Making recommendations in economic practice

Ing. Róbert Magyar Supervised by prof. Ing. Ján Paralič, PhD.

ABSTRACT

Selection of the right decision strategy is a crucial factor to success on the foreign exchange market. We present an innovative approach how to support related decision steps by means of suitable data mining methods applied on collected data from the market. The motivation is a trading under the best conditions, i.e. with the highest chance to be successful. To meet this requirement, we designed and implemented a decision support system (DSS) for trading on the foreign exchange market which uses a possibility to speculate on this market and in line with extracted rules, economic news and outputs of the technical analysis recommend the future trading direction. The rules extracted from the suitably selected decision tree have been used to design a dynamic trading strategy which was experimentally verified as profitable.

MOTIVATION

In general, the main reason of working with the Forex data is prediction of their future development

Our work was motivated by two factors:

❑ to enable a better understanding of the behavior of the foreign exchange market

❑ possible usability of the designed system in real business

The right prediction represents a major advantage for the participants of the market trading. This fact motivated us to design our own strategy, whose main requirement was to determine which currency is globally strong or is globally .The result is a trading on the financial markets under the best conditions, i.e. with the highest chance to be successful.

Our set objectives:

❑ high accuracy

❑ consistency

❑ profitability

❑ user friendly

DATA AND METHODS

❑We used **eight data sources** for our analysis. The seven data sources contained data about combination of one of the 7 currencies (Euro, British pound, Australian dollar, New Zealand dollar, Canadian dollar, Swiss franc and Japanese yen) and the U.S. dollar. The last source contained the economic news.

❑**The initial data understanding** showed that each currency pair has concrete price boundaries that limit the trading price zone. This information can be used as a trading guide, because it is more risky to sell the currency near the minimum as the maximum. The same rule is relevant for buying, but in reverse relationship.

❑**processing phase:** We created twenty one new attributes, e.g. *strength/ weakness attribute to label a weakening or strengthening of the currency pair*

❑**modelling phase**: Represented by application of the selected algorithms on the processed data. We selected following methods CART and C5.0.

❑**Extraction phase: T**otal of 236 rules that can be categorized into four groups:

➢The rules describing the loss trades (80 rules).

➢ The rules describing the indecision of the U.S. dollar (55 rules).

➢ The rules describing the weakening of the U.S. dollar (59 rules).

➢ The rules describing the strengthening of the U.S. dollar (69 rules).

RESULTS

❑ Consistency and profitability

.In order to describe the overall performance of the proposed DSS it is necessary to divide the investigated time interval into smaller parts, specifically into fifteen weeks. This evaluation provides information about a consistency of the system performance and a distribution of the frequencies.

Profitable positions(%) in 15 weeks
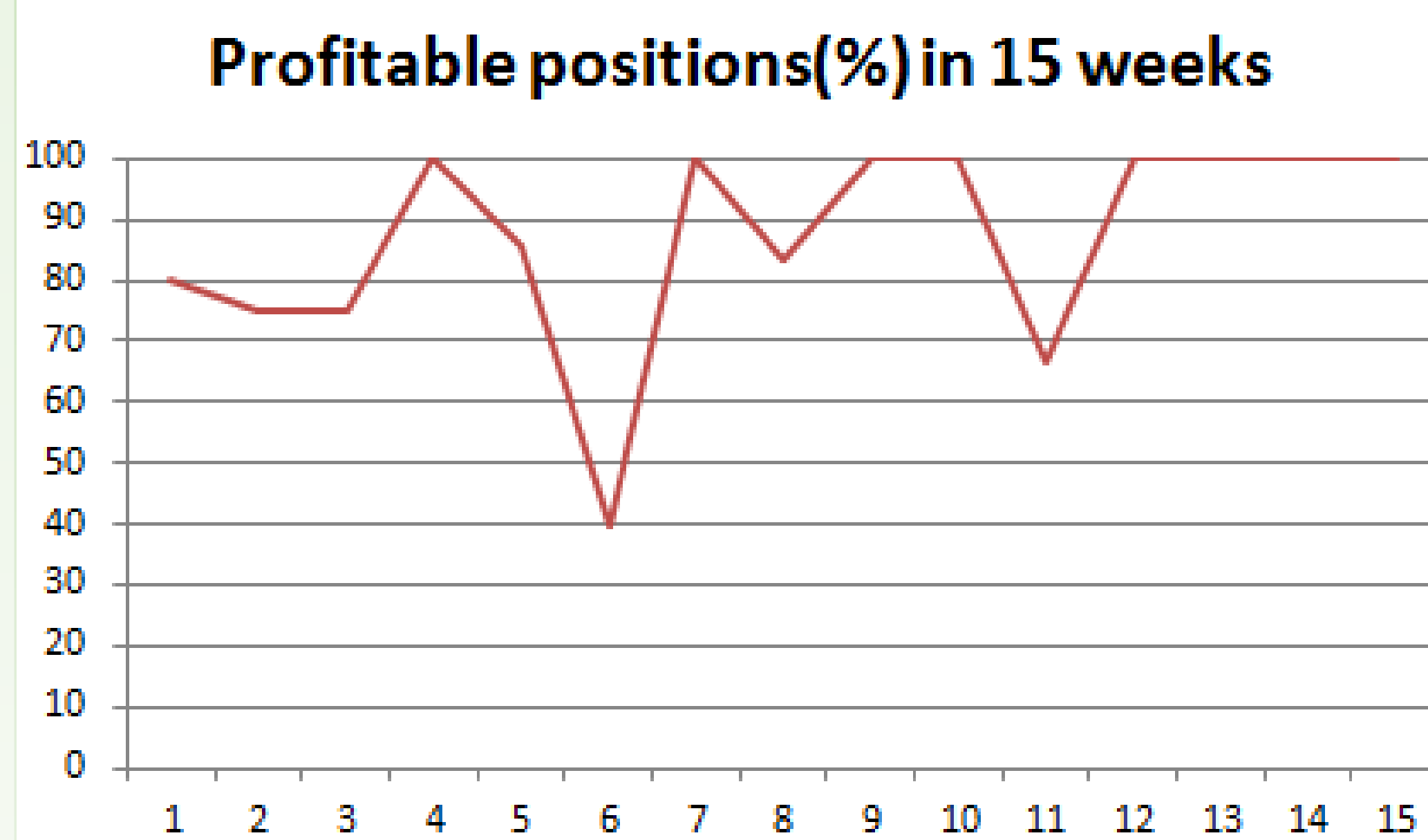
❑High accuracy and small drawdown: highest accuracy obtained was 88.73% with high consistency and sufficient frequency after modifying rules.

	Initial rules selection	Modiied rules selection
Gross profit (€)	896.61	572.95
Total net profit (€)	361.17	276.66
Number of positions	62	71
Maximal drawdown (%)	1.47	0.92
Profit position (%)	14.52	88.73
Successive wins	1	7
Successive loss	6	1
Risk (pip)	10	40
Expected profit (pip)	100	10

CONCLUSION

This approach is based on the decision rules extracted from the historical data representing various trades on the forex market. These rules take into account different aspects of the macro and micro analysis of the related currency. The rules represented a basis of the proposed decision support system which was necessary to optimize to ensure its long profitability through continuous rules' adaptation based on weights changes in accordance to their performance.

At the beginning we specified the hypothesis that in this market we can determine the direction of currency's movement based on the movement of the related currency pair containing this currency. The obtained results confirm that it is important to determine the global currency direction, i.e. to determine if the currency is globally strong or weak against other major currencies and this knowledge has a positive influence on the prediction of the currency development.

The created system can be used not only as recommender, but it is possible also to use it as an automatic trading system without human intervention.

PUBLICATION

Magyar, R., Paralič, J., Babič, F.: Decision Support System for Foreign Exchange Markets. In:19th International Conference on Business Information Systems - Workshops. Leipzig, Germany, 6-8 July 2016, Revised Papers. Abramowicz, W., Alt, R. Franczyk, B. (Eds.) Series: Lecture Notes in Business Information Processing, Vol. 263, Springer (in press)

CONTACT

jan.paralic@tuke.sk
robert.magyar07@gmail.com