

# Comparison of Price Reaction Chosen Indirect Crude Oil Investment to Trend in Crude Oil Prices

Jiří Polách, Michal Kovářik<sup>1</sup>

## Abstract

Investments in crude oil recently belong among the most profitable ones. Among these investments we include direct crude oil futures investments and modern structured indirect investments (in this case warrant) with crude oil being the underlying asset, crude oil companies funds investments, crude oil fund investments or crude oil companies stock investments. However development of prices of particular indirect investments differ not only comparing to each other but also comparing to direct investments in the commodity. The goal of our entry is to identify and compare different warrant price development reflectance to American crude oil and American crude oil companies' stock using the determination of so called psychological barrier regarding three time periods.

## Key words

Crude oil, warrant, stocks, psychological barrier, time periods.

## 1 Introduction

Our work deals with financial markets sphere. Permanent development of this part of economy in last decades produces new financial products. Warrants<sup>2</sup> are among the most modern ones. Comparing to shares warrant is a cheaper investment instrument and it precisely traces and multiplies the price effect of underlying asset development (crude oil in this case) which it projects in its value. Warrants therefore fulfill our requirements of price, maturity and other investment conditions. The goal of our work is to compare different warrant strategies at the crude oil market and to point out its advantages comparing to investment to shares of chosen US companies dealing with crude oil regarding three time periods – short term, medium term and long term. We will show this in the first chapter of our work. In our research markedly lower crude oil price development reflectance showed concerning tracked shares and the so called psychological barrier occurred. This means that the shares price, in contrast to warrants, did not react at all to crude oil price development in certain periods. We will show this in the second chapter of our work.

---

<sup>1</sup> prof. Ing. Jiří Polách, CSc., Department of Enterprise Economics (Head of Department), Faculty of Management and Economics (FaME), Thomas Bata University in Zlín, Mostní 5139, 760 01 Zlín, Czech Republic, polach@fame.utb.cz; profpolach@email.cz, Ing. Michal Kovářik, Department of Enterprise Economics (Doctoral student), Faculty of Management and Economics (FaME), Thomas Bata University in Zlín, Mostní 5139, 760 01 Zlín, Czech Republic, mkovarik@fame.utb.cz

<sup>2</sup> A warrant, like an option, gives the holder the right but not the obligation to buy an underlying security at a certain price, quantity and future time. There are two different types of warrants: a call warrant and a put warrant. A call warrant represents a specific number of shares that can be purchased from the issuer at a specific price, on or before a certain date. A put warrant represents a certain amount of equity that can be sold back to the issuer at a specified price, on or before a stated date.

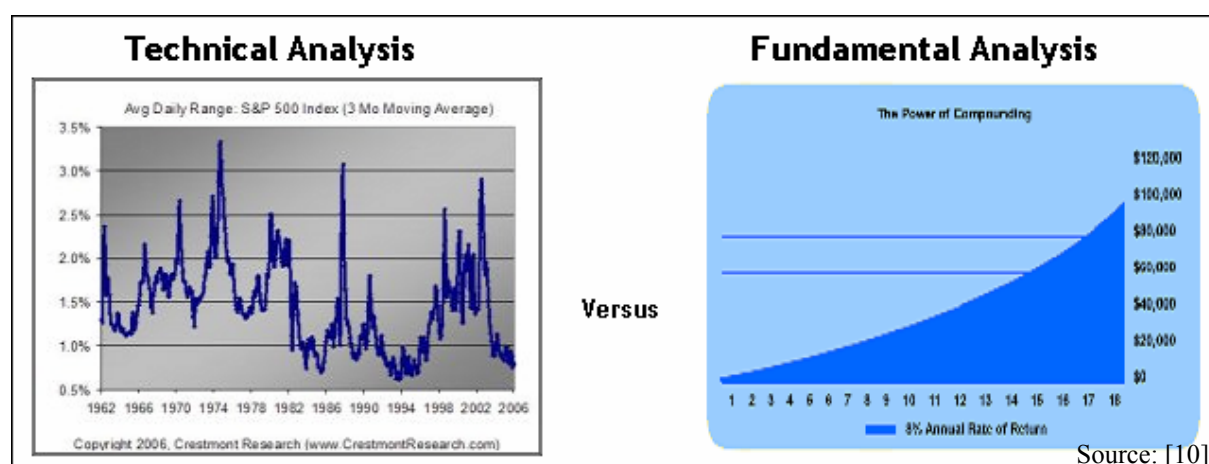
## 2 Used research methodology

Financial derivatives are financial instruments that are linked to a specific financial instrument or indicator or commodity, and which provide for market financial risk in a form that can be traded or otherwise offset in the market. Financial derivatives are used for a number of purposes including risk management, hedging, and speculation. Unlike with debt instruments, no principal amount is advanced to be repaid, and no investment income accrues. The value of the financial derivative derives from the price of the underlying items. [8]

When day trading, a trader makes the decision about what to trade, when to trade, and how to trade, using either fundamental or technical analysis. Both forms of analysis involve looking at the available information and making a decision about the future price of the market being traded, but the information that is used is completely different. Is it possible to use both fundamental and technical analysis together, but it is more common for a trader to choose one or the other. Fundamental traders use information about the global and national economies, and the financial state of the companies involved, as well as non financial information such as current political and weather information. Fundamental traders believe that the markets will react to events in certain ways and that they can predict future market prices based on these events. For example, if a company receives regulatory approval for a new product, a fundamental trader might expect the company's stock price to rise. Conversely, if a company has a financial scandal, a fundamental trader might expect its stock price to fall. Fundamental traders need access to all of the available information as soon as it is available, and are therefore often institutional traders with large support teams, rather than individuals. Fundamental analysis has probably been in use since there were markets to trade, and has traditionally been done manually, but as computing power increases it has become possible for some fundamental information to be processed automatically. Technical traders use trading information (such as previous prices and trading volume) along with mathematical indicators to make their trading decisions. This information is usually displayed on a graphical chart and is updated in real time throughout the trading day. Technical traders believe that all of the information about a market is already included in the price movement, so they do not need any other fundamental information (such as earnings reports). There are many different types of charts and many different mathematical indicators. Some indicators are better suited to short term trading, and others are better suited for longer term trend following trading. Individual traders are usually technical traders. Technical analysis appears to have been used at least 200 years ago in Japan. Modern technical analysis is usually performed by the trader interpreting their charts, but can just as easily be automated because it is mathematical. Some traders prefer automatic analysis because it removes the emotional component from their trading, and allows them to take trades based purely on the trading signals. [9]

Thereunder are made some comparisons of these strategies that people employ when playing the stock market. On the left hand column are images that to me, appear to closely reflect technical analysis; while the right hand column invokes images that reference fundamental analysis. Of course, these are just my casual notions about these two divergent investing methodologies. These differences aren't meant to be mutually exclusive nor comprehensive. [Modified 10]

Figure no. 1. Stock Market Volatility and The Power of Compounding

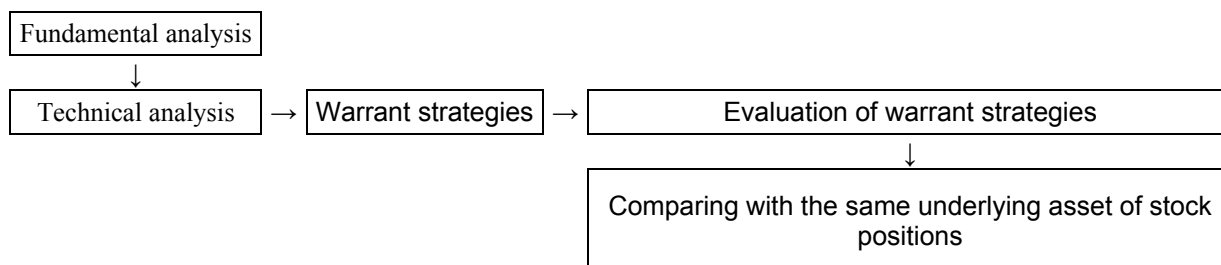


A derivative security that gives the holder the right to purchase securities (usually equity) from the issuer at a specific price within a certain time frame. Warrants are often included in a new debt issue as a "sweetener" to entice investors.

The main difference between warrants and call options is that warrants are issued and guaranteed by the company, whereas options are exchange instruments and are not issued by the company. Also, the lifetime of a warrant is often measured in years, while the lifetime of a typical option is measured in months. [11]

There are also call and put warrant. Theirs fundamental is for study in many literatures, so we won't be describing them in this paper.

Figure no. 2. Used investment/work paper diagram



Given the flexibility of warrants and the fast-paced nature of the markets, it is important to understand different warrant investment strategies in order to achieve the desired risk/reward profile. The figure number 2. generally describes our investment strategy. Every important methodology will be described in the following text.

The discussion of each strategy, we did in literature link [1, 2], includes the investment objectives, how is the strategy constructed, relevant examples, and benefits and risks. In this paper we do not deal this problem again, because of keeping this fundamental.

### 3 Business positions valuation

We created three investments strategies. The first of them is the long call strategy which contains two warrants (DZ3Z3H<sup>3</sup> and DZ3Z3F) with approximately two years maturity. We

<sup>3</sup> ISIN – International Securities Identification Number, using worldwide. Though in German speaking countries we can meet with a WKN (Wertpapierkennnummer) - six digits or capital letters (excluding I and O), no check digit. In the US are fully used “tickers” – mostly it is abbreviation name of a

invested CZK 20,000 to these warrants while the sum was equally shared between both warrants. The second investment strategy also contains two call warrants (DZ3Z3D and ABN069) with six months maturity. We invested CZK 20,000 to these warrants while the sum was again equally shared between both warrants. Regarding occurring conditions we sold these warrants beyond a certain date. The third strategy is the long put strategy which contains two put warrants (DZ1799 a DZ18AA) where the first one had a one month maturity (from the purchase date) and the second one had a six months maturity. We used the money from the cancelled 2nd investment strategy which means CZK 20,000 for the 3rd strategy investment. Again the sum was equally shared between both warrants. Therefore the total amount we invested was CZK 40,000.

### Short term and long term time period

We chose the short term and long term period for the period from 03/12/2007 to 04/27/2007. The sheet no. 1 shows that the largest drop on the account was caused by the 1st strategy warrants (DZ3Z3H and DZ2Z2F) during the first stage. This drop, specially for warrant DZ3Z3H, was not yet very important as this warrant had two years maturity which made the possible situation change very probable. Warrant DZ3Z3F was held till his maturity. 3rd strategy warrants (DZ1799 and DZ18AA) showed minor profit. Although they got to the limit of minimal acceptable profit level they were sold thanks to the circumstances at the crude oil market. The highest profit was brought by the 2nd investment strategy containing call warrants DZ3Z3D and ABN069.

*Sheet no. 1. Business positions valuation*

(in EUR)	1 <sup>st</sup> investment strategy		2 <sup>nd</sup> investment strategy		3 <sup>rd</sup> investment strategy	
	DZ3Z3H*	DZ3Z3F	DZ3Z3D	ABN069	DZ1799	DZ18AA
Warrant purchase price	1.40	1.08	1.17	1.21	0.98	1.02
Warrant sale price	1.67	1.31	1.68	1.70	1.36	1.31
Change in pts	0.27	0.23	0.51	0.49	0.38	0.29
Change in pct	16.17%	17.56%	30.36%	28.82%	27.94%	22.14%
Purchased pieces	233	271	307	297	364	349
Purchase volume	326.20	292.68	359.58	359.58	356.38	356.38
Purchase fee	28.83	28.49	29.17	29.17	29.14	29.14
Number of sold pieces	233	271	307	297	364	349
Sale volume	389.11	355.01	516.32	505.20	494.57	457.70
Sale fee	29.47	29.12	30.77	30.65	30.54	30.17
<b>Absolute profit/loss</b>	<b>4.61</b>	<b>4.72</b>	<b>96.81</b>	<b>85.80</b>	<b>78.51</b>	<b>42.02</b>
<i>Relative profit/loss</i>	<i>1.41%</i>	<i>1.61%</i>	<i>26.92%</i>	<i>23.86%</i>	<i>22.03%</i>	<i>11.79%</i>

*Source: own processing + [6]*

*\* Real sale was not made therefore we allege up-to-date values from the day of business positions evaluation (04/27/2007)*

The total profit after summarizing all positions was EUR 312.47 on 04/27/2007. Regarding the 28.064 EUR/CZK exchange rate and hypothetical sales fee when selling DZ3Z3H and DZ3Z3F warrant, the total profit was CZK 8,717.7. The total valuation of all business positions was 21.79pct on 04/27/2007.

---

company that emitted security. WKNs may be obsolete in future, and be replaced by ISINs. ISINs are slowly being introduced worldwide. At present, many countries have adopted ISINs as a secondary measure of identifying securities, but as of yet only some of those countries have moved to using ISINs as their primary means of identifying securities.

## Long term time period

In this case I will evaluate only the 1st strategy warrants thus the long term time period warrants (DZ3Z3H and DZ3Z3F) from 03/12/2007 to 05/09/2008. The profit for DZ3Z3H warrant is EUR 719.55 when using up-to-date vales. The profit for DZ3Z3F warrant is EUR 871.13 when using up-to-date vales. Therefore the total profit at the moment of evaluation of business positions is EUR 1,893.80 which means CZK 48,147.7 regarding the 24.953 EUR/CZK exchange rate or 120.37pct.

*Sheet no. 2. Business positions valuation*

(in EUR)	1 <sup>st</sup> investment strategy		2 <sup>nd</sup> investment strategy		3 <sup>rd</sup> investment strategy	
	DZ3Z3H*	DZ3Z3F	DZ3Z3D	ABN069	DZ1799	DZ18AA
Warrant purchase price	1.40	1.08	1.17	1.21	0.98	1.02
Warrant sale price	4.77	4.54	1.68	1.70	1.36	1.31
Change in pts	3.37	3.46	0.51	0.49	0.38	0.29
Change in pct	70.65 %	76.21 %	30.36%	28.82%	27.94%	22.14%
Purchased pieces	233	271	307	297	364	349
Purchase volume	326.20	292.68	359.58	359.58	356.38	356.38
Purchase fee	28.83	28.49	29.17	29.17	29.14	29.14
Number of sold pieces	233	271	307	297	364	349
Sale volume	1,111.41	1,230.34	516.32	505.20	494.57	457.70
Sale fee	36.84	38.05	30.77	30.65	30.54	30.17
<b>Absolute profit/loss</b>	<b>719.55</b>	<b>871.13</b>	<b>96.81</b>	<b>85.80</b>	<b>78.51</b>	<b>42.02</b>
<i>Relative profit/loss</i>	<i>220.58 %</i>	<i>297.64</i>	<i>26.92%</i>	<i>23.86%</i>	<i>22.03%</i>	<i>11.79%</i>

*Source: own processing + [6]*

*\* Real sale was not made therefore we allege up-to-date values from the day of business positions evaluation (05/09/2008)*

## 4 Warrants v. shares of US companies dealing with crude oil

To show the advantages of warrants we made a hypothetical comparison of virtual purchase of shares of three US companies dealing with crude oil (because we trade with American West Texas Intermediate light sweet crude oil in case of warrants) with the very same initial investment as when trading warrants which means CZK 40,000 in each company's share.

Due to threshold financial resources we decided for virtual purchases. Current month volume of business chosen US companies dealing with crude oil is approximately:

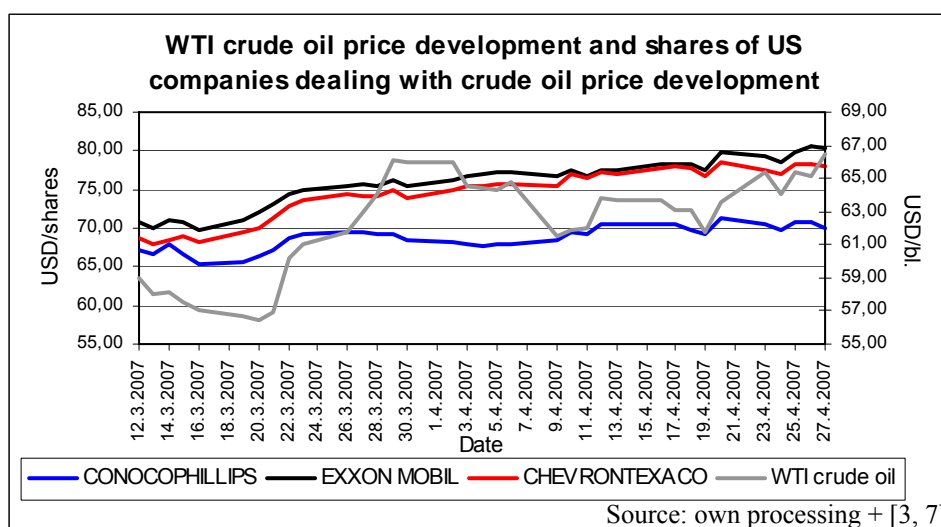
- CONOCOPHILLIPS 15 000 000 pcs.
- EXXON MOBIL 27 000 000 pcs.
- CHEVRONTEXACO 12 000 000 pcs.

Consequently in case that a given businesses would be realized in practice, they would have imponderable influence to development of three US companies prices. Therefore it is possible these valuables use for calculation of revenues these virtual businesses.

### Development from 03/12/2007 to 04/27/2007

As the Figure no. 3. and text mentioned higher show we work with CONOCOPHILLIPS, EXXON MOBIL and CHEVRONTEXACO shares.

Figure no. 3. WTI crude oil price development and shares of US companies dealing with crude oil price development (03/12/2007-04/27/2007)



As shown at the first tracked period (03/12/2007-04/27/2007) the lowest profit came from investments into CONOCOPHILLIPS shares. On the other hand the highest profit came from CHEVRONTEXACO shares. Unlike when investing into warrants an exchange rate loss of USD 86 (CZK 1,770) occurred when investing into US shares in tracked period. This exchange rate loss produced loss to investments into CONOCOPHILLIPS shares while both EXXON MOBIL and CHEVRONTEXACO shares stayed with profit.

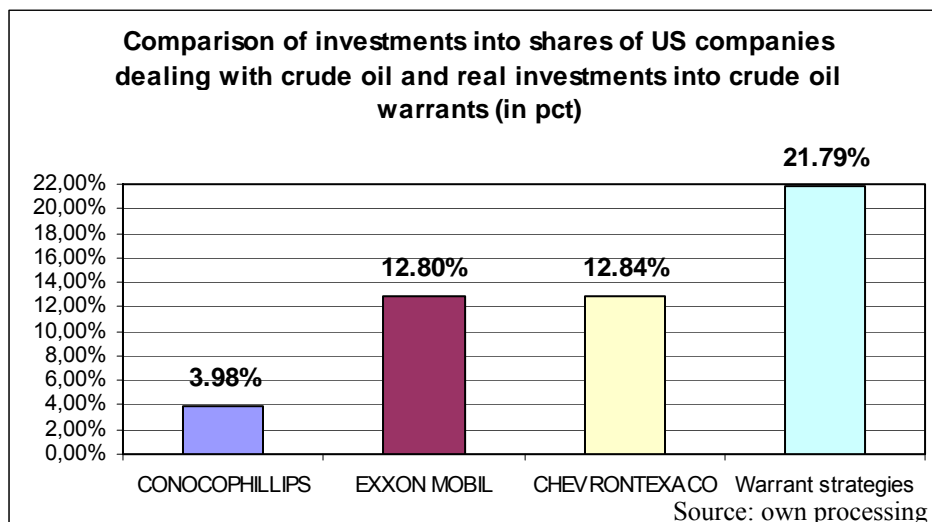
Sheet no. 3. Profit sheet of tracked US companies dealing with crude oil

Company	No. of shares	Purchase (USD/share)	Sale (USD/share)	Profit (in USD)	Profit (in CZK)	Relative profit
CONOCOPHILLIPS	28	67.24	70.04	77	1,592	3.98%
EXXON MOBIL	26	70.87	80.36	249	5,119	12.80%
CHEVRONTEXACO	27	68.83	78.08	250	5,138	12.84%

Source: own processing + [3, 5]

Final comparison of results of both possibilities is shown in Figure no.4. Warrant strategies showed to be much more profitable comparing to alternative investment (shares of US companies dealing with crude oil) in this time period. While warrant reflected the immediate crude oil price development shares reacted with delay in some periods. The most remarkable period was from 02/26/2007 to 04/09/2007.

Figure no. 4 Comparison of investments into shares of US companies dealing with crude oil and real investments into crude oil warrants (in pct).

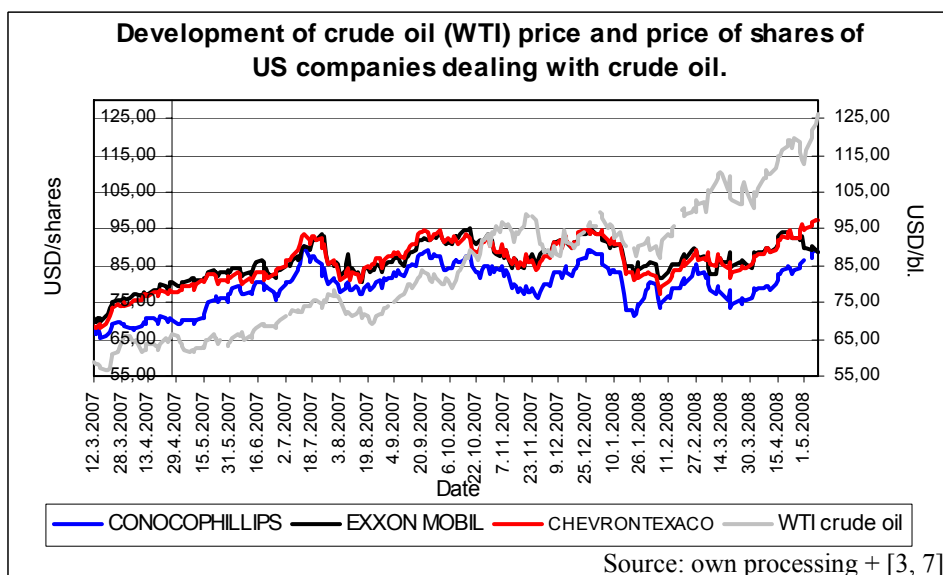


So called psychological barrier occurred at shares prices in this case and shares value was not rising above this barrier though the crude oil price was rising. We will not analyze this situation since it is not a part of this entry due to its size, exactitude and topic. Therefore we open an area for a new work that would fully explain this extreme of emergence of psychological barrier at particular financial assets markets.

#### Development from 03/12/2007 to 05/09/2008

The following figure shows the crude oil price and price of shares of US companies dealing with crude oil developed after the date of closing and evaluating business positions.

Figure no. 5, Development of crude oil (WTI) price and price of shares of US companies dealing with crude oil. (03/12/2007-05/09/2008)



The difference between shares and warrants (crude oil) value development is much bigger in long term time period than in short term and medium term time period. US companies dealing with crude oil saw the crude oil price development as a quite doubtful element and therefore the price of their shares was based rather on emotive seeing of crude oil price than on reasonable consideration. For example in periods of 10/22/2007-12/9/2007 and 02/27/2008-03/30/2008 the so called psychological barrier activity showed very markedly, when while the crude oil price was rising the value of shares of US companies dealing with crude oil did not react to this development and on the contrary it was falling. In this case the crude oil price was above USD 90 or USD 105 per bl.

The simulation of virtual alternative investments is shown in Sheet no. 4.

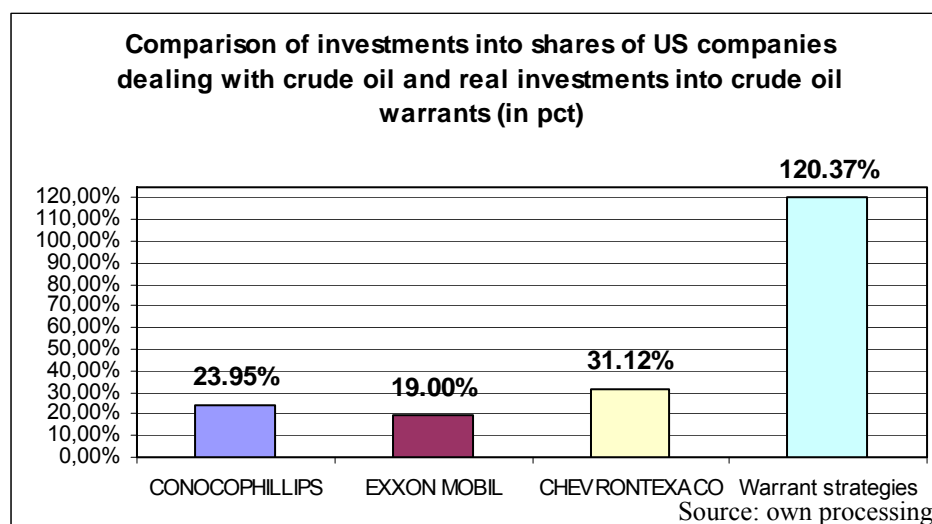
*Sheet no. 4. Profit from holding shares of US companies dealing with crude oil.*

Company	No. of shares	Purchase (USD/share)	Sale (USD/share)	Profit (in USD)	Profit (in CZK)	Relative profit
<b>CONOCOPHILLIPS</b>	28	67.24	79.34	<b>335</b>	5,642	14.11%
<b>EXXON MOBIL</b>	26	70.87	86.41	<b>408</b>	6,875	17.19%
<b>CHEVRONTEXACO</b>	27	68.83	84.42	<b>421</b>	7,102	17.75%

*Source: own processing + [3, 5]*

The exchange rate on the day of purchase (03/12/2007) was 21.513 USD/CZK and on the day of sale (05/09/2008) it was 16.134 USD/CZK. Therefore the exchange rate loss was much intensified, USD 619.896 (CZK 10,001.4) to be specific. This lead to loss when trading with shares of two tracked companies (CONOCOPHILLIPS and EXXON MOBIL). The profit of CHEVRONTEXACO shares was negligible. Warrants are, as also our work shows, designed for rather long term investment.

*Figure no. 6. Comparison of investments to shares of US companies dealing with crude oil and real investment in crude oil warrants (in pct).*



Warrants reaction to crude oil price development were immediate which allowed to use different strategies and their appropriate application on emerging market situations lead to higher valuation of financial resources than when investing in shares. This premise was basically proved already in short term and medium term investment period. Our work also showed the unpredictability of dependence of assets price on the underlying asset development in the period of psychological barrier activity.



## 5 Conclusion

Advantages of warrants that result from their principles showed in all three regarded time periods (short term, medium term, long term) when preparing this work. Warrant strategies showed to be more profitable than investments in shares of US companies dealing with crude oil. While warrants reflected the crude oil price development immediately, shares reacted with delay or did not react at all or even reacted contrariwise. The immediate reaction of warrants which allowed to use different strategies and their appropriate application on emerging market situations lead to higher valuation of financial resources than when investing in shares.

Therefore our investment ended up with profit. The total valuation of warrant portfolio in short term and medium term time period was 21.79 pct on 04/27/2007. The maximum rate of profit, that was achieved by CHEVRONTEXACO, the most profitable US company dealing with crude oil, was 12.84 pct. Therefore warrants were nearly twice as profitable.

The total valuation of warrant portfolio in long term time period was 120.37 pct on 05/09/2008. The maximum rate of profit, that was achieved by CHEVRONTEXACO, the most profitable US company dealing with crude oil, was only 17.75 pct. Therefore warrants were nearly seven times as profitable. All the goals of our work were realized by this and the fundamental of our work was fulfilled.

## Reference

- [1] KOVÁŘÍK, M. (2007): *Identifikace faktorů ovlivňujících cenu ropy na světových trzích a predikce jejího vývoje s praktickým využitím v obchodování s warrantovými produkty*, Diploma paper, Zlín, Tomas Bata University in Zlín, 2007.
- [2] KOVÁŘÍK, M. (2007): *Výzkum ziskové strategie derivátů v závislosti na kurzu podkladového aktiva*, Collection of abstracts – 3<sup>rd</sup> year of the students competition “Studentská vědecká činnost”, Tomas Bata University in Zlín, Faculty of Management and Economics (FaME) in Zlín, Department of business economics, in Zlín 16<sup>th</sup> May 2007.
- [3] POLÁCH, J. a kol.: *Peněžní a kapitálové trhy I+ II*, UTB Zlín, 2007.
- [4] [www.akcie-2000.cz](http://www.akcie-2000.cz)
- [5] [www.bloomberg.com](http://www.bloomberg.com)
- [6] [www.trading.kb.cz](http://www.trading.kb.cz)
- [7] [www.euwax.de](http://www.euwax.de)
- [8] [www.eia.doe.gov](http://www.eia.doe.gov)
- [9] [www.abs.gov.au](http://www.abs.gov.au)
- [10] [daytrading.about.com](http://daytrading.about.com)
- [11] [www.thedigeratilife.com](http://www.thedigeratilife.com)
- [12] [www.investopedia.com](http://www.investopedia.com)

## Summary

Investování do ropy patří v poslední době mezi nejvýnosnější. Mezi tyto investice zahrnujeme přímé futures na ropu a take moderní strukturované nepřímé investice( v tomto případě warranty) na ropu jako podkladové aktivum, fondy investující do ropy nebo do akcií ropných společností .

Nicméně vývoj cen zejména nepřímých investic umožňuje srovnání jednoho způsobu investování s druhým tedy i přímé investice do komodity. Cílem naší prezentace je identifikace a srovnání různých cen warrantů a jejich vývoj v návaznosti na americkou ropu a akcie amerických akciových společností, při využití takřkajíc psychologické bariéry z pohledu tří časových horizontů.