



Commodity Channel Index: Evaluation of Trading Rule of Agricultural Commodities

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ABSTRACT

This paper is focused on evaluating the trading rule of indicator commodity channel index (CCI), using selected agricultural commodities. The reason of testing is that this indicator is calculated with respect to fluctuation of commodity market - volatility. The recent issue of commodity markets examines trading under risk. The concept is in analyzing of predictive power of CCI. The main core of this paper is if the trading strategy under evaluating using technical analysis, respectively CCI, reaches positive profit. The returns of trading rule are measured using signals to buying or selling and comparison each of them. Authors of this paper created trading rule based on CCI and tested it on commodity markets. The results are positive in term of % CCI. Findings of the strategy are positive due to measurement volatility involved in indicator. The commodity markets are volatile, time series are fluctuating due to actual announcements or news.

Keywords: Commodity Channel Index, Agricultural Commodities, Trading

JEL Classifications: C22, C53, G17

1. INTRODUCTION

Technical analysis is one of the tools to analyze a situation on the market using past price behavior. The goal of the technical analysis is to identify the possible signals of trade entering. Trade positions are opened only a few hours or days (Osler and Chang, 1995). The methods of technical analysis are short based. In this case of evaluating of commodities there is no assumption of trends. Other point of technical analysis is on the field of repeating history. The technical analysis examines the same patterns or behavior as they are confronted with the same conditions from history. Technical analysis is needed to identify trend or reversal movements. There are two methods - charting and indicators. Charting method is used when the observer examines the price behavior as a trend. In the other case it is useful to use indicators connected with momentum (Neely, 1997).

1.1. Commodity Channel Index (CCI) Formula

CCI is the most common technical tool for investors. The type of indicator is so called momentum. The goal of CCI is to identify the cyclical trends and trend reversals. The CCI is an oscillator, which is unbounded in fluctuation. Its value is different without limits. The oscillator was developed for examination of overbought and oversold areas. The calculation of CCI is presented below (Kuepper, 2015).

Formula 1, CCI:

$$CCI = \frac{\text{Typical Price} - \text{Simple Moving Average}}{0.015 - \text{Mean Deviation}}$$

The typical price shown above consists of actual low, high and close price divided by 3. The computation of mean deviation is for the number of day included in simple moving average. The

constant 0.015 is set up due to approximately 70-80% of time stability of CCI value between the lines -100 and +100 (Lambert, 1980).

1.2. Interpretation of CCI

The oscillator CCI measures the differences between price change and the average price change for selected period. The high results of oscillator show that the actual price is above its average price. There is a probability to reverse. Low results of CCI show that the price is below the average price. There is a signal to enter the buy position with crossing +100. On the other side the sell position is entered with crossing -100. The trend should continue with respect to momentum (Lambert, 1980).

1.3. Agriculture Commodities

The agricultural commodities are very important in international trade (Svatoš et al., 2013, Svatoš and Smutka, 2012). In the recent years there is a sharp fluctuation in commodity prices. In the years 2006-2009 there was a rapid run up connected with commodity prices. After year 2009 there was a big decline (Huchet, 2011). Authors selected the most important commodities of international trade - coffee and cocoa. These commodities are used also for hedging strategies, according to market conditions (Shobhit, 2015). For instance there is a farmer, who wants to protect a profit connected with fixed delivery price (StockCharts, 2015).

2. CCI TESTING

Authors suggest testing indicator on replicable real data of cocoa and coffee market. The timeframe of calculating is considered as daily in term September 2015 to October 2015. This short term is due to recent news regarding higher volatility on commodity markets. The trading rule is created when the CCI indicator line cross the line +100 in the case of buying and -100 in the case of selling (Kruepper, 2015). Tables 1-4 presents the predictive signals of each commodity (DailyFx, 2011).

The timeframe of oscillator is selected as 20 - daily. The identification of trading signals is used by examination of values -100 and +100, respectively crossing these lines. The exit from positions is set up by evaluating reversal movements. The highest values of CCI indicate the most likely reversions.

The Table 1 shows the values of CCI of coffee price in the selected period. There are also the most likely entrances to each trade. The values of CCI are smoothed. There is no jump within oscillator. Table 2 shows the returns of oscillator in this strategy.

In the case of coffee strategy using CCI oscillator there were three trades, each with profit. The rate of sell to buy is 2:1. There is a downtrend on the coffee market. Daily timeframe has shown slowly fluctuation of prices connected a few trades.

Table 3 shows the values of CCI of cocoa price in the selected period. In third column there are the most likely entrances to each trade. The table is presented with respect to daily timeframe. The returns of oscillator are shown in the Table 4.

Table 1: Coffee CCI readings

Date	20 - Daily CCI	Signal	Date	20 - Daily CCI	Signal
4.9.2015	-84.59	-	5.10.2015	247.01	-
8.9.2015	-72.93	-	6.10.2015	214.79	Closed
9.9.2015	-62.93	-	7.10.2015	168.42	-
10.9.2015	-88.58	-	8.10.2015	147.56	-
11.9.2015	-92.53	-	9.10.2015	187.51	-
14.9.2015	-66.52	-	12.10.2015	195.13	-
15.9.2015	-64.31	-	13.10.2015	160.43	-
16.9.2015	-79.18	-	14.10.2015	139.38	-
17.9.2015	-86.10	-	15.10.2015	106.06	-
18.9.2015	-71.01	-	16.10.2015	30.63	-
21.9.2015	-91.13	-	19.10.2015	-11.69	-
22.9.2015	-138.65	Sell	20.10.2015	-20.09	-
23.9.2015	-124.66	Closed	21.10.2015	-57.02	-
24.9.2015	-72.97	-	22.10.2015	-86.37	-
25.9.2015	91.89	-	23.10.2015	-104.37	Sell
28.9.2015	28.37	-	26.10.2015	-121.47	-
29.9.2015	70.67	-	27.10.2015	-115.75	Closed
30.9.2015	95.73	-	28.10.2015	-94.76	-
1.10.2015	91.75	-	29.10.2015	-79.73	-
2.10.2015	150.35	Buy	30.10.2015	-64.75	-

Source: Own compilation, CCI: Commodity channel index

Table 2: Coffee returns in percentage CCI

Trade	Return in CCI term (%)
Sell	11.22
Buy	42.85
Sell	10.8

Source: Own compilation, CCI: Commodity channel index

Table 3: Cocoa CCI readings

Date	20 - Days CCI	Signal	Date	20 - Days CCI	Signal
4.9.2015	211.69	-	5.10.2015	-178.81	Closed
8.9.2015	296.22	-	6.10.2015	-149.57	-
9.9.2015	284.69	-	7.10.2015	-120.14	-
10.9.2015	232.72	-	8.10.2015	-123.78	-
11.9.2015	167.78	-	9.10.2015	-104.02	-
14.9.2015	149.41	-	12.10.2015	-86.89	-
15.9.2015	103.04	-	13.10.2015	-59.27	-
16.9.2015	101.65	-	14.10.2015	-44.45	-
17.9.2015	97.40	-	15.10.2015	-51.15	-
18.9.2015	119.74	-	16.10.2015	-40.90	-
21.9.2015	101.96	-	19.10.2015	-4.47	-
22.9.2015	86.43	-	20.10.2015	55.36	-
23.9.2015	81.69	-	21.10.2015	33.71	-
24.9.2015	67.06	-	22.10.2015	21.81	-
25.9.2015	47.92	-	23.10.2015	17.25	-
28.9.2015	12.31	-	26.10.2015	82.35	-
29.9.2015	-53.10	-	27.10.2015	131.18	Buy
30.9.2015	-137.46	Sell	28.10.2015	155.44	-
1.10.2015	-168.80	-	29.10.2015	127.61	-
2.10.2015	-182.15	-	30.10.2015	161.51	Closed

Source: Own compilation, CCI: Commodity channel index

Table 4: Cocoa returns percentage CCI

Trade	Return in CCI term (%)
Sell	30
Buy	23.12

Source: Own compilation, CCI: Commodity channel index

Both tables summarize the main readings of strategy using CCI. On the cocoa market there is not such a high volatility to trade more positions. With using of CCI strategy it is an instance of fluent crossing from positive values of CCI to negative values.

3. CONCLUSION

Technical analysis is in many cases important for swing or intraday trading. Authors of paper used the momentum oscillator - CCI to trade on the commodity markets. The period is not selected random. Nowadays, there are many fluctuations within commodity, currency and capital markets. The above formulated question can be answered using the trading rule based on CCI reaches the positive profit in term of CCI percentage. Authors can consider this trading rule "profitable." CCI is unique due to measurement of volatility - using mean deviation. This oscillator replicates the all characteristics of commodity prices during volatile period. Time series of price was tested under real conditions. Daily timeframe did not cause opening many trades. Authors can evaluate the CCI as suitable indicator for volatile markets, such as commodity markets.

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REFERENCES

Chang, K.P.H., Osler, C. (1999), Methodical madness: Technical analysis and the irrationality of exchange-rate forecasts. *Economic Journal*,

109(458), 636-661. Available from: https://www.newyorkfed.org/research/staff_reports/sr4.html.

DailyFx, *Forex Market News and Analysis*. (2011), Available from: https://www.beta.dailyfx.com/forex/education/trading_tips/daily_trading_lesson/2011/09/15/How_to_Trade_Commodity_Channel_Index_in_Forex.html.

Huchet-Bourdon, M. (2011), *Agricultural Commodity Price Volatility: An Overview*, OECD Food, Agriculture and Fisheries Papers, No. 52, OECD Publishing.

Kuepper, J. (2015), *Timing Trades with the Commodity Channel Index*, Investopedia. Available from: <http://www.investopedia.com/articles/trading/05/041805.asp>.

Lambert, D.R. (1980), *Commodity channel index: Tool for trading cyclic trends*. *Stocks & Commodities*, 1(5), 120-122. Available from: <ftp://ww.80.240.216.180/Transmission/%D0%A4%D0%B0%D0%B9%D0%BB%D1%8B/S&C%20on%20DVD%2011.26/VOLUMES/V01/C05/COMM.pdf>.

Neely, J.C. (1997), *Technical analysis in the foreign exchange market: A Laymans's Guide*. Review. Available from: <https://www.research.stlouisfed.org/publications/review/97/09/9709cn.pdf>.

Shobhit, S. (2015), *How to Use Commodity Futures to Hedge*, Investopedia. Available from: <http://www.investopedia.com/articles/active-trading/022415/how-use-commodity-futures-hedge.asp>.

StockCharts.com. (2015), Available from: http://www.stockcharts.com/school/doku.php?id=chart_school:technical_indicators:commodity_channel_index_cci.

Svatoš, M., Smutka, L. (2012), *Development of agricultural trade and competitiveness of the commodity structures of individual countries of the Visegrad Group*. *Agricultural Economics (Czech Republic)*, 58(5), 222-238.

Svatoš, M., Smutka, L., Elshibani, B.A.M., Mousbah, S.A.A. (2013) *Development of Visegrad countries' agricultural trade in relation to agricultural production development*. *Agris On-line Papers in Economics and Informatics*, 5(1), 61-71.