Trend Following

in the Bond Markets- Part 2

In the first part of this article we have shown how a simple moving average based trend-following system produced remarkable results on the Bund Future. Now we are going to check this successful trading logic on other markets. It will be outlined how our strategy works without any adaptation on various other bond markets and how to use it to construct a robust market portfolio.
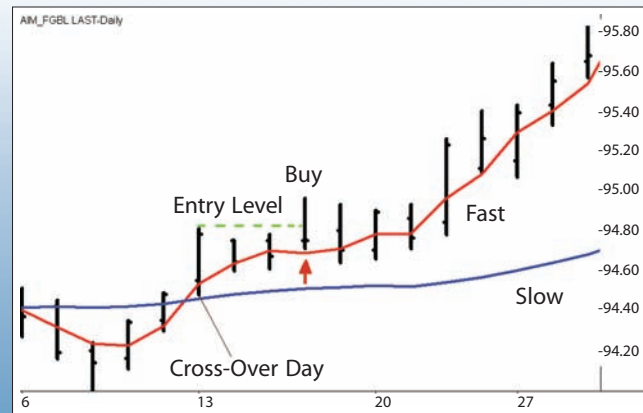
■ Before trying to code an idea with the purpose to build a systematic trading methodology it is important to understand the inner nature of the different markets you are going to trade. The market most appreciated by traders is the equity indexes universe. Stocks, the components of the equity indexes, move more with psychology than real events. Just think how an event could impact a stock: it is always an indirect influence, very seldom a direct one. Oil prices are going up? An oil stock can benefit from this situation but it will benefit more or less depending on its corporate efficiency, from the relative competitive position in the industry, from the intelligence of its management, and so on. Surely it will benefit, but how much it will benefit is always a matter of discussion. But if we are talking about oil, the true commodity, the real black gold, this is another story. Commodity prices are influenced by real demand and real offer. Psychology is still important but not dominant. If China is growing 10% per year in the following 10 years the demand of all kind of commodities will double, triple, nobody knows.

This is a direct effect: Chinese importers are bidding for oil on the international cash markets and prices are going up. Nothing is easier to understand. This is why psychology will be more important on stocks than on commodities. However, there is also another aspect to consider. If we are talking about „indirect effects" it means that there will be very few events that everybody will agree with that will modify the picture of the equity indexes. On the equity indexes everything is smoothed by discussion, interpretation, indirect effects, and so on. When on the contrary news directly affects demand and offer, and this news is dramatic, there is no room for discussion and interpretation. Prices jump or they crash. So you will have limit up and limit down days, you will have huge price swings in one direction or another. But in this black and white world, in between psychology and real demand and offer, you have a third environment: Bonds. Monetary policy has a steady nature, no climax, no sudden changes. Economic swings are slow and seldom have they surprised markets. In a period of economic recession interest rates will go down for months and months.

In a period of economic expansion interest rates will go up smoothly. Take for example the 17 interest rate increases in the US: at a certain point the market discounted them and it was obvious that they would have gone up. Monetary authorities try to envisage their beliefs to the markets in many ways, and if you listen, very seldom will there be a misunderstanding. A misunderstanding could really happen if you are at the very beginning of the interest rate increases or at the end of it, but we are talking about two situations out of ... 17. In a more serious way we can say that elements of a macroeconomic series are quite auto-correlated, so that if they start rising they will go on for a while, if they go down they will go ahead for a while. Monetary policy is not a kind of situation where one day you have an increase of 2% and tomorrow a decrease of 3% and then tomorrow again an increase of 1% and so on.

It is why prices in bonds tend to follow the same direction without much noise. And it is why moving averages on bonds are a good

F1) System Logic

The entry is not triggered by the crossing of the two moving averages. Instead at the crossover day the high is kept and used as long entry level. For further details see the first part of this article [1]

predictive tool, because they simply are able to catch this smoothing behaviour of prices. There is no other field in finance where moving averages are as good as on bonds. Moving averages are good on bonds, not for a kind of indirect optimsation, but simply because of their inner nature. There should be no fear in trading bonds with moving averages: they work!

In the first part of this article we have shown how a simple moving average based trend-following system produced remarkable results on the Bund Future. Now we are going to check this logic on other markets.

A Short Review of the Trading Logic

From the hundreds of trend-following systems which exist we have chosen a quite simple one with two moving averages, generating entries and exits. The main difference of this logic compared with classic moving average systems is a small but important filter: An entry is not triggered by the crossing of the moving averages already, but only when this crossing was confirmed by the price itself (figure 1).
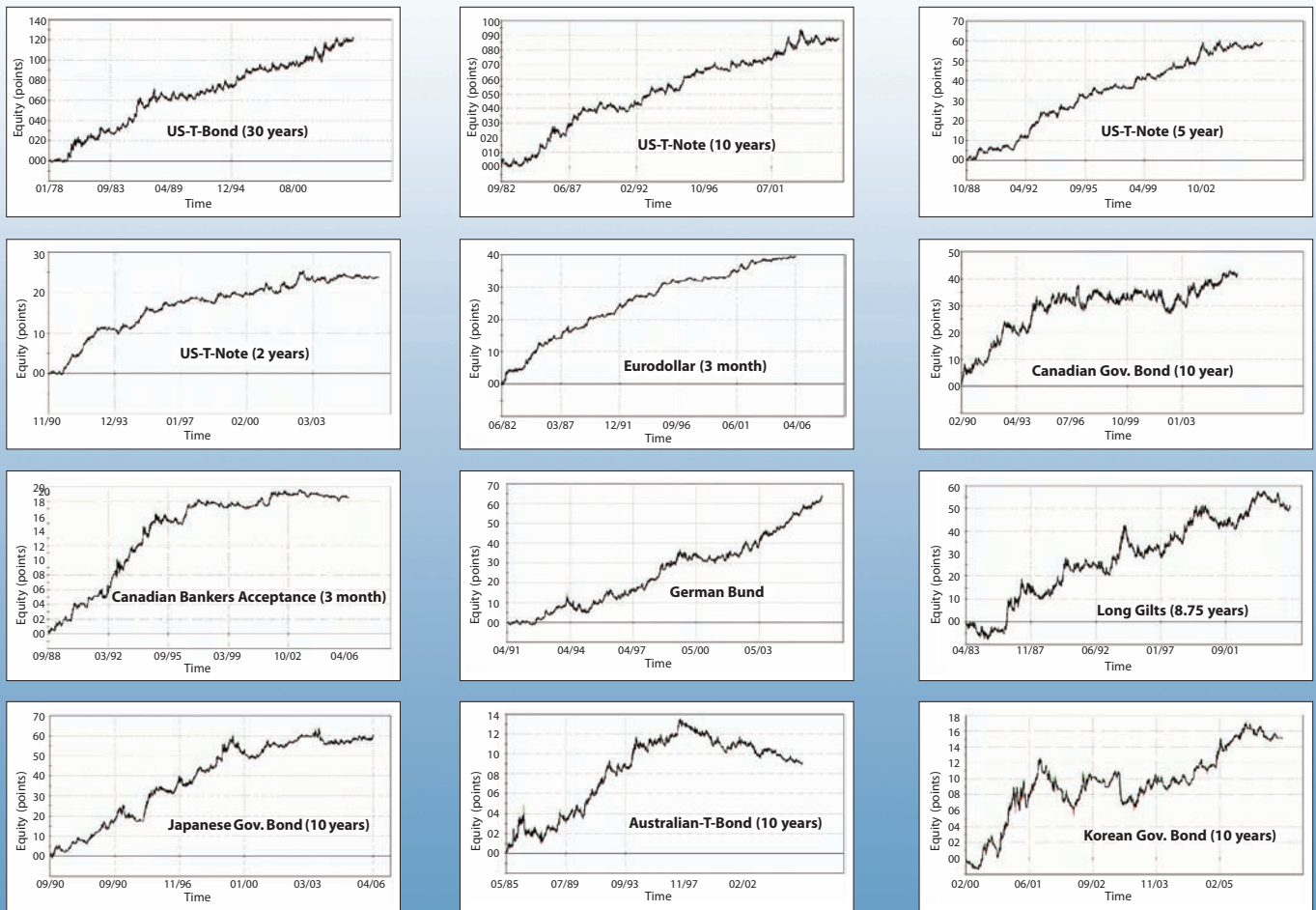
All the details of the logic you can find in part 1 of this article [1], so we won't further discuss it here but focus on the results of the strategy.

Please note that we do not apply any additional exits to the strategy at this point. Trades are only exited when the price crosses the slower moving average.

Of course you can and should add exits to the strategy which meet your personal needs. Some suggestions you can find in our earlier articles [2]. However it is important to mention that from all the added exits which we tested most could not achieve the good results of our base system presented here. In most times the added exits made the results worse. The reason for this behaviour is mainly that with trend-following systems the overall gains result from some big winning trades. The goal is to stand several smaller losses in order to capture some of the big moves.
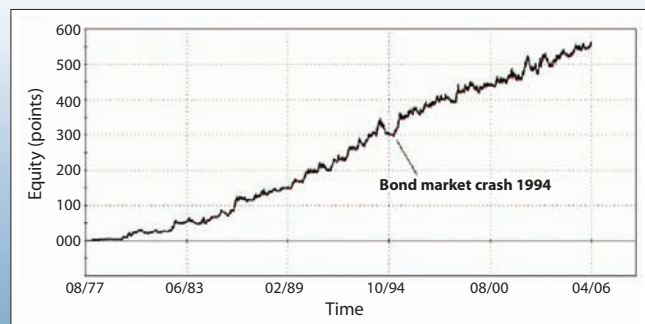
The more exits you add to your base system the more often you miss these big moves. This applies especially for profit targets. Profit targets give you a good feeling when they are reached, but often close the trade too early.

F2) Equity Lines of 12 Major Bond markets, in Points

Conversion from point values to base currency: German Bund: 1 point = 1000 Euro; US-T-Bond, US-T-Note (10 year) and US-T-Note (5 year): 1 point = 1000$; US-T-Note (2 year): 1 point = 2000$; Eurodollar (3 month) 1 point = 2500$; Long Gilts: 1 point = 1000 Brit. Pounds; Canadian Gov. Bond (10 year): 1 point = 1000Can-$; Canadian Bankers Acceptance (3 month): 1 point = 2500Can-$; Japanese Gov. Bond (10 year): 1 point = 10000 Jap. Yen; Australian Bond (10 year): 1 point = 1000 Aus-$; Korean Gov. Bond (3 year): 1 point =1 Mill. Kor. Won

F3) Portfolio of 12 Combined Bond-Markets

Bond market crash 1994

The system equities in points of the following markets were summarized: German Bund, Long Gilt, US-T-Bond(30 year, electronic), US-T-Note (10 year, electronic), US-T-Note (5 year, electronic), US-T-Note (2 year, electronic), Eurodollar (3-month, electronic), Canadian Gov. Bond (10 year), Canadian Bankers Acceptance (3 month), Australian 10 year Bond, Japanese Gov. Bond (10 year), Korean Gov. Bond (3 year).

Results in the Bond Markets

Now after this short review and introduction let us see how the logic works on the major bond markets. We want to check if Bond markets really fit well to trend-following systems like we expect from our fundamental argumentation previously mentioned.

All the following tests are based on a one contract basis and are performed with the standard input parameters of the system (Fast Moving Average Length= 7, Slow Moving Average Length=26). No adaptation of the parameters to the different markets were performed in order to keep the results comparable and to avoid the effect of curve-fitting.

The strategy is applied to the daily data which was provided by CSI Unfair Advantage (csidata.com). The futures data was point-based back adjusted to get rid of artificial gaps between different contract months. All results in the figures and tables are based on a one contract per market basis. Any considerations in terms of money and risk management are beyond the scope of this article.

If you apply our system to the bond markets, you see that in all of them you get more or less steady equity curves (figure 2). Some work better, like for example, the US-T-Bond, the US-T-Note (10 years), the German Bund, some look a little bit worse, like the not so well known Australian 10-year Treasury Bond or the Korean 3-year Government Bond. But with all of them you get positive results.

In order to add the results of all tested bond markets to a combined portfolio, you have different possibilities. You could first convert the point values and currency of each market and build a portfolio in US-Dollar. For this you must convert the Korean bond, Japanese bond etc., by using the Dollar conversion rates $/Won, $/Yen etc and then add all equity-lines. To simplify these calculations we took another way here. We tested all the single bond markets in points. We made a simplification to add these point equity curves of all 12 markets to get a portfolio. This is mathematically not 100% correct but the result comes very close as if you would use the exact currency conversion rates (for example 1 point in the Bund-future is 1000 Euro, 1 point in the US-T-Bond and US-T-Note is 1000 $ and so on).

The equity line becomes very nice and steady; you only get minor

draw downs (figure 3). The most significant one happened in 1994 during the bond market crash, when all markets turned their trend from upside to downside more or less at the same time. But on the combined, long-term equity line it rather looks like a small accident than as a big issue.

If you have the capability you could trade this portfolio in the three different time zones with all included markets. There is however one reason why we won't advise you to do this, even if the equity line looks good enough: Correlation! All the bond markets are so highly correlated that the possibility exists that the system might crash for all the markets at the same time, like it happened partially in the year 1994. Please just imagine that you are long in all 12 bond-markets and then they all go down at the same time. The high correlation increases the risk of your bond portfolio drastically.

In order to build a high return/low risk portfolio, the concept should be, in our opinion, as following: Take a mixture of different systems and apply them to different markets in different time frames. For example you could choose some liquid markets from the bond group and apply a medium term trend-following system, like the one described here. Then you would add, for example, swing-trading systems for the currencies and day-trading systems for the Mini S&P
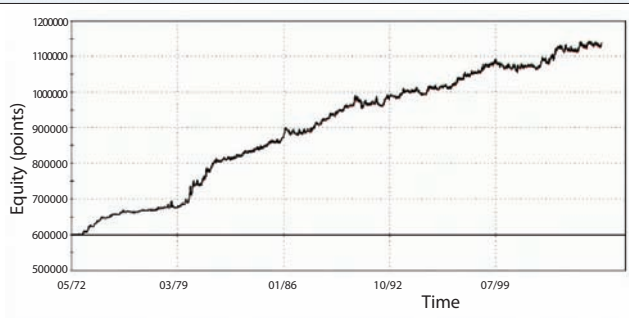
T1) System Figures

System Analysis			
Net Profit	$526,259.20		
Gross Profit	$1,620,546.45		
Gross Loss	($1,094,287.25)	Total Slippage	
		& Commission	$95,040.00
Percent profitable	37.59%	Profit factor	1.48
Ratio avg. win/avg. loss	2.46		
Annual Rate of Return	1.90%	Share Ratio	0.92
Return on Initial Capital	87.71%		
Return on Max. Drawdown	1337.42%		
Total Trade Analysis			
Number of total trades	3,168		
Average trade	$166.12		
Outlier Trades	Total Trades		Profit/Loss
Positive outliers	63		$606,487.35
Negative outliers	4		($24,871.00)
Total outliers	67		$581,616.35
Time Analysis			
Percent in the market		86.51%	
Longest flat period		24	
Avg. time in trades		12.95	
Avg. time between trades		0.48	
Avg. time in winning trades		24.92	
Avg. time between winning trades		2.27	
Avg. time in losing trades		5.74	
Avg. time between losing trades		2.67	
Equity Curve Analysis			
Avg. time between peaks (days)		73.32	
Maximum Equity Drawdown (daily)		($39,348.75)	
Date of Maximum Drawdown		13/12/2000	

System figures for the 6 market portfolio consisting of German Bund, US-T-Note (10 year), Mini S&P, Gold, Light Crude Oil, Euro/Dollar. All numbers arec alculated with 30$ Slippage and commissions per trade.

F4) 2 Bond-Markets And 4 Different Markets

The figure shows a Portfolio of 2 Bond-markets and 4 markets of different groups: German Bund, US-T-Note (10 year), Mini S&P, Gold, Light Crude Oil, Euro/Dollar. 30$ Slippage and Commisions per trade subtracted.

and so on. There exist various possibilities which you must fit to your personality and your trading style. The whole topic is too big to treat it seriously here.

Diversification with Other Market Groups

Here, to stay with our trend-following logic and to get a better feeling for it, we build a small portfolio of different market groups.

We use two bond markets, the German Bund and the US-T-Note (10 year) but add other markets from different market groups: The Euro/Dollar as a currency, the Mini S&P as a Stock Index, plus Gold and Light Crude Oil as famous commodities. So we have a portfolio in which the successful bond markets still build the core, but which is diversified with less correlated markets. What is important to mention here is that the Mini S&P produces a negative equity line, the gold just goes sideways and the Euro/Dollar in the last 3 years weakened slightly (the equity lines are not shown here).

Even with these markets included the overall portfolio shows a steady upward equity line, since the two bond markets and the crude oil kept the portfolio running well. The equity line does not look so steady for the complete bond portfolio, but that is not what we expected.

The idea here is to have a portfolio of less correlated markets in which there are always one or two that have big gains that compensate the losses of other markets.

Let us have a look at the portfolios main figures (table 1). The system figures which we get are typical for a trend-following system. Only 37% of all the 3168 performed have been profitable. The overall big gains of the system result from the high ratio of average win/average losing trades, which is nearly 2.5. A very important fact to mention is the following: The system's gains resulted from the 63 positive outlier trades. These outliers produced more profit ($606.487) than the final total net profit ($526.259)! This means that the extreme big winning trades made the profit of the system. This underlines again how important it is in trend following systems to let the profits run. If you missed the positive outliers you would have no gain at all. The annoying point for you as a trader is however that such big gains occur very seldom, but when they do occur, you must catch them.

An interesting fact of the system is also that the average time in winning trades is more than four times longer than the average time

References

[1] Emilio Tomasini, Urban Jaekle:
"Trend following in the bond markets", Part 1, TRADERS' August 2006

[2] Emilio Tomasini, Urban Jaekle:
"Developing Exit Strategies", Part 1 and 2, TRADERS' April and June 2006

which the system stays in losing trades (25 versus 6 days). This shows again how the trend-following logic cuts the losses short and lets the profits run.

Conclusion

With these two articles we wanted to show you how important it is in successful trading to select the right systems for the right markets. With the Bonds we have identified a group which could be exploited perfectly with trend-following methods over the last decades. From the fundamental point of view the chances are good that they continue to behave like this. We are aware that a trend-following system is not suited for every trader. It is annoying to have only a small amount of profitable trades and to wait most of the time until the big moves take place. But trend-following strategies work too well in bond markets to let them out. They are a key part in the most successful existing hedge funds. In our opinion they should be at least one component of your trading-systems if you want to be successful in the long run.

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