Money Flow Index (MFI)


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Introduction

The Money Flow Index (MFI) is an oscillator that uses both price and volume to measure buying and selling pressure. Created by Gene Quong and Avrum Soudack, MFI is also known as volume-weighted RSI. MFI starts with the typical price for each period. Money flow is positive when the typical price rises (buying pressure) and negative when the typical price declines (selling pressure). A ratio of positive and negative money flow is then plugged into an RSI formula to create an oscillator that moves between zero and one hundred. As a momentum oscillator tied to volume, the Money Flow Index (MFI) is best suited to identify reversals and price extremes with a variety of signals.

Calculation

There are several steps involved in the Money Flow Index calculation. The example below is based on a 14-period Money Flow Index, which is the default setting in SharpCharts and the setting recommended by the creators.

```
Typical Price = (High + Low + Close)/3

Raw Money Flow = Typical Price x Volume
Money Flow Ratio = (14-period Positive Money Flow)/(14-period Negative Money Flow)

Money Flow Index = 100 - 100/(1 + Money Flow Ratio)
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First, notice that Raw Money Flow is essentially dollar volume because the formula is volume multiplied by the typical price. Raw Money Flow is positive when the typical price advances from one period to the next and negative when the typical price declines. The Raw Money Flow values are not used when the typical price is unchanged. The Money Flow Ratio in step 3 forms the basis for the Money Flow Index (MFI). Positive and Negative Money Flow are summed for the look-back period (14) and the Positive Money Flow sum is divided by the Negative Money Flow sum to create the ratio. The RSI formula is then applied to create a volume-weighted indicator. The table below shows a calculation example taken from an excel spreadsheet.

	Date	Typical Price	Up or Down	Volume*	Raw Money Flow	1-period Positive Money Flow	1-period Negative Money Flow	14-period Positive Money Flow	14-period Negative Money Flow	14-period Money Flow Ratio	14-period Money Flow Index
1	3-Dec-10	24.63		18,730							
2	6-Dec-10	24.69	1	12,272	302,976	302,976	-				
3	7-Dec-10	24.99	1	24,691	617,060	617,060	-				
4	8-Dec-10	25.36	1	18,358	465,534	465,534	-				
5	9-Dec-10	25.19	-1	22,964	578,388	-	578,388				
6	10-Dec-10	25.17	-1	15,919	400,628	-	400,628				
7	13-Dec-10	25.01	-1	16,067	401,796	-	401,796				
8	14-Dec-10	24.96	-1	16,568	413,516	-	413,516				
9	15-Dec-10	25.08	1	16,019	401,810	401,810	-				
10	16-Dec-10	25.25	1	9,774	246,780	246,780	-				
11	17-Dec-10	25.21	-1	22,573	569,130	-	569,130				
12	20-Dec-10	25.37	1	12,987	329,483	329,483	-				
13	21-Dec-10	25.61	1	10,907	279,371	279,371	-				
14	22-Dec-10	25.58	-1	5,799	148,335	-	148,335				
15	23-Dec-10	25.46	-1	7,395	188,250	-	188,250	2,643,012	2,700,043	0.98	49.47
16	27-Dec-10	25.33	-1	5,818	147,351	-	147,351	2,340,037	2,847,394	0.82	45.11
17	28-Dec-10	25.09	-1	7,165	179,766	-	179,766	1,722,977	3,027,160	0.57	36.27
18	29-Dec-10	25.03	-1	5,673	141,978	-	141,978	1,257,443	3,169,137	0.40	28.41
19	30-Dec-10	24.91	-1	5,625	140,138	-	140,138	1,257,443	2,730,887	0.46	31.53
20	31-Dec-10	24.89	-1	5,023	125,057	-	125,057	1,257,443	2,455,317	0.51	33.87
21	3-Jan-11	25.13	1	7,457	187,374	187,374	-	1,444,817	2,053,521	0.70	41.30
22	4-Jan-11	24.64	-1	11,798	290,653	-	290,653	1,444,817	1,930,658	0.75	42.80
23	5-Jan-11	24.51	-1	12,366	303,090	-	303,090	1,043,007	2,233,748	0.47	31.83
24	6-Jan-11	24.15	-1	13,295	321,133	-	321,133	796,227	2,554,881	0.31	23.76
25	7-Jan-11	23.98	-1	9,257	221,953	-	221,953	796,227	2,207,703	0.36	26.51
26	10-Jan-11	24.07	1	9,691	233,205	233,205	-	699,949	2,207,703	0.32	24.07
27	11-Jan-11	24.36	1	8,870	216,084	216,084	-	636,663	2,207,703	0.29	22.38
28	12-Jan-11	24.35	-1	7,169	174,567	-	174,567	636,663	2,233,936	0.28	22.18
29	13-Jan-11	24.14	-1	11,356	274,191	-	274,191	636,663	2,319,877	0.27	21.53
30	14-Jan-11	24.81	1	13,379	331,942	331,942	-	968,605	2,172,526	0.45	30.84

* Volume shown in 1000s

Click here for an MFI calculation in an Excel Spreadsheet.

Interpretation

As a volume-weighted version of RSI, the Money Flow Index (MFI) can be interpreted similarly to RSI. The big difference is, of course, volume. Because volume is added to the mix, the Money Flow Index will act a little differently than RSI. Theories suggest that volume leads prices. RSI is a momentum oscillator that already leads prices. Incorporating volume can increase this lead time.

Quong and Soudack identified three basic signals using the Money Flow Index. First, chartists can look for overbought or oversold levels to warn of unsustainable price extremes. Second, bullish and bearish divergence can be used to anticipate trend reversals. Third, failure swings at 80 or 20 can also be used to identify potential price reversals. For this article, the divergences and failure swings are be combined to create one signal group and increase robustness.

Overbought/Oversold

Overbought and oversold levels can be used to identify unsustainable price extremes. Typically, MFI above 80 is considered overbought and MFI below 20 is considered oversold. Strong trends can present a problem for these classic overbought and oversold levels. MFI can become overbought (>80) and prices can simply continue higher when the uptrend is strong. Conversely, MFI can become oversold (<20) and prices can simply continue lower when the downtrend is strong. Quong and Soudack recommended expanding these extremes to further qualify signals. A move above 90 is truly overbought and a move below 10 is truly oversold. Moves above 90 and below 10 are rare occurrences that suggest a price move is unsustainable. Admittedly, many stocks will trade for a long time without reaching the 90/10 extremes. However, chartists can use the StockCharts.com scan engine to find those that do. Links to such scans are provided at the end of this article.

JB Hunt (JBHT) became oversold when the Money Flow Index moved below 10 in late October 2009 and early February 2010. The preceding declines were sharp enough to produce these readings, but the oversold extremes suggested that these declines were unsustainable. Oversold levels alone are not reason enough to turn bullish. Some sort of

reversal or upturn is needed to confirm that prices have indeed turned a corner. JBHT confirmed the first oversold reading with a gap and trend line break on good volume. The stock confirmed the second oversold reading with a resistance breakout on good volume.

Aeropostale (ARO) became overbought when the Money Flow Index moved above 90 in late September and late December 2009. Extremes in MFI suggested that these advances were unsustainable and a pullback was imminent. The first overbought reading led to a sizable decline, but the second did not. Notice that ARO peaked with the first overbought reading and formed lower highs into October. The late October support break signaled a clear trend reversal. After the December overbought reading, ARO moved above 23 and consolidated. There were two down gaps and a support break, but these did not hold. Price action was stronger than the overbought reading. ARO ultimately broke resistance at 24 and surged back above 28. The second signal did not work.

Divergences and Failures

Failure swings and divergences can be combined to create more robust signals. A bullish failure swing occurs when MFI becomes oversold below 20, surges above 20, holds above

20 on a pullback and then breaks above its prior reaction high. A bullish divergence forms when prices move to a lower low, but the indicator forms a higher low to show improving money flow or momentum.

On the Aetna (AET) chart below, a bullish divergence and failure swing formed in January-February 2010. First, notice how the stock formed a lower low in February and MFI held well above its January low for a bullish divergence. Second, notice how MFI dipped below 20 in January, held above 20 in February and broke its prior high in late February. This signal combination foreshadowed a strong advance in March.

A bearish failure swing occurs when MFI becomes overbought above 80, plunges below 80, fails to exceed 80 on a bounce and then breaks below the prior reaction low. A bearish divergence forms when the stock forges a higher high and the indicator forms a lower high, which indicates deteriorating money flow or momentum.

On the Aetna chart above, a bearish divergence and failure swing formed in August-September. The stock moved to a new high in September, but MFI formed a significantly lower high. A bearish failure swing occurred as MFI became overbought above 80 in late

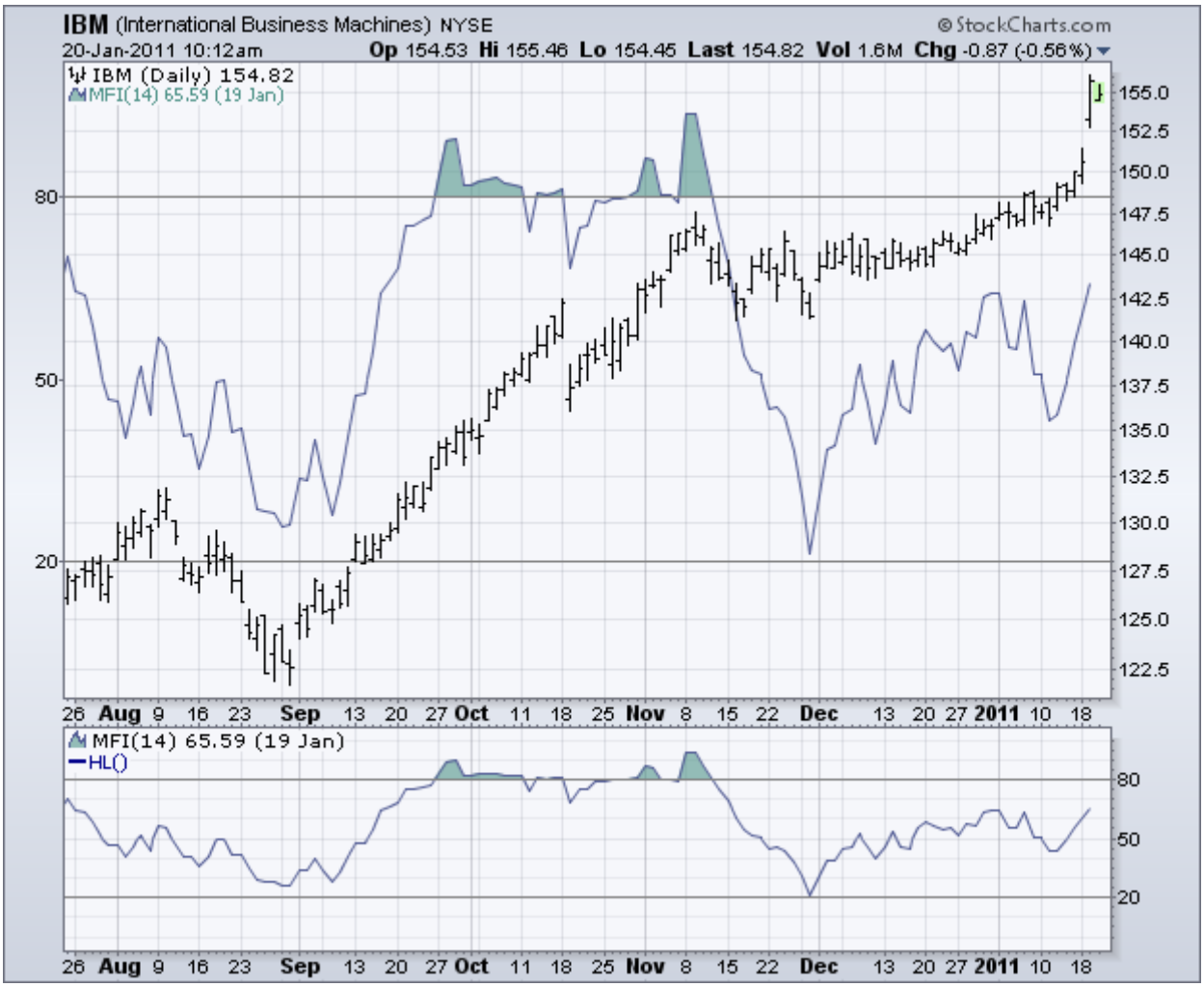
August, failed to reach 80 with the September bounce and broke the prior lows with a decline in late September.

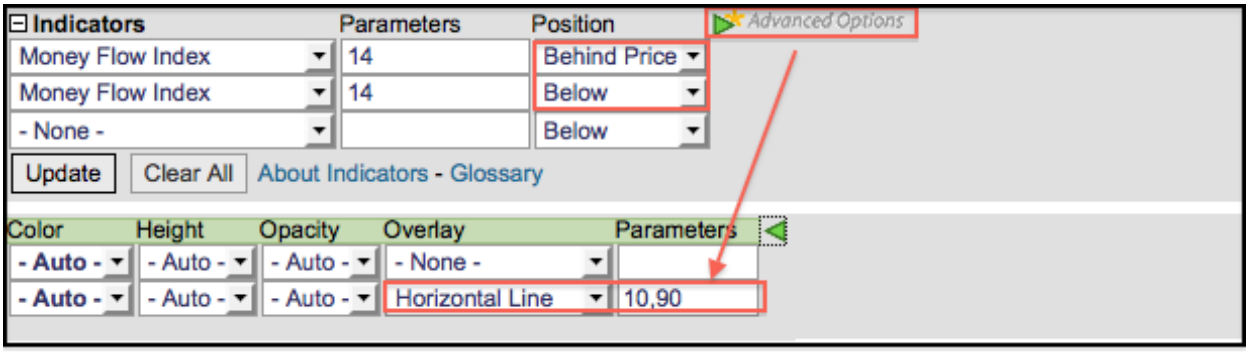
Conclusions

The Money Flow Index is a rather unique indicator that combines momentum and volume with an RSI formula. RSI momentum generally favors the bulls when the indicator is above 50 and the bears when below 50. Even though MFI is considered a volume-weighted RSI, using the centerline to determine a bullish or bearish bias does not work as well. Instead, MFI is better suited to identify potential reversals with overbought/oversold levels, bullish/bearish divergences, and bullish/bearish failure swings. As with all indicators, MFI should not be used by itself. A pure momentum oscillator, such as RSI, or pattern analysis can be combined with MFI to increase signal robustness.

Using with SharpCharts

The Money Flow Index is available as a SharpCharts indicator that can be placed above, below or behind the price plot of the underlying security. Placing MFI directly behind the price makes it easy to compare indicator swings with price movements. The default setting is 14-periods, but this can be adjusted to suit analysis needs. A shorter timeframe makes the indicator more sensitive. A longer timeframe makes it less sensitive. Users can click the green arrow next to “Advanced Options” to add horizontal lines for custom overbought and oversold levels. Two lines can be added by separating the numbers with a comma: (10,90).





Suggested Scans

MFI Oversold

This scan searches for stocks that are above $20 per share, trade over 100,000 shares per day and have oversold Money Flow Index (<10). Consider this a starting point for further analysis and due diligence.

```
[type = stock] AND [country = US]
AND [Daily SMA(20,Daily Volume) > 40000]
AND [Daily SMA(60,Daily Close) > 20]

AND [Daily MFI(14) < 10]
```

MFI Overbought

This scan searches for stocks that are above $20 per share, trade over 100,000 shares per day and have overbought Money Flow Index (>90). Consider this a starting point for further analysis and due diligence.

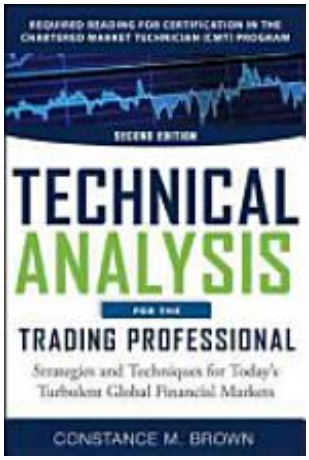
```
[type = stock] AND [country = US]
AND [Daily SMA(20,Daily Volume) > 100000]
AND [Daily SMA(60,Daily Close) > 20]

AND [Daily MFI(14) > 90]
```

For more details on the syntax to use for Money Flow Index scans, please see our Scanning Indicator Reference in the Support Center.

Further Study

Technical Analysis for the Trading Professional
Constance Brown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