

# Options and options markets - Uroš Todorović

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## 1. Introduction

The world of finance will never be explored to the very end. Its limits are not known. Nevertheless, everyone is aware of its huge significance. Many people with the biggest influence in political and economic point of view are big investors.

Even though many people consider derivatives as very dangerous things, nobody can tell they are not important for the financial and economic world. Even though the derivatives market is one very young market, we can say that its significance is higher than most of the other financial markets.

In next couple of pages, there will be the description of derivatives, with emphasize on options, their markets, risk and motives of use.

## 2. Theoretical background

Market is considered as every area (not necessary physical) on which there is a presence of demand and supply, and where suppliers meet buyers in order to exchange their goods and services. Markets of a specific good are established by current and potentially new buyers, who need that good and are able to afford it. (*Franklin, Douglas, 2002*)

We can distinct two types of markets according to the “physical” presence of the suppliers and buyers, especially if we are talking about financial instruments:

- Physical markets - buyers and sellers meet directly on some physical area (e.g. NYSE);
- Over-the-Counter markets - In today’s technology-driven economy, a stock market does not need to have a physical location. Stock transactions can be made over the phone or by computer network (e.g. NASDAQ). (*Berk et al., 2010*)

## 3. Derivatives and derivatives market

Financial derivatives became very popular topic nowadays mostly thanks to serials of financial losses caused to many companies, municipalities and banks, which unsuccessfully traded derivatives. However, derivatives are still very interesting and popular investment for many

investors. Many of investors are even indirectly getting in touch with the derivatives, by investing in mutual and hedge funds.

In some way, derivatives can be compared to the electricity. If you handle them with caution, and with a help of knowledge and permanent researching, derivatives can gain a lot of profit. Nevertheless, underestimating them can cause serious negative results. Derivatives are not bad. When there is completely understanding of these financial instruments, and responsible risk management, financial derivatives can be very useful instruments in investment strategy implementation. (*Rutledge, 2001*)

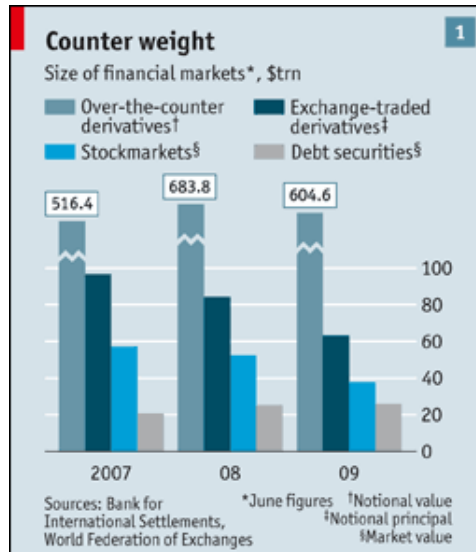
So, what exactly are derivatives? Almost every author and expert from this field has their own definition of derivatives. However, the essence stays the same. A **derivative** can be defined as a financial instrument whose value depends on (or derives from) the values of other, more basic, underlying variables. Very often the variables underlying derivatives are the prices of traded assets. A stock option, for example, is a derivative whose value is dependent on the price of a stock. However, derivatives can be dependent on almost any variable, from the price of hogs to the amount of snow falling at a certain ski resort. Since the agreement between two or more people stays behind establishment of a new derivative, we can say that the number of potential new derivatives is limited only by the human's imagination. (*Hull, 2006*)

### **3.1. History of trading**

Derivatives were firstly used back in 1865, when Chicago Board Of Trade - CBOT introduced futures. Ever since, Chicago has been the most important derivatives exchange in the world. It has not been before 26. April 1973 that Chicago Board Option Exchange - CBOE was established, and the options exchange could begin. First type of options were 'stock options', and during the first working day 911 stock option contract of 16 different companies. (*CBOE History, CBOE.com*)

After 1970's options market has lived an astronomical growth, as well as the rest of the derivatives market. Today, derivatives market volume (especially OTC exchange) is much bigger

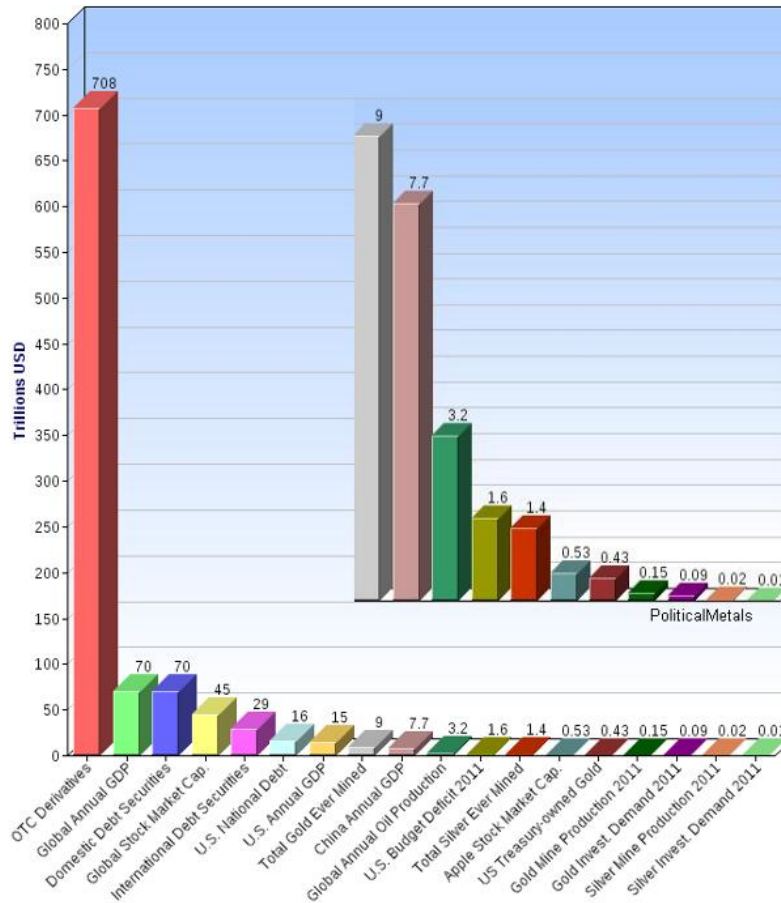
than the volume of stock markets, and market of debt securities, which can be seen easily from the graph bellow. (*“Over the counter, out of sight”, economist.com*)



*Graph 1 – Value (Volume) of derivatives market comparing to the value of stock markets and debt securities markets*

The size of the derivatives market became so enormously big, that non of the politicians has even thought of regulating it. Warren Buffet, the most known and successful investor of all time call derivatives as ‘weapons of mass destruction’.

Another graph that is explaining how the derivatives market is big, and exactly how it is dangerous.



Graph 2 – Derivatives OTC market compared to the other important figures

The most important financial institution on the derivatives market is certainly J.P. Morgan with around \$100 trillions. After it, Citibank and Bank of America follow. (*“What comes after a trillion?”*, *ftense.com*)

### 3.2. Types of derivatives

There are several most important derivatives:

- **Forward contracts** - relatively simple agreement between two sides about exchange of certain assets at certain price level at certain point in the future.
- **Futures** - similar derivative to forward contract. The biggest difference is in that futures are traded on organized exchanges, while forwards are rather not standardized; futures have daily settlements, while forwards have one settlement at the maturity date; futures can be canceled before the maturity date, while forwards can not. (*“What is the difference between forward and futures contracts?”*, Investopedia.com)

#### 3.2.1. Options

Options are very important element of professional investors' portfolios. Their importance and power lays in their multiple ways of use. Investors can hedge their positions with options, or they can just bet on prices of the security on which the options are relied. However, since options are very complex, and derivatives with big leverage and risk, trading with options is only advised to very experienced investors. Today, most options' prices derive from prices of stocks, stock indexes, exchange rates and futures.

Options are derivatives that give their owner a right to buy (call options) or sell (put option) certain asset at certain price - exercise or strike price. If the owner can execute his or her option before the expiration date, than we are speaking about the American options, while the European options can be only executed at the maturity or expiration date. One option contract is related to 100 stocks of a company (for example, if we are speaking about options related to stocks). Biggest difference between options and futures and forwards on the other side is that the owner of option does not have to execute their contract, if the price is not good for them. (*Olmstead, 2006*)

### 3.2.1.1. Call options

Call option gives its owner the right to buy certain asset at certain price at certain maturity date or before. Strike price can be higher or lower than the current price of the asset. The option will be cheaper as the strike price go higher and higher. This we can see from the following table.

(Brealey et al., 2011)

Maturity Date	Exercise Price	Price of Call Option
December 2008	\$370	\$ 78.90
	400	58.65
	430	41.75
	460	28.05
	490	17.85
March 2009	\$370	\$ 90.20
	400	70.80
	430	54.35
	460	39.85
	490	28.75
January 2010*	\$370	\$116.90
	400	100.00
	430	85.05
	460	71.60
	490	59.90

Table 1 – Price of options depending on strike prices and maturity dates

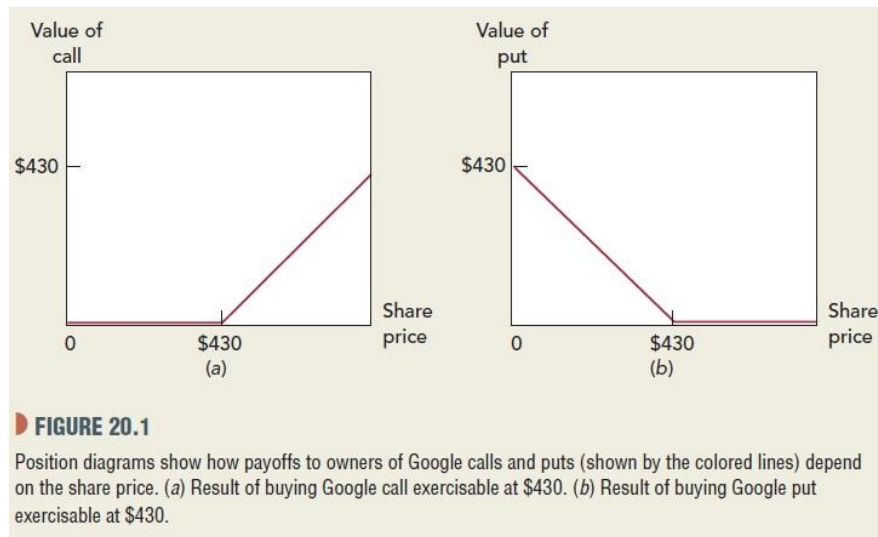
If the strike price is lower than the actual price of an asset, we say that the option is “in the money”. If it is higher than the actual price, we say it is “out of money”. In third case, we say the option is “at the money” if the strike price is at the same level as the current price of an asset. If it is “in the money” we can say that profit at the maturity date = current asset price on market - strike price of the option - purchase price of the option.

### 3.2.1.2. Put options

Put option gives its owner the right to sell certain asset at certain price at certain maturity date or before. Strike price can be higher or lower than the current price of the asset. The option will be

cheaper as the strike price goes lower and lower, because the owner wants the strike price to be as low as possible. Same like call option, closer the maturity date, more expensive the option. If the option is “in the money”, or when the strike price is higher than the current price of the asset on market, then the profit at the maturity date = strike price - current price of the asset on market - purchase price of the option.

Profit for both call and put options can be presented graphically (*Brealey, 2011*):



*Graph 3 – Profit from stock options (Google)*

### 3.2.2. Motives for options trading

Options markets are highly successful and profitable. Reason why lies in the fact that there is a great variety of different investors, and the liquidity is very high. There is usually no problems for an investor to find somebody who will take the opposite side in the contract.

There are two main groups of investment motives:

- **Hedging** - using options for hedging from risks. If an investor has some stocks in his or her portfolio, they can also buy put options on the same amount of stocks, and by doing that lower the risk of loss. Example will be given in the presentation



- **Speculating** - investors will very often use options just for “betting”. They would buy options (put or call) and based on their expectations and calculations, wait to see how the price will go. Example will be given in the presentation.

## 5. Conclusion

As we have seen, financial derivatives have a very important role in the financial world in last couple of decades. The value of derivatives market reaches beyond many expectations. Many talk about the derivatives market as the atomic bomb, waiting to explode, but the importance is very big. Too strict regulation of these financial instruments could cause drop in the value of the market, which will later cause big damages in financial system of the world. (*Why finance can't be fixed with better regulation, Reuters.com*)

Getting into the option contract means more money than getting into the futures or forward contract, but options could be used in really great variety of situations. Hedging and speculation could not be imagined without options.

The derivative market, and as well the market of options grow from day to day. It is hard to imagine that it can be destroyed in a matter of seconds. Time will show what influence it will have on the economy of the world.

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