# Equity Curve Feedback a powerful method to improve system performance

TradersStudio has many powerful features which allow system developers to test advance trading system concepts easily. One of these concepts equity curve feedback uses the two sets of "*virtual backtesters*" is built-in TradersStudio. Let's look at the following trivial system.

```
' Simple Channel Breakout System

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Sub CHANBREAKOUT (SLen)
        Dim MinMove
        MinMove=GetActiveMinMove()
        Buy("ChanBuy",1,Highest(High,SLen,0)+MinMove ,Stop,Day)
        Sell("ChanSell",1,Lowest(Low,SLen,0)-MinMove,Stop,Day)
End Sub
```

Let's now apply this system to the following market names given with their symbols:

1. Cotton #2 (CT)
2. CrudeOil Electronic (ZU)
3. Mini NASDAQ (EN)
4. EuroCurr Composite (FN)
5. Corn Electronic (ZC)
6. Copper Electronic (ZK)
7. Palladium Electronic (ZA)
8. Tbonds Composite (US)
9. Rough Rice Elect (ZR)
10. Nat. Gas Electronic (ZN)
11. Canadian $$ Composite (CN)
12. Orange Juice (JO)
13. Lumber (LB)

We will deduct $25.00 for commission and $75.00 for slippage. We are going to use a lookback length of 20 bars and apply this to daily data. A 20 day breakout is the standard length in 4 weeks time and does not require optimization. Our results are as follows:

**Summary Report for Session Consolidated 6/22/1999 to 10/21/2011**

| **Performance Summary: All Trades** | | | |
|---|---|---|---|
| | | | |
| **Total Net Profit** | $494,147.17 | **Open Position P/L** | $55,532.43 |
| **Gross Profit** | $2,091,150.73 | **Gross Loss** | ($1,597,003.56) |
| | | | |
| **Total # of trades** | 1120 | **Percent Profitable** | 37.05% |
| **Number winning trades** | 415 | **Number Losing Trades** | 705 |
| | | | |
| **Largest winning trade** | $101,860.00 | **Largest Losing Trade** | ($19,650.00) |
| **Average winning trade** | $5,038.92 | **Average Losing Trade** | ($2,265.25) |
| **Ratio avg. win/avg. loss** | 2.22 | **Avg. Trade (win & loss)** | $441.20 |

| | | | |
|---|---|---|---|
| **Max consec. winners** | 8 | **Max consec. losers** | 14 |
| **Avg. # bars in winners** | 57 | **Avg. # bars in losers** | 20 |
| | | | |
| **Max intraday drawdown** | ($112,246.82) | **Max # contracts held** | 1 |
| **Profit Factor** | 1.31 | **Yearly return on account** | 35.70% |
| **Account size required** | $112,246.82 | | |

This is a "*simple channel breakout system*". Let's suppose we want to filter our simple channel breakout system and only take trades based on recent system performance. Since, you can't filter a system based on its own trades, so you need to have two parallel copies of the system running. In TradersStudio, we have **three in-built backtesters** which makes it easy to develop trading strategies using **equity curve feedback**.

The *Buy*, *Sell*, *Exitlong*, and *ExitShort commands* show up in the performance reports. We also have a complete separate set of functions to access our statistics namely, *VirtualBuy*, *VirtualSell*, *VirtualExitlong*, and *VirtualExitshort* which produces a set of commands to access the full statistics, and yet not affect our backtested report results.

Let's look at an example using these basic features.

```
Sub VirFunctionTest(SLen)
        Dim MinMove

        MinMove=GetActiveMinMove()
        Buy("ChanBuy",1,Highest(High,SLen,0)+MinMove ,Stop,Day)
        Sell("ChanSell",1,Lowest(Low,SLen,0)-MinMove,Stop,Day)
        VirtualBuy("ChanBuy",1,Highest(High,SLen,0)+MinMove ,Stop,Day)
        VirtualSell("ChanSell",1,Lowest(Low,SLen,0)-MinMove,Stop,Day)

        Print FormatDateTime(Date)
        Print "VirBarsSinceEntryPlus"
        Print VirBarsSinceEntryPlus("")
        Print "VirBarsSinceExitPlus"
        Print VirBarsSinceExitPlus("")

        Dim ad
        ad =virMPEPrice("chanbuy")
        Print "virMPEPrice with chanbuy = ", ad

        ad =VirMEaPrice("chanbuy")
        Print "virMPEPrice with chanbuy = ", ad
        ad =VirMarketPositionPlus("chanbuy")
        Print VirGetPerformance("NetProfit")

        Print  VirGetSysPerformance("LN",0)
        Print  VirGetSysPerformance("SN",0)
        Print "VirMarketPositionPlus with chanbuy = ", ad
End Sub
```

This example shows our simple channel breakout system along with the clone set of virtual buy and sells. We also show the statistics to access these virtual statistics.

Let's now apply this technology into a real system example as below.

```
' Simple Channel Breakout System

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Sub CHANBREAKOUTFeedback (SLen,EQLB,EQMult)
        Dim MinMove
        Dim virprofit As BarArray
        Dim virlongprofit As BarArray
        Dim virshortprofit As BarArray
        MinMove=GetActiveMinMove()

        If (BarNumber<500 Or virlongprofit-virlongprofit[EQLB]>-
        EQMult*Average(Range,EQLB,0)*bigpointvalue) Then
                Buy("ChanBuy",1,Highest(High,SLen,0)+MinMove ,Stop,Day)
        End If

        If (BarNumber<500 Or virshortprofit-virshortprofit[EQLB]>-
        EQMult*Average(Range,EQLB,0)*bigpointvalue) then
                Sell("ChanSell",1,Lowest(Low,SLen,0)-MinMove,Stop,Day)
        End if

        VirtualBuy("ChanBuy",1,Highest(High,SLen,0)+MinMove ,Stop,Day)
        VirtualSell("ChanSell",1,Lowest(Low,SLen,0)-MinMove,Stop,Day)

        ExitShort("SX","ChanSell",1,Highest(High,SLen,0)+MinMove ,Stop,Day)
        ExitLong("LX","ChanBuy",1,Lowest(Low,SLen,0)-MinMove,Stop,Day)

        virprofit=VirGetPerformance("NetProfit")
        virlongprofit=VirGetSysPerformance("LN",0)
        virshortprofit=VirGetSysPerformance("SN",0)
End Sub
```

The *VirtualBuy* and *VirtualSell* use one of our virtual backtesters. We then use our *VirGetSysPerformance function* to get the current net profit long, short and both. This system waits for 500 bars, so that we have enough data for the **equity curve feedback** to mean something. We use the *virtual equity* to filter our long and short trades. We are using the difference in long equity to filter long trades. We don't need to have positive change in equity to allow trades but just have losses limited to the negative which is some multiple of the average range in dollars. The same is true for the short side. We are using the following parameters for our system:
*CHANBREAKOUTFEEDBACK(20, 80, 3)*

This means we are using a 20 bar breakout, an 80 bar difference in equity and the equity difference must be greater than (*3*Average(Range,80,0)*bigpointvalue*) to allow trades. This filtering does help performance

**Summary Report for Session: 06/22/1997 to 10/21/2011**

| **Performance Summary: All Trades** | | | |
|---|---|---|---|
| | | | |
| **Total Net Profit** | $566,544.77 | **Open Position P/L** | $48,327.43 |
| **Gross Profit** | $2,050,675.87 | **Gross Loss** | ($1,484,131.10) |
| | | | |
| **Total # of trades** | 1113 | **Percent Profitable** | 36.84% |
| **Number winning trades** | 410 | **Number Losing Trades** | 703 |
| | | | |
| **Largest winning trade** | $101,860.00 | **Largest Losing Trade** | ($19,650.00) |
| **Average winning trade** | $5,001.65 | **Average Losing Trade** | ($2,111.14) |
| **Ratio avg. win/avg. loss** | 2.37 | **Avg. Trade (win & loss)** | $509.02 |
| | | | |
| **Max consec. winners** | 8 | **Max consec. losers** | 13 |
| **Avg. # bars in winners** | 58 | **Avg. # bars in losers** | 21 |
| | | | |
| **Max intraday drawdown** | ($99,645.90) | **Max # contracts held** | 1 |
| **Profit Factor** | 1.38 | **Yearly return on account** | 39.68% |
| **Account size required** | $99,645.90 | | |

We can see that the profits increased by 15% while the drawdown decreased by about the same amount.

**Please note that, I am not declaring the above to be the ultimate system and equity curve filtering strategy.** This is just a simple example of this technology and to show how easy it is to implement this technology in TradersStudio.