>
</div>
<script>(RLQ=window.RLQ||[]).push(function(){mw.config.set({"wgHostname":"mw-web
.codfw.main-545fbb9556-
tp8hd","wgBackendResponseTime":111,"wgPageParseReport":{"limitreport":{"cputime"
:"0.607","walltime":"0.799","ppvisitednodes":{"value":3901,"limit":1000000},"rev
isionsize":{"value":53418,"limit":2097152},"postexpandincludesize":{"value":1134
06,"limit":2097152},"templateargumentsize":{"value":3631,"limit":2097152},"expan
siondepth":{"value":14,"limit":100},"expensivefunctioncount":{"value":25,"limit"
:500},"unstrip-depth":{"value":1,"limit":20},"unstrip-size":{"value":147208,"lim
it":5000000},"entityaccesscount":{"value":1,"limit":500},"timingprofile":["100.0
0%  592.214      1 -total"," 36.81%  217.981      1 Template:Reflist"," 15.64%
92.599      8 Template:Cite_web"," 14.12%   83.598      1
Template:Financial_markets"," 13.77%   81.543      1 Template:Sidebar"," 11.59%
68.646     14 Template:Citation","  9.45%   55.989      1
Template:Short_description","  7.54%   44.629      1
Template:Derivatives_market","  7.51%   44.495      2 Template:Navbox","  5.90%
34.915      2 Template:Pagetype"]},"scribunto":{"limitreport-
timeusage":{"value":"0.350","limit":"10.000"},"limitreport-
memusage":{"value":7025342,"limit":52428800}},"cachereport":{"origin":"mw-web.co
dfw.main-545fbb9556-
tclc7","timestamp":"20250524201018","ttl":2592000,"transientcontent":false}}});}
);</script>
<script type="application/ld+json">{"@context":"https:\/\/schema.org","@type":"A
rticle","name":"Option (finance)","url":"https:\/\/en.wikipedia.org\/wiki\/Optio
n_(finance)","sameAs":"http:\/\/www.wikidata.org\/entity\/Q187860","mainEntity":
"http:\/\/www.wikidata.org\/entity\/Q187860","author":{"@type":"Organization","n
ame":"Contributors to Wikimedia
projects"},"publisher":{"@type":"Organization","name":"Wikimedia Foundation, Inc
.","logo":{"@type":"ImageObject","url":"https:\/\/www.wikimedia.org\/static\/ima
ges\/wmf-hor-googpub.png"}},"datePublished":"2003-06-
26T22:02:38Z","dateModified":"2025-03-29T14:07:10Z","headline":"financial
derivative conferring the right to to buy or sell a certain thing at a later
date at an agreed price"}</script>
</body>
</html>
```

[4]:
```python
soup = BeautifulSoup(response.content, 'html.parser')
```

```
[5]: title = soup.find('h1').text
     print(f'Title: {title}')
```

Title: Option (finance)

```
[6]: # Extract the introduction section
     intro_paragraphs = []
     for element in soup.find("div", {"class": "mw-parser-output"}).find_all(['p',␣
       ↪'h2']):
         if element.name == 'h2':
             break  # Stop if we reach the first section header
         intro_paragraphs.append(element.text)

     # Join all paragraphs to form the complete introduction
     intro = "\n".join(intro_paragraphs)
     print("Introduction:", intro)

     # Generated using GPT-4o mini
```

Introduction:

In finance, an option is a contract which conveys to its owner, the holder, the
right, but not the obligation, to buy or sell a specific quantity of an
underlying asset or instrument at a specified strike price on or before a
specified date, depending on the style of the option.

Options are typically acquired by purchase, as a form of compensation, or as
part of a complex financial transaction. Thus, they are also a form of asset (or
contingent liability) and have a valuation that may depend on a complex
relationship between underlying asset price, time until expiration, market
volatility, the risk-free rate of interest, and the strike price of the option.

Options may be traded between private parties in over-the-counter (OTC)
transactions, or they may be exchange-traded in live, public markets in the form
of standardized contracts.

```
[7]: # Find all section headers in the HTML document, specifically looking for h2,␣
       ↪h3, and h4 tags
     sections = soup.find_all(['h2', 'h3', 'h4'])

     # Print a header for the output to indicate that section titles will follow
     print('Section titles:')

     # Iterate over each section found in the previous step
     for section in sections:
         # Get the text of the current section header, stripping any leading or␣
       ↪trailing whitespace
```

```
    section_title = section.get_text(strip=True)

    # Print the section title to the console
    print(section_title)

# Generated using GPT-4o mini
# Figure out how to store the section titles into a list
```

```
Section titles:
Contents
Definition and application
History
Historical uses of options
Modern stock options
Contract specifications
Option trading
Forms of trading
Exchange-traded options
Over-the-counter options
Exchange trading
Basic trades (American style)
Long call
Long put
Short call
Short put
Options strategies
Types
According to the option rights
According to the delivery type
According to the underlying assets
Other option types
Option styles
Valuation
Basic decomposition
Valuation models
Black-Scholes
Stochastic volatility models
Short-rate models
Model implementation
Analytic techniques
Binomial tree pricing model
Monte Carlo models
Finite difference models
Other models
Risks
Standard hedge parameters
Pin risk
Counterparty risk
```

```
Options approval levels
Options exchanges
Chicago Board Options Exchange (CBOE)
NASDAQ OMX PHLX
International Securities Exchange (ISE)
Eurex Exchange
Tokyo Stock Exchange (TSE)
See also
References
Further reading
```

```python
# Define the section titles you want to extract
desired_sections = [
    "Definition and application",
    "Historical uses of options",
    "Modern stock options",
    "References"
    # Add more section titles as needed
]

# Find all sections in the page
sections = soup.find_all(['h2', 'h3', 'h4'])  # h2 for main sections, h3 and h4
 ↪for subsections

# Initialize a list to store the extracted section titles and contents
extracted_content = []

for section in sections:
    # Get the section title
    title = section.get_text(strip=True)

    # Check if the title is in the desired sections
    if title in desired_sections:
        print(f'Section Title: {title}')

        # Get the next sibling elements until the next section title
        content = []
        for sibling in section.find_all_next():
            if sibling.name in ['h2', 'h3', 'h4']:
                break  # Stop if we reach the next section title

            # Collect text from paragraphs and lists
            if sibling.name in ['p', 'ul', 'ol']:
                content.append(sibling.get_text(strip=True))

        # Store the section title and content in the list
```

```
        extracted_content.append((title, '\n'.join(content) if content else 'No␣
    ↪content available.'))


        # Print the section content
        print('Section Content:')
        print('\n'.join(content) if content else 'No content available.')
        print('-' * 40)  # Separator for readability

# Generated using GPT-4o mini
```

Section Title: Definition and application
Section Content:
An option is a contract that allows the holder the right to buy or sell an underlying asset or financial instrument at a specified strike price on or before a specified date, depending on the form of the option. Selling or exercising an option before expiry typically requires a buyer to pick the contract up at the agreed upon price. The strike price may be set by reference to thespot price(market price) of the underlying security or commodity on the day an option is issued, or it may be fixed at a discount or at a premium. The issuer has the corresponding obligation to fulfill the transaction (to sell or buy) if the holder "exercises" the option. An option that conveys to the holder the right to buy at a specified price is referred to as acall, while one that conveys the right to sell at a specified price is known as aput.
The issuer may grant an option to a buyer as part of another transaction (such as a share issue or as part of an employee incentive scheme), or the buyer may pay a premium to the issuer for the option. A call option would normally be exercised only when the strike price is below the market value of the underlying asset, while a put option would normally be exercised only when the strike price is above the market value. When an option is exercised, the cost to the option holder is the strike price of the asset acquired plus the premium, if any, paid to the issuer. If the option's expiration date passes without the option being exercised, the option expires, and the holder forfeits the premium paid to the issuer. In any case, the premium is income to the issuer, and normally a capital loss to the option holder.
An option holder may on-sell the option to a third party in asecondary market, in either anover-the-countertransaction or on anoptions exchange, depending on the option. The market price of an American-style option normally closely follows that of the underlying stock being the difference between the market price of the stock and the strike price of the option. The actual market price of the option may vary depending on a number of factors, such as a significant option holder needing to sell the option due to the expiration date approaching and not having the financial resources to exercise the option, or a buyer in the market trying to amass a large option holding. The ownership of an option does not generally entitle the holder to any rights associated with the underlying asset, such as voting rights or any income from the underlying asset, such as adividend.

Section Title: Historical uses of options

Section Content:
Contracts similar to options have been used since ancient times.[1]The first
reputed option buyer was theancient Greekmathematician and philosopherThales of
Miletus. On a certain occasion, it was predicted that the season'soliveharvest
would be larger than usual, and during the off-season, he acquired the right to
use a number of olive presses the following spring. When spring came and the
olive harvest was larger than expected, he exercised his options and then rented
the presses out at a much higher price than he paid for his 'option'.[2][3]
The 1688 bookConfusion of Confusionsdescribes the trading of "opsies" on the
Amsterdam stock exchange (nowEuronext), explaining that "there will be only
limited risks to you, while the gain may surpass all your imaginings and
hopes."[4]
In London, puts and "refusals" (calls) first became well-known trading
instruments in the 1690s during the reign ofWilliamandMary.[5]Privileges were
options sold over the counter in nineteenth-century America, with both puts and
calls on shares offered by specialized dealers. Their exercise price was fixed
at a rounded-off market price on the day or week that the option was bought, and
the expiry date was generally three months after purchase. They were not traded
in secondary markets.
In thereal estatemarket, call options have long been used to assemble large
parcels of land from separate owners; e.g., a developer pays for the right to
buy several adjacent plots, but is not obligated to buy these plots and might
not unless they can buy all the plots in the entire parcel. Additionally,
purchase of real property, like houses, requires a buyer paying the seller into
anescrowaccount anearnest payment, which offers the buyer the right to buy the
property at the set terms, including the purchase price.[citation needed]
In the motion picture industry,film or theatrical producers often buy an
optiongiving the right - but not the obligation - to dramatize a specific book
or script.
Lines of creditgive the potential borrower the right - but not the obligation -
to borrow within a specified time period.
Many choices, or embedded options, have traditionally been included
inbondcontracts. For example, many bonds areconvertibleinto common stock at the
buyer's option, or may be called (bought back) at specified prices at the
issuer's option.Mortgageborrowers have long had the option to repay the loan
early, which corresponds to a callable bond option.

Section Title: Modern stock options
Section Content:
Options contracts have been known for decades. TheChicago Board Options
Exchangewas established in 1973, which set up a regime using standardized forms
and terms and trade through a guaranteed clearing house. Trading activity and
academic interest have increased since then.
Today, many options are created in a standardized form and traded through
clearing houses on regulatedoptions exchanges. In contrast, otherover-the-
counteroptions are written as bilateral, customized contracts between a single
buyer and seller, one or both of which may be a dealer or market-maker. Options
are part of a larger class of financial instruments known asderivative products,

or simply, derivatives.[6][7]


Section Title: References

Section Content:

^Abraham, Stephan (May 13, 2010)."History of Financial Options -
Investopedia".Investopedia. RetrievedJune 2,2014.^Mattias Sander. Bondesson's
Representation of the Variance Gamma Model and Monte Carlo Option Pricing. Lunds
Tekniska Högskola 2008^Aristotle. Politics.^Josef de la Vega.Confusión de
Confusiones. 1688. Portions Descriptive of the Amsterdam Stock Exchange Selected
and Translated by Professor Hermann Kellenbenz. Baker Library, Harvard Graduate
School Of Business Administration, Boston, Massachusetts.^Smith, B. Mark
(2003),History of the Global Stock Market from Ancient Rome to Silicon Valley,
University of Chicago Press, p. 20,ISBN0-226-76404-4^Brealey, Richard A.;Myers,
Stewart(2003),Principles of Corporate Finance(7th ed.), McGraw-Hill, Chapter
20^Hull, John C. (2005),Options, Futures and Other Derivatives (excerpt by Fan
Zhang)(6th ed.), Prentice-Hall, p. 6,ISBN0-13-149908-4, archived fromthe
originalon July 29, 2016, retrievedApril 21,2008^Characteristics and Risks of
Standardized Options, Options Clearing Corporation, retrievedJuly 15,2020^Trade
CME Products, Chicago Mercantile Exchange, retrievedJune 21,2007^ISE Traded
Products, International Securities Exchange, archived fromthe originalon May 11,
2007, retrievedJune 21,2007^Elinor Mills (December 12, 2006),Google unveils
unorthodox stock option auction, CNet, retrievedJune 19,2007^Harris, Larry
(2003),Trading and Exchanges, Oxford University Press, pp.26-27^invest-faqorLaw
& Valuationfor typical size of option contract^"Understanding Stock
Options"(PDF).The Options Clearing CorporationandCBOE. RetrievedAugust
27,2015.^Fabozzi, Frank J. (2002).The Handbook of Financial
Instruments(1st ed.).New Jersey: John Wiley and Sons.
p. 471.ISBN0-471-22092-2.^Benhamou, Eric."Options pre-Black Scholes"(PDF).Eric
Benhamou. Archived from the original on July 25, 2011.^Black, Fischer; Scholes,
Myron (1973). "The Pricing of Options and Corporate Liabilities".Journal of
Political
Economy.81(3):637-654.doi:10.1086/260062.JSTOR1831029.S2CID154552078.^Reilly,
Frank K.; Brown, Keith C. (2003).Investment Analysis and Portfolio
Management(7th ed.). Thomson Southwestern. Chapter 23.^Black, Fischer and Myron
S. Scholes. "The Pricing of Options and Corporate Liabilities",Journal of
Political Economy, 81 (3), 637-654 (1973).^Das, Satyajit (2006),Traders, Guns &
Money: Knowns and unknowns in the dazzling world of derivatives(6th ed.),
London: Prentice-Hall, Chapter 1 'Financial WMDs - derivatives demagoguery,'
p.22,ISBN978-0-273-70474-4^Hull, John C. (2005),Options, Futures and Other
Derivatives(6th ed.), Prentice-Hall,ISBN0-13-149908-4^abJim Gatheral (2006),The
Volatility Surface, A Practitioner's Guide, Wiley
Finance,ISBN978-0-471-79251-2^Bruno Dupire (July 2007) [January 1994]."Pricing
with a Smile"(PDF).Risk. Archived fromthe original(PDF)on September 7, 2012.
RetrievedJune 14,2013.^Derman, E.; Iraj Kani (January 1994)."Riding on a
Smile"(PDF).Quantitative Strategies Research Notes. Goldman Sachs. Archived
fromthe original(PDF)on July 10, 2011. RetrievedJune 1,2007.^Fixed Income
Analysis, p. 410, atGoogle Books^Cox, J. C.,Ross SAandRubinstein M. 1979.
Options pricing: a simplified approach,Journal of Financial Economics,

7:229-263.[1]^Cox, John C.;Rubinstein, Mark(1985),Options Markets, Prentice-Hall, Chapter 5^Crack, Timothy Falcon (2004),Basic Black-Scholes: Option Pricing and Trading, Timothy Crack, pp.91-102,ISBN0-9700552-2-6^"Investor Bulletin: Opening an Options Account".U.S. Securities and Exchange Commission. March 18, 2015. RetrievedAugust 27,2022.^Baker, Howard (2023)."50 Years of Exchange-Traded Options. Cboe Marks Golden Anniversary"(PDF).moaf.org. pp.20-23.^"Nasdaq PHLX (PHLX)".^"Nasdaq International Securities Exchange (ISE)".^"About us".www.eurex.com. RetrievedMarch 3,2024.^"Japan Exchange Group".Japan Exchange Group. RetrievedMarch 3,2024.
----

[9]:
```python
from textblob import TextBlob

# Process each section with TextBlob
for title, text in extracted_content:
    blob = TextBlob(text)
    print(f'Section Title: {title}')
    print(f'Sentiment: {blob.sentiment}')
    print('-' * 40)  # Separator for readability
```

Section Title: Definition and application
Sentiment: Sentiment(polarity=0.07319047619047618, subjectivity=0.45142857142857146)

Section Title: Historical uses of options
Sentiment: Sentiment(polarity=0.08432539682539683, subjectivity=0.40383597883597894)

Section Title: Modern stock options
Sentiment: Sentiment(polarity=0.07142857142857144, subjectivity=0.2619047619047619)

Section Title: References
Sentiment: Sentiment(polarity=0.08041666666666666, subjectivity=0.195)
----

[10]:
```python
external_links = soup.find_all('a', {'class':'external text'})
print('External links:')
for link in external_links:
    print(link.get('href'))
```

External links:
http://www.investopedia.com/articles/optioninvestor/10/history-options-futures.asp
https://web.archive.org/web/20160729024723/http://fan.zhang.gl/ecref/options
http://fan.zhang.gl/ecref/options
https://www.theocc.com/getmedia/a151a9ae-d784-4a15-bdeb-23a029f50b70/riskstoc.pdf;
http://www.cme.com/trading/

https://web.archive.org/web/20070511003741/http://www.iseoptions.com/products_traded.aspx
http://www.iseoptions.com/products_traded.aspx
http://news.cnet.com/Google+unveils+unorthodox+stock+option+auction/2100-1030_3-6143227.html
http://invest-faq.com/cbc/deriv-option-basics.html
http://www.wfu.edu/~palmitar/Law&Valuation/chapter%204/4-4-1.htm
https://www.cboe.com/LearnCenter/pdf/understanding.pdf
https://web.archive.org/web/20110725103707/http://www.ericbenhamou.net/documents/Encyclo/Pre%20Black-Scholes.pdf
https://doi.org/10.1086%2F260062
https://www.jstor.org/stable/1831029
https://api.semanticscholar.org/CorpusID:154552078
http://www.journals.uchicago.edu/JPE/
https://archive.org/details/tradersgunsmoney00dass_0
https://web.archive.org/web/20120907114056/http://www.risk.net/data/risk/pdf/technical/2007/risk20_0707_technical_volatility.pdf
http://www.risk.net/data/risk/pdf/technical/2007/risk20_0707_technical_volatility.pdf
https://web.archive.org/web/20110710170610/http://www.ederman.com/new/docs/gs-volatility_smile.pdf
http://www.ederman.com/new/docs/gs-volatility_smile.pdf
https://books.google.com/books?id=GnR3g9lvwfkC&pg=PA410
http://www.BasicBlackScholes.com/
https://www.sec.gov/oiea/investor-alerts-bulletins/ib_openingoptionsaccount
https://www.moaf.org/publications-collections/financial-history-magazine/145/_res/id=Attachments/index=0/Cboe%2050th%20Anniversary.pdf
https://www.nasdaq.com/solutions/nasdaq-phlx
https://www.nasdaq.com/solutions/nasdaq-ise
https://www.eurex.com/ex-en/find/about-us
https://www.jpx.co.jp/english/
http://www.journals.uchicago.edu/JPE/
http://www.iijournals.com/JOI/default.asp
http://www.physik.fu-berlin.de/~kleinert/b5
http://www.cfapubs.org/loi/faj
http://www.econlib.org/library/Enc/FuturesandOptionsMarkets.html
https://search.worldcat.org/oclc/237794267
https://web.archive.org/web/20070527102103/http://www.indexuniverse.com/JOI/
http://www.iijournals.com/JAI/
http://www.iijournals.com/JOD/
https://www.researchgate.net/publication/255650680_Why_We_Have_Never_Used_the_Black-Scholes-Merton_Option_Pricing_Formula
https://id.loc.gov/authorities/sh85109239
https://catalogue.bnf.fr/ark:/12148/cb11970951p
https://data.bnf.fr/ark:/12148/cb11970951p
https://id.ndl.go.jp/auth/ndlna/00575313
https://aleph.nkp.cz/F/?func=find-c&local_base=aut&ccl_term=ica=ph137530&CON_LNG=ENG

[11]:
```python
from wordcloud import WordCloud
import matplotlib.pyplot as plt
```

[12]:
```python
wordcloud = WordCloud(width=1000, height=500, background_color='white').
  ↪generate(text)

plt.figure(figsize=(12,6))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis('off')
plt.title('Word Cloud of Selected Sections')
plt.show()
```


Word Cloud of Selected Sections

The Wikipedia article on options delivers a neutral and objective source of information. This is expected and consistent with an encyclopedia-type publication. The word cloud shows the most frequently occuring words in the selection sections and the context of the sections is on-topic.