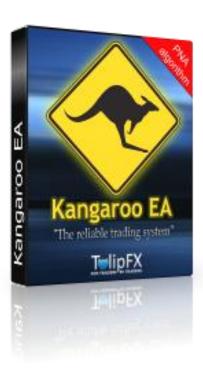
KangarooEA v5 White Paper



February 2011

All backtests referenced in this whitepaper can be downloaded in full from here:

http://tulipfx.com/downloads/Kangaroo_v5_backtests.zip

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KANGAROO EA TRADE LOGIC

The KangarooEA began its development with a simple objective:

Develop an automatic trader which trades in a similar manner to how a professional trader would trade.

And so our project was born. In short, our goal was to design an EA that trades following 3 major, but simple rules:

- 1. Always trade with the trend
- 2. Enter the market on a pullback or retracement
- 3. Avoid trading around major news announcements

To identify a trade Kangaroo uses a complex quantitative algorithm. To put it simply, Kangaroo successfully makes its trade decisions based on modelling the behaviour of recent price history. In its calculations Kangaroo judges the quality of a trend using two factors:

- Determine strong trend
- Calculate the probability of trend continuation

In basic terms KangarooEA is looking for a continuous trend with a rather steep slope. When it finds a strong and continuous trend, Kangaroo will look for a pullback before entering the trade in the same direction as the trend.



An illustration the trade logic can be seen in the graph below. Kangaroo observed a strong upward trend which continued for an extended period of time and then entered the trade on the pullback, expecting the trend to continue.



The first trade reached TP. As the trend continued, Kangaroo entered another long trade a bit later. However, this time the trend became flat and the EA took the opportunity to exit the position at break even after identifying that the trend did not continue.

Another example follows below. Again we see a strong trend identified. The KangarooEA took a trade on the pullback which very quickly went to profit.



The trend continued, and Kangaroo took another long trade, however the market continued in a sideways direction. However, the Kangaroo algorithm did not judge the trend was over, so Kangaroo entered a second long position, which shortly thereafter resulted in both trades closed for a collective (basket) profit.

After the second profitable trade, the market started moving sideways again. Kangaroo recognised the end of the uptrend and stayed out of the market.



This third example is probably the most interesting example of how Kangaroo is able to "correct" itself when a sudden trend change occurs.

In the example below, KangarooEA determined a strong upward trend and entered a long position. The price continued in the trend direction, but stopped just short of the take profit (TP) before reversing strongly.



Kangaroo recognised the trend had reversed and closed its open long trade at a loss, At the same time, however, Kangaroo opened a trade in the opposite direction (short). Moreover, it placed a pending sell order above the market looking to catch a correction, should it occur. In this case there was indeed a



correction, the pending order was opened and the downtrend continued. Finally, the two short positions closed at a profit which more than covered the loss on the long trade and as a result provided an overall profit for all trades taken in this sequence.

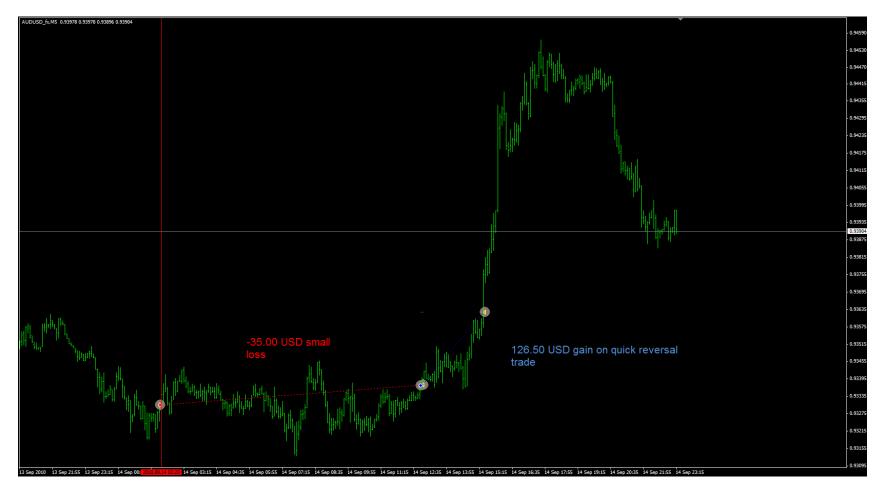
Here is another example of a trend reversal trade taken by the Kangaroo.



This time the pending order was not needed and the single reverse trade gained extra profits to more than make up for the previous long trade's loss.



Last, a final example in monetary terms to illustrate how the reversal trade makes up for the previous trade's loss. Kangaroo entered a short on a pullback, only to see that after some sideways price action, there was a trend reversal. Kangaroo closed the short for a small loss and immediately opened a long, hitting TP and yielding an overall nice profit.



Version History and the Proactive News Avoidance Algorithm

The KangarooEA has been extensively tested, both on historical data and forward live testing. The project started over a year ago and the "official" release version offered by TulipFX is version number 3.

Although we've witnessed Kangaroo picking high-probability trades and even if there was a trend reversal, Kangaroo would recover very fast, we did find that during forward testing and running on our live accounts, KangarooEA v1 got into potential difficulty if it took trades around the time of significant and important news announcements such as interest rate decisions, unemployment rates and consumer confidence numbers that could impact the current trend of the AUDUSD pair.

Feeling that it wasn't enough to blindly add news events to filter out in forward testing with confidence, TulipFX set about creating a unique news testing filter that we labelled "Proactive News Avoidance Algorithm" (or PNA for short). Thus we proceeded to create a database of every currency news event for the past 4 years.

When backtesting the KangarooEA with the PNA module installed, we could have the EA avoid upcoming news announcements as the test progressed, just as it would in live, forward operation.

With the development of the PNA, we were now able to ensure that the KangarooEA successfully <u>avoided opening trades too close to important news</u> announcements. Moreover, it allowed us to test precisely which **specific types of news** events could result in potential loss trades.



This made the KangarooEA much smarter. We found that every loss that the KangarooEA had over the past four years was due to major news announcements. And this makes a lot of sense. Nothing will change the trend of a currency like an unexpected interest rate change or unemployment figures. Not only had we proven that the KangarooEA was safe to trade if avoiding these important news events, but we could also determine which news events had the ability to dramatically change the trend of the currency.

Many hours of testing specific news events allowed us to have every confidence in the performance of the EA going forward. We could now run the EA on our accounts without having to be concerned whether we should shut it down for important upcoming news or not, as Kangaroo would now manage that for us automatically.

The KangarooEA with PNA module was v2. It proved successful and after performing well on our personal accounts we decided to investigate a public release of the EA.

With the EA almost ready for its release, we decided to put the KangarooEA through a few more very stringent tests to ensure it would be indeed safe enough for everyone to operate. While conducting these tests we came up with a small change in its trade logic. The calculations were tweaked ever so slightly and combined with the new PNA news avoidance technology we found to our pleasant surprise that we could reduce the stop loss from around 130 pips down to 60, while retaining the same take profit amount. This increased profitability even more while further reducing drawdown.

Because we needed to verify this new finding we had to delay the launch of KangarooEA (and the release of this whitepaper analysis) while we ran test after test. Yes – we decided; we had found a way to reduce the stop loss without increasing losing trades or reducing overall profitability.



This version was KangarooEA v4.1, released to the retail forex market in December 2010

We weren't done yet though. Investigating if the KangarooEA logic could be turned to other pairs we set to testing and refining the KangarooEA. The pair which offered the most promise was the EURUSD. This new pair had characteristics that were slightly different from those of the original AUDUSD pair, but with some tweaking of the trade management logic and a few other minor changes, we found the KangarooEA could profitably trade a second pair.

This is great news! Effectively we have been able to double the profits which our clients can make from the KangarooEA system. Of course we couldn't release the new pair immediately, as to release an EA takes a lot of testing. After exhaustive backtesting, forward testing and testing on our personal accounts we have announced that TulipFX has successfully programmed the KangarooEA to run on both the AUDUSD and the EURUSD.

When working towards refining KangarooEA for the new EURUSD pair we learnt a couple of nifty tricks, which we have incorporated into the original AUDUSD pair too. So not only is KangarooEA v5 able to now run on two pairs, it also has improved trade management logic on its original AUD pair also!

Is it possible for the KangarooEA to run on more pairs? Perhaps. We will continue to test, but we cannot promise anything. It would be nice to have another pair to announce to our clients at some point in the future, but honestly we just don't know.

KangarooEA v5 is our latest version. As you can tell from our development description; KangarooEA has taken us thousands of hours of development, testing, coding, more testing, inspirational moments, more testing, ideas which didn't work, more testing and months of forward observation of the different versions to bring you our latest version of KangarooEA v5.



Historical Testing Results and Analysis

In this section we'll dive into backtesting Kangaroo. First we'll show "regular" backtests using Metaquotes data and show why we believe this method is only useful for obtaining a very "generic" profitability assessment of any EA.

Then we'll move on and show what happens when Kangaroo is tested using actual tick data and show these results in a more realistic performance profile.

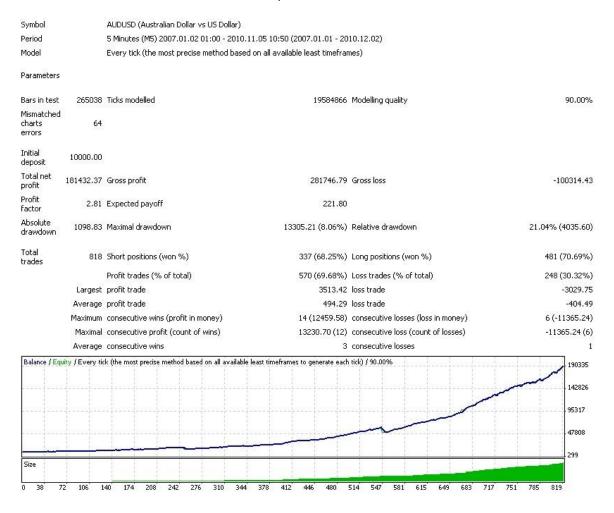
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90% backtest (Metaquotes data) - and the issues of Metaquotes data

Below you will see the test result using Metaquotes data from a GoMarkets account from 2007 till the start of November 2010. The starting balance of \$10,000 results in a final balance of \$191,432 after a little less than four years.

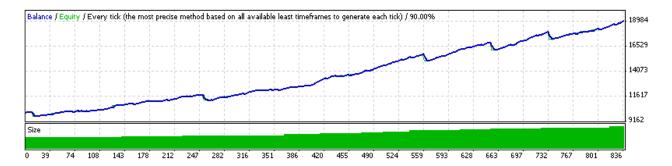


Some figures of note include:

- Return of 1,814%
- Maximum (relative) drawdown of 21%
- Profit factor of 2.81
- Average profitable trade of \$494 vs. Average loss trade of \$404

The first thing to point out is that this test is run with the maximum recommended risk factor. TulipFX does not like losing money, and neither should you. The maximum drawdown of 21% should be the highest risk that should be taken. Money Management is available in the EA and you can select the risk you wish to take on your account.

If you choose a conservative money management setting the results on 90% Metaquotes data looks like the following:



Reducing the drawdown to 5.30% the result since 2007 is reduced to 90% return because of smaller lot size and less compounding of returns. If you had a large account, small tolerance for risk and the KangarooEA was one of many EAs run in your portfolio, then this would be the recommended setting. If KangarooEA is run on a smaller account, with higher risk tolerance and as the only EA then the high risk setting could be used to maximise profits.

Metaquotes data has a number of limitations however. Many traders comment on the inaccurate modelling of Metaquotes data due to interpolation within the 1 minute data candles. This is true, but in Kangaroo's case however, there is an even larger issue.

The historical data a MT4 platform uses contains time inconsistencies. Different brokers have different GMT offsets. Different Metaquotes data shifts at different times of the year due to daylight saving shifts.



The interpolation and time issues add up to substantially reduce the quality of the backtest. In the above backtest, the Proactive News Avoidance Algorithm does not identify news correctly because of the data's time shifts over the course of the year. So while it gives an indication of trading performance it is not an accurate representation of historical performance.

For a true test we need to use actual tick data. Tick data contains many more data points increasing the accuracy of modelling to almost identical to live trading.

The true tick data is also arranged in a constant time throughout the year. It is always GMT+0. The data is not moved for daylight saving or GMT offsets. This is absolutely vital when we are testing KangarooEA with the PNA Algorithm. The PNA needs constant time so it can match up with its database of news events.

The difference is marked. The losses in the above testing are due to this time differential. The PNA misses the news announcements because of time changes within the Metaquotes data. For example the database says to expect unemployment news at 00.30 GMT. The time changes within the Metaquotes data however means that the time of the news on its historical charts does not match the database, and the news will occur at a time not expected during testing, invalidating the results.

In conclusion, testing on historical <u>tick data</u> is the <u>only</u> way to be able to use historic performance as the most reliable proxy for future results.

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99% backtesting with tick data (Dukascopy)

On the next few pages we show several "true backtests" using 99% modelling quality tick data. As can be observed, the news avoidance works correctly and the KangarooEA avoids losses which occurred on the poor quality Metaquotes data shown above.

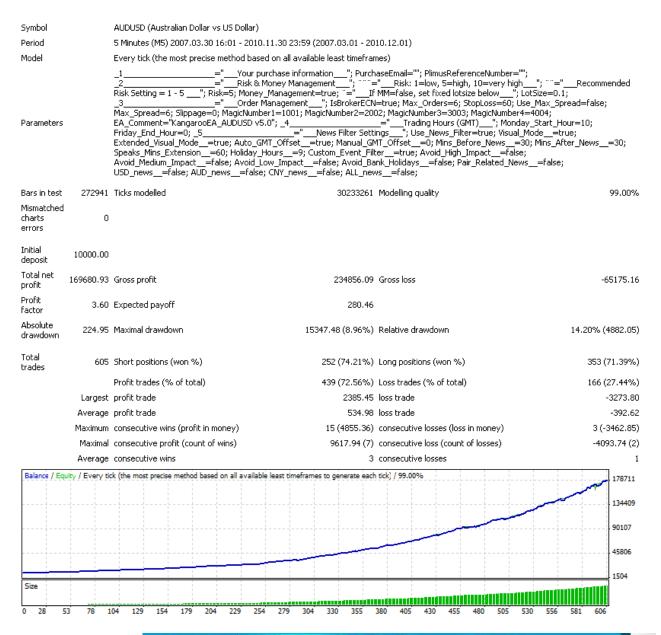
The tests start with the first data available from Dukascopy (April 2007). Previously, when testing the true tick data had to be divided up into years to allow for limitations in the MT4 platform's operation. However an update to the method of testing 99% tick data now enables a single backtest from April 2007 all the way through to the end of 2010.

There are two tests to conduct, the tests for KangarooEA on the AUDUSD and the tests for the KangarooEA on the EURUSD.

Historical testing KangarooEAv5 AUDUSD

As can be seen below, the PNA works correctly with the constant GMT offset, with KangarooEA suffering no major losses (hitting SL) from 2007 to the end of 2010. Average profitable trade is greater than the average loss trade and the profit factor is 3.60. The EA does not trade often, but when it does it is highly efficient at closing out its positions for an overall profit.







The return since 2007 would have been 1,696% - resulting in a balance more than 17 times the initial deposit.

KangarooEA copes with the volatile 2008 Global Financial Crisis market exceptionally well and offers confidence that it will continue to handle challenging markets in the future with safety.

For all four years displayed above the KangarooEA suffered no overall loss on its positions.

There is no curve fitting, no tricks. It simply sticks to the same rules of trading with the trend after a pullback while avoiding important news announcements.

Running Kangaroo from April 2007 till December 2010 on the AUDUSD, the return on investment would yield a staggering 1,696%.

This is during a time of great financial turmoil, falling stock markets and volatile markets.



Historical testing KangarooEAv5_EURUSD

After a lot of work we are proud to present the results of the KangarooEA on the new pair EURUSD. Just like on the AUDUSD pair, the KangarooEA on the EURUSD suffers no series loss from April 2007 to the end of 2010. **The EA does not trade often, but when it does it is highly efficient at closing out its positions for an overall profit.**

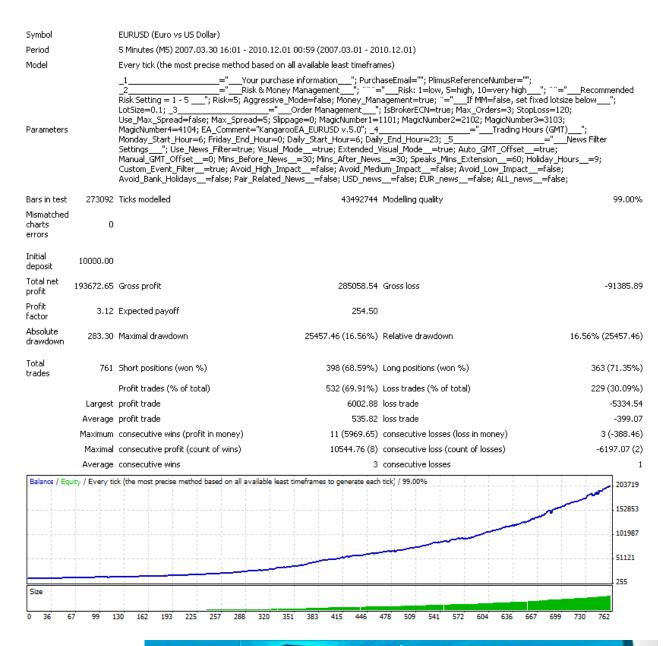
The EURUSD profit factor is 3.12 and like the AUDUSD pair its average profitable trade is larger than the average loss trade.

Maximum trades on the EURUSD pair is set to 3. On the AUDUSD pair the maximum trades in a series is 6.

Stop loss on the EURUSD pair is 120. On the AUDUSD pair the stop loss is 60.

The drawdown risk is about even on the two pairs because the differences in stop loss and number of trades evens the total risk.





The return since 2007 would have been 1,936% - resulting in a balance more than 20 times the initial deposit.

KangarooEA copes with the volatile 2008 Global Financial Crisis market exceptionally well and offers confidence that it will continue to handle challenging markets in the future with safety.

For all four years displayed above the KangarooEA suffered no overall loss on its positions.

There is no curve fitting, no tricks. It simply sticks to the same rules of trading with the trend after a pullback while avoiding important news announcements.

Running Kangaroo from April 2007 till December 2010 on the EURUSD, the return on investment would yield a staggering 1,936%.

Once again, this is during a time of great financial turmoil, falling stock markets and volatile markets.

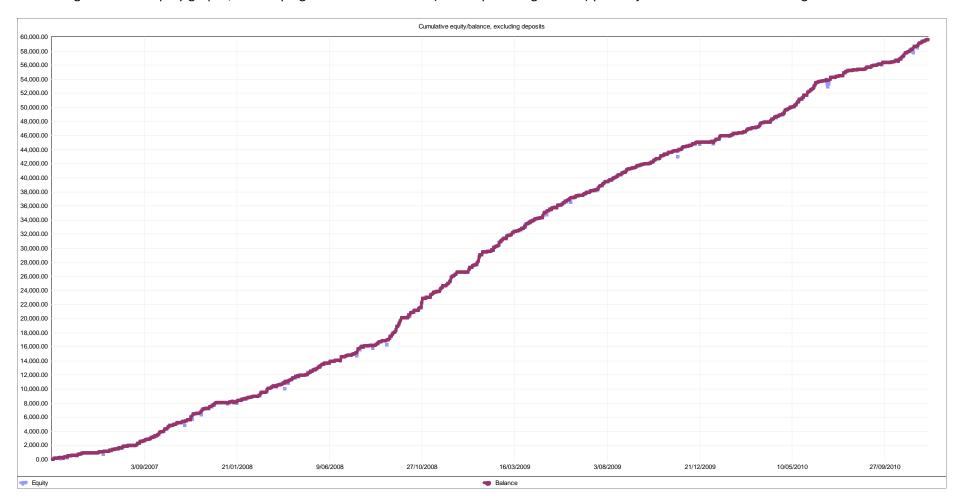
TulipFX is extremely proud to present these high quality tests to you because it has taken a lot of hard work to create the KangarooEA and we feel it is peerless in its ability to take consistently well thought out trades over many years resulting in regular profits while avoiding any major losses.

These tests were done separately on each currency as MT4 does not allow multicurrency tests to run at the same time. The two results compounded only on their own returns. Using rough Excel calculations if the account was combined and each pair compounded on both pair's profits the \$10,000 account would have grown into about \$2.3 million. The power of compounding returns is enormous and if we can help our clients get even half way close to that they should be very happy!



Monte-Carlo simulation & analysis

Combining the above equity graphs, but keeping the lot size constant (no compounding returns) proves just how consistent the KangarooEA is.



The lot size throughout this graph is the same; it is 0.5 lots and does not increase in line with the account balance. Both AUDUSD and EURUSD trades are included in this balance (red) and equity (blue) line.

The slope is fairly constant, however you can see periods of time where the line flattens off, and other periods where it rises rapidly. How many trades the

The slope is fairly constant, however you can see periods of time where the line flattens off, and other periods where it rises rapidly. How many trades the KangarooEA takes depends on the market.

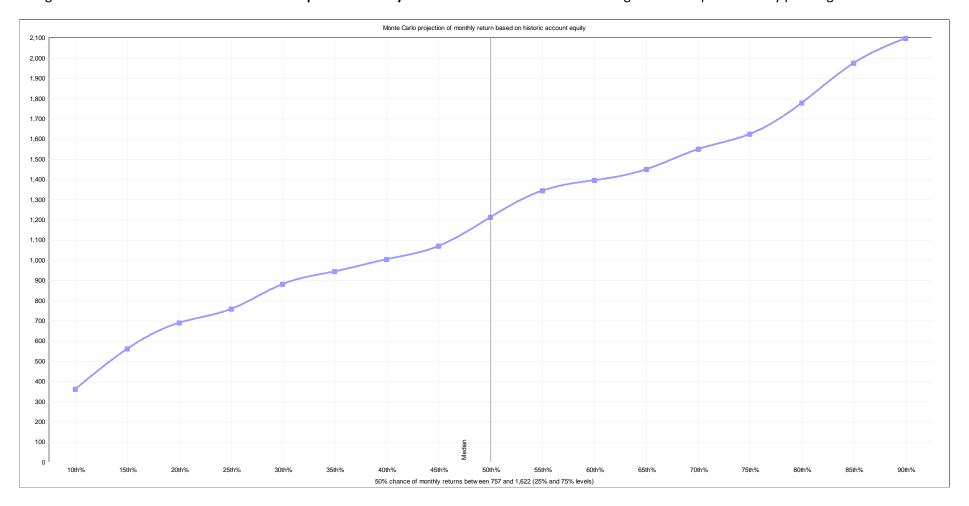
There will be slow weeks, and there will be busy weeks.

What is important is the KangarooEA is patient and smart with its trades.

After almost 4 years of consistent results using the same settings the KangarooEA should continue well into the future providing consistent growth on your account.



Using a Monte-Carlo simulation to determine expected monthly returns over the two currencies using 0.5 lot size presents very pleasing results.



This graph shows the probability of achieving various amounts of profits over the course of the month (based on 0.5 lot size – which is default money management for a \$10,000 account).

The median expected return is greater than 12% (\$1,200) a month.



There is a 50% chance that returns between 7.57% and 16.22% will be returned over the course of a month.

There is a small chance (10%) that the month will be a quiet one for trading and returns will be 3.6% or less, but also a 10% chance that the KangarooEA could have a bumper month and bank almost 21% in profits.

Why are we releasing KangarooEA to the public?

The very justified question often posed is 'Why release a profitable system to everyone? Would it not make sense to keep it for yourself?'

Answering that valid question depends on the answer to this question - 'Will the system become unprofitable if many people are trading with it?'

If we can be confident that by releasing this EA to be used widely by traders it will not make our own trading of the KangarooEA unprofitable then there is no reason why we should not. If we lose nothing on our own trading of the system but can gain revenue by allowing others to use the KangarooEA then it makes sense to allow others to profit from its use.

A win-win situation where we are rewarded for our thousands of hours of toil while the public get access to a reliable and profitable EA which should earn them well above the cost asked by TulipFX for the right to have it trade on their accounts.

We are confident that the EA will not decrease the profitability of our own accounts because of three important reasons:

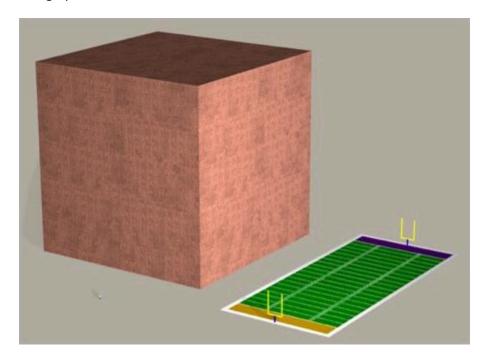
- 1. The FX market is HUGE
- 2. KangarooEA trades during times of high liquidity, around the clock
- 3. The EA trades on two of the most popular currency pairs

But just how big is the forex market?

According to the Bank for International Settlements, as of April 2010, average daily turnover in global foreign exchange markets is estimated at \$3.98 trillion per day.



How much is \$4 trillion dollars? It is a huge number which is so big it is hard to comprehend. If \$100 dollar bills were stacked up to form a pile of cash worth \$1 trillion dollars it would look similar to the graphic below:



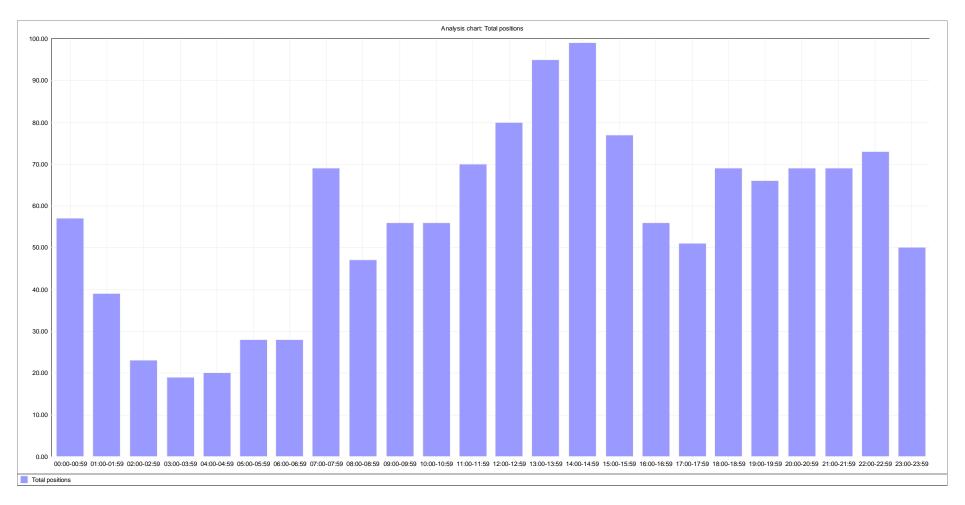
Four times this pile of cash is traded each day.

With so much money in the forex market we are confident that releasing the EA will not dry up funds for us, or our clients to trade KangarooEA profitably.

Sometimes liquidity can be an issue when trading popular EAs. Prime examples are so-called "Asian scalpers" that trade when Europe is asleep, America has closed and Asia is yet to open. With all the big players out of the market during the period of 22:00 to 02:00 but many retail systems trading at this time widening of spread and slippage occurs. A blog entry on our site discusses this issue and we encourage you to read it if you would like more information on this discussion point. You can find it here: http://tulipfx.com/2010/09/23/from-ozzies-desk/

KangarooEA trades 24 hours a day, however the majority of trades occur during the London and New York sessions.





Clients and ourselves will not suffer crowding out as positions are entered by the KangarooEA. Positions are taken all round the clock allowing us to provide KangarooEA to those who wish to take advantage of its trading system while not damaging our own trading profitability.

Being confident that releasing the system will not cost us trading profits, TulipFX will gain from purchase and subscription fees.



Pricing Kangaroo

We've debated a bit about this. We wanted a fair fee for our work, but did not want to charge high costs upfront.

So we decided to base our pricing on a monthly membership model with the following offer:

WE ARE OFFERING THE SYSTEM FOR €149 UPFRONT AND €30 A MONTH SUBSCRIPTION.

If you trade 0.5 lots your monthly profits historically would be on average greater than \$1200.

The Kangaroo subscription is equal to about \$40/mth.

If you were paying a money-manager 30% commission on profits that return would cost you \$360/mth.

For <u>one Euro a day</u> you are obtaining an automated system which took thousands of hours to create and test allowing you to set it up and profit from its operation in minutes. If you paid a team of traders, programmers and testers to develop the same system the costs would run into the hundreds of thousands.

You get the ability to use a system which would be worth hundreds of thousands to create because of two reasons:

- 1. It does not devalue the system to TulipFX or each individual client because the size of the market allows everyone to trade it effectively
- 2. By many people paying a small fee to use the profitable KangarooEA we receive a just reward for all the development effort taken

You gain, we gain. And we think that's fair.



The alternative would be to price the Kangaroo EA at a high price and charge no monthly fees. The cost for Kangaroo without a monthly subscription is 1499 Euro per copy.

However, we think a reduced upfront fee plus a monthly subscription cost is a better way for clients to purchase the KangarooEA.

Your purchase ensures you have access to free updates, Trade Alert emails and other goodies.

Monthly subscription ensures we keep working on giving you the best quality EA.

You can take confidence in this. The outlay to purchase the EA is far low and is backed by a 60 day refund policy. If you do not make a profit in those 60 days you can claim a refund.

We are so confident in our KangarooEA we will give you back your purchase price if you do not make money.

Not just that. Every month the EA needs to perform or you can cancel your subscription. No more fees to pay. Decide you need your capital for another reason? Close your account and cancel your subscription. You will not have paid big money for a system you no longer use.

For the latest news and updates, please visit our website: http://www.tulipfx.com. We also welcome questions posted there.

Warm regards and happy trading,

TulipFX

Ozzie & Dutch

