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WILLIAMS' PERCENT RANGE

(WILLIAMS %R OR %R)

By

MARCILLE GRAPA

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WILLIAMS' PERCENT RANGE

Table of Contents

RISK DISCLOSURE STATEMENT / DISCLAIMER AGREEMENT	2
Introduction	4
Definition of Terms & Related Concepts.....	4
Calculation/Formula	6
Advantages	10
Predicts Price Reversal or Retracement.....	10
Interpreting the Williams %R	11
Overbought Level	11
Oversold Level	12
Neutral Area	12
Uses	12
Ranging Market	13
Trending Market.....	15
Divergence.....	16
Application: Simple Scalping System	19
Rules:.....	20
Examples	21
Video.....	23
Comments/Notes	23
Conclusion.....	23

WILLIAMS' PERCENT RANGE

Introduction

The William's Percent Range, commonly known as Williams %R or simply %R is a popular momentum oscillator introduced in 1973 by Larry Williams, a famous futures trader and author of books and articles in trading.

This technical indicator is classified as an oscillator because its values fluctuate between 0 and -100. The Williams %R is usually compared to the Stochastic Oscillator because they are similar except that it has a reversed scale and doesn't have an internal smoothing component. It indicates the relationship of the closing price to the price range for the specified period.

The main feature of the Williams %R, and the main reason that made it so popular, is its ability to indicate that price reversal will occur a candle or two before the price actually does. By signaling that price has reached overbought and oversold conditions, it allows traders to anticipate the reversal, thus giving enough time to take action.

Definition of Terms & Related Concepts

Before moving forward with our study on the Williams Percent Range, let's define a few terms to facilitate understanding and avoid any confusion.

We usually say that a certain asset is overbought or oversold depending on which extreme the price is at according to the %R reading. **Overbought** is a term used for situations when the demand is too high that it causes the price to reach extremely high levels and in effect causing an oscillator to reach the upper limits. An asset is overbought when the %R reaches 0 to -20%.

In contrast, **Oversold** refers to situations when an asset's price has become much lower than its normal value making the oscillator reach the lower limit. An asset is oversold when the %R reaches -80 to -100.

The **Williams Percent Range** is a momentum indicator with levels from 0 to -100 and two horizontal lines that represent -20 and -80 by default. It determines overbought (0 to -20%) and oversold (-80 to -100%) levels by locating the close of the candles relative to the range between the highest and lowest price of a given period, which is 14 by default in the Metatrader platform, hence the "14 Period Williams %R".

Have a look at the EURUSD 1 Hour chart below:



Here, you can see the 14 Period Williams %R in dark violet. As the price moves, the %R fluctuates from 0 to -100. You can also see the oversold and overbought areas separated by a dark grey broken line. When the %R level is in the middle (-21 to -79), it is said to be neutral.

Momentum Failure occurs when the %R fails to return to its previous oversold or overbought condition especially if it has reached those conditions more than once in the period. This is an important indication that the momentum has weakened and a reversal is most likely to occur.

Concepts on the Williams %R are very simple. However, it may be used in certain ways that involve more complicated strategies, one of which is divergence.

Divergence occurs when the price of a financial instrument and the value of an indicator move in opposite directions. Traders observe the market for any occurrence of divergence, which indicates changes in trend direction.

In the image to the right, you can see that as the price makes a new high, the %R level is going down. This is bearish divergence. We will talk more about divergence in later sections.



Calculation/Formula

The computation for the Williams Percent Range is very straightforward. By default, the %R is based on 14 periods and can be calculated on an intraday, daily, weekly or monthly basis. We will use 14 periods as our example for the computation.

We will base the values of our examples on the table below. This is the data for the EURUSD 1 Hour Chart.

Candle	Date	Time	High (H)	Low (L)	Highest High	Lowest Low	Close	%R
	2011.04.01	4:00	1.41634	1.41571				
	2011.04.01	5:00	1.41726	1.41567				
	2011.04.01	6:00	1.41740	1.41636				
	2011.04.01	7:00	1.41765	1.41662				
	2011.04.01	8:00	1.41777	1.41580				
	2011.04.01	9:00	1.41790	1.41456				
	2011.04.01	10:00	1.41671	1.41479				
	2011.04.01	11:00	1.41703	1.41441				
	2011.04.01	12:00	1.41588	1.41439				
	2011.04.01	13:00	1.41637	1.41466				
	2011.04.01	14:00	1.41593	1.40882				
	2011.04.01	15:00	1.41167	1.40614				
	2011.04.01	16:00	1.41486	1.40619				
1	2011.04.01	17:00	1.42145	1.41317	1.42145	1.40614	1.42139	-0.39 %
2	2011.04.01	18:00	1.42166	1.41937	1.42166	1.40614	1.42138	-1.80 %
3	2011.04.01	19:00	1.42248	1.42112	1.42248	1.40614	1.42180	-4.16 %
4	2011.04.01	20:00	1.42447	1.42171	1.42447	1.40614	1.42339	-5.89 %
5	2011.04.01	21:00	1.42453	1.42190	1.42453	1.40614	1.42219	-12.72 %
6	2011.04.01	22:00	1.42347	1.42198	1.42453	1.40614	1.42328	-6.80 %
7	2011.04.03	23:00	1.42349	1.42205	1.42453	1.40614	1.42286	-9.08 %
8	2011.04.04	0:00	1.42336	1.42168	1.42453	1.40614	1.42221	-12.62 %
9	2011.04.04	1:00	1.42424	1.42209	1.42453	1.40614	1.42343	-5.98 %
10	2011.04.04	2:00	1.42680	1.42339	1.42680	1.40614	1.42432	-12.00 %
11	2011.04.04	3:00	1.42440	1.42161	1.42680	1.40614	1.42190	-23.72 %
12	2011.04.04	4:00	1.42290	1.42189	1.42680	1.40614	1.42247	-20.96 %
13	2011.04.04	5:00	1.42280	1.42190	1.42680	1.40619	1.42219	-22.37 %
14	2011.04.04	6:00	1.42261	1.42189	1.42680	1.41317	1.42261	-30.74 %
15	2011.04.04	7:00	1.42333	1.42209	1.42680	1.41937	1.42272	-54.91 %

Step 1: Obtain the Highest High and the Lowest Low for the past 14 days

These values are necessary to compute the relative location of the closing price to the range between the highest high and lowest low of the look-back period. In the table above, the Highest Highs from the past 14 candles are in yellow while the Lowest Lows are in green.

On the chart below, Candle 1 can be found along the green vertical line. To obtain the Highest High and Lowest Low for a 14 Period Williams %R, you must consider the highs and lows of the last 14 candles (look-back period) which starts from the candle along the blue vertical line.



Step 2: Actual Computation of the %R

First, deduct the closing price of the current candle from the Highest High of the look-back period. Second, divide this value by the difference of the Highest High and Lowest Low of the look-back period. Lastly, multiply the result by -100 to express the value in negative percent. Here is the formula:

$$\%R = [(Highest\ High - Current\ Close) / (Highest\ High\ in\ N\ Periods - Lowest\ Low\ in\ N\ Periods)] * -100\%$$

Example:

Candle 1 has the following values:

High = 1.42145 Highest High = 1.42145 Current Close = 1.42139
Low = 1.41317 Lowest Low = 1.40614

$$\begin{aligned}\%R1 &= [(\text{Highest High} - \text{Current Close}) / (\text{Highest High in N Periods} - \text{Lowest Low in N Periods})] \\ &\quad * -100\% \\ &= [(1.42145 - 1.42139) / (1.42145 - 1.40614)] * -100\% \\ &= (0.00006 / 0.01531) * -100\% \\ &= -0.39\%\end{aligned}$$

If we take a look at the previous image, the Williams %R value for Candle1 looks like this:



The Current Close is the Highest High of the 14 look-back period, thus it is at the 0% level. Note that if the close of the candle is much nearer to the Highest High than the Lowest Low, the %R will be closer to the 0% level.

In contrast, if a candle's closing price is much nearer to the Lowest Low, the %R level will be closer to 100%. Have a look at the image below.



Advantages

Predicts Price Reversal or Retracement

The Williams Percent Range indicator is very well known for its ability to anticipate price retracements or reversals. Have a look at the image below:



After the price goes up in the image above, you can see that the 14 Period Williams %R peaks and begins to move down (indicated by blue arrows) in the overbought area one or two candles before the price peaks and reverses or retraces downwards (red arrows).

In the next image, you can see the price going down and the Williams %R forms a trough and begins to move up (indicated by red arrows) one or two candles before the price reaches a bottom and reverses or retraces upwards (blue arrows) in the oversold area.



Interpreting the Williams %R

The readings for the Williams Percent Range are very simple and easy to understand. The price can only be in 3 conditions: overbought, oversold or neutral. The readings of the indicator highly depend on the period setting and the financial assets characteristics. A shorter period %R will cause the indicator to be more sensitive resulting in more signals, while a longer period %R will cause the indicator to be less sensitive and give lesser trade signals. Below is a short explanation of the %R readings and their implications to an asset's price movement based on the default period setting of 14.

Overbought Level

As mentioned, a financial instrument is overbought when it is at a %R level of 0 to -20%. This means that the price has risen so high towards the level of the Highest High, and it can even exceed to form a new Highest High.

An overbought condition can be considered as a confirmation of an uptrend. Here, the buyers are more powerful than the sellers that they are able to move the close of the market to the overbought area. Usually, this occurs on high volume and when the price has become much higher than its normal value. The %R may stay in overbought levels for a certain period but

because the asset is becoming more overpriced, you can expect price to eventually reverse if not a retrace and the %R will cross below -20%.

Oversold Level

On the other hand, a financial security is in oversold condition if it is at a %R level of -80 to -100%. In this situation, the ability of the sellers to close the market in the oversold area indicates their increased power. The financial asset becomes undervalued because the price decreases at extremely low levels and will eventually lead to price reversal if not retracement.

Neutral Area

The area between -20 and -80 is regarded as a neutral area. If %R fluctuates between these levels without spiking into the overbought or oversold areas, the power between the buyers and sellers is neutral but eventually, one will win over the other to bring the closing price nearer to the highest or lowest price of the given period.

Momentum failure occurs within the neutral area. If %R has been overbought for some time then crosses below the -20% but is unable to return to the overbought area, this indicates that the momentum of the price is decreasing and may eventually reverse.

If you add another horizontal line at the middle, which is at -50%, this helps indicate whether or not the price will most likely continue in its direction.

If the %R crosses below -20% level and goes on to exceed -50%, this can be considered as an indication of increasing strength among the bears or sellers in an effort to close the market near the lowest price, which confirms that the price will continue to decrease. However, if %R crosses above -80% and continues to increase above -50% then the price is more likely to continue increasing with the increasing strength of the bulls or buyers in an effort to close the market near the highest price.

If the market closes away from the overbought area, this gives a good Sell signal for the sellers. But if the market closes away from the oversold area, then it is a buy signal for the buyers.

Uses

Generally, a %R level between 0 and -20% indicates an overbought condition or a buying signal while a level between -80 to -100% indicates an oversold condition or a selling signal.

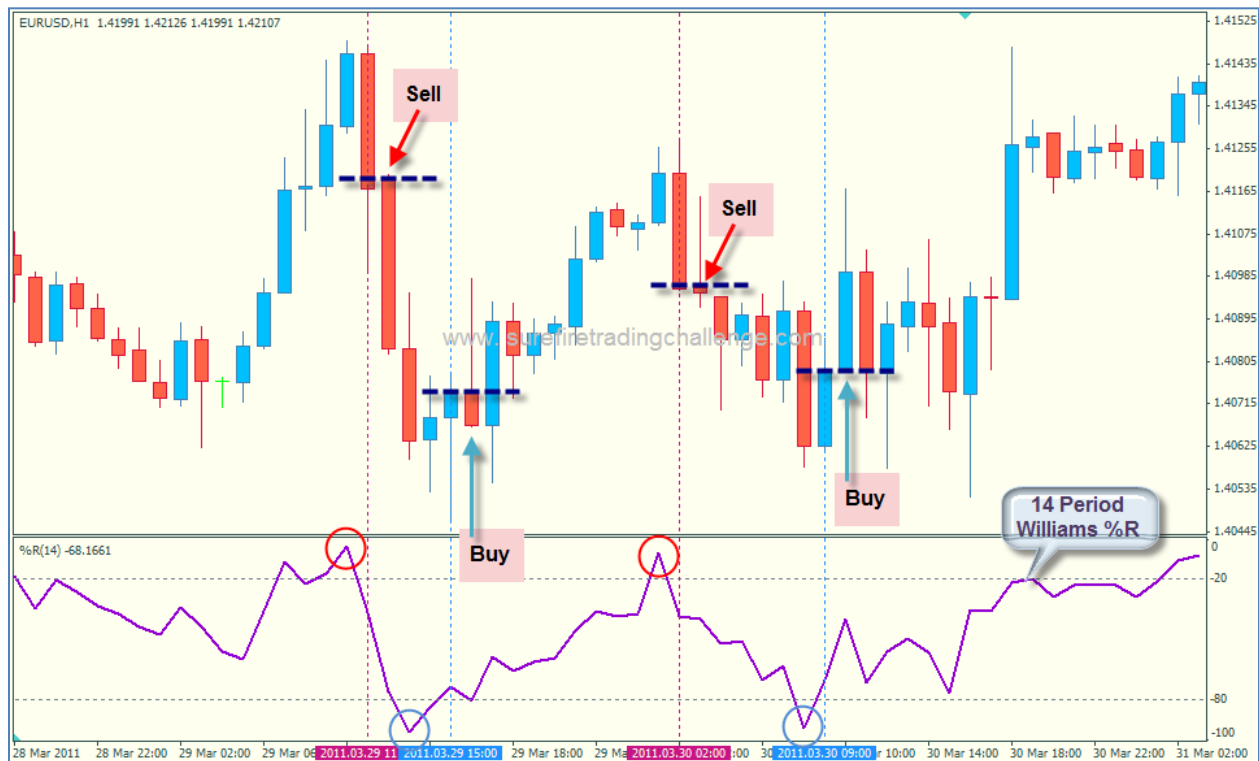
Identifying overbought and oversold areas is the most common use of the Williams Percent range. Williams %R readings normally fluctuate around the overbought or oversold area, so caution must be taken by waiting for a confirmatory signal that the price has actually reversed to the opposite direction before placing any trade.

Ranging Market

Although it is not recommended to trade ranging markets with the Williams %R, some traders still do because the market is usually ranging for most of the time. When the market is just ranging, there are a couple of techniques to use for entry and exit signals. Usually, a shorter period %R is used for ranging markets.

Wait for the %R to cross in and out of the overbought or oversold levels before entering a trade.

Wait for %R to cross above the -20% level and allow it to cross back below the -20% before placing a sell order. This means that right after price reaches the overbought level and shows the earliest sign of reversal, a sell trade is entered. Here are a few examples:



The red rings in the image above indicate that the %R crossed above the -20% level, and as soon as it crosses back below -20%, a sell trade is entered at the open of the new candle. When %R reaches overbought level and crosses back above -80%, exit the trade at the close of the candle.

The blue rings indicate the areas where %R crossed under the -80% level, and as soon as it crossed back above -80%, a buy trade is entered at the open of the new candle. Exit at the close of the candle after the %R has reached an overbought level and crosses back below -20%.

Another way to trade would be placing a pending order when %R is at overbought or oversold levels.

When the %R crosses the -20% level, place a pending sell stop at the previous candle's low so that when the price retraces and decreases beyond that level, a sell trade is entered.

Have a look at the same chart but this time with a different entry strategy:



In the image above, every time the %R has crossed over the -20% and formed a spike at the red rings, a pending sell stop is placed at the level of the previous low so that a sell trade is entered when price retraces and reaches this level.

Every time %R crossed below -80% at the blue rings, a pending buy stop is placed at the previous high so that a buy trade is automatically entered when price retraces and reaches that level.

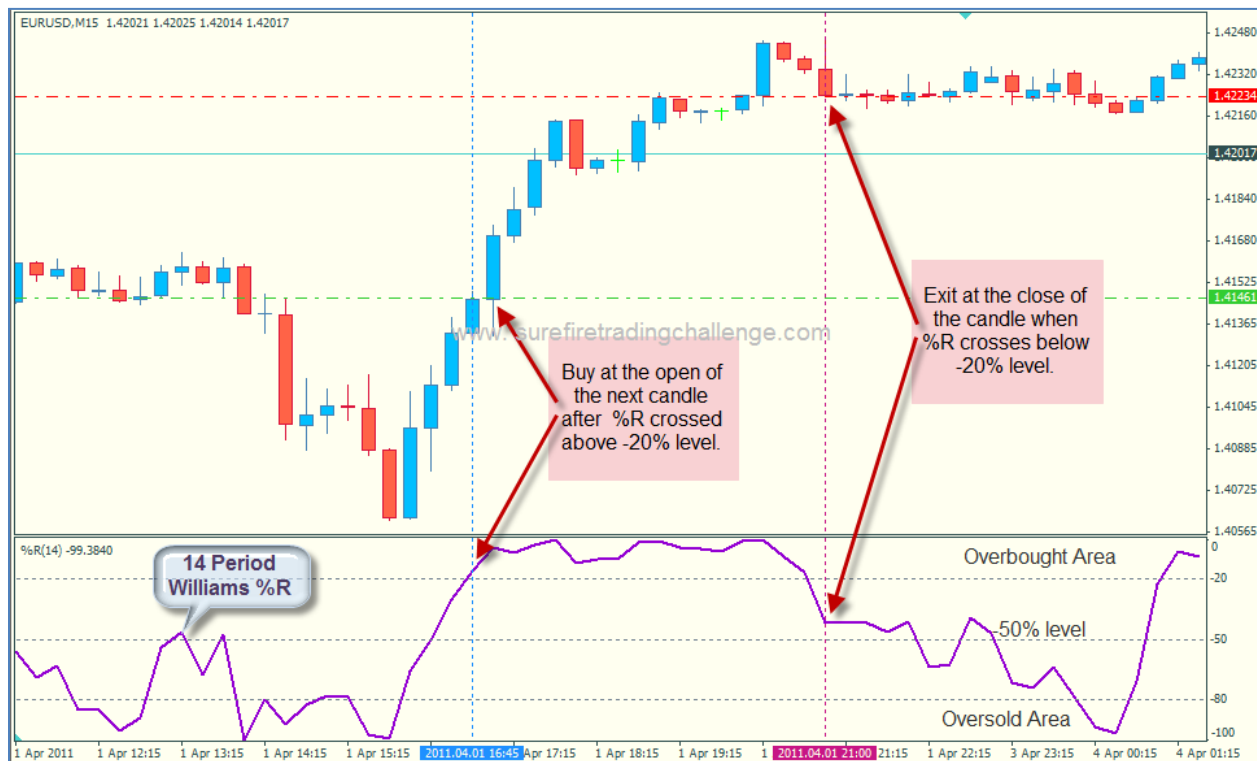
Trending Market

A trending market provides a very favorable environment to trade with the Williams Percent Range. A financial instrument can remain in an overbought or oversold condition for extended periods of time especially when there is a strong trend. Williams recommend trading with the %R when the market is trending well.

The %R level of a financial instrument crosses above the -20% and approaches the 0 level if its price has increased and is much closer to the Highest High than the lowest close of the look-back period. It reaches 0 when price becomes equal to the highest high and remains in the overbought area if price continues to increase and make new highs. A strong uptrend will remain in the overbought area for extended periods of time until it begins to reverse, in which price decreases, no new highs are formed, and the %R crosses back below the -20% level.

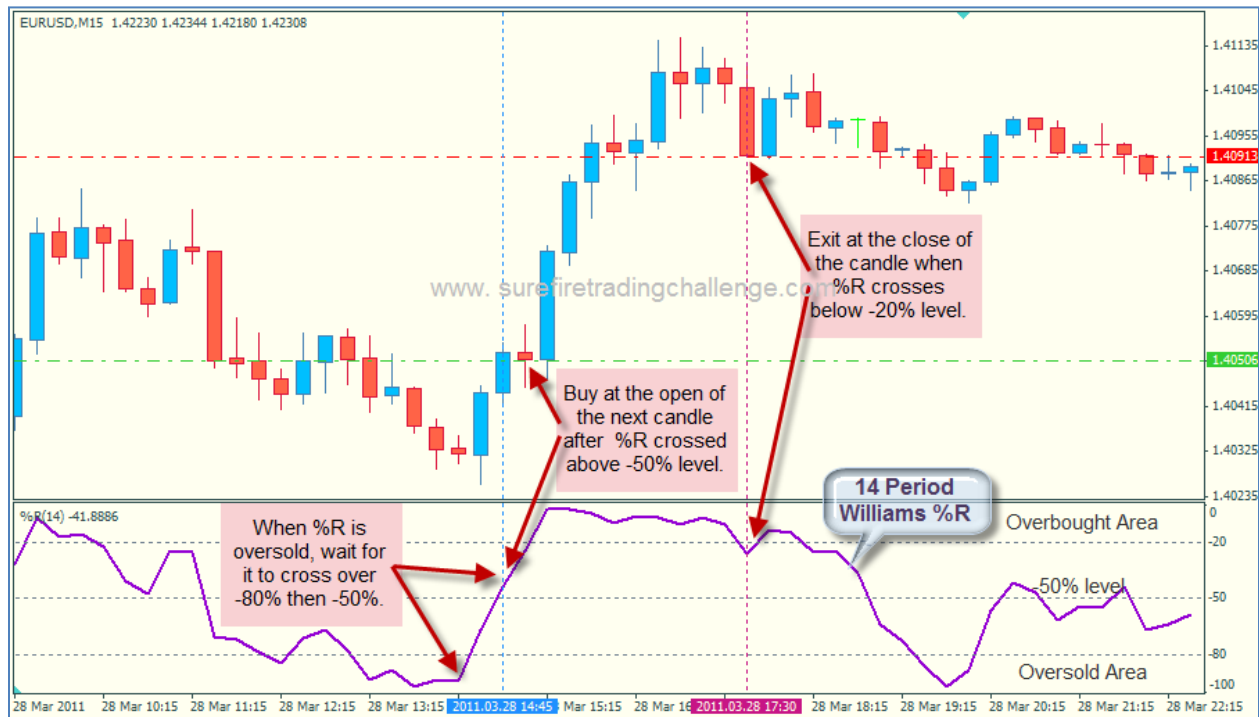
Inversely, the %R crosses under -80% and approaches the -100% level if price decreases and becomes much closer to the Lowest Low of a given period. It touches -100% when price becomes equal to the Lowest Low, and it remains in the oversold levels when new lows are reached until it begins to reverse, price decreases, no new lows are formed, and the %R crosses back above the -80% level.

To apply this concept, as soon as %R level crosses above -20%, a buy trade is entered. It will be exited only when the %R level crosses back below the -20%. Usually, a longer period %R is used.



In the image above, you can observe that a buy entry is placed at the open of the next candle after %R has crossed above -20%. Notice that in this method, a trade is entered much later than the previous methods.

Another way to find entry setups would be placing a middle level at -50%. This can drastically improve results especially when used with other indicators to confirm the trend. To determine whether the price has indeed reversed, wait for the %R in the overbought area to cross below the -20% then the -50% before entering a sell trade. Inversely, when the %R from the oversold area crosses above the -80% then the -50%, that's when a buy trade is entered. Take a look at the example below.



From an oversold condition, wait for the price to cross over the -80% level then the -50% level. Buy at the open of the next candle as soon as Williams %R level has crossed above -50% level. Exit the trade after %R crosses below the -20% level.

Divergence

Divergence between the price and the Williams Percent Range can also be used in identifying trade signals. To recall our definition of divergence, it occurs when the price of a financial instrument and the value of an indicator move in opposite directions.

Divergence allows traders to safely enter short trades closer to the tops or long trades closer to the bottoms as price reverses in direction. Also, if a trend has already formed, it allows traders a safe way to reenter the market. If done properly, this technique can be very profitable.

To help facilitate understanding on this topic, here's a comparison of some common types of divergence.

Type	Trend	Signal	Identification
Regular Divergence (Bullish)	Down	Buy	Trendline drawn downwards under the price (lower lows) and upwards under the Williams %R (higher lows).
Regular Divergence (Bearish)	Up	Sell	Trendline drawn upwards above the price (higher highs) and downwards above the Williams %R (lower highs).
Hidden Divergence (Bullish)	Up	Buy	Trendline drawn upwards under the price (higher lows) and downwards below the Williams %R (lower lows).
Hidden Divergence (Bearish)	Down	Sell	Trendline drawn downwards above the price (lower highs) and upwards below the Williams %R (higher highs).

Although divergence does not occur between price and Williams %R all the time, it is still worth knowing how it works because divergence is one of the most reliable techniques to identify the best trade setups.

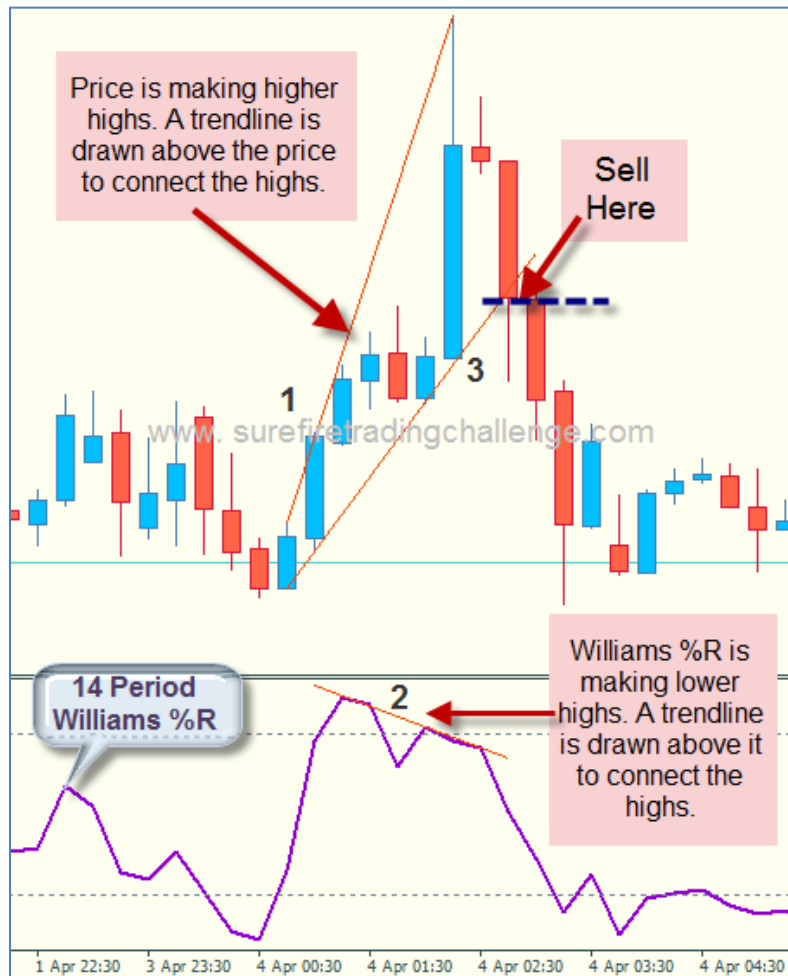
Here's a simple example of a Bullish Divergence between the price and Williams %R.



As you can see, while the price has been making Lower Lows indicated by Trendline 1, the Williams %R is making Higher lows indicated by Trendline 2. These are showing good signs that an upward price reversal is imminent and is therefore giving a Buy signal.

Trendline 3 is drawn above the price connecting the Highs to identify the entry point. As soon as price breaks below this trendline, a Buy trade is entered.

The next image is an example of a Bearish Divergence.



As you can see, while the price has been making Higher Highs indicated by Trendline 1. The Williams %R is making Lower Highs indicated by Trendline 2. These are showing good signs that a downward price reversal is imminent and is therefore giving a Sell signal.

Trendline 3 is drawn below the price connecting the Lower Lows to identify the entry point. As soon as price breaks below this trendline, a sell trade is entered.

Although divergence does not occur between price and Williams %R all the time, it is still worth knowing how it works because divergence is one of the most reliable techniques to identify the best trade setups.

Application: SMAs and Oscillators Combination

After we have learned what the Williams Percent Range is and the many ways it can be used, we can move on to the next step and apply it in our trading. Here is a new system that we can use and may develop even further.



Currency Pair: EUR/USD

Timeframe: 5 Minute is highly recommended, although other timeframes may be used.

Indicators:

- 3 Period Simple Moving Average (3 SMA)
- 8 Period Simple Moving Average (8 SMA)
- 14 Period Williams Percent Range (14 %R)
- 2 Period Relative Strength Index (2 RSI)

Rules:

Here are the Buy trade rules of the system. Please note that the rules are exactly the opposite for a sell trade.

1. Wait for the RSI and %R to cross below -80% line.

If the %R is below -80%, the market is in oversold condition. To confirm this, The RSI must also be at the %R's -80% level (which is actually 20% RSI). The RSI is a momentum oscillator, which oscillates between 0 and 100. It helps measure the speed and change of price movements.

2. Wait for the RSI and %R to cross back above -80% line.

This happens when the price has begun to move upwards and the downward momentum is over.

3. Check if the RSI is above %R but they must be close together.

This indicates that current price movement is strong enough to gain profit.

4. Enter a buy trade as soon as 3 SMA crossed above 8 SMA.

This will confirm the %R's reading that price is now moving up.

5. Set the stop loss level under the most recent swing low.

In case the price does not move as expected, this will serve as a safety precaution.

6. Exit once the RSI and the %R are below the overbought level only when the 3 SMA crosses under 8 SMA.

Once in the buy trade, the RSI and %R will move upwards with the price and will usually remain at an overbought level or at least fluctuate near that area, especially if the market is trending well. Since at some points within a profitable trade, the RSI and %R may cross under -20%, the SMA crossing will serve as a confirmation of reversal. As soon as the 3 SMA crosses under the 8 SMA, it indicates that the price has reversed.

Examples

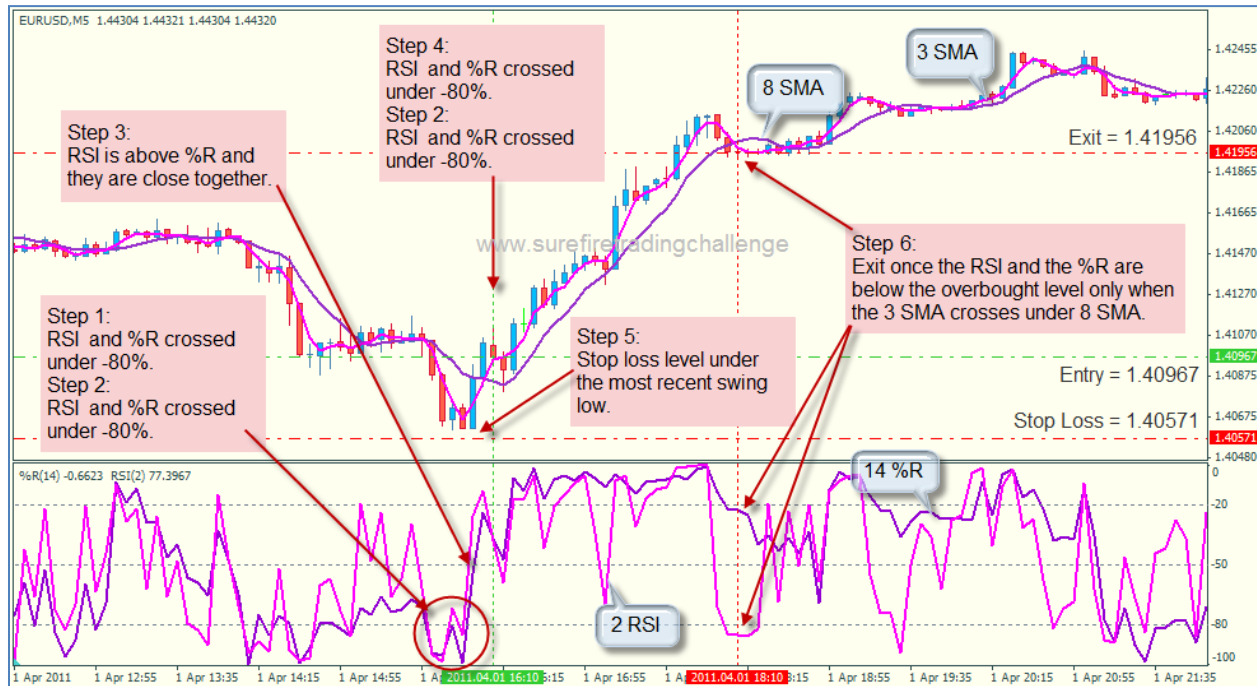
Buy Trade Example 1:



In the EURUSD 5 Minute chart, you can see that the RSI and %R have crossed below -80% and crossed back above it. At that point, the RSI is above the %R and they are close together, so a trade is entered at the close of the candle where the 3 SMA crossed over 8 SMA. The trade is entered at 1.42903. I placed the stop loss level at 1.42724 which is just under the most recent swing low.

The price continues to increase causing the RSI and %R to reach overbought levels. Later, the RSI has already gone below the overbought level and 3 SMA has already crossed under 8 SMA, but the %R is still in the overbought area. The trade is only exited when the %R has gone below the overbought area at 1.43402. We got 49 pips from this trade.

Buy Trade Example 2:



Just like the previous example, the RSI and %R have crossed below -80% and crossed back above -80%. The RSI is above the %R and the 3 SMA crossed over 8 SMA but they are very close to each other, so a trade is entered at the close of the candle at the price of 1.40967 then set my stop loss at 1.40571.

As price goes up, the RSI and %R reaches the overbought area. When the price started to reverse, the RSI has gone below -20 but the trade is not exited until the %R also crossed under that level and 3 SMA crossed under 8 SMA. The trade is then exited at 1.41956 and we got out of the trade with 98 pips.

Video

Here's a video that will show you another example of how I use the Williams Percent Range in my new method.

[CLICK HERE TO WATCH THE VIDEO](#)



Comments/Notes

Just knowing if a financial instrument is overbought is not enough. One must consider the reasons that it has reached such levels as price may not reverse right away. It may just be the beginning of a strongly trending market. Also, it is not impossible for %R to cross below the overbought level only to cross back above it again.

Other indicators such as Moving Averages or Moving Average Convergence Divergence (MACD) may be used to identify the major trend of the market and confirm the signals generated by the Williams %R.

Conclusion

The Williams Percent Range is a commonly used momentum indicator to identify the position of the closing price with respect to the price range of a given period. It serves as a vital indicator to determine oversold or overbought conditions. It forewarns the trader to anticipate price reversals, and as soon as price reversal is confirmed, appropriate action can be implemented.

As with every other indicator, The Williams %R is not perfect and cannot be used as a standalone indicator to base your decisions on. However, when used properly and in conjunction with other indicators, the positive results outweigh the negative. It is in this regard that the Williams %R is very famous among traders.

By:

Marcille Grapa

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