

IFTAUPDATE

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Education Lounge articles: Send submissions to newsletter@ifta.org.

All other content: Send submissions to admin@ifta.org.

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a newsletter for the colleagues of the International Federation of Technical Analysts

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President's Report to Colleagues



Dear Colleagues,

Although this year's IFTA Conference in Jakarta, Indonesia was a great get-together of old colleagues and new friends, as well a top-notch conference—therefore a considerable success, things have changed. We couldn't welcome as many Industry colleagues from all over the world as we were used to. But why?

Yes, we grow older and therefore may not like to travel so much anymore. And yes, budgets in the industry are tight. And also yes, our Industry isn't growing double-digits anymore. But what does this mean? Is technical analysis and everything related to it outdated—are we?

Not so fast! There is a rapidly growing audience in high numbers all over the world. Most of IFTA's Member Societies already know—as their member bases consist of them—that we are drawing new private investors and retail traders.

People are looking for proper investment approaches by visiting expos, conferences, and fairs to learn and discuss. This doesn't happen on another planet, but it might happen in a parallel universe.

So, my question is: Why not acknowledge the obvious and unite both universes into one? Thereby also facing the reality our member societies exist in? Why not address seasoned Industry professionals as well as "newby" retail investors?

Dear colleagues, the pandemic was a wake-up call for how we organize conferences. Now, let's talk about for whom we organize them.

What do you think?

Best regards,

Wieland Artl
IFTA President

Highlights from the 2023 Conference

With markets turning more volatile and unpredictable in a changing global landscape, it's well worth arming yourself with the skills and tools to be able to maximize opportunities in this uncertain environment.

IFTA's 36th Annual Conference took place in the Grand Sahid Jaya in Jakarta, Indonesia, from 5-7 October, 2023. The conference, themed, Unify the Diversity Towards Alpha, was hosted and organized by the Asosiasi Analis Teknikal Indonesia (AATI).



Congratulations New and Re-elected IFTA Board Members (Term October 2023–October 2026)

A complete list of board members can be viewed on the [IFTA website](#).



Wieland Arlt, CFTe

Nominated by: VTAD (Germany)

Wieland Arlt is a trader, trading coach, and trainer who conveys trading approaches that are easy to understand and implement. He is the author of the bestselling books *Risk and Money Management—Simplified* (German), *Risk and Money Management for Day and Swing Trading* (English), and *55 Reasons to Become a Trader* (German), as well as numerous articles in leading financial magazines. He is a sought-after speaker and expert at trader fairs.

Wieland is a board member of the Vereinigung Technischer Analysten Deutschlands (VTAD) and is in charge of the chapter in Hamburg. He holds a degree in economics.



Gregor Bauer

Nominated by: VTAD (Germany)

Dr. Gregor Bauer works as an independent asset manager for private clients and companies in Germany. He is also the president of the German Association of Technical Analysts (VTAD). Gregor authored two books on technical analysis and covers a regular technical outlook on German TV. He also writes articles on a regular basis for leading financial newspapers. He is specialized in applying advanced candlestick techniques in combination with traditional western techniques.

Gregor holds lectures on portfolio management and technical analysis at various elite universities in Germany and Liechtenstein and runs seminars and workshops on technical analysis for institutional investors.

Together with a partner, he runs a successful, computer-based, medium-term ETF trading system, which is now also open for institutional investors.



Shinji Okada, MFTA, MS

Nominated by: NTAA (Japan)

Shinji received the 2020 John Brooks Memorial Award for his MFTA thesis titled “Observation of Yield Points of Trends” and spoke at the 2021 Online Conference on “Regression Analysis to Determine Best Use of Technical Analysis Tools.” He serves as the General Manager of Research Dept. at the Nippon Technical Analysts Association (NTAA) and introduces not only the classic theories but also the latest ones to the members.

In addition, he is one of several regular lecturers at the extension course at Meiji University in Tokyo where NTAA offers several lectures on technical analysis to the public.

He currently works for QUICK Corp., a financial information vendor, covering the clients, e.g., brokers, analysts, and traders, at banks and securities firms.

His career began when he joined a brokerage firm called Securities Japan Co., Ltd. after he had earned his master's degree in political science from the graduate school of Nihon University. Through his experience as a securities broker, he had realized how he could help investors with

the various technical analysis tools. It is this experience that has driven him to his motivation towards the research of technical analysis.



David Watts, BSc (Hons), CEng, MICE, MIWEM, FSTA

Nominated by: STA (United Kingdom)

David is a trading system consultant and professional engineer. He first became involved with the LIFFE markets after being commissioned to provide IT support and write a trading model for a number of LIFFE traders in 1992.

Since then, he has used his engineering expertise on a number of innovative trading projects. Commissions include the implementation of Dunnigan's One Way Formulae, a technical trading model, the production of a number of swing timing models for traders within the Butterworth Group (1997–2000), as well as providing time series analysis tools for clients in the banking and fund management industry.



Ron William, CFTe, MSTA

Nominated by: SAMT (Switzerland)

Ron William, CMT, MSTA, is an accomplished market strategist, educator, and trader with 20 years of financial industry experience working for leading economic research and institutional firms and producing macro research and trading strategies. He specializes in macro, semi-discretionary analysis, driven by cycles and proprietary timing models.

Congratulations New and Re-elected IFTA Board Members (Term October 2023–October 2026) Continued

Ron also serves as an active trading mentor specializing in trading psychology, using the NLP model, and Van Tharp Peak Performance™. Previously, Ron was a senior tactical and market timing strategist at the ECU Group, a global macro investment and advisory firm. He was part of the Multi-Asset Research and Advisory Team headed by Robin Griffiths, applying his signature “Roadmap” cycle model.

Ron’s work, as part of his current institutional market advisory firm (RWA), acquired global industry recognition with the 2014/2013 Finalist Award for “Best Independent

Research House for FX” and the 2012 Finalist Award for “Best Technical Analyst of the Year.” His market insights are featured regularly across notable industry publications and financial media programs, most recently featuring U.S. presidential election cycle analysis, GBP/USD Brexit impact, and EUR/USD parity risk.

Ron dedicated four years to working at Bloomberg L.P. as a senior technical analyst specialist, responsible for training/consultation across the EMEA region, and contributed to the development of charting strategies and the technical analysis platform of the Bloomberg Professional Service™.



Technicals To Trading Systems Conference 2024

From Classic Charting to AI Developments



Tue, 16 April 2024, 09:00 - 17:30 BST



1 Moorgate Place, London EC2R 6EA (Or online)

Expose your firm to qualified traders and developers interested in system development.



Society of Technical Analysts
A Professional Network For Technical Analysts

Member News

STA (United Kingdom) The Society of Technical Analysts

On **14 September** the STA and colleagues in the wider financial sector gathered at London's iconic National Liberal Club to celebrate the STA's **55th anniversary**, preceded by our annual Awards Ceremony for some of the UK based MSTAs.

In November, we were treated to a live webinar by the legendary Robert Prechter. Bob gave a talk on 'Surfing the Waves of Social Mood'. In December we will be holding our Annual General Meeting and Christmas Drinks Party at One Moorgate Place, London—ending the year on a celebratory note.

We have a packed programme planned for 2024, including events in our newly reformed Scottish and Irish Chapters—and a follow-on '*Technicals to Trading Systems*' conference on **16 April 2024**. Building on the success of the 2023 event—the 2024 conference will offer new insights into how best to integrate classic charting, including using AI to help in this process. **Held both in-person and online—IFTA colleagues are eligible to attend this event at the discounted member rate.** [Click here](#) for full details and to register at early bird discount rate.

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The Option Greek Rho

By Bruno Nappini, Mauro Perotti

Foreword

We are interrupting, temporarily, the series of articles on volatility for two reasons: We have received requests for elucidation about the operational significance of this Greek and, second reason, we have now (re)entered an era of no longer zero (or negative) but rising rates: this makes the focus on the risk-free rate and how this can affect the price of options topical again.

The Risk-Free Rate

When we evaluate an option with the Black and Scholes (B&S) formula, among the parameters we must include in the model is the *risk-free rate*. But what do we mean by that phrase? It is the interest rate associated with a financial asset that is considered safe whose return, therefore, is certain. Bonds from issuers that are considered almost certainly solvent—a 99.9% certainty—are certainly a good benchmark. In rating agency rankings, these assets are denoted AAA. As an example, staying in Europe, we cite Bunds, bonds issued by the Federal Republic of Germany. In the Italian financial system, on the other hand, such an asset is the Treasury bond (BOT), less safe, however, than the Bund. In the United States, on the other hand, the T-Bill is used.

But why, such financial assets, are they considered risk-free? Now, I am convinced that we all know that there are no financial assets that are risk-free. So what?

The reason is that we consider short-term government bonds to be risk-free financial assets because, the relevant governments, have the power to print money (to tell the truth, Italy, and all the countries in the Eurozone, by joining that currency, have lost that power; power that is delegated by these countries to the ECB, European Central Bank).

It is then extremely unlikely that a government will default on its obligations. Therefore, the risk of default, especially if we are referring to short-term bonds, is practically zero.

And in Europe? There is the EURIBOR

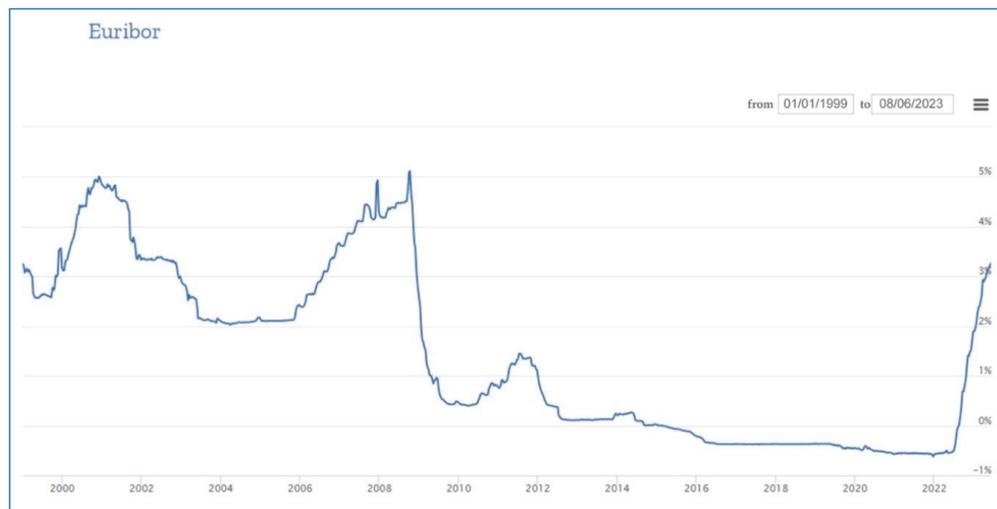
EURIBOR is the interest rate, applied to unsecured euro interbank loans, that a number of European banks—with high creditworthiness—use to calculate the repayment of loans that are made between the same lenders over a period of time that can range from one week to 12 months.

It is calculated daily by the European Banking Federation. This is the site where we can find the information we are interested in: www.euribor.it/euribor-oggi/.

And these, for example, are the periodic (daily) surveys of 1-, 3-, 6-, and 12-month rates.

EURIBOR	1 MONTH	3 MONTHS	6 MONTHS	12 MONTHS
08/06	3.26	3.49	3.76	3.94
07/06	3.27	3.46	3.73	3.92
06/06	3.25	3.48	3.72	3.91
05/06	3.22	3.49	3.74	3.88
02/06	3.22	3.49	3.73	3.88
01/06	3.21	3.46	3.72	3.88
31/05	3.21	3.46	3.75	3.94
30/05	3.21	3.47	3.77	3.97
29/05	3.21	3.48	3.78	3.98
26/05	3.20	3.46	3.76	3.96
25/05	3.20	3.46	3.77	3.94
24/05	3.14	3.42	3.74	3.93
23/05	3.14	3.42	3.73	3.91
22/05	3.14	3.41	3.74	3.89
19/05	3.13	3.42	3.71	3.88
18/05	3.15	3.38	3.69	3.86
17/05	3.15	3.39	3.67	3.83
16/05	3.16	3.38	3.66	3.81
15/05	3.15	3.36	3.66	3.81

The next figure shows the graph of the one-month Euribor, which, as can be seen, has not gone above 5% over the past two decades. In the last decade, moreover, it has moved around 0% while also touching negative quotations.



What rate to employ when evaluating the price of an option?

It depends on the remaining lifetime of the option contract we intend to trade. For options that expire in one month, we will use the one-month Euribor rate. For options that expire in three months, we will use the three-month Euribor rate. And so on.

For options that have a different expiration, say forty days, we will have to make do. Perhaps using some interpolation technique (linear for simplicity's sake; or, if we intend to be more precise, higher order than first). Of course, we do not intend to address such techniques in this article. They will be the subject of subsequent articles if there is interest.

Definition of Rho

For options that have a different expiration, say forty days, we will have to make do. This Greek letter, as many already know, measures the sensitivity of the price of an option to changes in the interest rate. In formula, denoting $V^{(t)}$ the price of an option (call or put whatever it may be):

$$rho = \rho = \frac{\partial V}{\partial r}$$

Basically, the value of this Greek⁽²⁾ tells us how much the value of the option will change for each percentage point change in r . The unit of measure is euro/percentage point (or dollar/percentage point; or other monetary unit).

As will now be shown, empirically, this Greek is positive for calls and negative for puts. In essence, for a call, we will have:

$$rho = \frac{\partial c}{\partial r} > 0$$

Whereas, for a put:

$$rho = \frac{\partial p}{\partial r} < 0$$

¹ V : Value of the option

² In literature, this Greek letter is referred to as Rho, or the corresponding Greek letter (ρ)

Let's try some simulations with a calculator. Today is June 9, 2023, and with the Dax spot at 16,000, let's consider a call and an atm put, with implied volatility of 20% and expiration September 2023. Since we are about three months from the expiration date, we set, as the risk-free rate, $r=3.49\%$. The next figure shows what we get.:

underlying	16000	
strike	16000	
today	9/6/23 23.45	
expiration date	15/9/23 13.00	
implied volatility	20,0%	
risk-free rate	3,49%	
yield dividend	0,00%	
	Call Option	Put Option
Price	733,6	585,0
Delta	0,556	-0,444
Gamma	0,024	0,024
Theta	-4,130	-2,614
Vega	32,668	32,668
Rho	21,833	-20,532

The value of the Greek under consideration is 21.8, for the call and -20.5, for the put. Looking at the prices, moreover, despite the fact that these are two options with equal moneyness, we have to see that there is a significant difference between them: the call is worth about 25% more than what the put is worth! How come? We will figure it out in a moment.

Now, if we understand the meaning of this Greek correctly, we must say that if the risk-free rate goes up by one percentage point, the call will have to appreciate by about 21.8 points, while, for the put, we will have to see a decrease in its value by about 20.5 points. Let us check whether this is the case.

And in fact, the calculations show that this is so (apart from a few insignificant decimals).

underlying	16000	
strike	16000	
today	9/6/23 23.50	
expiration date	15/9/23 13.00	
implied volatility	20,0%	
risk-free rate	4,49%	
yield dividend	0,00%	
	Call Option	Put Option
Price	755,6	564,7
Delta	0,567	-0,433
Gamma	0,024	0,024
Theta	-4,358	-2,413
Vega	32,537	32,537
Rho	22,210	-20,041

And now, let us try to see what happens if we set a risk-free rate to zero.

As might be expected, the prices of the two options are perfectly equal.

underlying	16000	
strike	16000	
today	9/6/23 23.53	
expiration date	15/9/23 13.00	
implied volatility	20,0%	
risk-free rate	0,00%	
yield dividend	0,00%	
	Call Option	Put Option
Price	659,7	659,7
Delta	0,521	-0,479
Gamma	0,024	0,024
Theta	-3,378	-3,378
Vega	32,954	32,954
Rho	20,499	-22,262

Thus, empirically, we are beginning to observe some peculiarities about the action of the risk-free interest rate on the prices of the two options: as r increases, the price of the call increases and the price of the put decreases.

On the other hand, it can be shown by performing the calculation of the partial derivative given in the definition that the Rho of a call is strictly increasing with the interest rate r . This means that as r increases, the price of the option also increases.

Likewise, it can be shown that the Rho of a put, on the other hand, is strictly decreasing with the interest rate r . And this means that as r increases, the price of the option decreases.

If, in the B&S model, we run the partial derivative of the price of a call as the rate r changes, we find:

$$rho(call) = \frac{\partial c}{\partial r} = K \cdot e^{-r(T-t)} \cdot (T-t) \cdot \Phi(d_2) > 0$$

It is not readily apparent from the formula why the rho of a call is positive. This is because there are two effects that operate in opposition: (1) it decreases the discount factor and, this, moves the final result downward; (2) it increases the drift of the S process, which pushes the final result upward. And it is precisely this second effect that prevails.

Whereas, for a put:

$$rho(put) = \frac{\partial p}{\partial r} = -K \cdot e^{-r(T-t)} \cdot (T-t) \cdot \Phi(-d_2) < 0$$

Here the two effects, discount factor and drift, both operate in the same direction, downward. This returns us an rho that, for puts, is strictly decreasing with rate r .

But why does this happen? When we buy a call, we are buying the right to be able to buy a certain financial asset, at a certain price and within a certain maturity. We all know, however, that in order to purchase that right, we do not have to make the full outlay for the purchase of the entire financial asset. Returning to the first figure, for example, the purchase of the 16,000 call at 733.6 gives us the right to be able to purchase, if we wish, the entire underlying asset by the maturity date of 9/15/2023. But our outlay, in percentage terms, is only about 4.6%! We could put in a deposit account, for about three months, the remaining 95.4% of the principal and enjoy the fruits of that deposit. Here, then, to avoid such arbitrage, this interest is incorporated, by the B&S model, into the option price.

For the put, it is necessary to reverse the reasoning. Warning. The person who sells a put (and not the person who buys it) knows that, if it is exercised, he will be forced to buy the financial asset, the subject of the contract, at the strike price. But the disbursement that will follow will occur only on the expiration date of the contract. So that money, which the put seller, however, must possess, could once again be paid into a deposit account from which to receive the relevant interest. For that reason, that put, the higher the risk-free rate, the less it will have to cost.

Of course, these arguments apply only when the underlying is a stock or index (even if cash-settled). They do not apply if, for example, the underlying is a futures, since, upon exercise, one does not receive all of the underlying but only a futures contract.

Also, still fiddling with the calculator, let's try to see what happens to two options, again atm, with expiration, however, closer together. Let's say a month or so. Consider, then, the July expiration.

underlying	16000	
strike	16000	
today	10/6/23	0.02
expiration date	21/7/23	13.00
implied volatility	20,0%	
risk-free rate	3,26%	
yield dividend	0,00%	
	Call Option	Put Option
Price	460,1	400,8
Delta	0,535	-0,465
Gamma	0,037	0,037
Theta	-5,887	-4,464
Vega	21,449	21,449
Rho	9,225	-8,917

We always notice a difference in value, in favor of the call. This time, however, less marked: the call is worth just under 15% more than what the put is worth!

And from this further observation we can infer that the longer the lifetime of the contracts we are going to trade, the greater the distance between the prices of the two options; with the same strike, of course.

This phenomenon, too, can be explained in the same way: the longer the life of a contract, the more interest we would earn by putting the capital needed to purchase the underlying asset (less the premium) into a deposit account.

The Variability of Rho

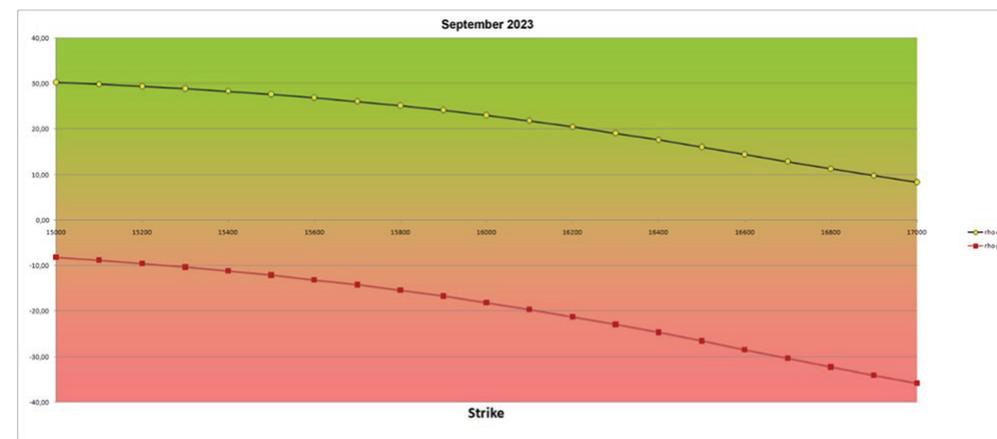
And now let us try to study more analytically the variability of this Greek as the underlying, time and implied volatility change.

To do so, we will resort, once again, to the methodology we have seen in the past: that of parametric curves. It is a methodology of analysis that I believe, from a visual point of view, is more effective than that based on three-dimensional graphs.

Rho as the Underlying and Time Vary

Short Deadline

Let's start by looking at how Rho varies as the underlying changes. Consider the value of the Dax spot, about 16,070, as of today, June 12, 2023, as the central value of our x-axis. Let the underlying vary from 15,000 to 17,000, about 6% above and below the spot. We calculate the Rho value, for each of those strikes, one for the call and the other for the put, based on the prices actually displayed by the market maker. This work we then replicate for three different maturities: about one month (July 2023), about three months (September 2023) and about six months (December 2023). And here is what we get for the first of these maturities (with r set to the current value of the one-month Euribor, 3.26%).



The curve with yellow dots represents the Rho of calls while, the one with red squares, is the Rho of puts. The first observation we make is that the Rho of calls is positive and that of puts is negative. This means that as the rate r increases, the price of calls increases and the price of puts decreases. In addition, the more OTM an option becomes, the lower the dependence on Rho becomes. Conversely, the more the option becomes ITM, the greater the dependence on Rho. This is the case for both calls and puts.

To fully explain this statement would require recourse to the B&S model and, in particular, to the formulas expressing the partial derivatives of the price of the call with respect to the rate r and the price of the put, again with respect to the rate r . In the first case we would see two opposing effects: one, the discount factor, which plays negatively; the other, the so-called S-process drift, which plays positively. It is then observed that the two effects, combined, give an overall positive result.

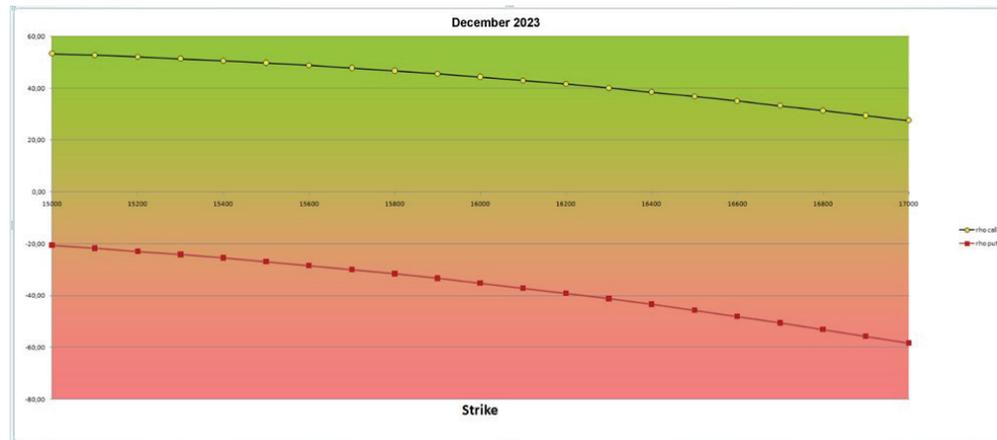
In the second case, however, a negative Rho is determined because the two effects act negatively.

In one of the next articles, if there is interest, we will address the study of such a model, in a strictly mathematical sense, tracing the steps that led Black, Scholes and Merton to the formulation of the same, which, a few years later (1996), opened the door for them to receive the Nobel Prize (which Fisher Black did not collect because, in 1995, his death had occurred).

For now, let us simply state that the more ITM the option, the greater the probability that this option will be exercised, thus becoming concrete the outlay of money to purchase the underlying asset.

Average Maturity

If we increase the contract duration to an (almost) quarterly amplitude, we see that the profiles of the two curves remain similar. The Rho curve of calls, however, has shifted upward. And that of puts downward: in essence, apart from the difference in algebraic sign, both Rho increase in absolute value. This is due to the higher cost associated with the interest rate, which, as we know, is commensurate with the term of the loan.

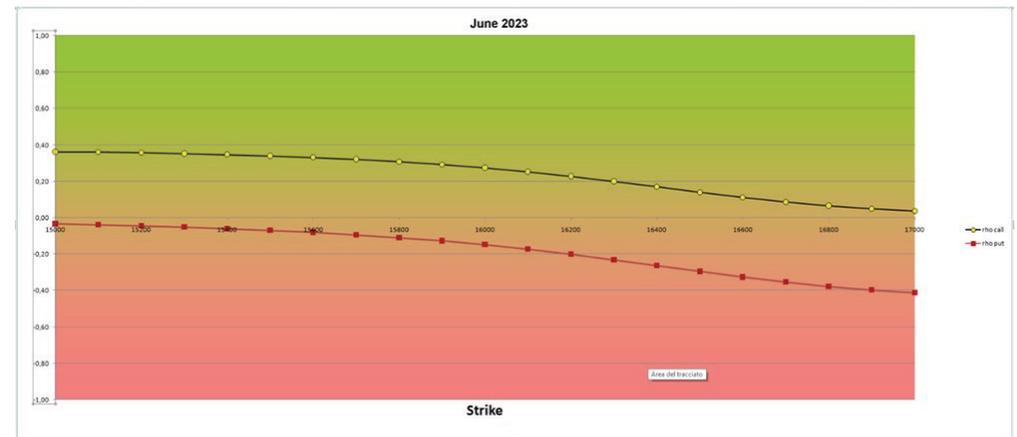


Long Expiration

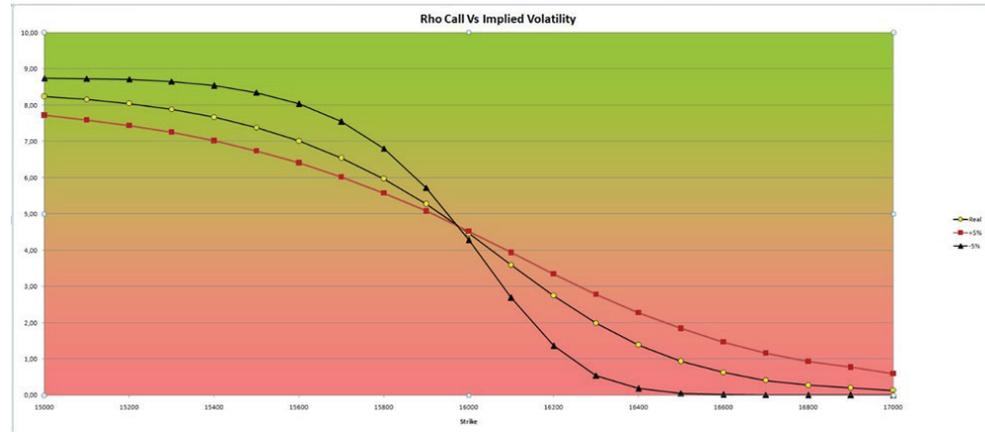
A further increase in the duration of the contract, reaching, in this case, an almost six-month amplitude, confirms what was already observed in the previous maturity: the profiles of the two curves continue to be similar to those of the short maturity. The Rho curve of calls shifts even more upward. And that of puts downward. The cost associated with the interest rate, in this case, is even more remarkable given the longer duration of the contract.

In conclusion, the closer the option gets to its expiration date, the lower will be the value of that Greek (lower, relatively, for the call and lower, in absolute value, for the put). In essence, looking at the last three graphs, we have to imagine that as the life time of the option contract decreases, closer and closer together will be the yellow dot and red square curves (just above zero, for calls; just below, zero, for puts).

To better understand this step, and because a picture is worth a thousand words, in the next graph, I have plotted the Rho curve of the call and the put expiring June 2023: these are basically contracts that are now only one day old!



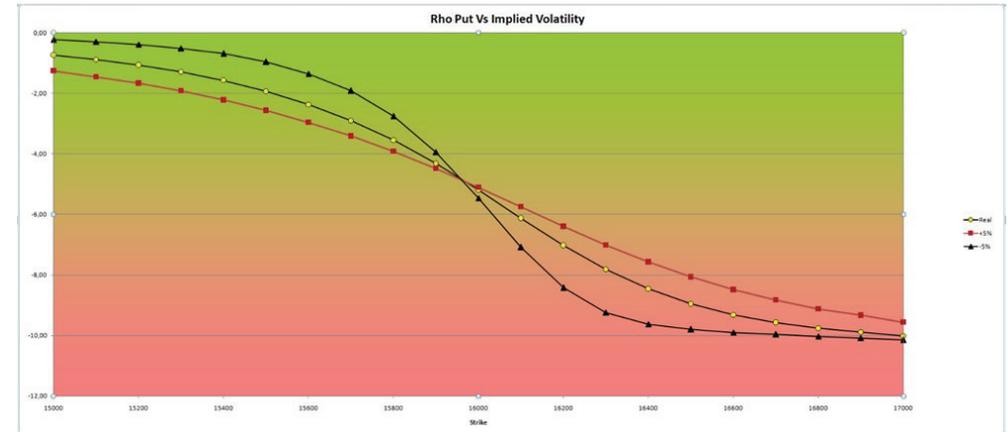
Rho as Implied Volatility Changes



What happens, to this Greek, if implied volatility varies? The above graph, yellow dot curve, shows the trend of Rho (call options), as the underlying changes, for the July (short) expiration, with the implied volatility at the time of writing (29/06/2023). If we increase the implied volatility by a percentage equal to 5%, Rho decreases for ITM options and increases for OTM options.

Whereas, if we reduce by 5%, the implied volatility, the trend of Rho reverses: it increases for ITM options and decreases for OTM options. The three curves, as can be seen from the graph, intersect at the atm strike.

The next graph, on the other hand, refers to the performance of Rho for puts, with equal maturity and similar increases and decreases in implied volatility. It should be remembered that, for puts, Rho is negative.



Conclusions

What can we conclude after a brief excursus on the characteristics of this Greek? Let's try to summarize what is written.

For Rho calls is positive and for puts is negative, meaning that if rates rise, calls will become more expensive and puts, on the contrary, will cost less.

These changes in option pricing, with current rate levels, are of little influence on short maturities; but, on long ones, they begin to be relevant. Therefore, if a strategy is set for the long term, it must be considered.

Moreover, in a scenario of rates that, after rising, begin to fall, those who will have purchased long-dated calls will find themselves doubly penalized:

- (1) by the descent of the r rate, which will negatively impact the call price;
- (2) from the fact that, as time elapses, the r rate applied will be lower and, this effect, too, will play negatively on the price of the call.

The Option Greek Rho continued

Education Lounge

For puts, on the other hand, reversing the reasoning, there are only advantages.

Of course, the buyer of options, whether call or put, will always have against the time decay of their price: but that is another story!

Until next time.



Bruno Nappini is the manager and co-founder of financial education website- Sunnymoney.it, Swindletrading.it, and TradingPro.it.

Following high school graduation, he pursued a degree in Political Science at the University of Siena. Over the years, he has garnered extensive expertise in risk management, specializing in the construction and oversight of portfolios involving options and futures on major European and American assets.

Bruno also collaborates with esteemed financial portals such as FinanzaOnline, Borse.it, and Finanza.com under the Brown Editori Group, along with Investing.com from the Fusion Media Group.

He is a sought-after speaker at conferences and workshops organized by financial institutions and industry publications, where he imparts wisdom as a mentor and as a Certified Coach recognized by the Italian University Centre and CSTA Professional SIAT (in accordance with Law no. 4 of 13 January 2013).



Prof. Mauro Perotti graduated in Physics in 1984 and in Educational Sciences in 1998, he held the chair of electronics and telecommunications in industrial technical education. He also held training courses for teachers.

His research interests as shown by the publications to his credit, range from finance to mathematics and computer science, from teaching to abstract games.

He has been involved in finance since the early 1990s, trading linear and non-linear instruments on his own.

He has been a guest speaker at various economics and finance conferences, presenting trading models for derivative instruments based mainly on statistical observations.

foreignths@libero.it

Razor Forex System: Backtesting and the Combination with Tendency Forex System

By YueWang, Department of G10 FX Trading and Research, Lino Capital, TianJin, China

Abstract

Objective

We back-tested and evaluated the Razor Forex System on G10 FX trading and the combination with the Tendency Forex System.

Method

Backtesting was done in eSignal Charting System with intraday historical data from 2010. VBA programming was used to merge or split the exported backtesting data, which was divided into 4 groups: Tendency Forex system, Razor Forex system, Filtered Tendency Forex system (Filtered by Razor Forex System), Filtered Razor Forex system (Filtered by Tendency Forex System). SPSS 24.0 was used for statistical analysis. Python 3.11.4 was used to calculate the smoothness and the deviation degree of the Equity curve of different groups.

Results

Filtered Tendency Forex System has a higher return and lower Drawdown ($P < 0.05$) when Compared with Tendency Forex System, but the difference was not statistically significant when compared with the Filtered Razor Forex System ($p > 0.05$). Python Analysis showed that the deviation degree of the Filtered Tendency Forex System was a little lower than that of the Filtered Razor Forex System.

Conclusion

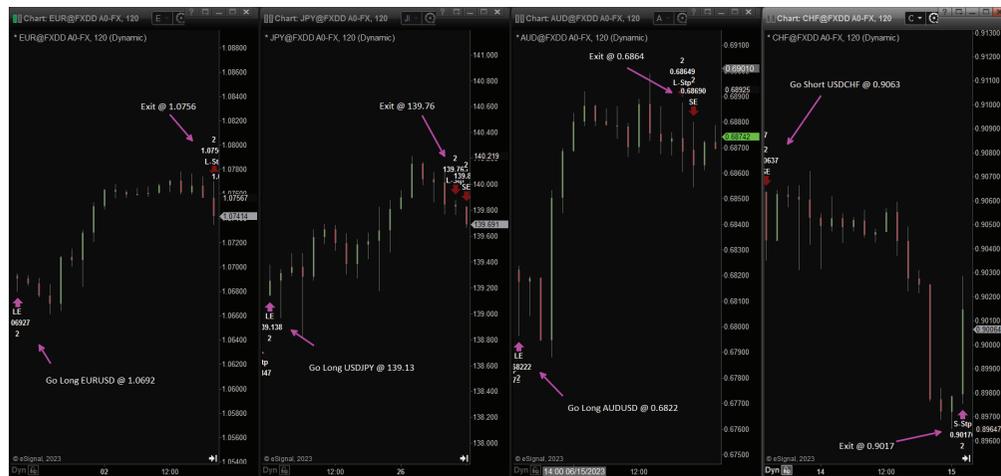
1. Tendency Forex system Filtered by Razor Forex System: The trading signal can be directly used in real-time trading.
2. Razor Forex system Filtered by Tendency Forex System: The trading signal can be used as a reliable back-testable indicator.

Key Words: Forex Trading Statistical Analysis Python VBA Programming

Introduction

The Razor Forex System was created with JavaScript in eSignal Charting System. It is an automated, back-testable, trend-following system^[1], working on EURUSD, USDCHF, AUDUSD, USDJPY 120 and 240 timeframes. The entry and exit signals can be directly flagged on the chart with audio and pop-up alerts.

Figure 1: Razor Forex System.



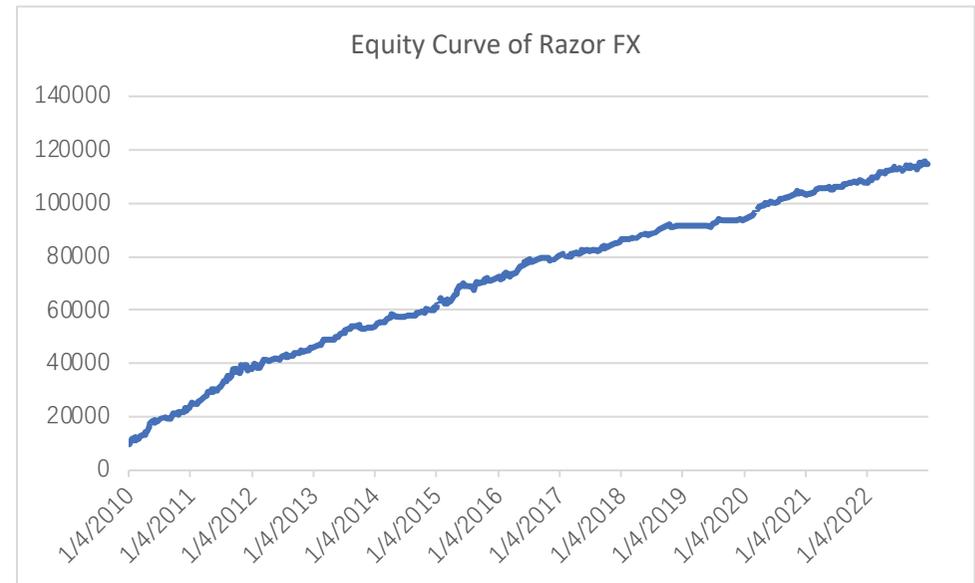
Material and Methods

Backtesting Conditions of the Razor Forex System

- Historical Data Feed: eSignal
- Period: From Jan. 2010 to Dec. 2022
- Initial Virtual Balance: \$10k

- Contract Size: Fixed 0.1 standard Lot per trade
- VBA Programming in Microsoft Excel 2019^[2-3] to merge or split the Exported Backtesting data

Figure 2: Razor Forex System: Merged Equity Curve of EURUSD, USDCHF, AUDUSD, USDJPY (Close to Close & End of the day)

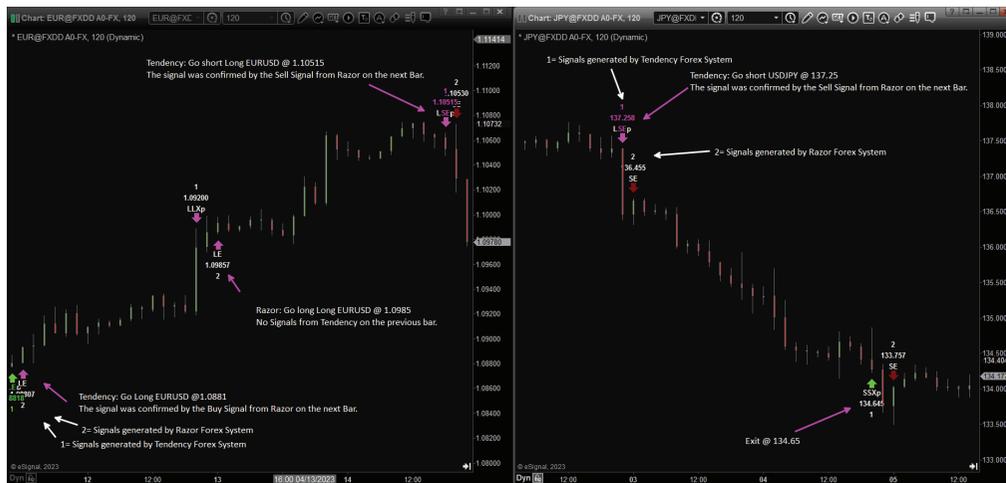


The Razor Forex System could be used independently for real-time trading. However, its original design was mainly to combine with the Tendency Forex System^[4] to complement each other in mechanism, so as to reduce Drawdown^[5-6] and enhance the stability.

For the Tendency Forex system, once a buy/sell arrow was flagged, if the Razor Forex system also generated a buy/sell arrow on the next bar, then the trading signal of the Tendency Forex system could be confirmed.

For the Razor Forex system, if we have no trading signal of Tendency Forex System on the previous bar, then the trading signal of the Razor Forex system could be confirmed.

Figure 3: Razor and Tendency Forex system Filtered by each other



Statistical Analysis Part 1

SPSS 24.0 was used for statistical analysis. The studies' parameters were displayed as Mean ± SD (Standard Deviation) for continuous variables. The comparison between the two groups was performed by t test^[7]. The comparison between multiple groups was performed by Paired Samples t- test^[8]. A P value <0.05 was considered statistically significant for all analysis.

Group 1: Tendency Forex system

Group 2: Razor Forex system

Group 3: Filtered Tendency Forex system (Filtered by Razor Forex System)

Group 4: Filtered Razor Forex system (Filtered by Tendency Forex System)

Table 1: Annualized Return of Different Trading Groups (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	6298	9211	6190	5978	4900	7033	8097	1432	4836	3073	7332	3113	5769	5635
Group2	13129	14592	8097	7848	7261	10736	8247	5765	5575	2657	9377	4398	6949	8048
Group3	9730	10221	6846	7366	6050	8215	9550	2282	5830	3846	7974	4329	8333	6967
Group4	11300	10750	5302	6681	5648	9563	6154	7515	3619	2082	3961	3956	6448	6383

Table 2: Annualized Drawdown of Different Groups (Close to Close) (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	1118	1116	1151	1189	893	1551	909	1233	771	774	742	1236	1270	1073
Group2	1006	2447	1549	1858	1110	2385	1636	1533	1041	1069	1260	1158	1876	1533
Group3	637	1050	865	968	789	1245	689	744	719	576	622	1028	855	830
Group4	573	1367	623	547	342	1143	644	493	544	421	1029	518	536	675

Table 3 Comparison of Quarterly Return Among multiple groups

Group	n	Before Filtered	After Filtered	t	P
Group 1	52	1408.87±1102.38	1741.80±1061.14	5.989	0.000
Group 2	52	2012.11±1540.15	1595.76±1045.49	3.440	0.005
t		2.189	0.569		
P		0.039	0.575		

In the Paired Samples t-test, to increase the sample size, we used Quarterly Return as the data source (n=4*13=52) for the statistical analysis. Due to the large amount of raw data, they were not included in this paper. If needed, please contact the author for further verification.

The results of group comparison showed that before filtering, the difference between the two groups was statistically significant (p=0.039<0.05). After filtering, the difference between the two groups was not statistically significant (p=0.575>0.05). The difference in the first group before and after filtering was statistically significant (p=0.000<0.05), while the difference in the second group before and after filtering was also statistically significant (p=0.005<0.05).

Table 4 Comparison of Annualized Drawdown Among multiple groups

Group	n	Before Filtered	After Filtered	t	P
Group 1	13	1073.30±240.40	829.83±197.28	5.966	0.000
Group 2	13	1532.79±493.60	675.38±305.93	8.766	0.000
t		3.017	1.530		
P		0.006	0.139		

For the observation of Drawdown, it is recommended to analyze it over a relatively long period. Using quarterly data may potentially divide some large Drawdowns into 2-3 small values, so we still use the annual Drawdown data for statistical analysis.

The results of group comparison showed that before filtering, the difference between the two groups was statistically significant (p=0.006<0.05). After filtering, the difference between the two groups was not statistically significant (p=0.139>0.05). The difference in the first group before and after filtering was statistically significant (p=0.000<0.05), while the difference in the second group before and after filtering was also statistically significant (p=0.005<0.05).

Python Analysis

Python^[9] 3.11.4 was used to calculate the smoothness and the deviation degree of the Equity curve of different groups.

Group 1= Filtered Tendency Forex System (Filtered By Razor Forex System)

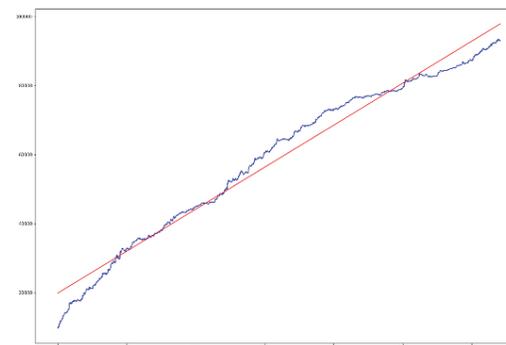
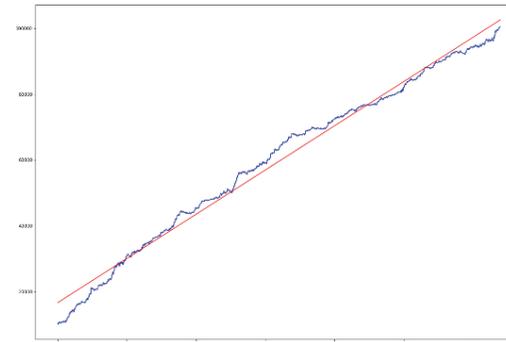
Group 2= Filtered Razor Forex System (Filtered By Tendency Forex System)

Table 5 The smoothness and the deviation degree of the Equity curve of Different Groups

Group	Smoothness	Deviation degree
Group 1	0.517521902377973	0.0546482910397301
Group 2	0.519650655021834	0.0602633158438454

The results showed that the Smoothness of both groups is very close, but the deviation degree of Group 2 is a little higher than that of Group 1.

Figure4: The Equity Curve of Different Groups in Python



Statistical Analysis Part 2

The method is the same as Part 1.

Group 1: Tendency Forex System

Group 2: Filtered Tendency Forex System (Filtered by Razor Forex System)

We compared the annualized return and drawdown of all the pairs in Group 1 and Group 2.

Table 6: EURUSD - Annualized Return of Different Groups (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	3498	1178	1617	-510	1695	3500	2355	486	2961	882	2154	1451	830	1700
Group2	4966	750	2316	595	2325	3817	2981	1015	2853	1060	2219	1585	1404	2145

Table 7: EURUSD - Annualized Drawdown of Different Groups (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	650	1297	712	1180	309	292	505	630	332	220	503	294	562	576
Group2	448	1195	668	835	309	300	418	459	210	216	387	292	495	479

Table 8: USDCHF - Annualized Return of Different Groups (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	501	4424	889	1104	823	1112	1176	424	1051	982	2163	617	1078	1257
Group2	1583	4635	1133	1433	1122	1554	1725	992	1227	1330	2170	870	2403	1706

Table 4: USDCHF - Annualized Drawdown of Different Groups (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	1059	628	834	698	318	934	756	785	979	533	302	517	868	708
Group2	613	628	499	492	270	856	598	563	753	434	255	269	411	511

Table 9: AUDUSD - Annualized Return of Different Groups (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	879	3734	2707	1795	1331	1563	1336	-306	304	502	2008	361	903	1317
Group2	1757	4603	2666	1528	1435	1505	1506	-182	894	518	2310	781	1360	1591

Table 10: AUDUSD - Annualized Drawdown of Different Groups (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	494	614	477	514	641	967	334	872	662	391	332	1570	718	660
Group2	370	359	347	462	465	916	318	718	494	352	310	1076	527	516

Table 11: USDJPY - Annualized Return of Different Groups (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	1420	-125	977	3588	1052	857	3230	828	521	706	1008	684	2958	1362
Group2	1424	234	731	3810	1168	1339	3337	458	856	938	1276	1094	3166	1525

Table 12: USDJPY - Annualized Drawdown of Different Groups (USD)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Avg.
Group1	373	1218	293	282	311	555	312	536	410	522	520	361	479	475
Group2	335	931	234	212	274	496	309	430	363	391	463	312	460	401

Table 13: Paired Samples t-test of all the pairs in Different Groups (USD)

		Group 1	Group 2	t	p
EURUSD	Return	1699.65±1183.81	2144.95±1280.93	-3.193	0.008
	Drawdown	575.78±334.13	479.39±277.87	3.463	0.005
USDCHF	Return	1257.32±1042.94	1705.85±985.07	-4.364	0.001
	Drawdown	708.36±239.50	510.79±184.95	4.827	<0.001
AUDUSD	Return	1316.65±1085.65	1590.88±1165.59	-2.793	0.016
	Drawdown	660.38±334.33	516.36±242.05	4.035	0.002
USDJPY	Return	1361.85±1144.29	1525.50±1149.15	-2.387	0.034
	Drawdown	474.93±244.69	400.66±182.81	3.711	0.003

The results showed that before and after filtering, the differences in each group were statistically significant (P<0.05).

Results

1. The results of Statistical Analysis Part 1 showed that:

1.1 Razor Forex System **VS** Tendency Forex System

Return was higher, but Drawdown was also higher, and the difference was statistically significant.

1.2 Filtered Tendency Forex System **VS** Tendency Forex System

Return was higher, Drawdown was lower, and the difference was statistically significant.

1.3 Filtered Razor Forex System **VS** Razor Forex System

Return was slightly lower, Drawdown was lower, and the difference was statistically significant.

1.4 Filtered Tendency Forex System **VS** Filtered Razor Forex System

Return and Drawdown were basically equivalent, and the difference was not statistically significant.

2. The Results of Python Analysis showed that the deviation degree of the Filtered Tendency Forex System was a little lower than that of the Filtered Razor Forex System, indicating potential higher stability.

3. The results of Statistical Analysis Part 2 showed that

in the Filtered Tendency Forex System, the Return of each currency pair was higher than that before filtering, and the Drawdown was lower than that before filtering, and the difference was statistically significant.

4. Considering the trading logic, the Tendency Forex System could identify potential trading opportunities earlier than the Razor Forex System. The system had been applied to Real-time trading for a long time without any logical expression bugs. The results of both Real-time trading and Backtesting were completely consistent regardless of profit or loss.

Therefore, the Filtered Tendency Forex System was selected as the preferred trading system, with the Filtered Razor Forex System as a supplement when necessary

5. Filtered Tendency Forex system: Detailed Backtesting Parameters in 13 Years

Fixed 0.1 Standard Lot per trade on \$10k Initial Balance.

Average Annualized Return: 6967 USD

Peak Close to Close Drawdown: 1244 USD (From Jan 22, 2015 to March 04, 2015)

Gross Win: 245272 USD

Gross Loss: 154699 USD

Profit Factor: 1.58

Winning Rates: 45.34%

Total Trades: 10119 (2235 Trades were Filtered out)

Expected Payoff: 8.95 USD

Table 14: Monthly Return During the Backtesting Period (USD)

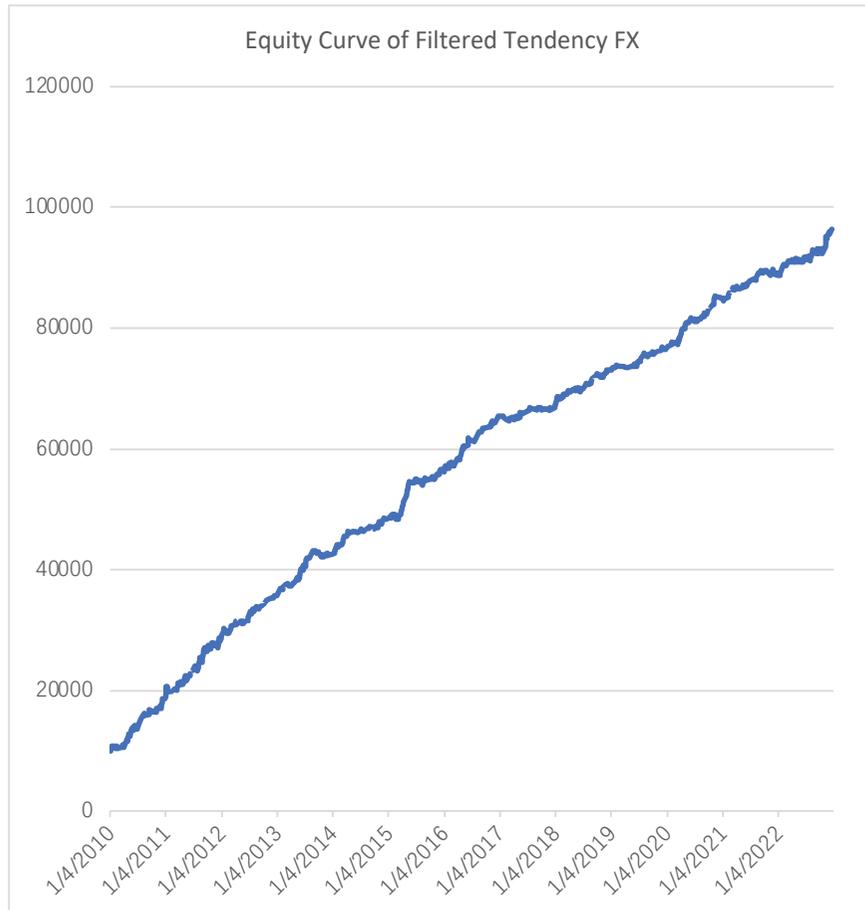
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan	601	880	1150	1291	1263	640	276	-154	937	353	492	337	1412
Feb	271	198	62	643	124	-653	449	-430	617	238	490	1292	299
March	22	1044	633	-130	1473	1877	1129	479	1056	57	966	169	371
April	1388	215	414	694	467	2667	1675	-91	92	88	1643	226	368
May	1629	395	172	1144	320	1224	186	1096	578	446	529	377	-186
June	436	1298	1235	1702	-15	316	773	406	-63	357	388	1017	411
July	1719	-75	1066	1142	369	-173	960	641	503	742	98	181	96
Aug	270	2712	-22	1197	320	512	879	-341	1017	188	523	990	1373
Sep	500	1455	584	-376	-208	334	486	10	555	524	1223	364	73
Oct	-27	1181	1069	-168	1502	-215	650	-97	-489	505	616	-172	973
Nov	898	-84	311	-179	79	750	1037	33	634	73	1129	224	1953
Dec	2025	1002	172	406	355	938	1051	732	393	274	-124	-676	1189
Total	9730	10221	6846	7366	6050	8215	9550	2282	5830	3846	7974	4329	8333

Figure 5. Peak Close to Close Drawdown (USD)

Peak		Trough		Drawdown
Time	Equity	Time	Equity	
2015/1/22	41272.59	2015/3/4	40028	1244.59

开始

Figure 6. Equity Curve (Close to Close & End of the day) (USD)



Discussion

1. Drawdown Control

In this article, VBA Programming in Microsoft Excel 2019 was used to calculate the Peak Drawdown. As eSignal does not support Backtesting of multiple symbols and multiple timeframes at the same time, we can only get the Peak close to close Drawdown. However, according to the data of every symbol, the peak floating Drawdown was 1.2-1.4 times of peak close to close Drawdown, no higher than 1.5 times. The highest peak close to close Drawdown of the Filtered Tendency Forex system was 1244 USD. We assume the peak floating Drawdown is 1866 USD (1.5 * Peak DD).

Compared with the Average annualized return (6967 USD), the Risk-Reward is nearly 1:3.7.

2. Multiple Timeframes

How to identify potential inflection points on different timeframes in an early stage is an eternal theme for traders.

The Tendency Forex System and Razor Forex System have highly quantified many classic indicators. From the Logic perspective, if combining the chart patterns^[10] on the daily timeframe^[11-12], the effectiveness will be even better. For example, if a sell signal was flagged after a bearish key day reversal or a rising wedge with downside resolved, it should be a highly convincing trading opportunity. We could increase the volume if necessary.

3. The Change of Return

Starting from 2016, the annualized return in backtesting has shown a pattern of “slightly higher in one year, slightly lower in the following year”. This may be related to the changing rhythm of the market (clear trend in one year, consolidation in the next year). Therefore, starting from any time point, measuring the performance of the trading system on a 2-year cycle is more appropriate.

4. Over-Optimization

No over-optimization in both Tendency Forex System and Razor Forex System. All the indicators are working with default settings.

In order to pursue the results of backtesting one-sidedly, some indicators of the trading system are over-optimized, resulting in a “high degree of fit to historical data”, which is one of the important reasons why many trading systems are eventually eliminated.

5. Futures and Other Symbols

The Filtered Tendency Forex System can also work well on Gold, Silver, Oil, USDCNH, Euro Futures, Australian Dollar Futures, Swiss Franc Futures, Japanese Futures. However, they are not included in my Spot Forex trading portfolio. This topic is also not discussed in this article.

Conclusion

1. Tendency Forex system Filtered by Razor Forex System: The trading signal can be directly used in real-time trading.

2. Razor Forex system Filtered by Tendency Forex System: The trading signal can be used as a reliable back-testable indicator.

Limitation

1. It is advisable to explore strategies for Cross-Pairs, such as AUDNZD, EURGBP, and fully hedge the risk of the US dollar when necessary.

2. Both Tendency Forex System and Razor Forex System are created from the technical perspective only.

If combined effectively with fundamental analysis, we can gain a better and more comprehensive understanding of the market.

The fundamental views require confirmation through technical analysis; otherwise, the results of fundamental analysis are likely to be incorrect. The technical views require

support from fundamental analysis; otherwise, they could be false signals or the trend could not develop well.

Acknowledgments

I am extremely grateful to my wife, Flora ZH. The process of learning trading has been exceptionally challenging, and the path to making a living through trading has been filled with obstacles. However, what has remained constant is her encouragement and trust in me.

I am deeply thankful to my parents. Our family was very poor when I was young. However, they not only taught me through their words and actions in order to shape me into a person with a strong sense of justice and integrity, but also they financially supported my education and life through pinching and scraping. Besides, they encouraged and developed various interests for me, enabling me to acquire not only a wealth of knowledge but also the ability to learn and absorb various types of knowledge. Ultimately, I became a trader from a surgeon.

Finally, I express my gratitude to all those who have supported and helped me all these years.

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Razor Forex System continued

Education Lounge

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Yue Wang, born in 1973, is the Founder of Tendency Forex and Lino Capital. He holds a Master's Degree in Hepatobiliary Surgery, and became a full-time trader in 2010..



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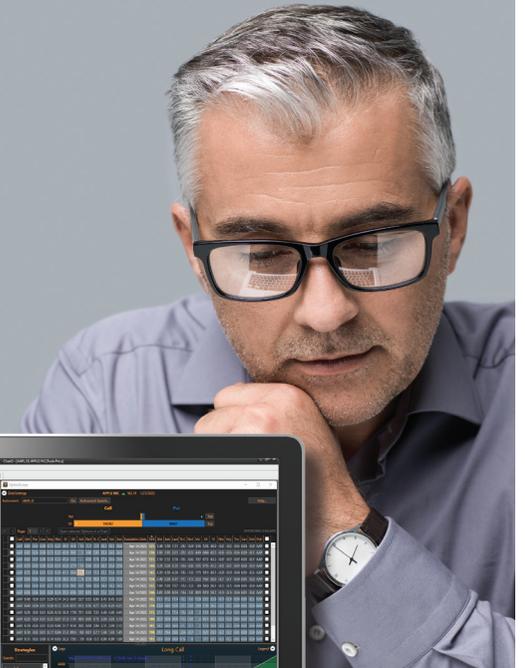
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Dr. Edzard Wiener holds a master's in physics and a PhD in medicine, specializing as a Senior Physician in Neuroradiology with a significant focus on artificial intelligence, computer vision, and neuroscience. Since 2018,

Dr. Wiener has established a specialized position for himself in the field of technical analysis. He offers a unique mix of academic and practical expertise in physics, neuroscience, and trading. He has investigated various aspects of market behavior, data science, artificial intelligence, and neural networks. His intense involvement in exploring the synergy between data science and trading has not only expanded his professional horizon but also contributed extensively to his success as a private trader over the past five years. He is recognized for merging traditional trading methodologies with cutting-edge AI and data analysis, thereby fostering a blend of human and artificial intelligence in understanding market movements. His innovative indicators offer promising avenues for understanding and predicting significant price movements. In 2022, Dr. Wiener obtained the Certified Financial Technician (CFTe) designation and further strengthened his credentials in 2023 by acquiring the Master of Financial Technical Analysis (MFTA), underscoring his profound expertise and commitment in technical analysis.

Calendar-at-a-Glance

Date	Topic	Host	Speaker	Location	Time	Contact
Monthly	Monthly Meetings are held monthly in nine cities across Australia. All monthly meetings are free to members. Visitors are welcome to attend. Bookings are not required. Visitors are welcome, first visit free.	ATAA	Varies	Varies, or online	Varies	ataa.asn.au/
Monthly	Meets monthly on second Tuesday and fourth Thursday	CATA	Varies	Via Zoom	8:00 PM US Eastern Time Zone	canadianata.ca/
Monthly	Presentations from local and international speakers on a comprehensive range of topics (e.g., sharemarket, CFDs, options, futures, FOREX trading, methodologies, money management, psychology).	STANZ	Varies	Varies, or online	Varies	stanz.co.nz/
Monthly	Monthly Meetings & Events: The STA holds monthly meetings in London, usually on the second Tuesday of every month, except for a summer break in August.	STA	STA Varies One Moorgate Place, Chartered Accountants Hall, 1 Moorgate Place, London	Online or One Moorgate Place, Chartered Accountants Hall, 1 Moorgate Place London	Varies	www.technicalanalysts.com/meetings/

2024

Jan	<i>No events scheduled for January at this time</i>					
Feb	28	<i>Registration deadline for CFTe II on 11 April 2024</i>				
	15	IFTA Update submission deadline for all news content (mid-March release)	IFTA	NA	NA	admin@ifta.org ; www.ifta.org
	28	Master of Financial Technical Analysis (MFTA), Alternative Path, Session 1 application deadline	IFTA	NA	NA	admin@ifta.org ; www.ifta.org
Mar	4	<i>STA (UK) Diploma, Part 1 Examination</i>				
	15	Master of Financial Technical Analysis (MFTA), Session 2 paper deadline	IFTA	NA	NA	admin@ifta.org ; www.ifta.org
	20	IFTA Webinar: An Alternative to Candlestick Charts	IFTA	Kevin Bull	NA	2:00 PM US Eastern Time Zone admin@ifta.org ; www.ifta.org
Apr	11	Certified Financial Technician (CFTe) Level II Examination	IFTA	NA	NA	admin@ifta.org ; www.ifta.org
	16	Technicals to Trading Systems Conference 2024—From Classic Charting to AI Developments	STA	Varies	1 Moorgate Place, London EC2R 6EA	09:00–17:30 BST www.eventbrite.co.uk/e/technicals-to-trading-systems-conference-2024-tickets-737017117037?aff=oddtcreator
	25	<i>STA (UK) Diploma, Part 2 Examination</i>				

May	1	Certified Financial Technician (CFTe) Level II - registration opens for October examination through IFTA website.	IFTA	NA	NA	NA	admin@ifta.org ; www.ifta.org
	2	Master of Financial Technical Analysis (MFTA) Session 1 application, outline and fees deadline	IFTA	NA	NA	NA	admin@ifta.org ; www.ifta.org
	15	IFTA Update submission deadline for all news content (mid-June release)	IFTA	NA	NA	NA	admin@ifta.org ; www.ifta.org
Jun	<i>No events scheduled for June at this time</i>						
Jul	1	STA (UK) Diploma, Part 1 Examination					
	31	Master of Financial Technical Analysis (MFTA) Alternative Path, Session 2 application deadline	IFTA	NA	NA	NA	admin@ifta.org ; www.ifta.org
Aug	15	IFTA Update submission deadline for all news content (mid-September release)	IFTA	NA	NA	NA	admin@ifta.org ; www.ifta.org
Sep	5	STA (UK) Diploma, Part 2 Examination	STA	NA	Zoom	To be announced	www.technicalanalysts.com/education/sta-courses/#course2-details
	12	Registration deadline for CFTe II on 24 October 2024	IFTA	NA			
Oct	2	Master of Financial Technical Analysis (MFTA), Alternative Path, Session 2 application deadline	IFTA	NA	NA	NA	admin@ifta.org ; www.ifta.org
	15	Master of Financial Technical Analysis (MFTA), Session 1 paper deadline	IFTA	NA	NA	NA	admin@ifta.org ; www.ifta.org
	19	Certified Financial Technician (CFTe) Level II Examination via Zoom	IFTA	NA	Zoom	To be announced	admin@ifta.org ; www.ifta.org
	20	STA (UK) Diploma, Part 2 Examination	STA	NA	Zoom	To be announced	www.technicalanalysts.com/education/sta-courses/#course2-details
Nov	15	IFTA Update submission deadline for all news content (mid-December release)	IFTA	NA	NA	NA	admin@ifta.org ; www.ifta.org
Dec	<i>No events scheduled for December at this time</i>						



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 EGYPT—ESTA Egyptian Society of Technical Analysts www.estaegypt.org
 FRANCE—AFATE Association Française des Analystes Techniques www.afate.com
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*Developing Society

IFTA Update Schedule

The *IFTA Update* is the quarterly electronic newsletter of the International Federation of Technical Analysts, reaching more than 7,000+ IFTA colleagues worldwide. The *Update* is an efficient and cost-effective way to communicate with IFTA's member societies and colleagues.

PUBLICATION SCHEDULE

March Issue.....	All content due February 15
June Issue.....	All content due May 15
September Issue.....	All content due August 15
December Issue.....	All content due November 15

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