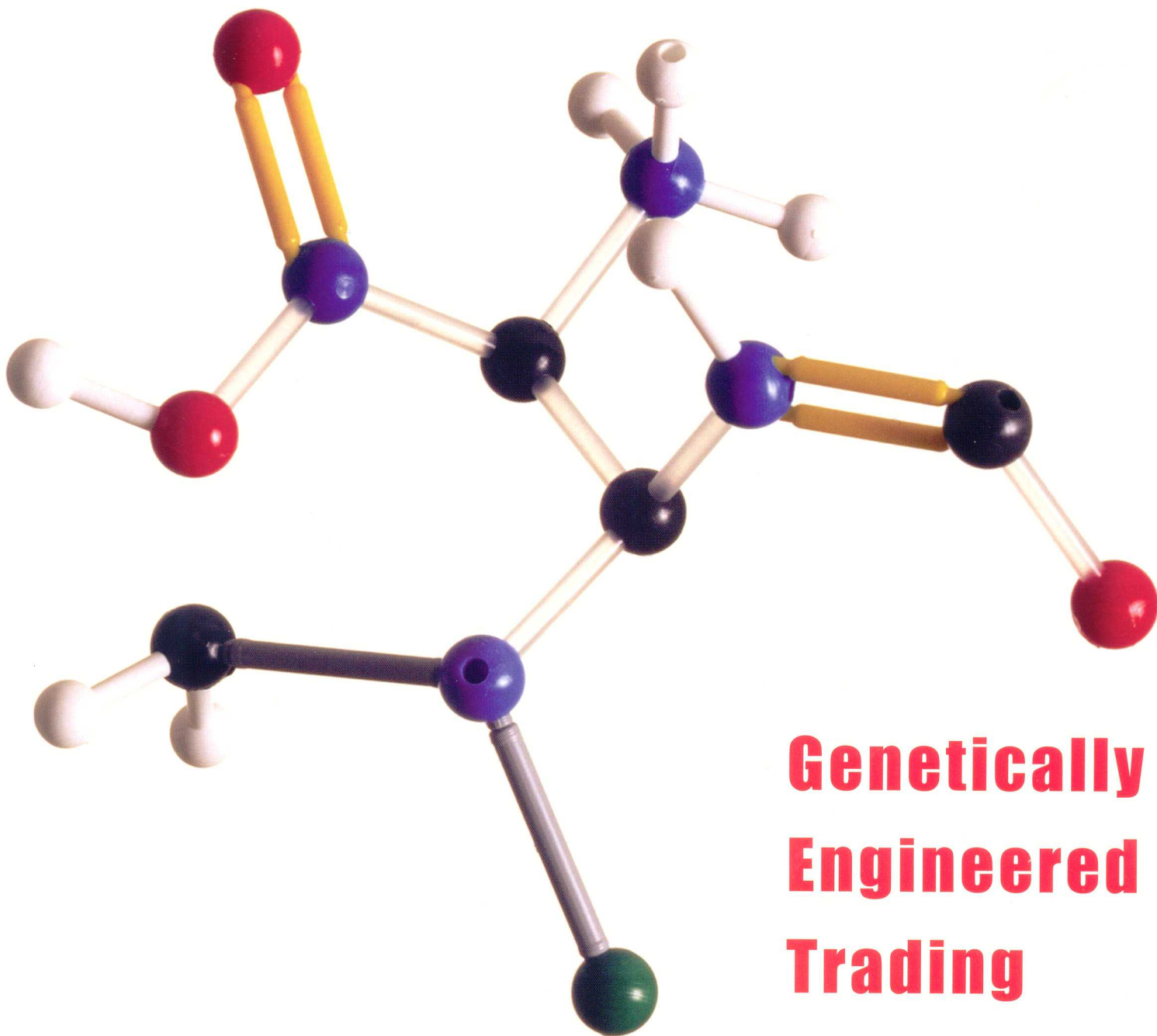


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# CENTRAL BANK INTERVENTIONS, CHARTISTS & THE FX MARKETS

by Frank Westerhoff and Cristian Wieland

Central banks frequently intervene in foreign exchange markets to reduce volatility or to correct misalignments. Such operations may be successful if they drive away destabilizing speculators. However, speculators do not simply vanish but may reappear on other foreign exchange markets. Using a model in which traders are able to switch between foreign exchange markets, we demonstrate that while a central bank indeed has several means at hand to stabilize a specific market, the affect on the other markets depends on how the interventions are implemented.

Interventions are motivated by the desire to check short-run trends or to correct long-term deviations from fundamental values (Neely 2001). Although central banks seem to believe in the power of intervention operations, both the theoretical and the empirical literature remains sceptical about its usefulness.

One noteworthy exception is Hung (1997) who argues that central bank interventions may be successful in the presence of trend-extrapolating chartists. First, a central bank may try to destroy technical trading signals by breaking a price trend. Second, a central bank may stimulate positive feedback trading by inducing a price trend in order to guide the exchange rate closer towards its fundamental value.

While chartists display bandwagon behaviour, fundamentalists expect the exchange rate to converge towards its fundamental value. However, the fundamentalists only perceive the fundamental value on average. When the exchange rate is equal to its fundamental value, half the fundamentalists view the exchange rate as undervalued and half as overvalued. Consequently, the net impact of fundamentalists is zero. But as the distortion in the market becomes larger, the influence of fundamentalists increases. Due to this nonlinear weighting scheme, the model generates interesting dynamics. Overall, this chartist-fundamentalist approach has proven to be quite successful in replicating the stylized facts of financial markets.

## The model

We develop a model in the spirit of this chartist-fundamentalist approach that allows us to investigate the effectiveness of central bank interventions. The model makes the following key assumptions:

- ◆ Fundamental analysis is time-consuming and requires intensive research. Fundamentalists are therefore regarded as experts who specialize in one market and thus remain in that market.
- ◆ Since chartists use rather flexible extrapolative trading rules, they may easily wander between markets.
- ◆ Fundamentalists bet on mean reversion, whereas the philosophy of technical analysis is to ride on a bubble (Murphy 1999).
- ◆ To limit the risk of being caught in a bursting bubble, chartists prefer markets which are not too distorted. To be precise, chartists trade forcibly in those markets which display price trends but which are not too misaligned.
- ◆ The behaviour of fundamentalists tends to stabilize markets whereas the activity of chartists is typically destabilizing. If a market attracts an increasing number of chartists, the exchange rate is likely to be driven away from fundamental values (and vice-versa).

Our model examines the consequences of interventions by a single central bank within a system of linked foreign exchange markets. In particular, we study the effectiveness of the two most common intervention strategies (Neely 2001). First, the "leaning against the wind" rule (LAW), which aims at reducing positive feedback pressure. For instance, if the price of a currency goes up, the central bank takes a short position. Second, the "targeting long-run fundamentals" rule

(TARGET), which means that the central bank always trades in the direction of the fundamental exchange rate. If the exchange rate is below (above) its fundamental value, the central bank submits buying (selling) orders.

The two strategies, LAW and TARGET, are in turn assessed under two different conditions, according to whether the interventions have been used to drive the rate closer to the fundamental value (unbiased interventions) or away from it (biased interventions). Thus, a total of four types of intervention are considered in the model, the results of which are summarised in Table 1.

## Unbiased interventions

LAW interventions which are unbiased (i.e. are not contrary to fundamental values) stabilize all markets. The reason is that this rule destroys or at least weakens the trading signals of chartists. Since the intervention market is less distorted, it draws in chartists from the other markets so that these markets also benefit from the intervention operations.

TARGET interventions also calm down all the markets because they effectively work like an increase in the power of fundamentalists. If more demand is based on mean reversion, exchange rates are indeed driven closer towards fundamentals. As in the previous case, more chartists enter the intervention market so that all markets profit from this policy.

## Biased interventions

Central banks sometimes attempt to shift the exchange rate away from fundamentals in order to boost the domestic economy. According to the model, both LAW and TARGET interventions successfully result in moving the exchange rate away from the fundamentals. Moreover, exchange rate fluctuations are completely eliminated in the intervention market. Since the intervention market is now very unattractive for the chartists,

		Volatility in Intervention Market	Distortion in Intervention Market	Volatility in Other Markets	Distortion in Other Markets
Unbiased Intervention	LAW	↓	↓	↓	↓
	TARGET	↔	↓	↓	↓
Biased Intervention	LAW	↓	↑	↑	↑
	TARGET	↓	↑	↑	↑

Table 1. Summary of simulation results

they wander to the other markets. Volatility therefore increases in these related markets.

**Conclusions**

We provide the first multi-foreign exchange market framework based on a chartist-fundamentalist approach to evaluate central bank operations. Simulation analysis reveals that central bank interventions may succeed in calming down markets. However, the market in which intervention takes place either attracts more or drives away some destabilizing chartists, depending on the nature of the intervention, which may lead to the destabilisation of other markets.

**References:**

Hung, J. (1997) *Intervention strategies and exchange rate volatility: A noise trading perspective*, *Journal of International Money and Finance*, 16, 779-793.

Murphy, J. (1999) *Technical Analysis of Financial Markets*, New York Institute of Finance, New York.

Neely, C. (2001) *The practice of central bank intervention: Looking under the hood*, *Federal Reserve Bank of St. Louis Review*, 83, 1-10.

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Further details of this study will be available in the paper "Spill-over dynamics of central bank interventions", Frank Westerhoff and Cristian Wieland, due for publication in the German Economic Review at the end of 2004.