

Manipulation in Political Stock Markets – Preconditions and Evidence

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Abstract

Political stock markets (PSM) are sometimes seen as substitutes for opinion polls. On the bases of a behavioral model, specific preconditions were drawn out under which manipulation in PSM can weaken this argument. Evidence for manipulation is reported from the data of two separate PSM during the Berlin 99 state elections.

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1. Introduction

Political stock markets (PSM) are futures exchanges on the outcome of an election. In most cases they are organized into vote share markets — with the price of a party-contract representing the expected vote share on election day. Compared to opinion polls PSM are a rather new instrument to predict the outcome of an election, nonetheless they yielded comparatively reliable results over the last decade. Since the presidential election in 1988, with the Iowa Presidential Market predicting the outcome by 0.2% error (Forsythe et al., 1992), more than 150 PSM¹ have been conducted in at least 14 countries (Forsythe et al., 1999, Berlemann and Schmidt, 2001).

We analyzed the impact of manipulation on political stock markets (PSM). The literature reports on the attempts of traders to improve their individual results (Bohm and Sonneggard 1999). Our concern is a different one: on the bases of a behavioral model we are going to show that there is an incentive for manipulation, provided a) that the media is covering PSM and b) that there is a situation in which a decisive vote illusion can be generated. This effect is analyzed on the bases of empirical data from two separate PSM that ran simultaneously during the Berlin-state elections in 1999. In our analysis we also have to consider a conflict between media coverage and prognosis quality. To allow for media coverage we present a second-best solution that attempts to reduce the PSM vulnerability to manipulation.

The paper is organized as follows. In the next section we discuss a behavioral model of manipulation in PSM. Section 3 gives an overview of the preconditions for manipulation in the Berlin state elections in 1999. In section 4 we present the empirical evidence for manipulation. Section 5 summarizes the results of the individual sections and provides the necessary conclusions.

¹ Figures were presented by Forrest Nelson at the „Experimental Electronic Markets“ Workshop in Berlin 2000.

2. Manipulation in political stock markets

The rationale of a PSM is sketched in Figure 1, left. The population is characterized by a latent and unobservable voting behavior. Market participants try to acquire information about the population’s voting behavior and form beliefs about it. On the bases of the conclusions reached, traders act on the market by means of trading contracts. The market prices of these contracts can be interpreted as an indicator of the voting behavior. In other words, the market aggregates the believes of the individual traders with regards to the election outcome. As long as the causal dependence between voting behavior and market prices works in one direction, the prognosis seems to be a decent approximation of the real voting behavior. Thus, any inaccuracies in the prognosis need to be attributed to incomplete information sampling or failures in the mental faculties of the traders.²

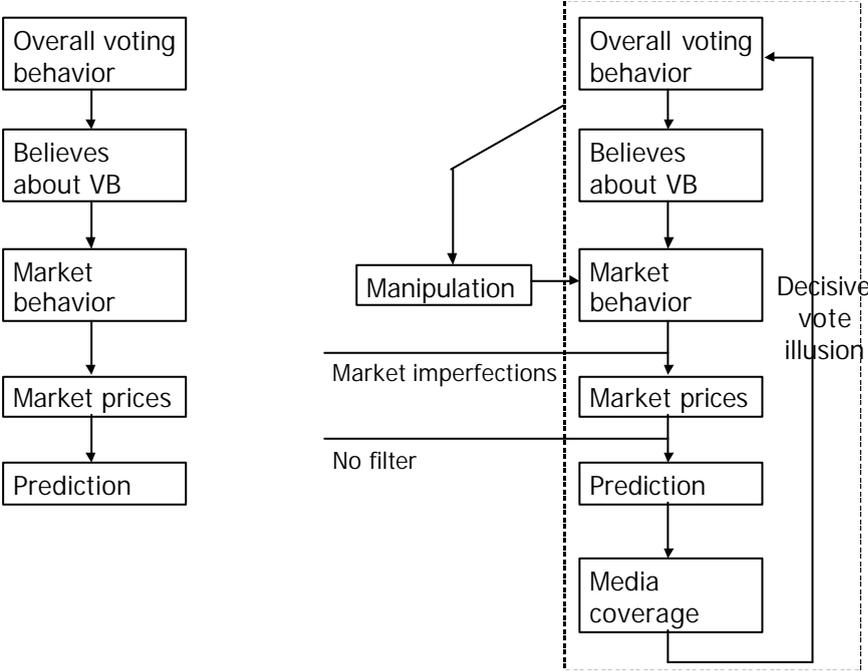


Figure1: Rationale of a political stock market with (right) and without (left) the inclusion of the mass

² The rather naïve explanation according to which a trader’s individual voting behavior is influenced by investment decisions can be excluded.

The situation changes substantially, when the transaction prices of the PSM are published via mass media and when voters have access to this information. Since the prognosis is communicated to many voters it might have an impact on the overall voting behavior of the population. One specific reason for voters to change their voting behavior is the impression of having a decisive vote. Even though the probability that a single vote might be decisive is infinitesimal small (see Owen and Grofman, 1984, Gelman et al., 1998), voters tendency to vote increases as the likelihood becomes greater that their vote may actually decide the final outcome (Barzel and Silberberg, 1973, p. 56). For example, if the weaker candidate in a presidential election promises to catch up, non-voters might be mobilized to vote for this candidate due to their illusion of having a decisive vote. In the model, the mass media together with the decisive vote illusion closes the circle of influence (Figure 1, right). In such a situation a party or its members might enter the market and attempt to manipulate the prices, hence the prognosis, and with that the voting behavior. Due to the imperfections of the PSM persistent manipulation of market prices is feasible. Since market participants have finite endowments³ an unreasonable trader's influence on the market prices can only partly be neutralized by one rational player.

3. Preconditions in the Berlin 99 state election

To predict the outcome of the Berlin 99 state election two independent PSM were conducted: the commercial project *Wahl\$street* of the daily newspapers *Tagesspiegel* and *Morgenpost*, and the *Wahlboerse* of the Humboldt University Berlin and the daily newspaper *Berliner Zeitung*. The *Wahlboerse* was open for 47 days and *Wahl\$street* for 48 days. In both PSM the maximum deposit was limited to 50 € per participant, and both used a continuous double auction with unit-portfolios as market institution (see Berg et al., 1997 for an introduction).

³ The maximum investment is usually limited due to legal restrictions.

The *Wahlboerse* attracted 200 participants whereas *Wahl\$street* registered 561 traders (Berlemann and Schmidt, 2001).

For the six weeks that preceded the election the three newspapers presented a daily column on the first page of the local Berlin pages that included last day's prices of the vote share-contracts. The following information was included: the market prices at 4 p.m. of the last day, the changes in last day's quotes, and *Wahlboerse* additionally published a short comment on last day's market activity. Altogether, the three newspapers were read by about 30% of all individuals in the Berlin area.⁴

In 1995 the *FDP* party did not exceed the minimum of 5% of the vote shares that are needed in order to be represented in parliament. Close to election day the *FDP* started to run a decisive vote campaign. The advertisements that were published in the newspaper ran as follows: "Sensation: opinion polls see *FDP* to re-enter parliament! Chance for Berlin: Infratest/Dimap one week ago: *FDP* at 3%. Infratest/Dimap this week: *FDP* has good chances to make the 5%-barrier. Your vote will not be lost!"

4. Evidence for manipulation

4.1 The email

Eleven days prior to the election day, on September 29, the headquarter of the *FDP* sent the following message to all members of the Berlin *FDP* that have access to email: "The *Tagesspiegel* is publishing a PSM on a daily basis, according to which the *FDP* is traded at 4.23% at the moment. You find the PSM on the internet at <http://berlin.wahlstreet.de>. Many citizens do not think of the PSM as a game, but consider it a result of opinion polls. Hence, it

⁴ This includes non-electives. Source: MA 99, AG.MA e.V., Media Micro-Census GmbH.

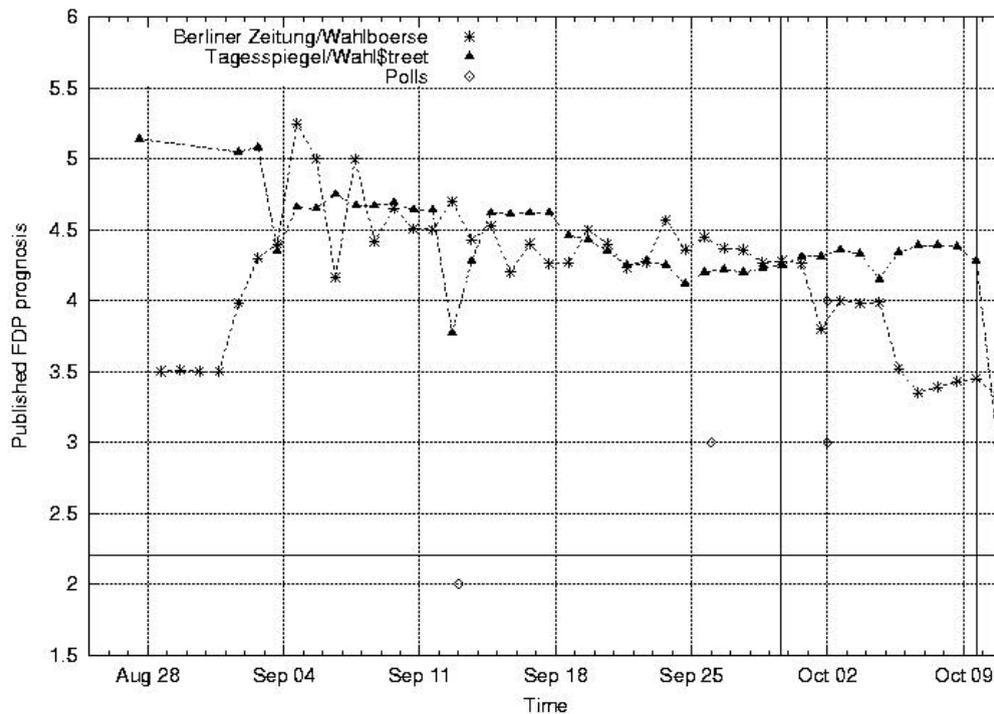


Figure 2: Daily PSM prognosis of FDP contracts in Berlin newspapers

is important that the price of the *FDP* will rise during the last days. As is the case with every exchange, the price level is a result of the demand. Please participate at the PSM and buy *FDP* contracts. Eventually, we are all convinced of the success of our party.”

4.2 Published prices

The daily *FDP* quotes of the two PSM published in the newspapers are shown in Figure 2. The four published polls conducted by 3 different institutes are also arranged according to their publication date. The horizontal line represents the final vote share of the *FDP* on election day (2.2%). One needs again to consider, that a representation in parliament requires at least a 5% share of votes. The left vertical line indicates the date of the email, whereas the right vertical line represents the final publication of prices prior to the election. The last prices given correspond to the final prognosis of the PSM which were published in the newspaper after the election.

We attribute the significantly higher *FDP* price variance of *Wahlboerse* ($F=1.816$; $p<0.030$) to the fact that a lower number of traders were involved. After the publication of the email, 12

days prior to the election day, the *FDP* prices started to increase at *Wahl\$street* and to decrease at *Wahlboerse*. When the newspaper publications stopped their propaganda influence the *FDP* price falls by 30% at *Wahl\$street*, whereas the *FDP* contract at *Wahlboerse* remained at about the same level. Our own interpretation of these facts is, that due to different means of payment new participants who registered at *Wahl\$street* were able to trade instantly while at *Wahlboerse* the procedure took about one week. This way it was possible for *FDP* members to influence prices at *Wahl\$street* immediately, whereas at *Wahlboerse* they were able to act only at the very end.

4.3 Trading behavior

In this paragraph we are going to examine the data of *Wahlboerse* for instances of manipulation.⁵ The number of trades was highest during the hour prior to the 4 p.m. prognosis and double the amount compared to the hour before and after this time range. On contract level this effect is pronounced for the large parties *CDU* and *SPD* and the small party *FDP*. We do not observe effects on the *FDP* contract after the publication of the email. We find that the daily number of trades and the trade volume in *FDP* rises after the email, yet this can also be observed when including all other contracts. Handrich and Roericht (2001) report that party sympathizer at *Wahlboerse*, besides the group of *FDP* sympathizer, did not pay higher prices for their house stock.⁶ To explore whether this is an indicator for manipulative attempts we define a strategy for a manipulative trader, who functions as *FDP* follower by collecting only this contract on the market and not selling them until the final prognosis is published. Out of the 200 participants we identified 5 traders that matched this criterion. There was only one trader in this group who registered after the email of the *FDP*, namely on September 30th,

⁵ We were not able to receive the complete data of the *Wahl\$street* market from the organizer. A regular analysis of the data of the *Wahlboerse* can be found in Handrich and Roericht (2001).

⁶ Party sympathy of participants was obtained by a questionnaire.

and who participated only during the last three trading days demonstrating a price taking behavior.

Finally we are concerned with the amount of manipulators that were needed to keep the *FDP* price at 5% at *Wahlboerse*. A small party buyer at 5% has to be counterbalanced by about 20 sellers. Therefore to keep the price at the 5% level, it would take 6 manipulative traders with the maximum endowment of 50 € in order to counterbalance 200 participants with an average endowment of 29 €. When buying at an average price of 5% the hypothetical losses of the additional traders would rise up to 127.60 €

5. Conclusions

From the data of the Berlin 99 election we conclude that PSM are vulnerable to manipulation. At *Wahlboerse* we can observe manipulative attempts related to the daily publication. The participation delay due to the means of payment might be responsible for only minor *FDP* manipulation attempts. Therefore, the differences in *FDP* prices that were quoted in the two PSM after the publication of the email might be attributed to manipulation. For comparatively small contracts in particular manipulation seems to be very effective. The vulnerability to manipulation does not exclusively apply to elections with the 5% rule, but might be detected at a presidential election with three candidates also. To avoid manipulative effects one simple solution might be the prevention of media coverage. Lately, PSM seem to have become a subject of interest to the media rather than to the scientific community. Consequently, future PSM are more likely to be covered by the media. Therefore, we propose a second-best solution that might compensate for manipulation attempts: (1) the reduction of market imperfections and (2) the filtering of the prognosis. For electoral systems with entrance barriers it might be an option to leave small parties out and assign their votes to the “Rest of Field” contract. An additional winner-takes-it-all market might serve as another alternative,

especially with regards to the decision whether small parties should make it to the parliament or not. Last and not least, the *FDP* of all German parties claims to have the highest economic competence. Considering the markets we found some evidence that they might be true.

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